Photo: KL Engineering

Chapter 4:

Our System Tomorrow: 2050

Our System Tomorrow: 2050

What will our transportation system look like in 2050? What critical issues and drivers of change will shape how our transportation system grows and evolves? How do we leverage transportation to achieve our long-term vision for the region? This chapter explores these issues, identifies the future needs of our transportation system, and provides recommendations and supporting actions to make the vision a reality.

Critical Issues

As the greater Madison region's transportation system evolves, three critical issues that should play an important role in planning and decision-making are equity, climate change, and health. Each is directly affected by the benefits and burdens of the transportation system, and each deeply affects quality of life.

Central to local and regional agencies' ability to act on equity, climate change, and health is the effective coordination of transportation and land use strategies that naturally support these goals. The foundation for this is community design that provides access for all to transportation options, affordable housing, and other basic needs, thereby fostering equitable access to opportunity, wise use of natural resources, and the ability of individuals to live healthy, sustainable lives.

To provide a framework for this coordination, the Greater Madison MPO works closely with the Capital Area Regional Planning Commission (CARPC) to align the agencies' regional plans and implementation strategies that guide communities. The goals, recommendations, and performance measures in the *Connect Greater Madison* Regional Transportation Plan (RTP) for 2050 reinforce the goals and objectives of CARPC's *Regional Development Framework (RDF),* together promoting positive outcomes for equity, climate action, and health.

The following sections summarize the significance of these three critical issues; their relationship to our transportation system; and how the RTP advances each.

EQUITY

Existing definitions of "transportation equity" include common themes, but vary based on the areas to which they are applied and the perspectives of those involved in the development process. A typical definition is something like:

> Transportation equity means that transportation decisions are made with deep and meaningful community input that leads to transportation networks and land use structures that support health and well-being, environmental sustainability, and equitable access to resources and opportunities. – Urban Institute[1]

The critical connections between equity, land use, and transportation are clear in the long history of racial and economic segregation in the U.S., perpetuated through policies, programs, and projects such as urban renewal, urban freeways, exclusionary zoning, and more. The 2020 Black Lives Matter movement and nation-wide reckoning with systemic and institutional racism – sparked in part by the killing of George Floyd in a Minneapolis bicycle lane by a uniformed police officer – prompted

[1] Urban Institute (2020). *Access to Opportunity through Equitable Transportation,* https://www.urban.org/research/publication/access-opportunity-through-equitable-transportation/view/full_report (p. 3).

a necessary re-focusing in the planning profession on undoing the harms caused over the last century. Although the scale and pervasiveness of institutional racism has only recently become apparent to many planners, the American Planning Association's Code of Ethics[2] is explicit that planners must work to achieve economic, social and racial equity, and center the voices and needs of minority communities.

The disparate impacts of the COVID-19 pandemic on various demographic groups further highlighted inequities at many levels of society nationwide, including in transportation access and transit dependence. When safer-at-home orders were issued in March 2020, many "choice" transit riders who were either able to telework or switch to a personal vehicle, stopped riding. Many essential workers, however, including grocery and healthcare staff, continued to rely on transit to access their jobs. This pattern was clear in the Madison area, where overall Metro Transit ridership declined markedly with safer-at-home orders, yet decreased the least in areas with the largest populations of transit-dependent riders – primarily people of color and those with low incomes.[3]

For residents of these areas, the combined impacts of spatially segregated land use policies; transit service optimized for white-collar commuters; poor sidewalk and bicycle network connectivity[4]; and the high cost of owning and operating a private vehicle; pose significant barriers to economic mobility and access to basic needs. Exacerbating this situation, undocumented immigrants in Wisconsin are not able to obtain a driver's license, restricting their legal transportation options even if they are financially capable of owning a private motor vehicle. [5]

In light of these extreme challenges, it is imperative that planners and policymakers apply an equity lens throughout transportation and land use decision-making processes – from implementing public engagement efforts, to creating plans and finalizing designs in consultation with those who will be most impacted. To this end, the RTP and RDF use the same socioeconomic forecasts and same forecast growth scenario, and apply consistent goals and strategies aimed at advancing equity and reducing racial disparities. A critical shared focus is prioritizing land use and transportation decisions that improve access to affordable housing, transportation options, jobs, and services for all. As part of the planning process, the MPO and CARPC analyzed assumptions and plans relative to the potential impacts on Environmental Justice (EJ) Priority Areas, and coordinated engagement with minority and low-income populations to gather input; this engagement will continue to be a priority in future planning efforts.

To further advance equity in its policies and processes, the MPO recently revised local scoring criteria for the two federal funding programs for which it selects projects (Surface Transportation Block Grant-Urban and Transportation Alternatives), increasing the proportion of points earned by projects that improve transportation access to and from

[2] https://www.planning.org/ethics/ethicscode/

[3] Metro Transit Network Redesign Choices Report, https://www.cityofmadison.com/metro/documents/network-redesign/ExistingConditionsChoicesReport-20210311.pdf (pages 11-12)

[4] See the MPO's *Pedestrian and Bicycle Facility Requirements, Policies, and Street Standards* report at https://www.greatermadisonmpo.org/planning/documents/PedestrianFacilityRequirementsandPoliciesandStreetStandards_FINAL_5_25_21.pdf (beginning on page 56)

[5] Sixteen states and the District of Columbia have enacted laws enabling undocumented immigrants to obtain driver's licenses https://www.ncsl.org/research/immigration/states-offering-driver-s-licenses-to-immigrants.aspx

MPO-identified EJ areas.[6] The MPO has also begun to collect data for a number of new equity-based performance measures and metrics that will help monitor equity-related progress and setbacks in a transparent and accountable way, and support efforts to improve transportation equity with relevant data. Finally, the MPO conducts an environmental justice review of all projects in the Transportation Improvement Program (TIP) on an annual basis.[7]

An assessment of local conditions related to transportation equity and environmental justice, and an EJ analysis of projects in the RTP, can be found in Appendix C.

CLIMATE CHANGE

Climate change is a defining critical issue of our time that is causing unprecedented global effects on our natural systems and built environments. Each year brings new record-breaking weather extremes and more frequent severe weather events including floods, droughts, and heatwaves. Changes in temperature and precipitation are intensifying storm damage and accelerating infrastructure deterioration. Without action to reduce the causes of climate change, adapting to future impacts will become more difficult and costly. Drastic reductions in greenhouse gas (GHG) emissions from all sectors of the economy are necessary in the coming decades to mitigate possible catastrophic outcomes.

2018 Flooding At Old Sauk & N. High Point Rd.

Transportation systems both contribute to and suffer from the impacts of climate change. As of 2019, transportation accounts for the largest share (29%) of all U.S. GHG emissions, of which 58% come from light-duty vehicles.[8] Transportation infrastructure is increasingly vulnerable to extreme weather events that degrade system integrity and performance, resulting in more frequent maintenance needs, increased repair costs, and other economic costs. These climate change-induced extremes pose serious threats by making it more difficult to provide crucial transportation services relied upon by individuals and communities. Under these circumstances, ensuring that transportation systems are resilient, or able to withstand and recover rapidly from adverse conditions and events, while also reducing the GHG emissions of the transportation sector, is a vitally important challenge.

To mitigate the harmful effects of climate change, transportation providers and decision makers must prioritize strategies that reduce the number and length of trips that are made in personal vehicles. Well-planned public transportation is a particularly effective tool, as a typical trip on public transit emits 55% fewer GHG emissions than driving or ride hailing alone; and if the fleet is electrified, an electric bus emits 62% fewer emissions than an average diesel bus.[9] Designing communities to make it easier to take more daily trips by walking and bicycling is also essential, while broader adoption of telework presents an additional opportunity to reduce driving.

[6] STBG-U criteria amended 2021, STBG-TA criteria amended 2019 and 2021

[7] See https://www.greatermadisonmpo.org/planning/improvementprogram.cfm for current TIP and project EJ analysis

[8] U.S. EPA, "Fast Facts on Transportation Greenhouse Gas Emissions," https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions. Accessed on 2/28/2022.

[9] Transportation Research Board. 2018. TCRP Research Report 226: An Update on Public Transportation's Impacts on Greenhouse Gas Emissions. Retrieved from: https://www.trb.org/Main/Blurbs/181941.aspx.

To support this work, the MPO collaborates with CARPC to prioritize regional planning strategies that build climate change resiliency and reduce GHG emissions from the built environment. A critical shared goal is to promote compact, mixed-use development that supports walking, bicycling, and public transit. Other climate-related goals in CARPC's RDF that involve increasing tree canopy, increasing water infiltration, and decreasing the urban heat island effect are further supported by RTP 2050 goals for environmental sustainability and system performance, which speak to mitigating the environmental impacts of the transportation system and limiting demand for future roadway expansions.

2018 Flooding Damage

HEALTH

Transportation plans, policies, and projects directly influence public health by determining the type and quality of transportation options available to help people get where they need to go. As a core element of the built environment, transportation is a critical social determinant of health[10] that often disproportionately burdens low-income and minority communities. In transportation planning, it is vital to consider the health implications of decisions and to involve affected communities in the decision-making process, in order to achieve systems that support health and a high quality of life for all.

Transportation affects public health in four key areas:

- **Physical Activity:** The ability of individuals to easily integrate physical activity into their daily routines through the transportation choices available to them.
- **Natural Environment:** The impact of transportation on air and water quality, and the ability of individuals to take action on climate change through their transportation choices.
- **Safety:** The ability of users of all ages and abilities to safely navigate the transportation system.
- **Access:** The ability of individuals to access basic needs including jobs, healthcare, healthy food, schools, social services, community centers, and green space.

Healthy community design[11], which makes it easier for people to live healthy lives through the built environment, uses a combination of land use and transportation strategies to promote physical activity, improve air quality, lower safety risks, and strengthen social connections. This approach relies on cross-sector collaboration among urban planners, engineers, public health professionals and others to act on critical issues including obesity, heart disease, asthma, and traffic injuries and deaths. Key strategies include compact, mixed-use development; quality public transit and active transportation infrastructure; affordable housing; and equitable access to resources such as healthcare, healthy food, greenspace, and community centers.

As the framework for transportation planning and investing in the greater Madison region, the *Connect Greater Madison* RTP coordinates closely with CARPC's RDF, incorporating goals, recommendations, and performance measures that support healthy community design in numerous ways. This

[10] "Social Determinants of Health," Centers for Disease Control and Prevention, https://www.cdc.gov/socialdeterminants/about.html. Accessed on 2/25/2022.

