Appendix F:

Congestion Management Process (CMP)

Introduction

The Greater Madison MPO (Metropolitan Planning Organization; **"the MPO"**) is the policy body responsible for cooperative, comprehensive regional transportation planning and decision making for the Madison Metropolitan Planning Area as designated by the Governor of the State of Wisconsin under Federal law and regulations. The goal of the MPO planning process is to build regional agreement on transportation investments that balance roadway, public transit, bicycle, pedestrian, and other transportation needs and support regional land use, economic, and environmental goals and plans.

Purpose

As an MPO for a Metropolitan Planning Area with a population over 200,000 (called a transportation management area or *TMA*), the MPO is required to maintain and integrate a congestion management process (CMP) as part of its continuing, comprehensive, and cooperative (3-C) transportation planning process. A CMP is a data-driven, systematic process that provides information on transportation system performance and provides priorities and alternatives strategies to alleviate congestion and enhance the mobility of people and goods. Federal regulations require that "the transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system , based on a cooperatively developed and implemented metropolitan-wide strategy, or new and existing transportation facilities... through the use of travel demand reduction and operational management strategies."[1]

For the past two decades, Dane County has experienced rapid population and employment growth, and with it an increase in traffic. COVID-19 temporarily reduced traffic volumes, and particularly in the central Madison area volumes are still below pre-COVID levels. The pandemic is likely to have some long-lasting impacts on travel patterns with likely continued high levels of teleworking. These changes need to be monitored and factored into congestion management decisions. However, continued population and employment growth will place demands on the transportation system, making it critical to find ways to efficiently moving people and goods through the region.

Major capacity expansion projects, such as adding additional lanes, are often not feasible or desirable because of the cost and negative impacts to the environment, residents' quality of life, and other roadway users; prioritizing strategies such as travel demand management and actively managing the transportation system to improve traffic operations will be crucial to optimizing the ability of the transportation system to meet regional needs. This document sets forth the established process that the Greater Madison MPO will use to monitor and evaluate congestion, and identify and implement strategies to reduce congestion and increase system reliability in the greater Madison region.

Federal Requirements

The Federal regulations in 23 CFR Part 450 Section 320 provides a thoughtful framework for addressing the undesirable impacts of congestion on the mobility of people and goods, while providing flexibility to the MPO to decide how congestion management fits among its other priorities for resource allocation. The approach must address all modes of travel and their interrelationships as well as the relationship between land use and transportation. Strategies that manage demand, reduce single occupant vehicle (SOV) travel, and improve transportation system management and operations should be considered first. Where the addition of general purpose travel lanes or other major capacity projects (e.g., adding interchange(s)) are determined to be an appropriate congestion management strategy, explicit consideration is to be given to the incorporation of appropriate features into the project to facilitate future demand management strategies and operational improvements that will maintain the functional integrity and safety of those lanes.

1 23. CFR 450.320(a)

It is noted that a CMP does not require an MPO to change its process for identifying priority projects or the TIP project development selection process. CMP's do not require that specific Federal performance measures or targets be adopted. Rather, performance goals and strategies are supposed to reflect local policies and conditions and transportation system goals. CMP's do not require MPOs to set aside a portion of their project funds for congestion mitigation other than what they normally identify as part of their TIP process. A CMP also does not require MPO member agencies to change their internal processes.

The Federal Highway Administration's (FHWA) Congestion Management Process guidebook (2011) identifies the following 8-Step Process for carrying out the congestion management process, which serves as the foundation for the development of the rest of this report:

- Develop Regional Objectives For Congestion Management
- Defining the CMP Network
- Develop Multimodal Performance Measures
- Collect Data/Monitor System Performance
- Analyze Congestion Problems and Needs
- Identify and Assess Strategies
- Program and Implement Strategies
- Evaluate Strategy Effectiveness

Integration into the Regional Plan

Once the Congestion Management Process is adopted, it will be directly linked to the MPO's long-range Regional Transportation Plan (RTP). This entire approach fits well with the national focus on outcome-oriented, performance based planning. As noted throughout, congestion mitigation is amenable to the application of performance measurement in a way that requires the MPO and its member agencies to shift their attention from agency-oriented outputs to user-oriented outcomes. The CMP can form the basis for looking at other elements of transportation investment in the same way.

Defining the CMP Network

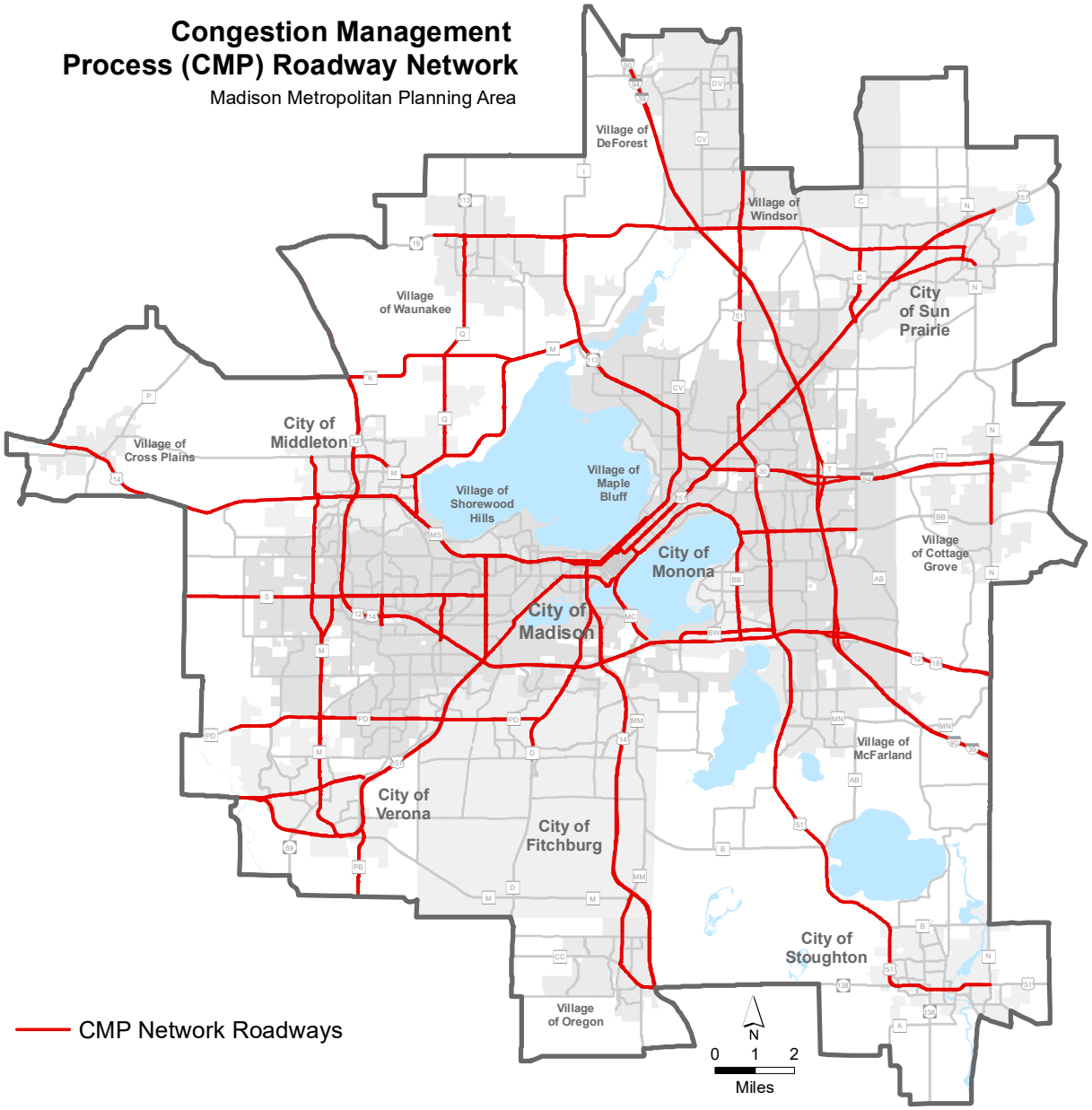
Functional classification is the process by which highways and streets are grouped into classes according to the service they provide or are intended to provide, ranging from a high degree of travel mobility to a high degree of land access function. The regional roadway network consists of principal arterials, minor arterials and collectors. For the purpose of the CMP, only principal and select minor arterials will be monitored (Map F-a) , however the congestion mitigation strategies and principles identified in the process apply to all arterial and collector roadways within the MPO planning area boundary.

The CMP Network will be re-evaluated every 5 years concurrent with the development of the Regional Transportation Plan for additions or deletions from the system as necessary.

Congestion Management Objectives

The Congestion Management Process for the Greater Madison region is designed to support the following objectives:

- Increase system reliability for all modes to provide for the safe and efficient movement of people and goods on the region's arterial roadway network, reducing excessive delays where possible, prioritizing operational improvements of existing infrastructure and existing bottlenecks over new roadway capacity expansion
- Prioritize alternatives to single-occupancy vehicle (SOV) travel to reduce roadway demand, increase equity, and minimize environmental impacts including greenhouse gas emissions that contribute to climate change
- Support the Capital Area Regional Planning Commission's Regional Development Framework goals, objectives, and strategies.



Map F-a Congestion Management Process (CMP) Roadway Network

Roadway capacity enhancements will generally be considered only after implementing both travel demand management (TDM) and transportation system management (TSM) strategies and not achieving anticipated or desired congestion reduction. The MPO recognizes that in certain circumstances lower levels of service may have to be tolerated due to right of way constraints and the negative impacts of expanded roadway capacity such as impact to other roadway users, removal of parking, and land use development impacts.

Defining Congestion and Reliability

Congestion is caused when the demand for a transportation facility approaches or exceeds the capacity of the roadway, resulting in slower travel speeds, longer trip lengths, vehicle queuing, and traffic diversions. There are two types of congestion: reoccurring and non-reoccurring. Reoccurring congestion is generally predictable, during peak travel periods, where the number of vehicles using the roadway approaches or exceeds the capacity. Non-reoccurring congestion is caused by temporary disruptions that take away part of the roadway from use or significantly slow traffic, such as a disabled vehicle or poor weather. Reliability is the variability in travel times that can occur from

one day to the next. Drivers generally allow extra time to allow for routine delays and slower peak-period travel delays, whereas unanticipated variability can be a source of frustration as it can make a commuter late for work, cause buses to run late, cause truckers to be charged for late deliveries, and can disrupt the just-in-time delivery process.

The following are seven commonly accepted sources of congestion that can lead to travel time reliability issues. Capacity limitations of roadways (physical bottlenecks) only account for, on average, about 40% of the delay.[2]

- Physical Bottlenecks (40%)- Capacity limitations due to design of roadway
- Traffic Incidents (25%)- Crashes that impede travel lanes
- Work Zones (10%)- Construction activities that result in temporary physical changes, such as lane closures, to the roadway
- Weather (15%)- Snow, rain, or other events that change driver behavior and impact traffic flow
- Traffic Control Devices (5%)- Poorly timed traffic signals, rail crossings, etc.
- Special Events (5%)- Sporting events, concerts, etc. that cause surges in traffic demand
- Fluctuations in Normal Traffic Days- Day-to-day variations that lead to high-demand days

2 https://ops.fhwa.dot.gov/congestion_report/executive_summary.htm

CMP Performance Measures and Targets

In order to better identify system operating condition deficiencies it is important to identify CMP performance measures that can be quantified based on reliable existing and new data sources that are relatable to the existing measures but that are also understandable to the traveling public. It is important to understand that targets do not in themselves establish priorities to guide investment in the transportation system. The MPO planning and TIP development processes will accomplish priority setting in terms of how congestion relief fits with safety, system preservation, other modal improvement needs, and livability/quality of life considerations in the Madison area. The CMP targets guide choices within the congestion goal area. There are no Federal requirements for specific performance measure targets, which are supposed to reflect local conditions and goals. Targets can be adjusted over time, usually linked to updates of the long-range Regional Transportation Plan and CMP. Not all measures will have targets; some measures are included for more detailed analysis purposes only.

The Moving Ahead For Progress in the 21st Century Act (MAP-21), the transportation reauthorization bill enacted in 2012, created a framework for a national performance management approach to transportation decision-making on investments with Federal highway and transit funding. Subsequent reauthorization bills have continued this framework. The federal performance management framework includes measures for highway safety, system performance, freight and congestion reliability, and transit asset management. The MPO has adopted targets for each of the federal performance measures and tracks them in the RTP, TIP, and an annual report. TMAs that are non-attainment for air quality are also required to track congestion mitigation and air-quality performance measures, however as an attainment area the Greater Madison MPO is exempt from this requirement. The federal performance measures for National Highway System (NHS) system reliability and freight reliability are included in the following CMP performance measures and are denoted with an asterisk (*).

CMP Performance Measures

ROADWAY MEASURES

RECURRING CONGESTION

Vehicle Miles Travelled: The sum of the number of miles traveled by each vehicle within Dane County in a one-year period.

Level of Service: This standard performance measure compares actual or forecasted traffic volume on a roadway to its capacity and assigns the roadway an associated level of service (LOS) based on an A-F scale. LOS can be directly related to volume-to-capacity ratios for roadway segments. According to the Highway Capacity Manual (HCM), v/c is the ratio of demand flow rate to capacity for a traffic facility. A v/c ratio greater than 1.0 has been described as "not enough road for the traffic". For the CMP process, the MPO uses planning level daily traffic volume capacities developed by WIsDOT using the HCM.

Congestion Duration: The length of traffic congestion periods can vary depending on travel demand patterns and facility capacity. Baseline traffic counts used in establishing volume-to-capacity ratios can also be used based on the distribution of hourly traffic flows on a typical day to define if congestion involves a single peak hour or more than hour during the peak period.

Truck Volumes: This measure monitors the percentage of truck traffic that makes up roadway volumes. Corridors experiencing congestion or that are not reliable may create bottlenecks for freight movement if there is a large number or percentage of truck traffic on them.

Non-Recurring Congestion

Crash Frequency: While crashes are not the only type of incident that results in lane closures, thereby creating non-recurring delay, they do constitute a major cause.

System Reliability

System reliability reflects the quality and variability of travel time. A reliable transportation system provides users with a consistent range of predictable travel times.

Travel Time Index: The Travel Time Index is calculated by dividing the 80th percentile travel time from the morning peak (7-9 AM) or evening peak (4-6 PM) by the free flow travel time. A travel time index close to 1.0 indicates little change between the typical peak period and free flow travel times; the higher the index value, the greater difference and level of unpredictability in trip times. For example, a morning peak Travel Time Index of 1.25 means that on average it will take you 25% longer to travel during the morning rush hour than during uncongested free flow conditions. Free flow speeds are defined as the average travel times from 12 am- 6 am.

Vehicle Hours of Delay: This measure monitors the extra time spent driving due to congestion as compared to time with free-flowing traffic.

Level of Travel Time Reliability: Percent of the Interstate System that is Reliable*, Percent of the non-Interstate NHS that is Reliable*: These measures are similar to the travel time reliability measure above, however the federal measure defines the morning peak period as 6-10 AM and evening peak as 4-8 PM. Level of Travel Time Reliability (LOTTR) is defined as the ratio of the 80th percentile travel time of a reporting segment to a "normal" travel time (50th percentile), using data from FHWA's free National Performance Management Research Data Set (NPMRDS) or equivalent. Data are collected in 15-minute segments during all time periods other than 8 p.m.-6 a.m. local time. The measures are the percent of person-miles traveled on the relevant NHS roadway segments that are reliable. [23 CFR 490.511]

Truck Travel Time Reliability*: The performance measure related to freight movement on the Interstate uses truck speed and travel time reliability data to calculate the Truck Travel Time Reliability Index for the Interstate System. This measure can be used to identify and quantify major freight truck bottlenecks along Interstate highways. Freight bottleneck locations routinely experience recurring congestion and backups because traffic volumes exceed highway capacity.

TRANSIT MEASURES

Transit Ridership: The annual number of transit boardings.

Transit On-Time Performance: Transit passengers have the expectation that their bus will arrive at or near the scheduled time. Transit operators construct schedules so that time points can be met under typical conditions. Because buses in Madison do not travel on exclusive busways or in most cases on reserved lanes, they are impacted by arterial street congestion. While the transit operator may adjust schedules to reflect congested conditions, this does not address the root cause of the problem (e.g., a problem turning movement at an intersection). As such, poor on-time performance that is attributable to arterial street congestion is a measure of transit congestion.

Transit Accessibility: This measure monitors the level of accessibility of the transit system by the number and percent of people residing, and jobs located, within walking distance of public transit service or a certain level of transit service (e.g., every 15 or 30 minutes all day).

BICYCLE AND PEDESTRIAN MEASURES

Pedestrian Activity by Intersection[3]: The relative volume of pedestrian activity at arterial and collector roadway intersections.

Bicycle Activity Index[3]: The relative volume of bicycle activity on segments of the regional bikeway network.

Low-Stress Bike Network: Bicycle level of traffic stress is an objective, data-driven approach to evaluating traffic-related stress on bicycle routes based on roadway design, traffic volumes, traffic speeds, and other factors. The low-stress bicycle network is all of the routes, including streets and off-street paths, on which an average adult would be expected to feel comfortable riding a bicycle. For purposes of this performance measure, the network is the identified regional bikeway system. The measure is the percent is the system that is low-stress and percent that is high-stress (i.e., would be uncomfortable and perceived as unsafe by most all bicyclists).

LAND USE MEASURES

The following land use measures are taken from the Capital Area Regional Planning Commission's (CARPC) Regional Development Framework (RDF).

New Development Built In Centers And Along Multimodal Transportation Corridors: The RDF identifies existing and planned new mixed-use centers, categorized as metro, regional, and community, and multimodal corridors that connect some of them. It recommends that about 50% of all future household growth be in these centers and corridors. Centers are "vibrant places where people can live, work, shop, be entertained, and meet and connect with others. Corridors connect centers. They "provide a variety ways to travel, and also in many cases offer the same combinations of activities found in centers."

New Development Built in Already Developed Areas: Another key strategy of the RDF is to prioritize growth in already developed areas. The growth scenario upon which the RTP is based assumes that one of every four new jobs and four out of every ten households will be located in already developed areas. Prioritizing growth in these areas increases multimodal access to jobs and services and reduces auto dependence, supporting congestion management priorities.

ADDITIONAL MEASURES

The above measures represent data that is currently available to the MPO. Desired measures to add in the future as data becomes available include: roadway segment crash rates, incident response (on the Beltline, Interstate, and perhaps other principal arterials), and transit level of service (demand/capacity ratio). It is expected that as more connected and autonomous vehicles (C/AVS) come online a whole host of new congestion data will become available.

The MPO will include additional measures from outside reports as available, such as the Inrix Traffic Scorecard.

3 It is anticipated that pedestrian and bicycle volume estimate data will be available later this year via the MPO's subscription to StreetLight Data. Once that is available, the MPO will use volume (network or intersection) and/or trip data rather than the index data for the performance measures.

Performance Targets

The MPO has developed targets for the federal performance measures developed by FHWA and FTA, per Federal requirements. These performance measures will be monitored over time to determine progress in achieving or making progress in achieving the established targets. The federal performance measures directly or indirectly related to congestion management will be monitored to determine the effectiveness of implementation of congestion management measures. The MPO has also developed targets for many of the additional MPO CMP measures, while other performance measures will only be tracked for informational purposes. Figure F-a identifies all the CMP performance measures, their target/goals as applicable, when and where they will be tracked, and the data sources used to measure them.

Measure		Target/Goal	Where/When Tracked*	Data Source
Vehicle Miles Traveled/Per Capita		Reduce Per Capita VMT	PMR, RTP, TIP	WisDOT, StreetLight Data
Level of Service (LOS)	Freeway- Interstate	D	RTP, Project Development	Travel Model, Operations Analysis
	Freeway- Other	Mid E		
	Arterial	Mid E		
	Intersection	Mid E	Project Development	Operations Analysis/Modeling
Congestion Duration		Informational	RTP, Project Development	StreetLight Data
Truck Volumes		Informational	RTP	StreetLight Data
Travel Time Index		TTI should be less than 1.5	PMR, RTP, TIP	StreetLight Data
Vehicle Hours of Delay		Maintain/Reduce	PMR, RTP, TIP	WisDOT, StreetLight Data
Reliability	Person-miles traveled on the Interstate that are reliable*	Greater than 90%	PMR, TIP, RTP	UW TOPS Lab/NPMRDS
	Person-miles traveled on the non-Interstate NHS that are reliable	Greater than 86%		
Freight truck travel time reliability index*		Less than 1.6	PMR, TIP, RTP	UW TOPS Lab/NPMRDS
Safety	Intersection Crash Frequency	Reduce	Intersection Network Study (every 2/3 years)	WisTransPortal,
	Intersection Crash Rate	Reduce		
	Crash Frequency*	Reduce fatal and injury crashes by 2% annually	PMR, RTP	WisTransPortal
	Crash Rate*	Reduce fatal and injury crash rate by 2% annually	PMR, RTP; Project Development	WisTransPortal, MetaManager
Transit On-Time Performance		Maintain/Increase % of Buses On-Time	Annually: PMR, TIP; RTP Every 5 years: TDP (routes)	Metro/MPO
Transit Ridership		Increase	Annual PMR; RTP;TDP Every 5 Years: TDP	Metro
Transit Access to Employment		Increase	In conjunction with major service change: PMR, RTP, TDP	MPO

Figure F-a CMP Perforamance Measures and Targets

Measure	Target/Goal	Where/When Tracked*	Data Source
Pedestrian Activity by Intersection	Informational	RTP; Project Development	StreetLight Data
Bicycle Activity Index	Informational	PMR, RTP, Bicycle Plan	StreetLight Data
Low-Stress Bicycle Network	Increase in % miles of low-stress facilities	PMR, RTP, Bicycle Plan	MPO
	Decrease in % miles of high-stress network		
New Development Built In Centers And Along Transportation Corridors	Informational	PMR, RTP	CARPC
New Development Built in Already Developed Areas	Informational	PMR, RTP	CARPC

* RTP: Regional Transportation Plan, updated every 5 years; PMR: Performance Measures Report, released annually (although not all measures are calculated and reported annually); TIP: Transportation Improvement Program, released annually; TDP: Transit Development Plan, updated generally every 5 years.