[11] "Healthy Community Design," American Public Health Association, https://www.apha.org/topics-and-issues/environmental-health/healthy-community-design. Accessed on 2/25/2022.

includes through recommendations and supporting actions detailed in this chapter that focus on improving traffic safety; bicycle and pedestrian infrastructure; public transit and specialized transit services; and transportation demand management (TDM).

The MPO, local communities, and partner agencies, including CARPC and Dane County, must continue to work together to support positive public health outcomes through coordinated transportation and land use planning. Resources provided by the MPO, including the recent intersection safety analysis and safety optimization tool; Low-Stress Bicycle Network report; and Pedestrian/Bicycle Facility Requirements, Policies, and Street Standards report, provide important tools to identify gaps and opportunities, while new resources such as Streetlight Data will further help to visualize data, identify patterns, and guide investments.

Drivers of Change

Transportation is currently experiencing a rapid change not seen since the early 20th century. Some of this change is due to paradigm shifts, such as the growth of telework and the increase in freight going directly to homes due to the rise of online shopping, while other changes are due to the advent of emerging technologies, including connected and automated vehicles. While many of these technologies on their own would be transformational, the confluence of a number of them into and affecting the transportation system at once poses more questions than answers for manufacturers, consumers, and planners. It will be important to determine quantifiable ways that the new technologies will impact planning – be it newfound capacity, cost savings, or a complete reimagining of the transportation system. It will be important, now more than ever, to recalibrate planning efforts based on these and other emerging trends and technologies and to remain flexible, nimble, and adaptable in the coming years.

TELEWORK

According to a recent Gallup[12] poll, 45% of full-time employees in the US were working partly or fully remotely at the end of 2021, a seismic jump from 6% prior to the start of the Covid-19 pandemic. While telework is not an option for many occupations (e.g., manufacturing, education, health care, and the service industry), national and local surveys indicate that telework is likely to be a common part of workplace structures beyond the pandemic, primarily as a hybrid/part-time option. Relative to the long-term impact that telework may have on vehicle miles traveled in the region, responses to a recent MPO survey indicate that telework may have the potential to help employees reduce their overall weekly driving, and in some cases choose alternate commute modes on their in-office days. Greater adoption of flexible workplace models that include both telework and flexible schedules offers greater opportunity to reduce driving and peak period congestion, in turn reducing peak-period roadway demand and expanding opportunities to prioritize investments in other modes of transportation.

E-COMMERCE AND ONLINE SHOPPING

Online shopping is more popular than ever. In fact, in 2019 the total market share of online retail sales exceeded that of bricks-and-mortar retail locations,[13] with consumers expecting quick turnaround, in many cases same-day delivery. One study found that although e-commerce has generated an increase in parcel delivery trips, the net effect of e-commerce has been a reduction in VMT and fuel consumption.[14] The rise in e-commerce requires large warehouse

[12] Saad & Wigert. Remote Work Persisting and Trending Permanent. Gallup, 2021. https://news.gallup.com/poll/355907/remote-work-persisting-trending-permanent.aspx

[13] Rooney, Kate. Online shopping overtakes a major art of retail for the first time ever. CNBC, 2019. https://www.cnbc.com/2019/04/02/online-shopping-officially-overtakes-brick-and-mortar-retail-for-the-first-time-ever.html

[14] Stinson, Enam, and Moore. Citywide impacts of e-commerce: does parcel delivery travel outweigh household shopping travel reductions? Argonne National Laboratory, 2019.

and distribution centers in urban settings, particularly locations with prime Interstate access. The recently proposed 3.4 million square foot Amazon distribution center in the Village of Cottage Grove just off the Interstate 94 and CTH N interchange is an example of this. Transportation-related implications of e-commerce include more daily truck traffic around warehouse and distribution centers, and the increased need for loading zone management practices.

SHARED MOBILITY

According to FHWA[15], advancement in social networking, location-based services, the Internet, and mobile technologies have contributed to the sharing economy. The sharing economy can improve efficiency, provide cost savings, monetize underused resources, and offer social and environmental benefits. Benefits also include encouraging multimodal travel by making it possible to move away from automobile ownership when combined with other transportation options such as walking, bike sharing, and transit.

One of the most popular shared mobility models is on-demand ride services, sometimes called ridesharing or transportation network companies, which use smart phone applications to connect passengers to drivers. In many ways this is not very different than traditional taxi services; however, the increased price transparency and availability of travel information (such as arrival times and GPS locations) have caused these services to increase in popularity. Examples of this type of service include Lyft and Uber. Local taxi services, such as Green Cab, also utilize similar functionality. The transportation and environmental benefits of on-demand ride services depend upon reaching sufficient demand to allow for multi-occupant rides and on the use of electric vehicles for such services.

Carsharing is another shared mobility model, where individuals have temporary access to a vehicle without the cost and responsibilities of ownership. Typically, the carsharing operator provides insurance, gasoline, parking and maintenance, and participants or members pay a fee each time they use a vehicle. Local examples include Zipcar. Bikesharing, such as BCycle in Madison, allows users to access bicycles on an as-needed basis for one-way mobility and/or round trips. Station-based kiosks are unattended, concentrated in urban settings, and allow for a variety of pickup and drop-off locations. Trips are generally less than 30 minutes.

If applied to transit, the technology could help agencies discover new fixed-routes that may not have otherwise been apparent and also address "first mile, last mile" connections to transit. According to the American Public Transportation Association, shared modes complement public transit, enhancing urban mobility; further, the more people use shared modes, the more likely they are to use public transit, own fewer cars, and spend less on transportation overall. To be a convenient, accessible, low cost option, shared mobility services do require a critical mass of population density to be successful.

VEHICLE ELECTRIFICATION

According to the Dane County Climate Action Plan, electrifying the transportation sector is a key strategy for achieving deep decarbonization. Even though more than half of the electric generation in Wisconsin today is from coal (55%), the average EV purchased in Wisconsin today emits approximately 40% less carbon dioxide emissions than the average gasoline-fueled car. A federal Executive Order set an ambitious target for 50% of all new vehicles sold in 2030 to be zero-emissions vehicles, including battery electric, plug-in hybrid electric, or fuel cell electric vehicles. Since 2010, battery pack costs dropped 85%, paving the way to sticker price parity with gasoline-powered vehicles; average vehicle range has increased dramatically as charging times have shortened; and electric models available to U.S. consumers has expanded to over 40 and growing.[16]

[15] Shared Mobility Current Practices and Guiding Principles. FHWA, 2016.

[16] Fact Sheet: President Biden Announces Steps to Drive American Leadership Forward on Clean Cars and Trucks. The White House, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/

CONNECTED AND AUTONOMOUS VEHICLES

Connected and Autonomous vehicles (CV/AVs) are vehicles in which at least some aspect of safety-critical control functions occurs without driver input. Over time, it is anticipated that vehicles will gradually gain more autonomy. Because of this continuum of automation, "levels of vehicle automation" have been developed to determine how driver-reliant a vehicle is. A vehicle with a rating of 0 has no automation, while a rating of 5 is completely automated (Figure 4-a).

Examples of vehicle automation are becoming more mainstream each year. Many higher-end vehicles currently come with automated features such as parking assist and crash avoidance. Examples of this type of technology include advanced drive assistance systems (ADAD) that alert drives to objects or people nearby using radar, sonar, or infrared signals; technologies that apply breaks to avoid crashes; and technologies that avoid collisions by cooperative communication between cell-phone signals, vulnerable users, and vehicles to notify both parties of potential issues.

The future impact of Level 5 (completely automated) CV/AVs on the transportation system is still uncertain. It is likely that fleets and freight will be early adopters. The potential benefits and challenges will largely be dependent on which technology and service models businesses and consumers embrace, and how regulators and policy makers respond. Benefits of this technology are likely to include a dramatic reduction in crashes, reduced travel times, reduced energy consumption, reduced vehicle emissions, improved reliability, increased roadway capacity, and increased transit accessibility. Shared mobility options could become much more attractive since they would be able to provide door-to-door service for all riders. Transit service could be delivered at a reasonable cost in lower-density communities. On the other hand, completely automated vehicles are likely to encourage more driving unless public policies are implemented to make car travel less appealing and to promote shared fleets of such vehicles rather than privately owned ones. For example, if people own their vehicle they can send it on "zero-occupancy" trips or errands. People may also be more inclined to move further from their workplace. Policies to make an automated transportation future more environmentally sustainable will need to be adopted before automated vehicles become widespread.

Levels of Vehicle Automation

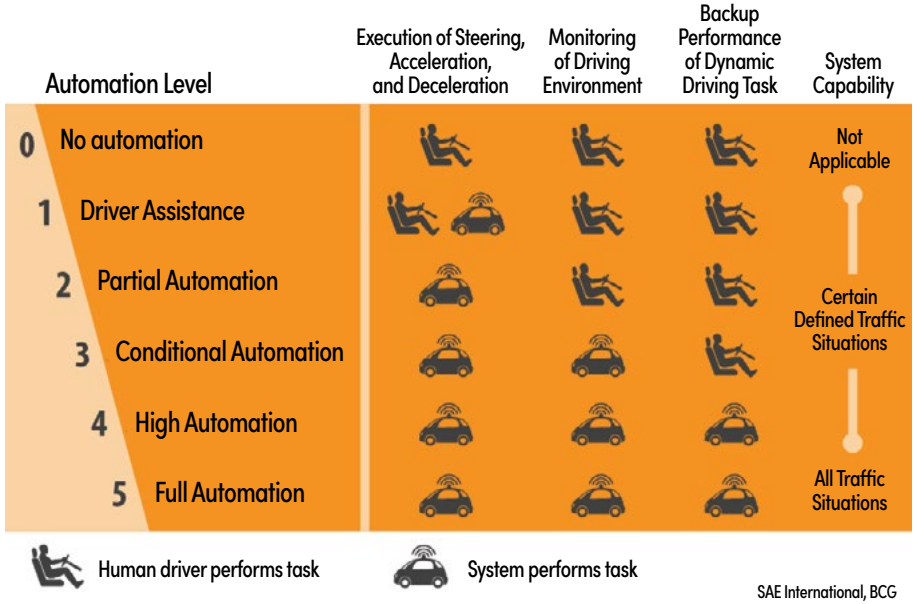


Figure 4-a Levels of Vehicle Automation

Source: businessinsider.com

ITS ADVANCEMENTS

Advanced analytics and machine learning is a technology that provides computers with the ability to learn without explicitly being programmed, particularly when being

inputted with "big data." Example programs are being created with the capability of using big data to identify patterns that can be used to make well-informed predictions such as traffic models. Some traffic operations centers have automated traffic operations systems that automatically adapt signalization during periods of high traffic or alert operators of potential traffic accidents. An adaptive signal system was installed in the McKee Road and Fish Hatchery Road corridors as part of the Beltline/Verona Road construction project and has recently been installed on the University Avenue and East Washington Avenue corridors. Benefits include increased efficiency of existing roadways through predictive analytics and pre-trip guidance for travelers, and increased safety due to automatic dispatching of 911 services though a mixture of this technology and the "internet of things."