Figure F-a CMP Perforamance Measures and Targets

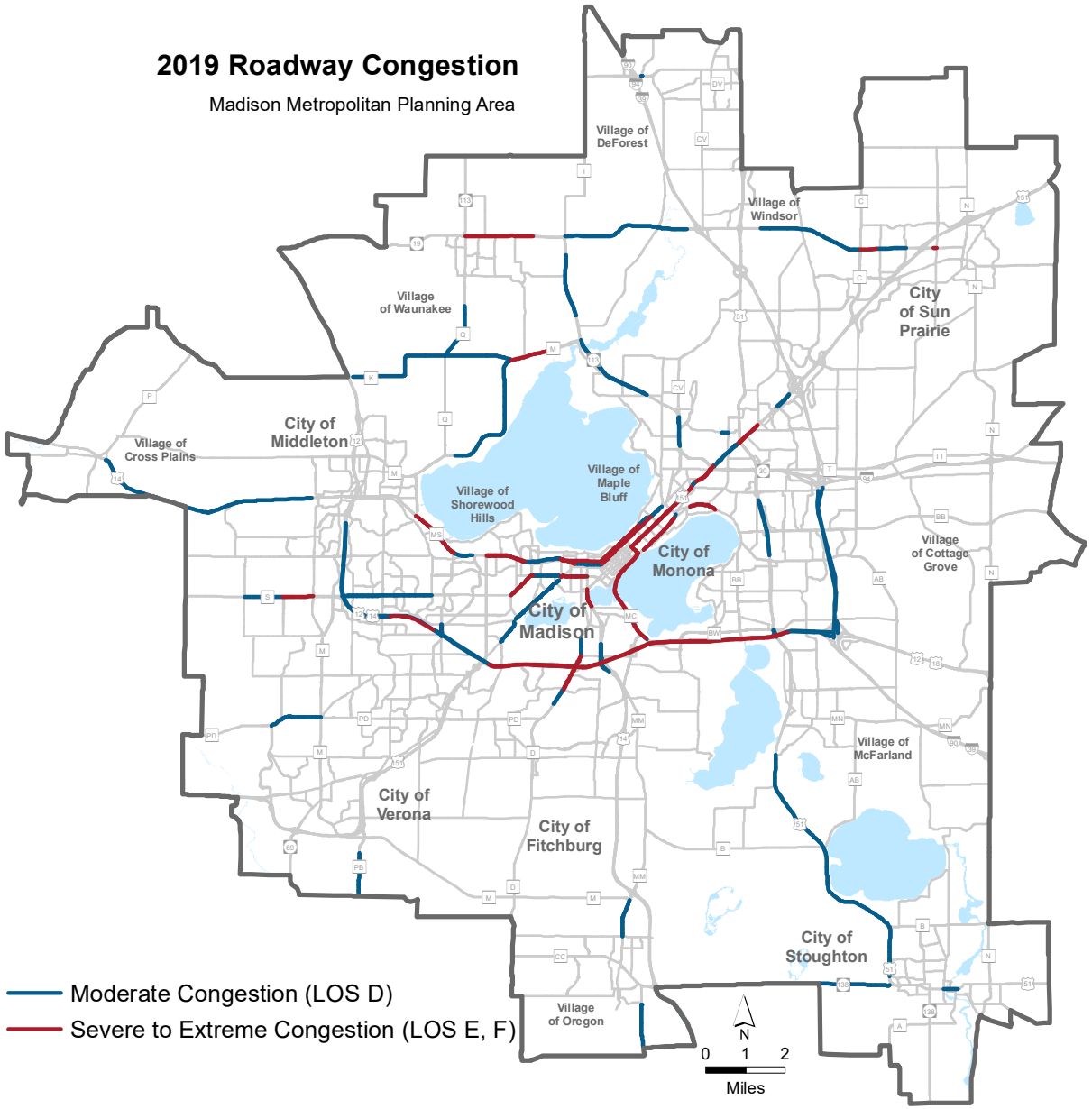
Analyzing Congestion Problems and Needs

The process for developing, evaluating, and recommending actions to address existing and estimated future traffic congestion is explicitly considered in the preparation of the regional transportation plan. The RTP undergoes a major update approximately every 10 years, with an interim update every 5 years. The Dane County Travel Demand Model is a key tool used to inform the plan development process. The Travel Demand Model is used to forecast future travel based on forecast growth – done for this plan update in conjunction with development of CARPC's Regional Development Framework land use plan – and assumed changes to the roadway, transit, and bikeway systems.

Forecast growth was based on a land use development scenario that prioritizes growth in infill/redevelopment areas and centers and multimodal corridors and with generally higher densities. In addition, ambitious planned regional transit and bikeway network plans were assumed in the travel model, along with planned collector roadways to help efficiently distribute traffic and roadway capacity projects already programmed in the next five years. This scenario was modeled first to determine its ability to accommodate expected traffic prior to consideration of any new roadway capacity expansion projects. Modeling results were reviewed with both the MPO Technical Advisory Committee and MPO Policy Board.

Between 2010 and 2019, vehicle miles of travel (VMT) increased on average just shy of 1% annually, largely due to population and employment growth in the region. VMT decreased by 15% in 2020 due to the Covid-19 pandemic, however traffic volumes have largely rebounded to pre-pandemic levels.

Currently roadway congestion is common during the morning (7am-9am) and evening (4pm-6pm) peak periods on some heavily traveled regional roadways, particularly on radial arterials leading to the downtown/campus area and in the Beltline and CTH M/K corridors due to Madison's unique geography with lakes and isthmus, which funnels traffic onto a small number of corridors. Map F-b shows the 2019 generalized traffic congestion on the arterial roadway system using planning level daily traffic volume capacities in the regional travel model, highlighting congested CMP network segments. These include the Beltline, a section of CTH M north of Lake Mendota, John Nolen Drive, East Washington Avenue, Williamson St/Atwood Ave corridor, Johnson St/Gorham St corridor, and University Avenue.