The MPO plans to test the potential range of impacts on traffic volumes and VMT of some of these drivers of change using its regional travel forecast model to inform current and future planning efforts, including the Beltline and Interstate corridor studies.

Needs and Recommendations

The MPO has synthesized transportation system needs and developed a series of recommendations with supporting actions for each mode of transportation, as well as transportation demand management (TDM) and transportation system management (TSM). Recommendations are largely focused on optimizing the use and capacity of existing facilities, and improving land use and transportation integration. Recommendations are based on: analysis of the existing transportation network condition and performance; prior and ongoing transportation planning efforts by the MPO and implementing agencies; travel forecasts accounting for future growth; and input received from stakeholders and the public through public engagement activities. Implementing agencies, including WisDOT, Dane County, and local governments, are encouraged to use the following recommendations when undertaking planning efforts and implementing specific transportation projects to ensure regional continuity of the transportation system and support regional transportation plan goals.

The discussion of needs, recommendations, and supporting actions are organized by topic area and mode in the order listed below with the recommendations and supporting actions/strategies highlighted in the tables. Appendix A contains a complete table of the recommendations and supporting actions. Needs and recommendations are organized as follows:

- Land use and Transportation Integration
- Roadways
- Transportation System Management and Operations (TSMO) and Technology
- Public Transit
- Specialized Transit
- Bicycles
- Pedestrians
- Travel Demand Management (TDM)
- Parking
- Inter-Regional Travel
- Freight, Air, and Rail

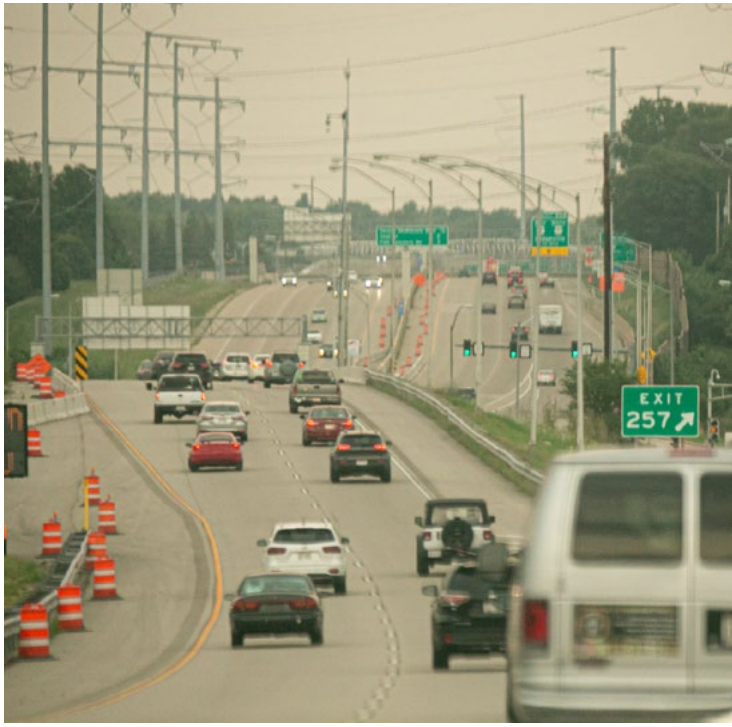
Land Use and Transportation Integration

Though this is a transportation plan, land use and transportation are intrinsically and inextricably related. The role of transportation is to connect people with opportunities, services, goods, and other resources. In order for transportation policies and investments to be successful in achieving this, they must be coupled with land use plans, policies, and implementing ordinances that support the transportation system goals and plan, and recognize the importance of spatial or geographic proximity, layout, and design of land uses. Dispersed, low-density land use patterns and single use developments increase demand for transportation because of greater travel distances. This increases automobile dependency for accessing economic opportunities and needs, thereby placing other travel modes at a disadvantage. Location-efficient development with a balance of mixed uses and pedestrian oriented design provides easy access to desired destinations and reduces people's transportation costs by making alternative travel modes more convenient and economical.

Increasing access to jobs, housing, and services for all people is one of the top priorities of the Capital Area Regional Planning Commission's (CARPC) 2050 Regional Development Framework (RDF) with supporting objectives of increasing the percent of development that is compact, mixed-use, walkable, and where feasible, transit supportive and supporting job growth in identified areas. Key RDF strategies for achieving this goal are focusing growth in centers and multimodal corridors connected by transit and prioritizing growth in already developed areas. See Figure 4-b for Land Use Recommendations and Supporting Actions.

ADOPT AND IMPLEMENT LOCAL LAND USE PLANS AND POLICIES THAT SUPPORT CARPC'S REGIONAL DEVELOPMENT FRAMEWORK GOALS, OBJECTIVES, AND STRATEGIES

Because of the important relationships between land use and transportation, planning for them must be coordinated. This requires that local communities evaluate how land use decisions will affect the transportation system and travel options for people to access jobs, services, and other destinations. It also requires that transportation agencies and communities consider the effects of transportation investments on land use development demand, travel choices, and regional land use patterns. A first step in this coordination is agreement on a vision for how the region grows that supports regional goals combined with transportation policies and planned investments that support that vision. This Regional Transportation Plan was developed in conjunction with, and is designed to support, CARPC's RDF. Specifically, the RTP supports the growth scenario that was developed to accommodate projected new population and jobs in a way that helps achieve RDF goals, while also being consistent with local comprehensive plans and recognizing the development market. Local communities are encouraged to use the RDF to serve as a foundation for decisions on where and how to grow, adopting and implementing plans that support the RDF. To a large degree, current local plans do support the RDF. The challenge is in realizing those plans through appropriate development policies and ordinances and supporting public investments.



Land Use and Transportation Recommendations and Supporting Actions

	Recommendations and Supporting Actions	Timeframe	Implementing Party
1	**Adopt local land use plans and policies that support RTP goals and policies.**		
A	Update land use ordinances and street design and parking standards to remove barriers to mixed use, pedestrian oriented development, where appropriate.	Ongoing	Local governments
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.	Ongoing	Local governments
C	Require pedestrian, bicycle, and transit (where appropriate) facilities in (re)developments.	Ongoing	Local governments
D	Plan, zone for, and encourage transit supportive development in planned transit corridors through TOD zoning and other policies.	Ongoing	Local governments
E	Plan for and promote new development in multi-modal mobility corridors to maximize the efficiency of the transportation system and residents' access to jobs and services.	Ongoing	Local governments
F	Collect information on Transportation Insecurity[1] at the local level through inclusion of TSI questions in relevant local surveys.	Ongoing	Local governments
2	**Provide a mix of housing types with higher densities in areas with multi modal 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.	Ongoing	Local governments
B	Prioritize local subsidies for affordable housing projects in areas with frequent transit service.	Ongoing	Local governments
C	Support (re)development in centers and corridors through infrastructure investments and incentives.	Ongoing	Local governments

[1] See Transportation Security Index and Validation Paper

Figure 4-b Land Use and Transportation Recommendations and Supporting Actions

Roadways

Streets and roadways provide mobility for the vast majority of residents in the region, regardless of whether they drive, take transit, or ride a bicycle. Streets can also be considered the "living rooms" of neighborhoods throughout the community, providing an outdoor space to congregate, recreate, and socialize. It is important to preserve this infrastructure and make targeted enhancements, when appropriate. The following highlights the major needs and recommendations to address them to ensure the efficiency, safety, and cost effectiveness of the roadway network. See Figure 4-c for Roadway Recommendations and Supporting Actions.

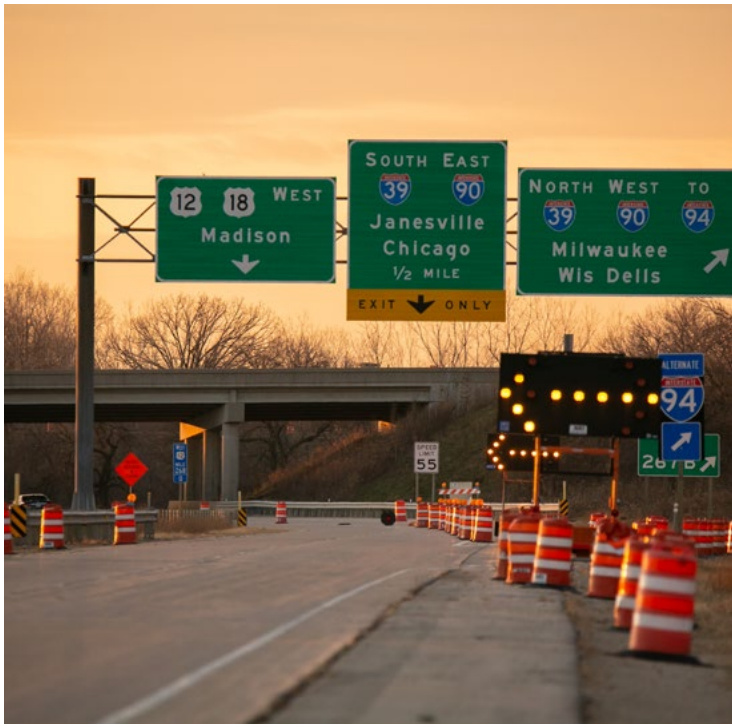
PRESERVE EXISTING REGIONAL ROADWAY INFRASTRUCTURE

Preserving the condition of the regional roadway system—including pavement, bridges, and other associated infrastructure such as signals, lighting, and storm water facilities—is critical for safe and efficient travel. Well-maintained roads also reduce vehicle operating costs, help retain and attract businesses, and contribute to achieving a high quality of life for the region's residents.

Roadways and bridges can last a long time before they need to be completely reconstructed or replaced (typically 50+ years for roads and 50-75 years for bridges). However, motor vehicle use and changing weather conditions, especially freeze/thaw cycle in winters, deteriorate roads over time. Therefore, routine maintenance, periodic rehabilitation, and eventually reconstruction are necessary. The timing and choice of treatment is important for achieving long-term cost savings. Focusing on relatively small-scale maintenance work (e.g., crack sealing, patching and seal coating) prior to structural degradation can avoid the need for costly premature pavement reconstruction.