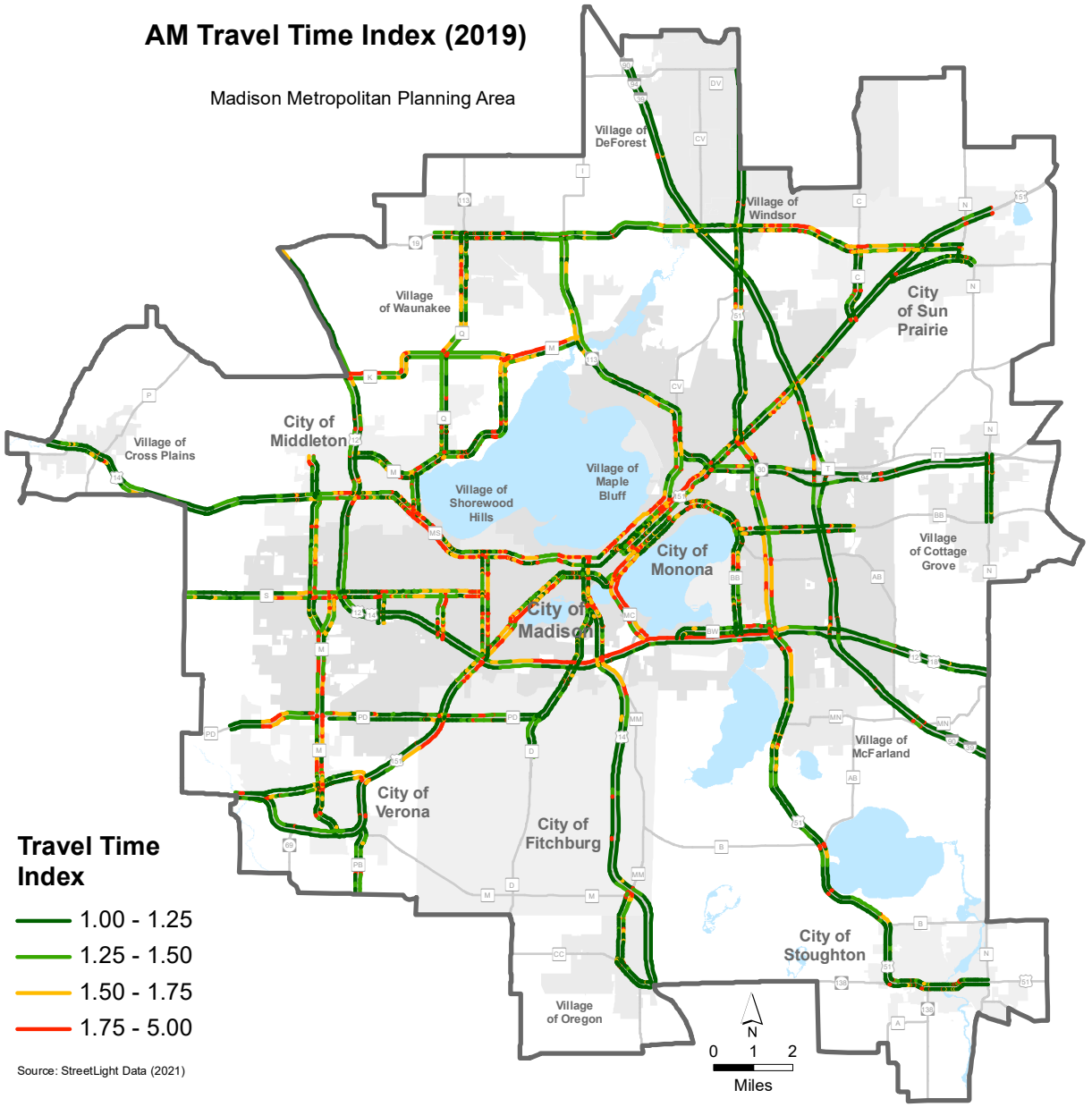
Map F-b 2019 Roadway Congestion

The Beltline is the only centrally located roadway that directly connects the east and west sides of the metro area. According to WisDOT's Beltline study, most vehicles that use the Beltline exit after passing only a few interchanges. WisDOT's Flex Lane project is scheduled to be operational in 2022. It will address the current demand by providing additional capacity on the Beltline during peak periods and other times with non-recurring congestion. The congested segment of CTH M is programmed in 2023-'24 to be expanded from 2 lanes to a divided 4-lane cross-section with intersection improvements, including a major improvement to the CTH K intersection. Additional major state highway projects potentially involving capacity expansion are expected to come out of the current major corridor studies of the Beltline (USH 12/14/18/151) (USH 14 to CTH N), Stoughton Road/USH 51 (STH 19 to Beltline), and the Interstate (39/90/94) (Beltline to Portage). The East-West Bus Rapid Transit (BRT) project is programmed for construction in 2023-'24 with service starting in fall 2024. It will connect the East Towne and West Towne areas through the isthmus and will help ease congestion through this busy corridor. A North-South BRT project is also planned following completion of the East-West route. Planning for that project will begin in 2023 with construction starting in the 2026-'28 timeframe. There are no identified physical freight bottlenecks in the region, however congestion on regional roadways such as the

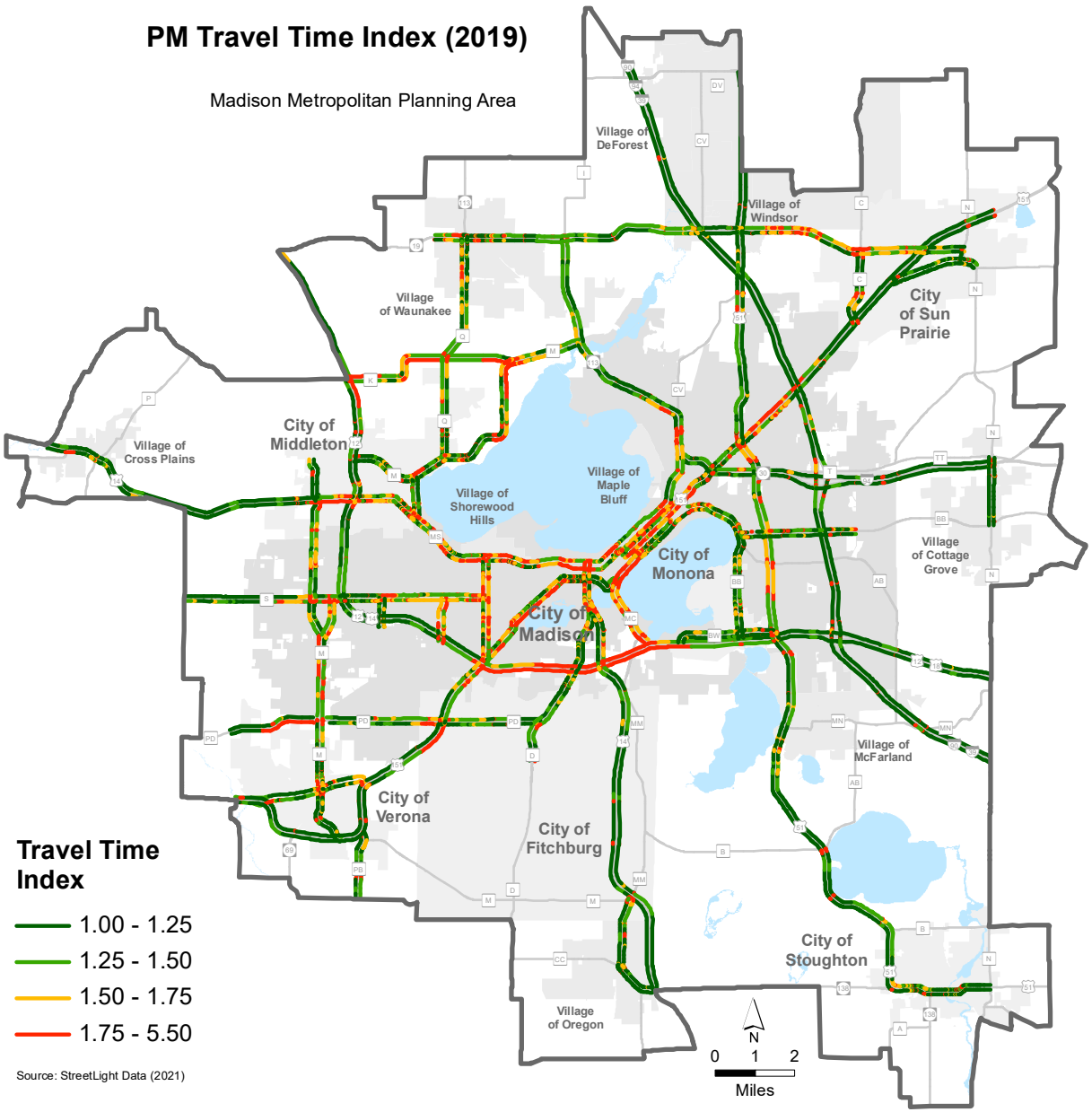
Beltline can impact the reliability of freight movement during peak periods.

Maps F-c and F-d shows the AM and PM peak period travel time index (2019) of the CMP network. The PM peak is slightly less reliable than the AM peak period. It is anticipated that the Beltline Flex Lane project mentioned previously will greatly improve the peak period travel time reliability of the Beltline. Throughout the rest of the CMP network it can be seen that the majority of the delay that impacts travel time reliability occurs at signalized intersections, such CTH K and USH 12 intersection and the Pflaum, Buckeye, and East Washington Avenue intersections with Stoughton Road. Travel time reliability can be improved through transportation system management and operations strategies, as identified in the next section.

Map F-e shows the projected traffic volume increases on the regional roadway system between 2016 (travel model base year) and 2050 under the initial modeling scenario 1 that assumes completion of all programmed capacity projects, planned collector streets, and the transit and bicycle network plans. Map F-f shows the projected generalized levels of congestion in 2050 under this scenario. Based on the results of this scenario, local roadway capacity project needs were then identified to address corridors projected to be near or over capacity, but only those deemed consistent with plan goals. State



Map F-c AM Travel Time Index

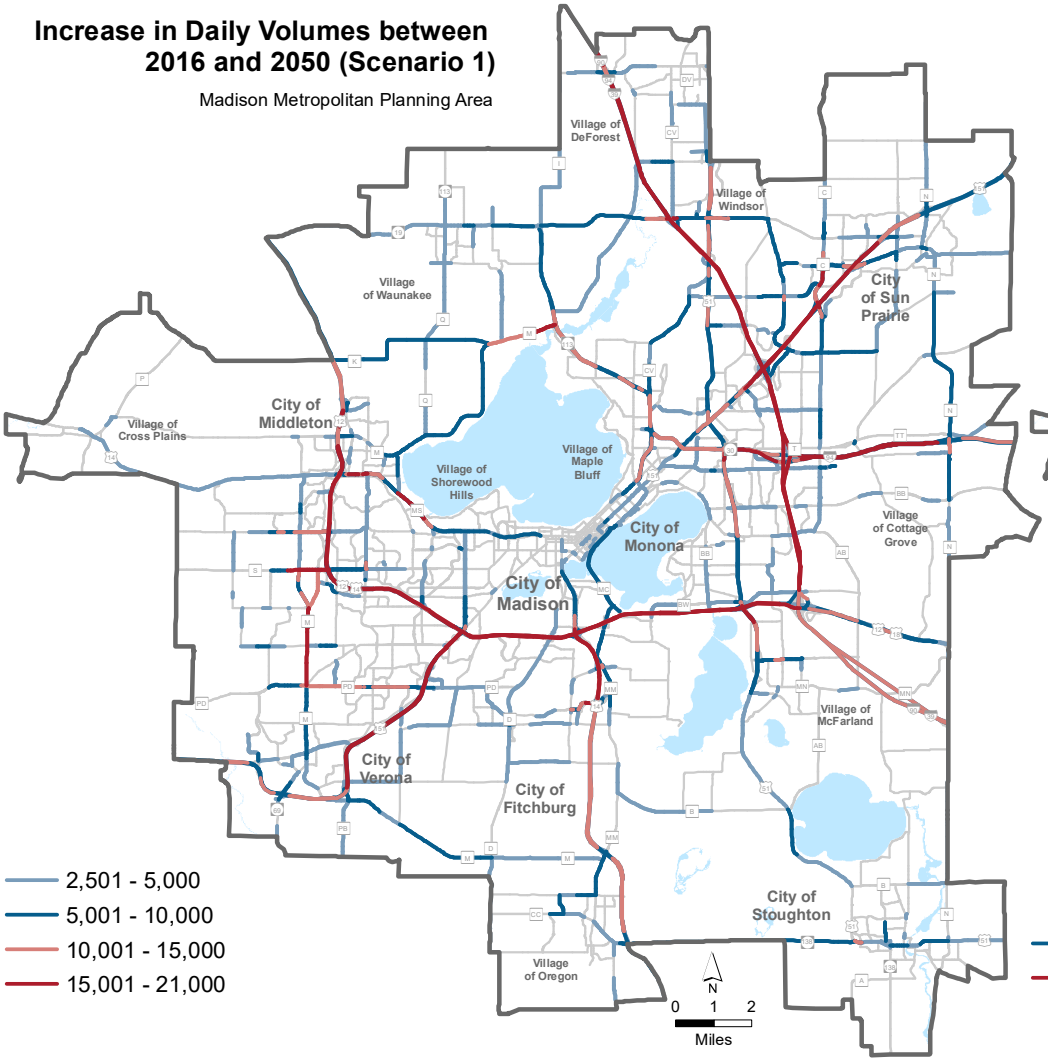


Map F-d PM Travel Time Index

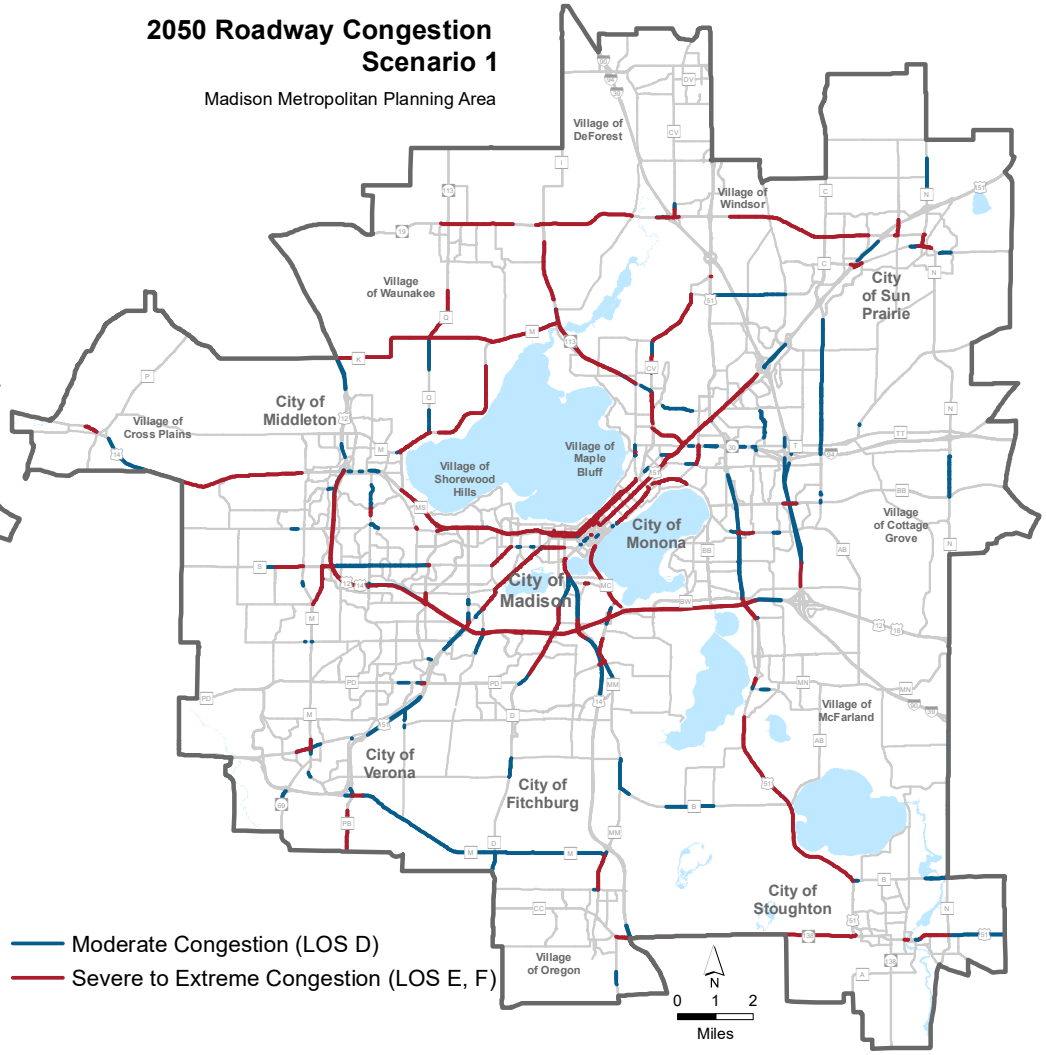
highway projects potentially involving some type of capacity expansion will be identified as part of current studies of the Beltline, Stoughton Rd/USH 51, and Interstate studies.

The two most significant local arterial roadway projects are CTH K (CTH M to US Highway 12) and Reiner/Sprecher Road (Innovation Way to Milwaukee Street and the section on new alignment to CTH AB) corridors. The CTH K corridor is part of the long studied "North Mendota Parkway" concept. A capacity project in the CTH K corridor would ideally be completed on new alignment if right of way can be secured. Map F-g also identifies existing and planned new peripheral roadways where a capacity expansion may be required at some point in the future to accommodate future development. Based on the planned growth scenario, however, in most cases it does not appear that expanded capacity would be needed within the plan timeframe. Timing of reconstruction of these roadways, with or without expanded capacity, is dependent upon future development and other funding priorities. In order to keep options open, it is recommended that right-of-way be reserved, if needed, access managed, and the corridors officially mapped, where appropriate.

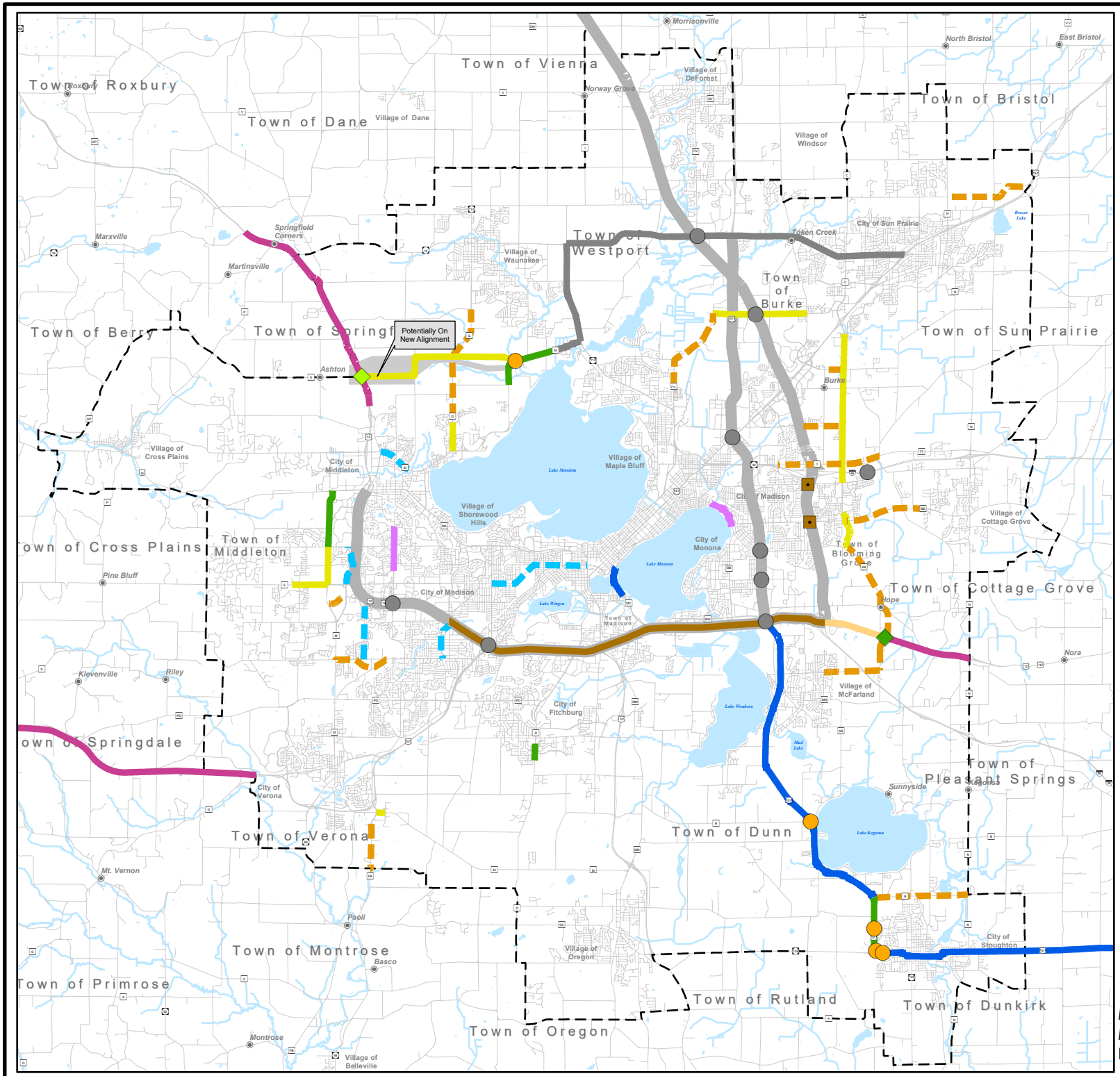
Figures A-a and A-b in RTP Appendix A list programmed and planned major capacity expansion and intersection, interchange, and bridge widening projects as well as major state highway corridor studies through 2050.



Map F-e Increase in Daily Volumes Between 2016 and 2050



Map F-f 2050 Roadway Congestion



Major Roadway Projects and Studies

Madison Area, Wisconsin

- Bridge Capacity Expansion (Planned)
- Major Intersection Improvement (Programmed)
- New or Improved Interchange (Programmed)
- New or Improved Interchange (Planned)
- Study Potential Interchange or Intersection Improvement

- Freeway Capacity Expansion: Flex Lanes (Programmed)
- Freeway Conversion (Programmed)
- Official Map For Potential Freeway Conversion
- Major Arterial Roadway Reconstruction (Programmed)
- Major Corridor Studies (Current)*
- Major Corridor Studies (Recommended)
- Arterial Roadway Capacity Expansion (Programmed)
- Arterial Roadway Capacity Expansion (Planned)
- Reserve ROW Official Map, Manage Access
- Arterial Roadway Capacity Reduction (Programmed or Planned)
- Study Potential Capacity Reduction

- MPO Planning Area Boundary

* Improvements Pending EIS and Funding

Prepared by staff to the:

GREATER MADISON mpo

Date Revised: 5/31/2022

Map F-g Connect Greater Madison RTP Major Projects and Studies

N

0 1 2 Miles

Lambert Conformal Conic Projection
WISCRS- Dane, NAD 83(91)

Author: pbrns
Path: M:\MPO_GIS\GIS_Users\Dan_S\ArcMaps\[T]\Trans\RTP_2050_U\Plan\RTP_2050U_Plan.mxd

Congestion Management Priorities and Strategies

The MPO has adopted the following hierarchy of congestion management priorities:

1. **Strategies that eliminate vehicle trips through land use changes or other actions that reduce peak-period vehicle trips like flexible work hours or telecommuting.**
2. **Strategies that eliminate peak period vehicle trips by causing a mode change from auto to transit, cycle, or pedestrian mode.**
3. **Strategies that improve the operation of the existing roadway system, making it more efficient and safe for all users.**
4. **Strategies that add roadway capacity, primarily at bottlenecks or other strategic locations. Considered only when strategies outlined in priorities 1-3 above are not adequate to meet roadway needs and consistent with RTP recommendations.**

Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies seek to reduce the need for automobile travel, encourage the use of alternative transportation modes, and improve the operation of the transportation system. TDM initiatives attempt to reduce or spread out peak traffic demand. These strategies and programs typically do not require large capital investments, but often require an ongoing commitment to support operation of the programs. TDM strategies include: land use planning and development policies that steer development to transportation efficient locations and create an environment supportive of alternative travel modes; promotion of car- and vanpooling, alternative work hours, and telecommuting; parking management; transit improvements; and pedestrian/ bicycle improvements. In comparison, TSM strategies involve direct improvements to the operation or capacity of the transportations system to reduce traffic congestion and to increase efficiency of the transportation system.