The state highway system is in better shape than the local roadway system with 100% of the Interstates, 87% of U.S. Highways, and 67% of State Trunk Highways in good condition. The recent five-year trend in state highway condition is mixed with U.S. Highways improving, but State Trunk Highways getting worse. A total of 11% of lane-miles of U.S. Highways and 16% of State Trunk Highways were in poor condition in 2019/'20. The overall condition of county and local arterials has stayed about the same in recent years, but the condition of collectors and local streets has deteriorated. Around 9-16% of these local streets is in poor condition and another 32-38% in fair condition. Additional funding will be needed in the future to maintain the current roadway system, let alone begin to reduce the percentage of the system in poor or fair condition. For more information, see the financial analysis of the plan in Chapter 5.

Figures A-a through A-e in Appendix A lists programmed, planned, and other potential needed high cost, major preservation projects during the plan period. This includes both peripheral area arterial roadways that will need to be reconstructed to urban standards to accommodate planned development and arterial streets within existing developed areas that will likely require reconstruction due to their age and condition.



CONSTRUCT NEW ROADWAYS TO EFFICIENTLY ACCOMMODATE FUTURE GROWTH

Planning for and building a well-connected roadway network to serve developing areas is crucial for efficiently distributing traffic on the regional system and providing multimodal connections between neighborhoods. As connectivity of the system increases, travel

distances decrease and route options increase, allowing more direct travel between destinations, creating a more accessible and resilient system. Dispersing traffic over more roads is more efficient from a traffic circulation perspective, and also better supports alternative travel modes by providing more route options and by limiting the need for overly-wide arterials and intersections that serve as barriers to bicyclists and pedestrians. Other benefits of a connected network include improved emergency response and increased efficiency and safety of services such as garbage collection, street sweeping, and school bus service.

The traditional roadway functional classification system described in Chapter 3 provides a good starting point for planning and managing a roadway system that provides mobility for moving traffic and goods while at the same balancing that with the other functions streets provide such as property access, parking, and safe, convenient, and comfortable travel by non-motorists. Traffic speeds, access, and level of street connectivity should vary depending on the function of the street. The design of streets and the level of traffic congestion tolerated must also consider the land use context, community development goals, and the needs of all modes of travel. The street typology concept discussed in Chapter 3 addresses these tenets. See the *Pedestrian and Bicycle Facility Requirements, Policies, and Street Standards* report for current metro-area community requirements and standards, as well as national recommendations for these standards.

Map 4-a illustrates the planned future roadway functional classification system, including important planned collector streets to serve (re)development. It also highlights roadways that are likely to move up in classification – existing collectors that will function as minor arterials or minor arterials that will function as principal arterials – due to increased traffic volumes and new development served. Examples include the Egre Rd. corridor (including planned extension to USH 151) in Sun Prairie – forecast as a future minor arterial – and the Grand Ave./Reiner Rd./Sprecher Rd. corridor on the east side – forecast as a future principal arterial.

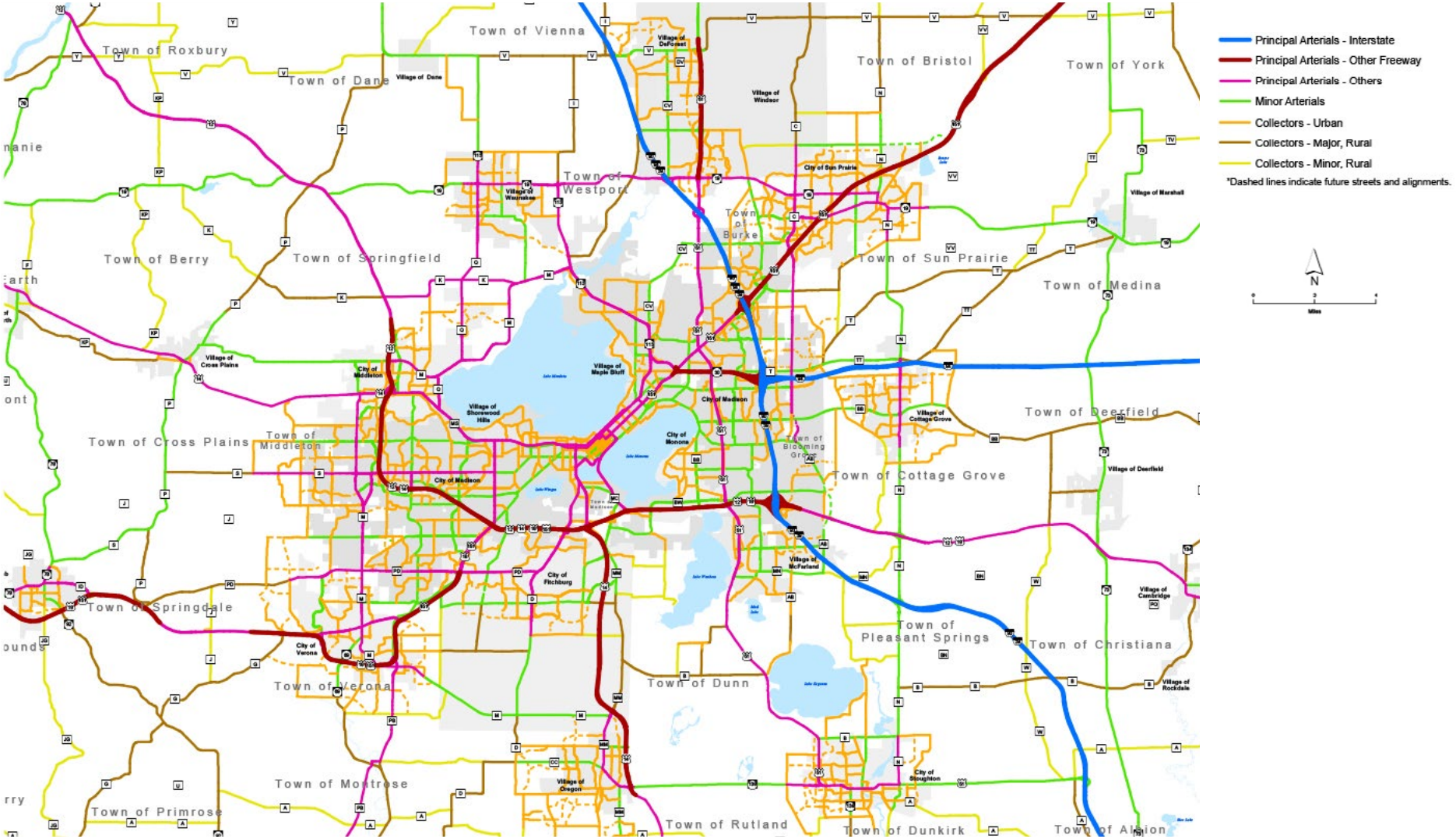
EXPAND THE REGIONAL ROADWAY SYSTEM STRATEGICALLY TO ADDRESS CRITICAL BOTTLENECKS AND ACCOMMODATE FUTURE GROWTH

Household and employment growth and development and travel trends such as increased suburb-to-suburb travel have led to increasing traffic volumes and congestion levels on some regional roadways. While increased teleworking due to the pandemic has resulted in flatter peaks in traffic and slightly less traffic overall compared to pre-COVID, anticipated growth will continue to worsen congestion in the future, eventually negatively affecting the region's economic competitiveness and quality of life. While transportation demand management (TDM) and transportation systems management and operations strategies can mitigate this 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.

In order to evaluate the future performance of the roadway system from a capacity standpoint, the MPO used a regional travel forecast model to project future travel and traffic volumes on the regional roadway system based on forecast household and job

Future Roadway Functional Classification System (2050)

Madison Area, Wisconsin



Map 4-a Future Roadway Functional Classification System (2050)

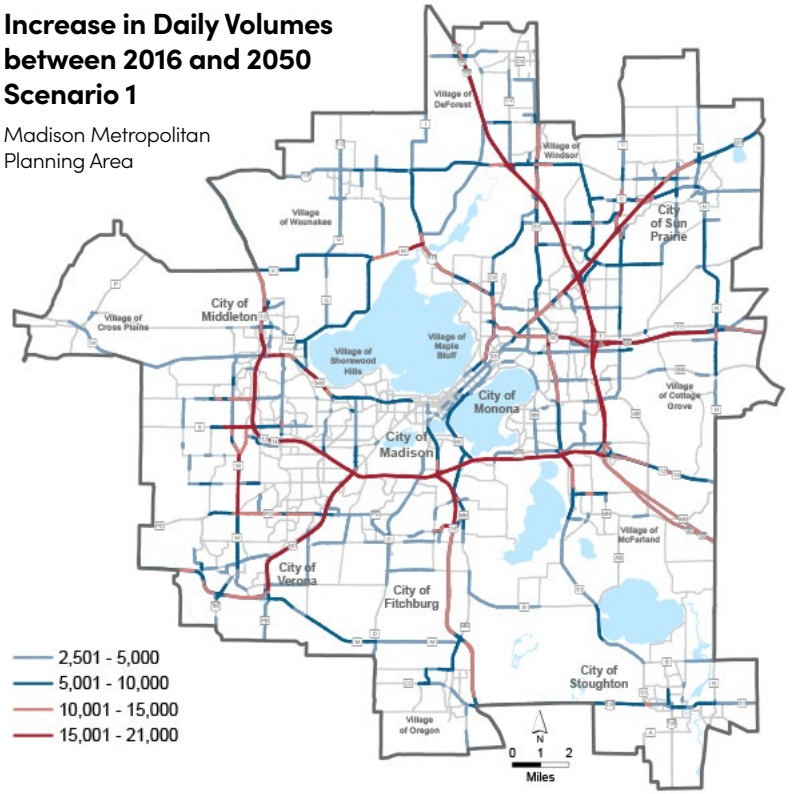
growth and assumed land use development to accommodate that growth. Consistent with the MPO's congestion management policy to utilize transportation demand management (TDM) first in addressing congestion, travel forecasts were based on a land use development scenario that prioritizes growth in infill/redevelopment areas and centers and multimodal corridors and with generally higher densities consistent with CARPC's Regional Development Framework. Also consistent with that policy, the ambitious planned regional transit and bikeway network plans were assumed in the travel model. This includes a full Bus Rapid Transit vision. Finally, consistent with the policy to look next to roadway system management strategies, planned new two-lane collector streets and street extensions to serve developing and redeveloping areas were added to the model. These collector streets help distribute traffic, allowing the regional arterial system to more efficiently handle that traffic. Finally, roadway capacity projects that are programmed for construction in the next five years were added to model. These include the Beltline Flex Lane and County Trunk Highway (CTH) M (North) projects. The travel model was run with these transit, bikeway, and roadway projects to first determine their impacts prior to consideration of recommending any new roadway capacity expansion projects.