This section outlines the MPO's congestion management priorities and recommendations and strategies to reduce congestion and improve system reliability. It also identifies multimodal recommendations and supporting actions from the RTP that can help ease congestion and improve reliability.

Priority 1 - Strategies that eliminate vehicle trips through land use changes or other actions that reduce peak-period vehicle trips like flexible work hours or telecommuting

LAND USE PLANNING POLICIES AND DEVELOPMENT PRACTICES

Land use, including the spatial location of residential, employment, and other trip ends, density, and design, is the primary controlling factor in travel movement. Low-density, single-use development patterns increase dependence on cars, resulting in longer trip lengths, more vehicle-miles of travel, and ultimately traffic congestion. Compact development, combined with mixed uses and connected streets, can reduce trip length and frequency, offering at least a portion of the population an opportunity to live near where they work, shop, or meet other needs. This creates an environment supportive of travel by modes other than the automobile. The impacts of traffic improvement projects (e.g., expanding an intersection with turn lanes or removing parking) on the pedestrian environment need to be considered as they can negatively affect the street space and therefore work at cross purposes with long-term congestion management and other goals.

Studies have shown that a 10 % increase in urban development density can reduce per capita VMT by 1-3%.[3] Street connectivity with shorter blocks also reduces travel dependence on the automobile by creating direct, low conflict routes for walking and biking to access local destinations within a community. The benefits of land use planning policies and pedestrian and transit supportive development do not result in short-term improvements, however, but require extensive time periods to realize their potential benefits as development proposals occur over time.

Select Land Use Recommendations and Supporting Actions

1) Adopt local land use plans and policies that support CARPC's Regional Development Framework goals, objectives, and strategies

a) Update land use ordinances and street design and parking standards to remove barriers to mixed-use, pedestrian-oriented development, where appropriate.

b) Prepare detailed neighborhood development plans in areas slated for growth in order to provide for complete neighborhoods with good street connectivity and multi-modal access to daily needs.

c) Require pedestrian, bicycle, and transit (where appropriate) facilities in (re) developments.

d) Plan, zone for, and encourage transit-supportive development in existing and planned transit corridors.

e)-Plan for and promote new development in multi-modal mobility corridors to maximize the efficiency of the transportation system and resident's access to jobs and services

2) Provide a mix of housing types with higher densities in areas with multimodal access to jobs and services in order to provide affordable living options in less car dependent neighborhoods

a) Plan for and incentivize the location of affordable workforce housing in areas with existing or planned future high-quality transit service and in multi-modal centers and corridors.

b) Prioritize local subsidies for affordable housing projects in areas with frequent transit service.

c) Support (re)development in centers and corridors through infrastructure investments and incentives.

Transportation Demand Management Program Overview

Transportation Demand Management (TDM) programs are being implemented to help manage congestion by reducing the number of peak period single occupant vehicle (SOV) trips on arterials by encouraging commuters to shift to other modes of travel or to trips that occur at a more efficient time, route or place. It is understood that TDM programs are regional in nature, and that the impact on mitigating congestion on a specific corridor may be difficult to measure. They are still an important component of a congestion management program, because working to influence the travel behavior of individuals can have a long-term impact. Incentives are often included within the TDM program. Examples include: parking policies such as preferential parking for people using car/vanpools, or bicycles or parking "cash out"; free or reduced price transit passes; transportation allowances for transit; and guaranteed ride home programs, and land use management policies. The following recommended TDM strategies and actions for the Madison Area. Most of these are strategies, including ridesharing promotion, park-and-ride lots, bicycle facility improvements, intersection pedestrian enhancements, alternative work hours, parking management, and transit enhancements, are already being implemented to one degree or another.

Transportation Demand Management Recommendations and Supporting Actions

1) Develop a strategic plan for the MPO's TDM program and increase capacity of regional TDM planning and programming

a) Develop a time-bound strategic plan for the MPO TDM program that integrates an

3 Litman, Victoria Transport Policy Institute, 2005.

equity analysis and aligns strategies with best practices in behavior change.
b) Establish a dedicated budget for MPO TDM program activities beyond staffing costs in order to expand capacity for outreach, marketing, incentive programs, mini-grants, pilot projects, and other partnerships.
c) Work with local communities, Dane County, WisDOT, and public and private sector stakeholders to develop a TDM plan for the Madison region.
d) Educate eligible entities about the availability of STBG-Urban funding for TDM programs and services, and assist in the development of local projects.

2) Expand the availability and use of interconnected, multimodal transportation service that support ridesharing and shared mobility in the Madison region

a) Develop partnerships to expand the regional network of park and ride lots and increase the number of lots with multimodal access.
b) Expand vanpool options by growing the WisDOA vanpool program and supporting the development of additional vanpool programs, both regional and employer-based.
c) Expand the use and availability of bike share and car share systems.
d) Evaluate and plan for emerging shared micromobility options.
e) Expand the use and availability of TDM-supportive technology, including ridesharing platforms and mobility as a service (MaaS).

3) Work with employers, institutions, and municipalities to implement and promote strategies to reduce single-occupancy vehicle trips

a) Support the development of transportation management associations (TMAs) to facilitate coordinated, efficient TDM activities in major employment centers.
b) Encourage and assist local communities to integrate TDM plans as a condition of approval for large developments, including specific standards and criteria for such plans
c) Encourage and assist employers interested in developing or expanding commuter benefits programs that promote alternatives to driving alone.

4) Expand the availability, use, and funding of financial incentives and encouragement programs, and increase the funding available to market these programs

a) Expand employer use of financial incentive programs that reduce drive-alone trips such as the Metro Commute Card, parking cash-out, occasional parking, and workplace commuter challenges.
b) Expand employer participation in programs that celebrate commute options leaders, including Dane County Climate Champions and Best Workplaces for Commuters.
c) Increase funding for regional TDM marketing activities to expand existing strategies and support new approaches such as "SmartTrips."
d) Increase funding for support services such as Emergency Ride Home, and encouragement programs such as Love to Ride and local commuter challenges.
e) Increase awareness and use of local TDM programs and resources among minority and traditionally underserved communities, including non-driving adults.

5) Support transportation options at schools through infrastructure and programming

a) Secure sustainable funding for a regional Safe Routes to School program utilizing resources such as mini-grants, CIP funding, local operating budget funding, private funding, or federal funding.
b) Work with schools to reduce vehicle use and encourage alternatives to driving alone among students, parents, staff, and teachers for trips including and beyond the school commute.

TELEWORK AND ALTERNATIVE WORK HOURS

Alternative work hours includes flextime, compressed work week or staggered shifts to reduce vehicle trip demand on roadways by shifting work start and stop times to avoid peak commuting hours. Flextime means that employees are allowed some flexibility in their daily work schedules, for example, rather than all employees working 8:00 to 4:30, some might work 7:30 to 4:00 or 9:00 to 5:30. Compressed work week (CWW) means that employees work fewer but longer days, such as four 10-hour days each week or 9-hour days with one day off every two

weeks. A staggered shift means that shifts are staggered to reduce the number of employees arriving and leaving a work site at one time. For example, some shifts may be 8:00 to 4:30, others 8:30 to 5:00 and other 9:00 to 5:30. This is similar to flextime but does not give individual employees as much control over their schedule.

A benefit for flextime is that it allows employees to match their work schedules with transit and rideshare schedules and can increase productivity and satisfaction. Flextime and CWW make it easier for employees to meet their household scheduling requirements, reduce commuting time and stress, reduce fears about being late, and use rideshare or public transit and work when they are most productive. Unlike rideshare programs, which are almost always sponsored or coordinated by public agencies or designated non-profits, alternative work hour programs are a decision of the employer. As such, the employer must see the value of providing this choice to their workforce. Studies have shown this is recognized in terms of higher employee productivity and satisfaction. Transportation agencies must understand that there are some types of businesses like healthcare facilities or manufacturers that must maintain rigid shifts for many of their employees.

The MPO developed a TeleWORKS Toolkit in 2021 to serve as a resource for local employers and employees, to inform ongoing planning for the future of telework in Dane County as a commute solution to reduce vehicle miles traveled in the region. The toolkit includes results from the first regional telework survey, tip sheets, national statistics, and profiles of local employers navigating the new normal. The toolkit can be found at www.greatermadisonmpo.org/planning/documents/teleWORKSToolkit_2021.pdf. The MPO is also working with a consultant in 2022 to develop a broader TDM Toolkit.

RIDESHARING AND THE GUARANTEED RIDE HOME PROGRAM

Ridesharing reduces single occupancy vehicles due to commuters sharing a ride with one or more people for trips on a regular basis. Carpooling typically uses the participants' own vehicle and vanpooling generally uses leased vans supplied by the employer or government agencies. Studies have shown that ridesharing programs historically have been able to attract 5-15% of commute trips if they only offer information and encouragement, and 10-30% if they also offer financial incentives.[4] Many people are initially resistant to ridesharing, so incentives may be necessary to overcome that barrier. Carpool programs typically require a large commuter database to be successful in matching commuters. Ridesharing also reduces vehicle travel, peak period traffic and shifts vehicle travel to alternative modes.

4 VTPI.

Guaranteed Ride Home programs provide an occasional subsidized ride to commuters who use alternative modes, for example, if a bus rider must return home in an emergency, or a car pooler must stay at work later than expected. The mechanism is to provide taxi service at no cost to the commuter. The cost is assumed by the agency sponsoring the rideshare program. One survey of commuters found that 59% of rideshare and transit patrons considered the Guaranteed Ride Home program important in their decision to use alternative modes (K.T. Analytics, 1992), because they do not want to be stranded at work if an unexpected need arises.