Map 4-b shows the projected traffic volume increases on the regional roadway system between 2016 (travel model base year) and 2050 under this scenario (called Scenario 1), while Map 4-c shows the projected generalized levels of congestion in 2050.

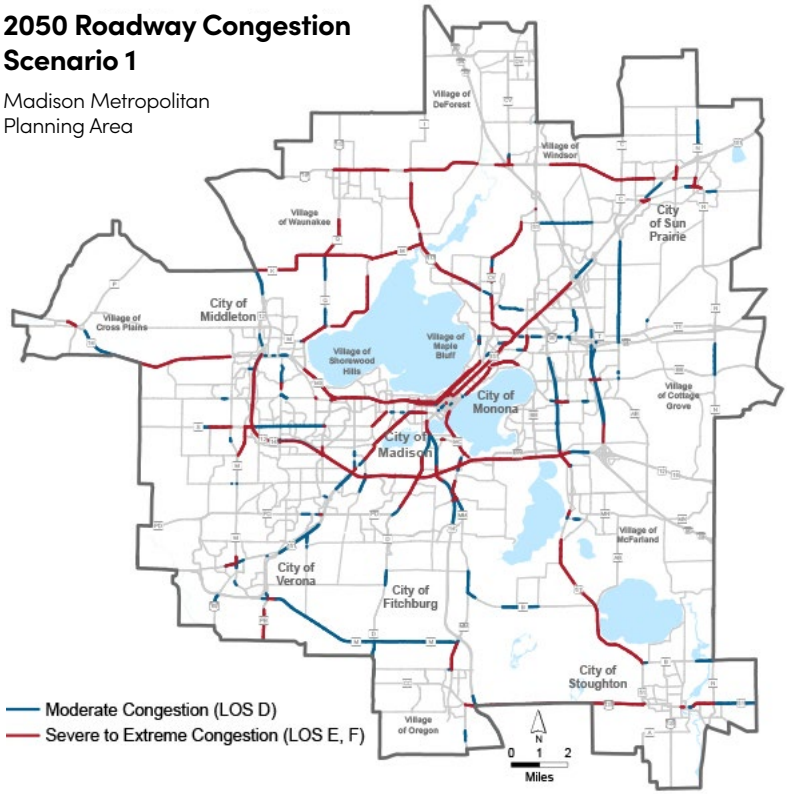
Based on the results of this initial scenario, local roadway capacity project needs were then identified to address corridors projected to be near or over capacity, but only those deemed consistent with plan goals. The two most significant of these are the CTH K (CTH M to US Highway 12) and Reiner/Sprecher Road (O'Keefe 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. The preferred solution to capacity in this corridor would be to build a roadway on new alignment in the corridor to avoid splitting farms and taking homes. If that proves too difficult and costly, the default solution would be to expand CTH K to four lanes. Either way, an interchange is recommended at USH 12, the likely location of which was identified in the USH 12 freeway conversion study. It is recommended that a study of the CTH K corridor be resumed again, a specific route identified, and the corridor officially mapped. This would allow real estate acquisition to begin, a necessary first step for a construction project. See Map 4-d for all of the planned local arterial capacity expansion projects , also listed in Figure A-b in Appendix A. It is recommended that arterial roadways reconstructed with more than two travel lanes generally include medians, with appropriate openings for turning movements and turn lanes. Access management strategies, such as restricting driveway access, should also be used. These and other design strategies provide for more efficient operations and improve safety.

Increase in Daily Volumes between 2016 and 2050 Scenario 1

Madison Metropolitan Planning Area



Map 4-b Increase in Daily Volumes between 2016 and 2050 Scenario 1



Map 4-c 2050 Roadway Congestion Scenario 1

Map 4-d also identifies existing and planned new peripheral roadways where a capacity expansion will or may be required at some point in the future to accommodate future development. Based on the planned growth scenario, however, it is not clear that expanded capacity will be needed within the plan timeframe. Timing of reconstruction of these roadways, with or without expanded capacity, is dependent upon future development. 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. Many of these are county highways, including CTH Q, CTH CV, CTH T, and CTH AB.

Two state highway capacity expansion projects are currently programmed. The most significant is the Beltline Flex Lane project from Whitney Way to the Interstate, which will be completed in 2022. The other is the section of the larger USH 51 (McFarland to Stoughton) project from Jackson Street to CTH B, scheduled for construction in 2025-'26. 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).

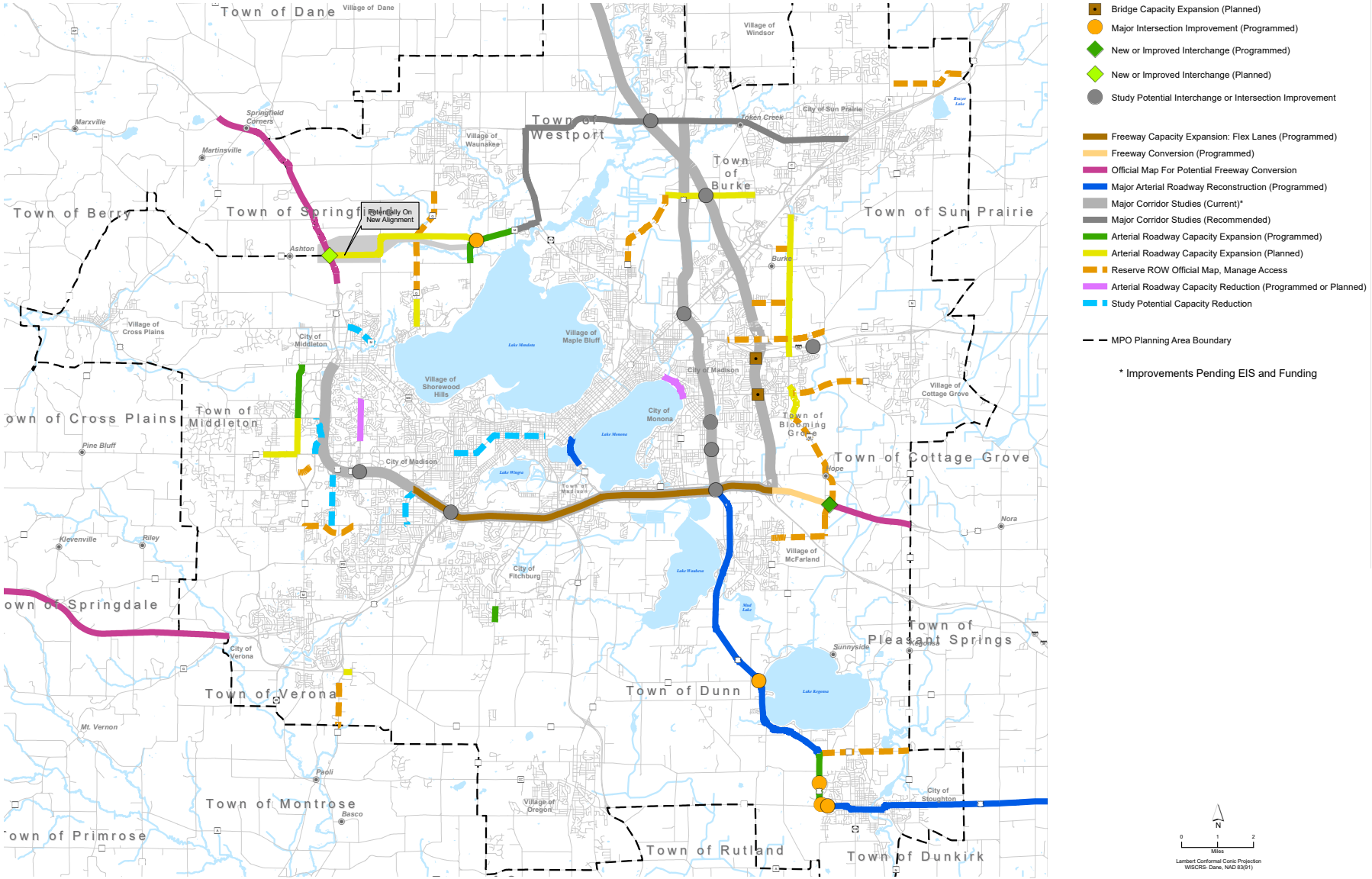
The Flex Lanes on the Beltline are expected to provide the needed capacity for the next fifteen years or so. The current study, which is in its initial phase, is looking at possible long-term solutions to improve traffic operations, including extending the Flex Lanes or adding a general purpose lane and further interchange improvements. Multimodal improvements in the corridor are also being studied, including street and bike/pedestrian crossings of the Beltline and transit priority through some interchanges. The capacity issues on Stoughton Road are at the remaining at-grade intersections. These intersections are also the worst performing from a safety standpoint. The Stoughton Road study is looking at solutions to these issues along with multimodal improvements; addition of travel lanes is unlikely. The Interstate study is looking at long-term needs in that corridor, which revolve around its heavy freight use and summer tourist traffic peaks. As part of this study, potential new interchanges at Hoepker Road and I-90/94 and Milwaukee Street extension and I-94 will be studied for their impact on operations, including other interchanges. This is being done at the request of the City of Madison.

A future study is recommended for the STH 19/STH 113/CTH M ("North Mendota Parkway") corridor. The timing of this is uncertain, but much of this corridor is anticipated to be nearing or at capacity in the future. Continuation of intersection and other small-scale safety, operations, and multimodal improvements in the corridor are recommended in the interim.

Three state highway corridors have been studied for potential freeway conversions with environmental studies completed and recommended alternatives identified. These are: USH 12/18 (Interstate to CTH N); USH 12 (Parmenter Street to STH 19); and USH

Major Roadway Projects and Studies

Madison Area, Wisconsin



Map 4-d Major Roadway and High Capacity Transit Projects and Studies

18/151 west of Verona. The conversion of the segment of USH 12/18 from I-39/90 to CTH AB with a new CTH AB interchange is scheduled for construction in 2023-2024 to address safety issues in this corridor. For the remainder of that highway and the other two, the next step is to officially map the corridors with potential future freeway conversion dependent on real estate acquisition, funding, and other priorities.

Map 4-d illustrates recommended major capacity expansion and intersection, interchange, and bridge widening projects as well as the aforementioned major state highway corridor studies, also listed in Figure A-a and A-b in Appendix A. Figure A-a lists programmed projects for 2022-2026 and Figure A-b lists additional planned projects grouped into two time periods (2027-2035, 2036-2050). The actual timing of the planned projects will depend on future development and traffic growth, impacts of congestion management strategies, system preservation needs, available funding, and other factors.

Figure A-e in Appendix A includes a short list of "illustrative" major capacity expansion projects that are not part of the fiscally constrained, federally recognized plan at this time. These include projects that will come out of the three ongoing major state highway corridor studies of the Beltline, Stoughton Road, and Interstate 39/90/94. Inclusion of these projects in the federally recognized plan is dependent upon completion of the environmental studies, identification of and regional agreement on the scope and cost of recommended improvements, and demonstration that funding is likely to be available for them.

INCORPORATE COMPLETE STREETS AND GREEN STREETS CONCEPTS FOR REGIONAL AND LOCAL ROADWAYS

Complete streets are streets that are designed to help people get where they want to go, whatever their mode of choice. Serving the needs of those who have historically been marginalized in the transportation planning process and underserved by the transportation system—low-income people, elderly and disabled people, and racial and ethnic minority groups—is of particular importance. Integrating community context into all planning, construction, and operations activities can help ensure that the goal of providing free-flowing thoroughfares for motor vehicles does not crowd out safety, equity, and other community priorities. While a complete street may or may not be equipped with facilities like sidewalks and bike lanes, the need for facilities to accommodate travelers using alternative modes should be thoroughly considered prior to construction.

Green streets are designed to slow, filter, and cleanse stormwater runoff through the use of permeable pavement, rain gardens, trees, and other features. Using these types of design features can remove up to 90% of roadway pollutants that would otherwise be washed into nearby water bodies. Green streets also help to increase groundwater supplies, improve air quality, and provide green connections between areas of open space. Some common features of green streets, such as vegetated curb extensions, also serve to calm traffic and improve safety for bicyclists and pedestrians.

MPO policy is to support the adoption of green and complete streets policies by local communities, and to require that streets funded through the STBG-Urban program be designed and constructed as complete streets. The City of Madison is in the process of developing a Complete Green Streets policy to improve livability, and as a way to mitigate and adapt to the effects of climate change.

CONTINUE TO PRIORITIZE SAFETY

The Safe System Approach defines five elements of a safe transportation system—safe road users, safe vehicles, safe speeds, safe roads, and post-crash care—and considers them in an integrated and holistic manner (Figure 4-c). To make meaningful progress, changes are needed in how to think about the traffic safety problem and approaches to solve the problem. Principles of the Safe System Approach include[17]:

- **Safe Road Users**—The safety of all road users is equitably addressed, including those who walk, bike, drive, ride transit, or travel by other modes.
- **Safe Vehicles**—Vehicles are designed and regulated to minimize the frequency and

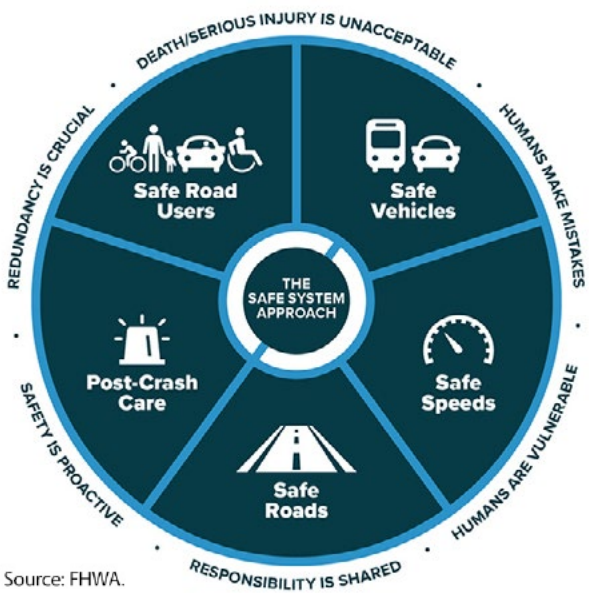
[17] Doctor, M., & Ngo, C. (2022). Making Our Roads Safer Through a Safe System Approach. Public Roads; FHWA-HRT-22-002.

severity of collisions using safety measures that incorporate the latest technology.

- **Safe Speeds**—Humans are less likely to survive high-speed crashes. Reducing speeds can accommodate human-injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.
- **Safe Roads**—Designing transportation infrastructure to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and other road users.
- **Post-Crash Care**—People who are injured in collisions rely on emergency first responders to quickly locate and stabilize their injuries and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident management, and other activities.

Network screening is a systematic review of roadway crashes to identify problematic locations. In 2021 the University of Wisconsin Traffic Operations and Safety Lab (TOPS Lab) updated the MPO intersection network screening report for 2017-2020 and developed an optimization tool that is recommended to help local agencies identify intersection locations and cost effective safety countermeasure strategies that can

The Safe System Approach



Source: FHWA.

Figure 4-c The Safe System Approach

be used for prioritizing safety projects. The MPO will also be partnering with the TOPS Lab to develop a High Injury Network that can be used to prioritize system-wide safety improvements to help achieve zero deaths and serious injuries on Dane County roadways.

Contributing factors to vehicle crashes may include both roadway design and/or behavioral factors such as speeding, distraction, and impairment. It is critical to continue supporting local efforts to improve roadway safety. Both Madison and Sun Prairie have adopted Vision Zero policies to achieve zero roadway deaths and serious injuries. Strategies include reducing speed limits, improving bike and pedestrian accommodations, and outreach and education efforts. The Dane County Traffic Safety Commission is a multidisciplinary coalition of public and private organizations, including public health, law enforcement agencies, engineering, judicial, education, and advocacy organizations working together to monitor and improve traffic safety. The Traffic Safety Commission meets quarterly to review serious and fatal crashes, identify possible contributing factors, and make traffic safety recommendations. Current traffic safety emphasis areas that the Commission is working on include: reducing impaired driving; reducing risky driving behaviors; improving pedestrian safety; and centering equity in traffic safety.

ADDRESS SECURITY AND RESILIENCY NEEDS OF THE REGIONAL ROADWAY SYSTEM

The regional roadway system must be able to withstand natural and manmade threats, shocks, and stressors. The region relies on a resilient transportation system that can ensure the movement of people and goods in the face of one or more major obstacles to normal function, such as extreme weather events, major accidents, or other infrastructure failure. As technology plays an increasingly integral role in the transportation system, ensuring the cybersecurity of vital ITS networks will become increasingly important in the future.

Roadway Recommendations and Supporting Actions

	Recommendations and Supporting Actions	Timeframe	Implementing Party
1	**Preserve and maintain the region's street and highway system in a manner that minimizes their life cycle cost, maintains safety, and minimizes driver costs while reducing their impact on the environment.**		
A	Monitor regional roadway system pavement and bridge condition and continue to coordinate with WisDOT federal performance targets.	Ongoing	MPO, WisDOT
B	Develop and implement asset management plans to assist in making cost-effective decisions concerning the maintenance and rehabilitation of roadways, bridges, and associated infrastructure.	Ongoing	WisDOT, Dane County, local governments
C	Provide for ongoing maintenance activities in major state and local arterial corridors planned for future potential expansion until capacity is needed and major project funding can be secured.	Ongoing	WisDOT, Dane County, local governments
D	Promote the Wisconsin Salt Wise partnership and support additional research and demonstration projects to provide safe roadways in the winter while minimizing chloride and sodium application.	Ongoing	WisDOT, Dane County, local governments
2	**Build a well-connected network of regional roadways to accommodate future growth and efficiently distribute traffic to avoid bottlenecks on overburdened routes.**		
A	Conduct detailed planning for existing and new streets and utilize official mapping, right-of-way dedications, and other methods to preserve existing and planned regional roadway corridors for potential improvements.	Ongoing	Local governments
B	Utilize travel model to conduct a "build-out" analysis of peripheral area development plans to support planning for future regional roadway system.	Near Term	MPO
3	**Incorporate complete streets and green streets concepts for regional and local roadways.**		
A	Adopt and implement formal complete streets policy.	Near Term	WisDOT, Dane County, Local governments
B	Adopt and implement green streets policy.	Near Term	Local governments
C	Develop modal priority corridors based on the RTP.	Near-Mid Term	Local governments
4	**Expand regional roadway system capacity to address critical bottlenecks and accommodate future planned growth consistent with RTP goals.**		
A	Continue or initiate detailed planning, design, and construction of state and local arterial capacity roadway, bridge, and interchange projects shown in Map 4-d and listed in Figures A-a through A-e as needed with consideration given to project phasing where appropriate.	Ongoing	WisDOT, Dane County, Local governments
B	Complete major corridor studies of the **Beltline**, **Stoughton Road/USH 51**, and **Interstate 39/90/94**. Upon completion of accepted environmental documentation, seek enumeration as Majors projects and advance recommended alternatives. Continue to implement short-term TSM, safety, and multi-modal improvements in the corridors in the interim until Majors program funding is secured.	Near-Mid Term	WisDOT
C	Initiate major study of the STH 19/STH 113/CTH M corridor to identify the long term solution to existing and future congestion and safety issues in the east-west corridor north of Lake Mendota. Continue in the meantime to implement TSM, safety, and multi-modal improvements.	Near-Mid Term	WisDOT, Dane County, MPO

Figure 4-d Roadway Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
5	**Adopt a Safe System Approach for addressing safety needs on the regional roadway system through a comprehensive "4-E" approach (Engineering, Education, Enforcement, and Emergency Services).**		
A	Implement WisDOT's Wisconsin Strategic Highway Safety Plan (SHSP).	Ongoing	WisDOT, Dane County, local governments, state agencies, law enforcement agencies, private organizations
B	Develop a high injury network and continue to identify regional high crash severity intersections. Conduct further detailed study of these locations to identify countermeasures and prioritize projects for federal and state safety funding.	Ongoing	MPO, Dane County, local governments
C	Continue to support local safety initiatives such as Vision Zero.	Ongoing	Local governments
D	Continue to support the Dane County Traffic Safety Commission.	Ongoing	WisDOT, local governments, law enforcement agencies, non-profit organizations, MPO
E	Continue to expand state and local safety education efforts, including neighborhood-based initiatives.	Ongoing	WisDOT, local governments, non-profit organizations
F	Support local and county efforts to ensure equitable enforcement of traffic laws.	Ongoing	Local governments
G	Support local efforts to identify corridor level systemic safety improvements, and work with WisDOT to identify changes to safety program criteria to allow funding of such projects.	Ongoing	WisDOT, MPO
6	**Address security and resiliency needs related to the regional roadway system.**		
A	Update the vulnerability assessment of critical transportation infrastructure in the state as part of development of the State Highway Investment Plan. Monitor identified facilities and make improvements as needed.	Ongoing	WisDOT
B	Update as necessary hazard mitigation and emergency evacuation plans to reduce risk of disruptions to the regional roadway system due to flooding, winter storms and severe weather conditions, terrorism, hazardous material spills, civil disorder, and other events.	Ongoing	Dane County, Local governments
C	Initiate study to identify roadways and other transportation facilities that are susceptible to flooding, identify alternate routes when flooding occurs, and identify improvements to make the facilities more resilient to flooding.	Near Term	MPO, Dane County, Local governments