Priority 2- Strategies that eliminate peak period vehicle trips by causing a mode change from auto to transit, cycle, or pedestrian mode

TRANSIT IMPROVEMENTS

Making public transit more convenient and attractive is a primary TDM strategy to move people from SOV to a shared-ride mode. There are many ways to improve transit service and encourage transit ridership. They include:

- Increased services, which includes new routes covering additional areas in response to changing population or employment patterns, increased service frequency and/or longer operating hours

and addition of limited-stop express service
- Improvements to transit on-street operations, including bus priority which includes bus lanes, queue-jumps at intersections, and traffic signal priority
- Fare reductions for the general ridership or directed at specific groups like low income individuals seeking to enter the workforce.
- Commuter Choice Programs which allows free or discounted bus passes to employees and the University Bus Pass Programs (UPASS) which allows students/faculty to ride the bus for free or at a discounted rate
- Transit technology or ITS, which includes improved system surveillance, monitoring and customer information by providing real time bus information to passengers, automated passenger counts, and security cameras
- Making transit bicycle friendly by placing bike racks on buses and at stations. This makes bus service accessible to people whose trip origin or destination is beyond walking distance from the bus stop, but who use a bicycle for shorter trips.

The transit improvements listed above impact travel demand by reducing personal vehicle use as people alter their mode choice for some trips due to having an attractive alternative for commute trips.

Benefits for transit services include vehicle cost savings, congestion reduction, increased safety and health, parking cost savings, energy conservation and pollution emission reductions. The Victoria Transport Policy Institute indicates that shifting from driving to transit saves on fuel and oil costs, insurance and parking costs, vehicle repairs and replacement costs. Also, driving a vehicle increases the risk of crashes, traffic and parking citations.

The City of Madison is working to implement a Bus Rapid Transit (BRT) system as part of an effort to improve its existing transit system and reduce travel times across the region. The proposed BRT will include an initial corridor that will operate east/west through Madison's downtown and the University of Wisconsin campus areas, with a targeted start date of fall 2024. Madison Metro is also finishing up a bus network redesign study, which will result in redesigning the route system to better meet the needs of Madison area residents and businesses by increasing access and frequency, decreasing travel times, and improving the quality of transit riders' experience. As part of this effort, more service will be allocated to corridors with high ridership, typically more congested roadways.

Select Public Transit Recommendations and Supporting Actions

1) Implement a Bus Rapid Transit system

d) Expand the use of transit priority treatments, focusing initially on the BRT corridors

2) Improve the local bus network by investing where needs are greatest

a) Continue to optimize the local bus network to maximize its utility with available resources and complement the BRT system.

d) Continue to improve the convenience and ability to navigate the transit system by reducing travel times and simplifying the service.

e) Expand and enhance the network of frequent local service

g) Prioritize improving or providing new service in corridors that are supportive of transit.

3) Add service in developing neighborhoods

4) Enhance transit stops with improved pedestrian and bicycle access and amenities

7) Implement a regional express bus network

8) Expand park-and-ride facilities in conjunction with BRT and express services

BICYCLE AND PEDESTRIAN NETWORK IMPROVEMENTS

Providing bicycle and pedestrian accommodations and encouraging people to walk or ride a bicycle can reduce congestion in dense areas and/or where short trips are frequently made. Ensuring that pedestrians and bicyclists feel safe and confident using the system, regardless of age of ability, is critical to encouraging more active transportation trips.

In order to substantially increase the share of trips made by bicycle, a connected low traffic stress network must be provided. The low stress network provides for the needs of cyclists of all abilities, including young and old people, people with low to moderate cycling ability, people who are not comfortable biking in high-speed, high-volume traffic conditions, and others who demand low traffic stress accommodations. The MPO has developed a Low-Stress Bicycle Route Finder to help people plan trips throughout the urban areas of Dane County. The Low-Stress Bicycle Route Finder can be accessed at https://cityofmadison.maps.arcgis.com/apps/webappviewer/index.html?id=cb7a2e78477044c19bf6a5eaa1820e38. Reducing the physical, economic, and safety-related barriers to biking and walking is the best way to increase the number of people willing to travel by these modes. Other user needs include adequate bicycle storage opportunities, access to bike sharing services, end-of-trip facilities such as showers and lockers for bicycle commuters, and adequate wayfinding to, from, and on the bicycle network.

The MPO released a **Pedestrian and Bicycle Facility Requirements, Policies, and Street Standards** report in 2021 that details locally-adopted bicycle and pedestrian facilities requirements along with national recommendations and best practices to help local planning and engineering staff and elected officials make informed decisions regarding street design standards and bicycle/pedes-

trian facilities, and to give them tools to make the roadways safer for all users. The report can be read at https://www.greatermadison-mpo.org/planning/documentsPedestrianFacilityRequirementsandPoliciesandStreetStandards_FINAL_5_25_21.pdf

The MPO also supports active transportation outreach and education activities such as Safe Routes to School and the Bike Buddy program.

Select Bicycle Network Recommendations and Supporting Actions

1) Expand the bikeway network with new share-use paths and on-street facilities

d) Provide enhanced or premium bicycle facilities in key urban arterial corridors within right-of-way where feasible

e) Expand the use of bicycle boulevards, bicycle priority streets, and other priority or bicyclist protection treatments such as intersections.

3) Reduce barriers to bicycling

4) Provide adequate bicycle parking

5) Improve bicyclist safety

6) Continue bike share, education, and bicyclist supportive policies

Select Pedestrian Network Recommendations and Supporting Actions

2) Retrofit regional streets with modern, safe, and accessible pedestrian accommodations

3) Improve safety and usability for pedestrians at intersection crossings

PARKING MANAGEMENT

There are many ways to improve parking management by altering the supply and demand of parking to encourage alternative modes of transportation.

Preferential parking/discounted parking is a positive incentive to provide less expensive or more convenient parking to people who rideshare (carpool/vanpool). Even the visibility of assigning the most preferred spots to carpools can demonstrate the commitment of the employer to the program.

High generator parking efficiency programs manage parking in downtowns and other locations that generate a large number of trips like universities, or hospitals. These programs often use pricing as a way to manage demand. Charging more to park in a centrally located garage or lot while offering a significant price break or even free parking at a remote location with shuttle bus service will influence drivers' behavior. The congestion management benefit involves the diversion of traffic from a congested core location like downtown or the central campus. This can be realized by including parking attendants in ramps, parking rate changes and fringe lots with shuttle buses to be used by downtown business employees only. It also alters the supply and demand of parking to encourage alternative modes of transportation.

Park and Ride Lots consist of facilities at transit stations, bus stops and highway interchanges, particularly in and around urban areas to facilitate transit and ridesharing. Parking is typically free or very cheap compared to urban parking centers. These facilities can increase transit and rideshare travel. Park and Ride Lots impact travel demand by reducing a portion of car trips, supporting transit and ridesharing, and supporting bicycling when bike parking is provided. There are no exact percentages as to how much Park and Ride lots reduce traffic but studies have shown that these facilities reduce urban highway traffic congestion and worksite parking demand. However, Park and Ride lots only provides a moderate reduction in local road traffic, pollution, energy use and consumer costs since a local trip is still made.

Parking cash out is a program where an employer gives employees a choice to keep a parking space at work or to accept a cash payment and give up the parking space. The program encourages employees not to drive alone to work. Parking cash out has the potential to reduce vehicle trips by 10-30%, which helps reduce traffic congestion, road and parking facility cost and pollution emissions.[5] This program can often be offered as a pre-tax benefit to employees.

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Parking Recommendations and Supporting Actions

1) Use parking management strategies to reduce congestion and parking demand, particularly in major activity centers

a) Encourage ridesharing by implementing policies that provide reduced rates and/or preferential parking spots to carpools and vanpools.

b) Encourage multimodal commutes by reducing or eliminating monthly and annual parking options that promote daily driving.

c) Implement technologies and associated policies such as demand responsive pricing that efficiently manage existing infrastructure, and reduce pollution and safety risks due to vehicle idling and circling.

d) Develop and implement a downtown Madison parking management plan.

2) Modify parking requirements for new development to encourage multi-modalism and innovative design, while addressing potential spillover impacts

a) Review and consider eliminating minimum parking requirements to ensure an appropriate balance between parking needs, other transportation options, and continuity of the built environment.

b) Allow deviation from parking minimums, particularly in dense urban areas, to accommodate innovative project designs that maximize access to alternative modes and incorporate TDM strategies.

c) Conduct a local parking study to assist communities in right-sizing parking requirements and facilities.

3) Ensure the flexibility of on-and off-street parking facilities to accommodate changing demand

a) Design streets with flexibility in mind and ensure that parking policies allow for the conversion of street parking to other uses such as dining, loading, or micromobility as needs change and new technologies are implemented.

b) Design new parking structures to accommodate conversion to other uses as parking priorities change due to emerging technologies, changing travel habits, and other market factors.

Priority 3- Strategies that improve the operation of the existing roadway system, making it more efficient for all users.

Transportation System Management (TSM) strategies and programs typically do not require large capital investments, but often require an ongoing commitment to support operation of the programs. TSM strategies involve direct improvements to the operation or capacity of the transportations system to reduce traffic congestion and to increase efficiency of the transportation system. Many of these initiatives are already being undertaken in the Madison Planning Area. These include the implementation of ITS technologies, traffic signal coordination and timing adjustments, arterial street intersection improvements, access management, peak-hour parking restrictions, special event planning, work zone traffic management plans, freeway management, and service patrols. Technology will play an ever-increasing role in how congestion is managed, such as smart roadway networks, automated vehicles, and applications that provide real-time travel information on all transportation modes or combinations of modes.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

ITS involves the application of advanced sensor, computer, electronic, and communications technologies and management strategies in an integrated manner. Aside from congestion management, ITS strategies also have the ability to provide many other benefits, including improved traveler safety, emergency management, improved transit speed and reliability, parking management, inter-agency communication, and data management.