Figure 4-d Roadway Recommendations and Supporting Actions *(Continued from previous page)*

Transportation System Management and Operations (TSMO) and Technology

Adding travel lanes to a roadway or other major capacity expansion is often not feasible or desirable because of the cost and many negative impacts to the environment, residents' quality of life, and other roadway users. However, actively managing the transportation system to improve traffic operations can increase the capacity of a roadway without constructing new lanes. Transportation system management and operations (TSMO) includes strategies such as improved traffic signal operations, management of roadway incidents, and traveler information, as well as targeted roadway modifications (often at intersections where most delay occurs) to provide bottleneck relief. Intelligent Transportation Systems (ITS) – technologies or systems (e.g., sensors, computers, communications) that allow multiple agencies to work together – can aid these TSM strategies. Even for roadways that will eventually need to have travel lanes added, TSM can delay the need for the capacity expansion and should be utilized first and in conjunction with the new capacity. In short, TSM, including ITS, is about actively managing the operation of the transportation system using technology and targeted infrastructure investments to improve travel conditions and make the best use of existing transportation infrastructure. See Figure 4-e for TSMO and Technology Recommendations and Supporting Actions.

IMPLEMENT THE CONGESTION MANAGEMENT PROCESS

To minimize congestion for all transportation modes and reduce unexpected delay, the MPO has adopted a comprehensive congestion management process (CMP) (Appendix F). The CMP prescribes comprehensive transportation system management and operations strategies such as traffic signal coordination, traveler information, and enhanced incident response coupled with physical bottleneck relief through targeted capacity expansion to ensure the most efficient use of resources and minimize the environmental impact of the transportation system. The efficacy of this process is determined in part by an annual performance measurement and monitoring process.

The CMP prioritizes:

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, bicycle, or pedestrian.
3. Strategies that improve the operation of the existing roadway system, making it more efficient for all users.
4. Strategies that add roadway capacity, primarily at bottlenecks or other strategic locations, should only be considered when other strategies prove ineffective and doing so is consistent with other goals and policies.

The development of a regional Transportation Systems Management and Operations (TSMO) plan could help achieve the goals and priorities of the CMP. 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.

IMPROVE THE OPERATION OF THE TRANSPORTATION NETWORK BY MANAGING ROADWAY ACCESS

Access management is the control of the location, spacing, design, and operation of driveways, median opening, interchanges, and street connections to a roadway. Access management is intended to provide vehicular access to land and development in a manner that preserves the safety and efficiency of the transportation system. Access management follows a roadway hierarchy similar to

functional classification. Access management can help increase roadway safety and reduce traffic congestion. Multimodal benefits of access management includes fewer traffic conflict points for motorists, cyclists, and pedestrians, a safer walking environment (e.g., through median refuges for crossing roadways), and reduced delay and travel times for transit riders.

MODERNIZE THE TRANSPORTATION NETWORK THROUGH THE USE OF TECHNOLOGIES THAT IMPROVE THE OPERATIONS OF EXISTING INFRASTRUCTURE

The operation of the transportation system can be impacted not only by roadway design, but also by technologies that modify traffic flow and provide information to influence traveler behavior. In terms of importance, neither method can be understated. To plan for and coordinate future operational improvements, the MPO adopted the first *Regional Intelligent Transportation Systems Strategic Plan* in early 2016. This plan contains a prioritized list of recommended projects, as well as strategies to guide plan implementation. The plan should be implemented and updated as needed.

PROMOTE THE TRANSITION TOWARDS ELECTRIC VEHICLES BY DEVELOPING CHARGING INFRASTRUCTURE

Transitioning away from traditional fossil fuels toward electric powered vehicles represents one way in which Dane County can decrease emissions, slowing global warming and reducing our reliance on imported fossil fuels. A 2018 study conducted by Frontier Group, Environment America and U.S. PIRG, estimates that Madison would need 202 level 2 chargers in workplaces, 126 level 2 chargers in public places and 14 public DCFCs to accommodate 9,000 electric vehicles within the city limits by 2030.[18] These numbers are based on a conservative city population growth scenario; Madison, and the surrounding communities, may well need more public and workplace chargers than these recommendations. This same study recommends the following to implement clean transportation systems: expanding access to charging infrastructure, increasing familiarity with electric vehicles, and easing range anxiety. Local governments can help speed the growth of charging networks in collaboration with local energy providers by allowing, incentivizing, or even requiring property owners to make those improvements.

[18] Frontier Group, Environment America and U.S. PIRG, https://frontiergroup.org/sites/default/files/reports/US%20Plugging%20In%20Feb18.pdf

TSMO and Technology Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Implement the adopted Congestion Management Process.**		
A	Continue and improve monitoring of system performance and measurement of the impact of implemented projects utilizing the methodology outlined in the plan.	Ongoing	MPO, WisDOT
2	**Develop a Regional Transportation Systems Management and Operations (TSMO) Plan.**		
A	Identify, prioritize, and implement corridor and intersection TSM projects to improve traffic and transit operations and safety on the arterial roadway system.	Near Term	MPO, WisDOT, Local Governments

Figure 4-e TSMO and Technology Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	**Implement access management plans and standards for existing and planned future arterial roadways as development and street (re)construction occur.**		
A	Initiate access management plans on congested corridors as development and street reconstruction occur.	Ongoing	WisDOT, Dane County, Local governments
B	Develop a regional access management plan that identifies standards for future arterials roadways, best practices, and safety considerations.	Near Term	MPO
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.	Ongoing	WisDOT
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.	Ongoing	WisDOT
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.	Ongoing	WisDOT, Dane County, Local governments
B	Replace obsolete traffic signal controllers with "smart" controllers when replacing traffic signals or constructing new signalized intersections.	Ongoing	WisDOT, Dane County, Local governments
C	Implement adopted process to identify and integrate ITS infrastructure into planning and design of major state roadway construction projects.	Ongoing	WisDOT
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.	Ongoing	WisDOT, Dane County, Metro, Local governments
B	Continue efforts to provide comprehensive real-time traveler information to people and businesses.	Ongoing	WisDOT, City of Madison
C	Implement a smart card payment system that can be expanded to include a common fare media for other civic uses, as well as an open payment system that accepts fares using personal electronic devices.	Near Term	Metro
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.	Near Term	WisDOT, City of Madison, MPO
6	**Promote electric vehicle charging infrastructure to reduce greenhouse gas emissions.**		
A	Conduct a regional electric vehicle charging infrastructure readiness assessment.	Near Term	MPO, Dane County, Utility providers
B	Support development of alternate fuel corridors.	Ongoing	WisDOT

Figure 4-e TSMO and Technology Recommendations and Supporting Actions *(Continued from previous page)*

Public Transit

The Metro Network Redesign project is taking place concurrently with the development of this Regional Transportation Plan. The transit element of this plan builds upon this planning effort to identify a long-term vision for a regional transit system. Map 4-e illustrates this future planned transit network. With implementation of the planned transit network, the number of average weekday boardings on the system is projected to increase by 72% percent from 59,200 to nearly 102,000 by 2050 with assumed growth, while the number of trips (excluding transfers) is projected to grow from 54,500 to 94,300.[19] This excludes supplemental school service ridership.

The future transit system shown in Map 4-e was developed in six steps.

1. BRT east-west and north-south corridors and local service extensions serve as the framework or core of the transit system;
2. Routes in the "Ridership Alternative" from the Metro Network Redesign, which focuses resources on frequent service on densely-developed corridors, were added[20];
3. Regional express routes to outlying communities, largely unchanged from the last RTP, were added;
4. Based on projected development by 2050 as included in the growth scenario developed for the Regional Development Framework and RTP, additional routes were added and/or service frequency was increased, including new BRT service connecting southwest and east Madison with the UW campus and downtown, extending N-S BRT south to the Fitchburg government center, and extending BRT through Middleton to connect to the east-west BRT corridor near Mineral Point Road and the Beltline. In addition to BRT, new high-frequency routes serve important corridors such as the Johnson/Gorham couplet, Williamson Street, Monroe Street, Atwood Avenue, Old University Avenue, and Watts Road;
5. The draft future transit system was reviewed with community planning and Metro staff; and,
6. Revisions were made to the network based on feedback from community planning and Metro staff.

It is important to note that the future transit system shown here is intended to inform local land use planning efforts and guide future transit service planning as well as gauge the impact on auto travel in selected corridors as part of the plan update; it is a concept plan, not a detailed service plan, in that routes do not necessarily include required turn-around points, and routes have not been evaluated for efficient running times.