The MPO worked with the City of Madison Traffic Engineering Division/Parking Utility, Metro Transit, and other stakeholders to prepare a ***Regional Intelligent Transportation Systems (ITS) Strategic Plan for the Madison Metropolitan Area***. Transportation systems management and operations strategies, including ITS, must play a major role in managing congestion in the Madison area

due to the region's unique geographic constraints and lack of freeway access to downtown. In addition, much of the region's congestion is non-recurring from crashes, work zones, weather conditions, and special events. ITS is particularly effective in dealing with this type of congestion. More information about the MPO ITS plan can be found at www.greatermadisonmpo.org/planning/ITS.cfm#ITS_Plan

OPERATIONAL IMPROVEMENTS

Operational improvements are implemented to decrease congestion and delay and include the following strategies:

- *Access Management* involves controlling roadway access through limiting or prohibiting driveways, use of medians and median turn lanes on a given roadway segment, and other strategies. Transportation Research Board studies have shown that traffic conflicts associated with the number of driveways per mile adversely impacts the capacity of a roadway and the rate of crashes. These traffic conflicts also adversely impact pedestrian and bicycle mobility and safety.
- *Freeway interchange improvements* include modifications to reduce congestion and improve freeway traffic flow, including minor changes (e.g., lengthening off-ramps or adding turn lanes) to more significant redesign of the interchange (e.g., eliminating a cloverleaf design, which results in weaving movements that reduce capacity in the interchange area).
- *Intersection Improvements* are intended to increase roadway capacity through the construction of turn lanes, minor approach widening, the addition of bike lane and transit stop enhancements, lane restriping or traffic control improvements. Intersection improvements can also be designed to accommodate transit queue jumping, allowing buses to bypass intersection congestion.
- *Parking Modifications* include parking restrictions intended to improve the operation of roadways by eliminating parking spaces near intersections and restricting peak hour parking.
- *Traffic signal improvements* consist of improving signal phasing, timing and progression to allow for better traffic flow through intersections during peak directional traffic demand periods, including during special events or inclement winter weather conditions.
- *Transit Priority Signal Operation* provides transit vehicles detection coordination with traffic signals to extend arterial street green indications when a bus is approaching or when a bus is departing an intersection after taking on passengers to minimize transit travel delays that may occur with a red 'stop' indication. Transit priority timing can adversely impact automobile traffic progression along an arterial corridor.
- *Hard Shoulder Running or Flex Lanes* involves using freeway facility right hand shoulders for bus operation during peak periods of traffic congestion. Freeway facilities need to have continuous hard shoulders across bridges and at ramp merge & diverge locations to effectively accommodate this strategy that provides travel time benefits for transit operation. Shoulder running can also be designed for use of the inside shoulders by automobiles, a very cost effective capacity expansion strategy. The Beltline flex lane/hard shoulder running is scheduled to begin operations in 2022 and is projected to meet peak period roadway volume needs for the next 15 years.

DEVELOP A REGIONAL TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) PLAN

While the RTP identifies many long-term recommendations and actions to address congestion, it also recommends the development of a regional TSMO plan, which would focus on shorter term solutions to improve system reliability. A TSMO plan is a set of strategies that focus on optimizing operational improvements that can maintain and even restore the performance of the existing transportation system before extra capacity is needed. TSMO solutions should be considered at any location that experiences either recurring or non-recurring congestion. TSMO improvements may include traffic signal coordination, integrated corridor management, work zone management, traffic incident management, transit signal priority and more.

WORK ZONE MANAGEMENT

Work zone management strategies can help reduce non-recurring congestion associated with roadway construction projects. Strategies for reducing include the use of design techniques that require less new construction, doing the construction in ways that reduce the time or the amount of road closures, and accommodating construction techniques that also mean less maintenance over the many years of pavement life.

INCIDENT MANAGEMENT

Traffic crashes and incidents such as a flat tire on major arterials and freeways are a prominent source of non-recurring congestion. Implementing strategies to speed up and improve incident detection, the dispatching of response personnel, and clearance times can improve travel-time reliability and increase safety by reducing the occurrence of secondary crashes. This requires close coordination and communication between key stakeholders including law enforcement, tow trucks, and maintenance personnel. The Dane County Sheriff's Office operates a Freeway Service Team for the Beltline. The Freeway Service Team operates two four-wheel drive pickup trucks with special equipment to assist motorists and clearing the Beltline of vehicles or debris that cause slowdowns. The vehicles are equipped with a changeable message sign, appropriate fluids, traffic cones, and other appropriate equipment needed to assist a stranded motorist on the Madison Beltline. WisDOT manages a Traffic Incident Management Enhancement (TIME) program dedicated to improving responder safety, enhancing the safe, quick clearance of traffic incidents, and supporting prompt, reliable, interoperable communications, and is a sustained initiative for assessing needs, developing solutions and strategies, and fostering the transportation-public safety partnerships that are essential for effect TIM.

TSM and Technology Recommendations and Supporting Actions

1) Implement the Congestion Management Process

2) Develop a regional transportation systems management and operations (TSMO) Plan

3) Implement access management plans and standards for existing and planned future arterial roadways as development and street (re)constructions occur.

a)Initiate access management plans on congested corridors as development and street reconstruction occur

b)Develop a regional access management plan that identifies standards for future arterials roadways, best practices, and safety considerations

c) Continue efforts to implement short-term safety related and TSM improvement recommendations from preservation/safety studies in state highway corridors, including USH 14 (West), STH 19, and STH 138.

d) Officially map the USH 12 (Parmenter St. to STH 19 West), USH 12/18 (Interstate to CTH N), and USH 18/151 corridors for potential future freeway conversion based on recommended study alternatives. Continue to implement interim access management improvements with future conversion dependent upon ongoing needs assessment and available funding.

4) Modernize the multimodal transportation network using technology

a) Include as part of new urban roadway projects infrastructure for connected and autonomous technologies (such as fiber optic lines), where appropriate.

b) Replace obsolete traffic signal controllers with "smart" controllers when replacing traffic signals or constructing new signalized intersections.

c) Implement adopted process to identify and integrate ITS infrastructure into planning and design of major state roadway construction projects.

5) Implement and periodically update the Regional Intelligent Transportation Systems strategic plan

a) Continue or initiate planning efforts to advance the recommendations listed in the ITS plan

b) Continue efforts to provide comprehensive real-time traveler information to people and businesses.

d) Investigate the feasibility, benefits, and costs of an expanded incident detection and response program for additional state roadways (e.g., Verona Road) and selected local arterials.

Priority 4: Strategies that add roadway capacity, primarily at bottlenecks or other strategic locations

While transportation demand management (TDM) and transportation systems management and operations strategies can help mitigate congestion – and are the only practical and acceptable solutions in central Madison and the downtown business districts of suburban communities – strategic roadway capacity increases will be necessary in the future to address some current bottlenecks and handle projected traffic from planned growth. The MPO's policy is to only consider adding roadway capacity when implementing priorities 1-3 discussed earlier is not enough to address critical bottlenecks or congestion in key corridors and when consistent with plan goals.

Figures A-a and A-b in Appendix A of the RTP identifies planned major capacity expansion and intersection, interchange, and bridge widening projects as well as the aforementioned major state highway corridor studies. Projects potentially involving a capacity expansion will come out of those studies.

Implementing and Evaluating Congestion Management Projects

Project Programming and Implementation

The MPO is a planning and funding agency, and the implementation of the RTP, including the recommended congestion management strategies, is dependent upon the actions taken by state, county, and local agencies. Implementation responsibilities, schedule, and possible funding resources for recommended congestion management strategies are identified in the RTP, and are reviewed and updated with each reevaluation of the plan every five years. As part of plan implementation, more detailed planning will be conducted prior to the programming of certain congestion management elements of this plan. This includes more detailed state, county, and local planning efforts required to refine the TSM, transit, active transportation, and highway improvements recommended in the plan.

The Transportation Improvement Program (TIP), which the MPO updates annually, is a coordinated listing of short-range transportation improvement projects anticipated to be undertaken in the next

five-year period. The TIP is the mechanism by which the long-range transportation plan, and by extension CMP, is implemented, and represents the transportation improvement priorities of the region. The TIP includes all projects to be funded under programs of the FTA and FHWA. The MPO also strives to include all regionally significant projects using local funding. Consequently, the TIP provides the vehicle for implementing transit and roadway improvements, including ITS deployments, identified in the CMP. The CMP is only one input among many into the TIP development process. As a result, there may be projects that meet objectives that appear to be contradictory to CMP objectives. For example, capacity of a roadway may be reduced to enhance bicycle facilities and/or transit service and safety even though that increases traffic congestion. Conversely, a road reconstruction project may include construction of new capacity to meet future forecasted travel needs related to new development, even though congestion is not severe because it is cost efficient to do so when the street is reconstructed to urban standards and utilities put in.

MPO-ADMINISTERED FUNDING

As a large MPO, the Greater Madison MPO receives a sub-allocation of funding under FHWA's Surface Transportation Block Grant (STBG)-Urban program, and administers a biennial application and project selection process. STBG provides flexible funding that may be used for projects to preserve and improve the conditions and performance on any Federal-aid roadway (i.e., classified as an arterial or collector), for bridge projects on any public road, for pedestrian and bicycle infrastructure or programs, and for transit capital projects. Eligible recipients are Dane County and local units of government. The MPO sets aside a small percent of its allocation to fund the MPO's TDM program.

The MPO approved revised STBG – Urban program policies and project screening and scoring criteria for evaluating project applications in 2021. The applications are reviewed using scoring criteria covering nine categories, one of which is directly related to congestion mitigation and others indirectly related (in bold): (1) importance to the regional transportation system; (2) system preservation; (3) **congestion mitigation/TSM**; (4) **safety enhancement**; (5) **enhancement of multi-modal options**; (6) transportation efficient land use, livability, and economic prosperity; (7) environment; (8) environmental justice/health equity; and (9) cost benefit. The project scoring criteria was developed to be consistent with the CMP. The STBG – Urban Project Selection Process document, which outlines the process, policies, and project scoring criteria, is included as Attachment A of the TIP.

The most recent transportation funding bill, the Infrastructure Investment and Jobs Act (IIJA, also called the Bipartisan Infrastructure Bill), introduced new funding programs, including the Carbon Reduction program for which the MPO will receive sub-allocation of funding. The MPO will develop project scoring and evaluation criteria for that program consistent with CMP goals and strategies once that funding becomes available.

Monitoring and Evaluation

The objectives, performance measures, and recommendations contained within the CMP will be reviewed and refined as part of the development of the regional transportation plan (RTP), updated every five years. A system performance report is prepared for both the RTP and the annual TIP, which includes the federal performance measures, the MPO adopted targets, and monitor progress. This include the travel time reliability measures. An analysis is conducted to assess the extent to which the RTP and TIP will help achieve the performance targets. The RTP system performance report includes a model statistics section where forecast model outputs such as VMT, LOS, vehicle hours of delay, travel mode share, and transit ridership are documented to estimate the expected impacts of the RTP over its implementation. The annual TIP also includes an appendix, which provides a status report on TDM and TSM projects within the region. The MPO tracks the total amount and percentage of funds for TIP roadway projects utilized for TSM/Safety projects, and plans to make this information more visible in the

future. The MPO will also resume its annual performance measure report (PMR) in 2022, with plans to move it towards an interactive digital dashboard format. Evaluating the impact of major congestion mitigation projects has historically been challenging, however the MPO will be using StreetLight Analytics location based services data along with other data to attempt to evaluate the impact of major congestion mitigation projects such as adaptive signal systems and capacity projects through a before/after data collection analysis effort.