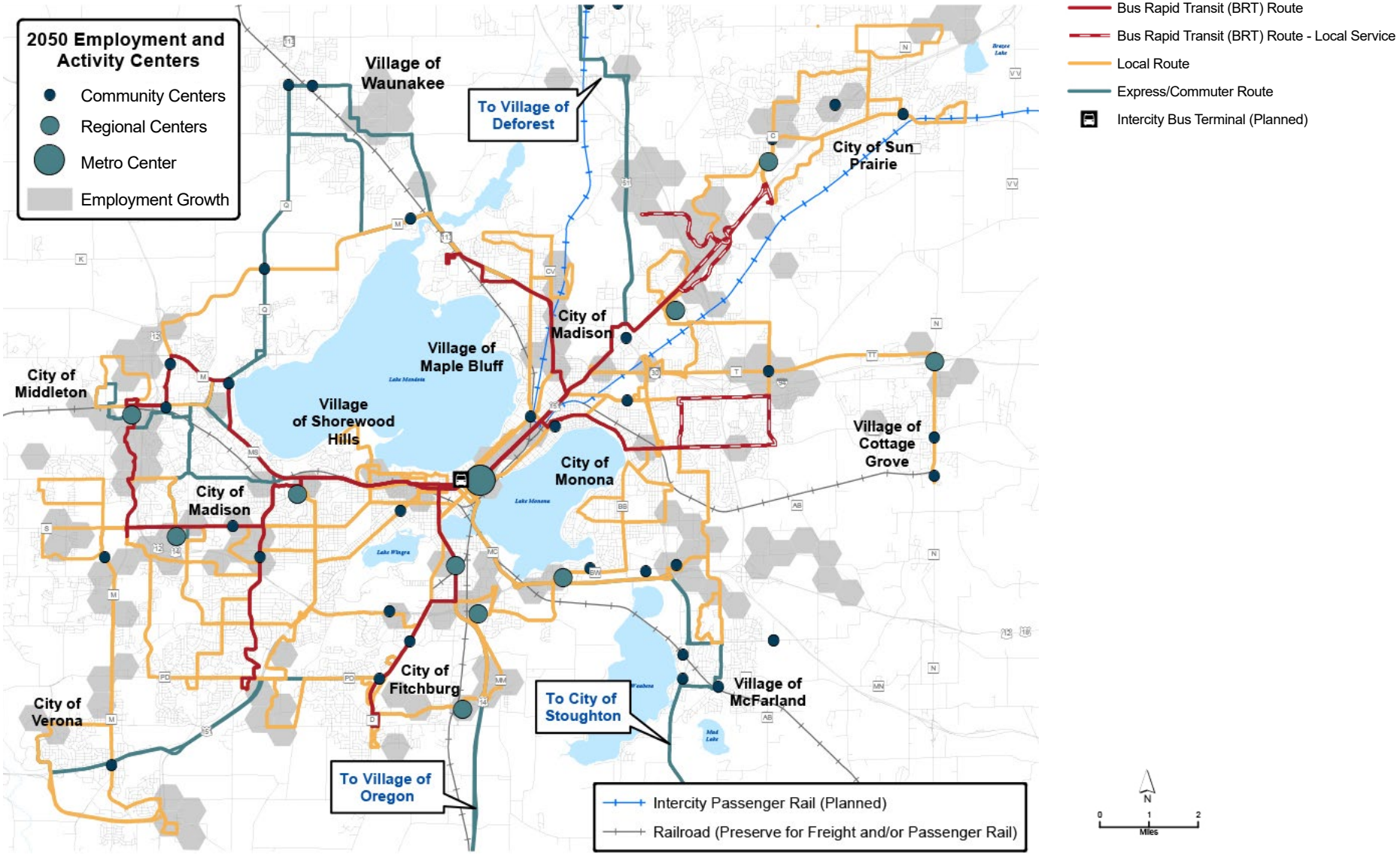
Map 4-f shows the planned transit network service frequency during the weekday peak periods. The frequent service network (15-minute service throughout the day) would be increased from five routes during peak periods and only one route mid-day to seven routes during the AM peak and eight routes for the remainder of the day. In addition to the number of routes providing frequent service, the mid-day frequent service network will

[19] Travel model base year of 2016

[20] Due to differing schedules of the RTP Update and the Network Redesign, the RTP proposed future transit network was based on an alternative network that was designed in order to elicit feedback, not to be implemented. The Madison Transportation Policy and Planning Board (TPPB) directed staff to develop a draft transit network based on the Ridership Alternative with improved coverage; the proposed future transit network is consistent with that direction but does not incorporate most of the changes incorporated into the draft network currently being considered due to conflicting project schedules.

Future Planned Regional Transit Service Network

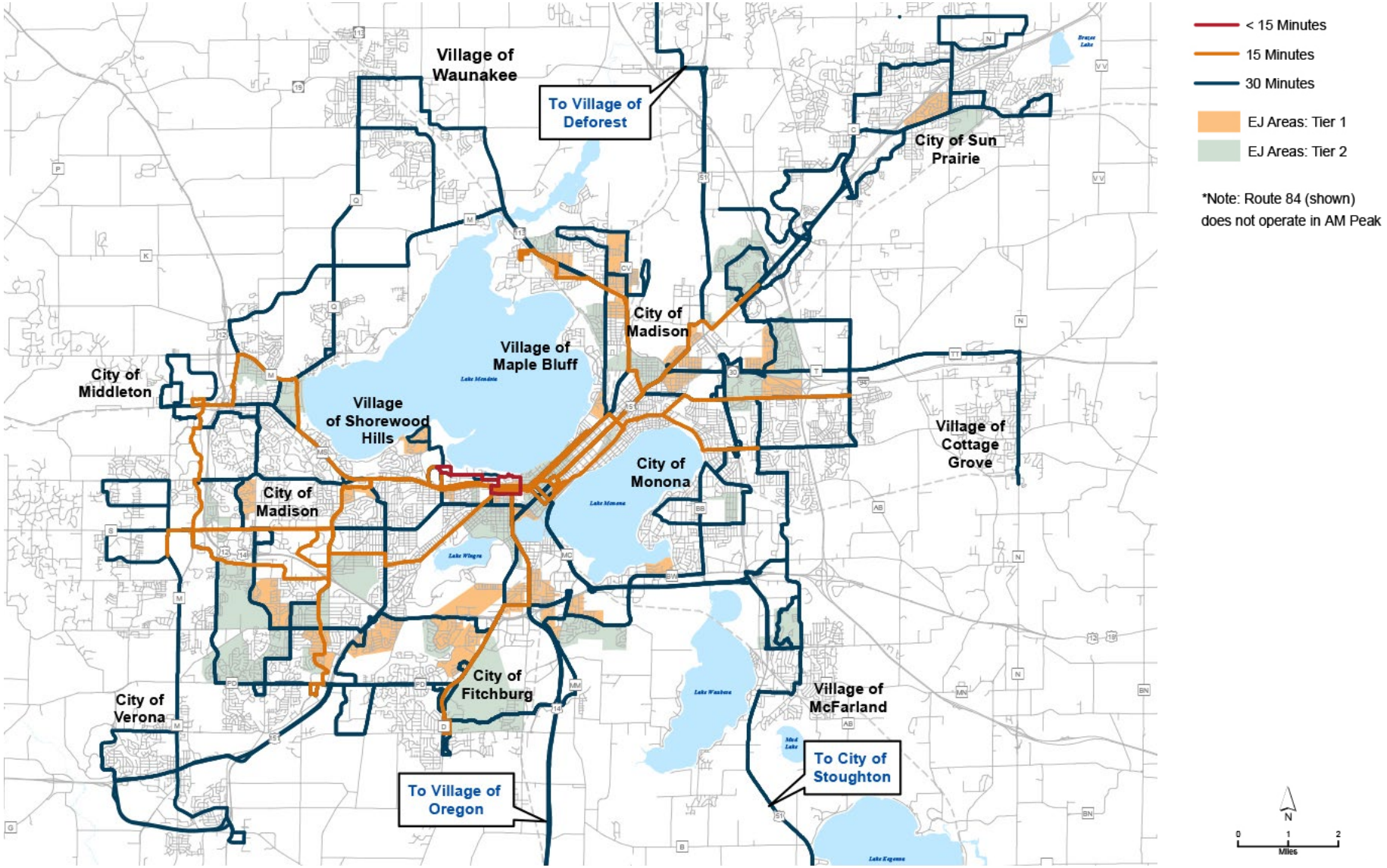
Madison Area, Wisconsin



Map 4-e Future Planned Regional Transit Service Network

Future Planned Regional Transit Network: AM & PM Peak Route Headways

Madison Area, Wisconsin



Map 4-f Future Planned Regional Transit Network: AM & PM Peak Route Headways

grow from 6 miles (mid-day)/42 miles (peak only) to 88 miles (all day) in length. With this expansion of frequent service area will come a marked increase in the number of jobs and households within ¼ mile of the frequent service network, as shown in Figure 4-f. The number of households within ¼ mile of the frequent service network will grow by 290%, and the number of jobs accessible on the network will grow by 185%. Map 4-g shows the number of buses per hour during the mid-day period under the planned transit network.

Jobs and Households within 1/4 Mile of the Frequent Service Network (15 min)

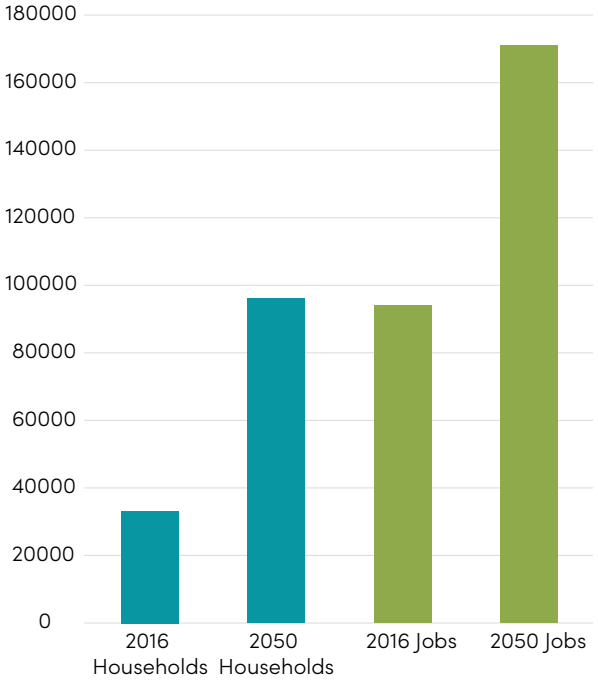


Figure 4-f Jobs and Households within 1/4 Mile of the Frequent Service Network (15 min)

While Maps 4-e through 4-g show the transit system vision, a new infusion of funding—for example through creation of a regional transit authority providing a dedicated funding source—will be needed to fully achieve this vision. For more information, see the Financial Analysis in Chapter 5.

IMPLEMENT A BUS RAPID TRANSIT SYSTEM AND RESTRUCTURE EXISTING ROUTES TO IMPROVE EFFICIENCY

Recognizing that BRT was a more cost effective, realistic high capacity transit service option for the Madison area due to its mid-size, the unlikelihood of securing grant funding for a rail project, and lack of a dedicated transit funding source, the MPO led the *Madison Transit Corridor Study* in 2013 in cooperation with Metro Transit, using funding secured by the Capital Area Regional Planning Commission through a Sustainable Communities grant. The study identified four corridors suitable for bus rapid transit (BRT). BRT elements identified in the plan include frequent, direct, limited-stop service, branded buses and stations with level boarding and off-board fare collection, and transit priority measures like bus lanes and transit signal priority. These corridor improvements would improve capacity and reduce travel times for transit riders throughout the Madison area. At the time, it was envisioned that capital costs could be funded in large part through a federal Small Starts grant. As was envisioned in 2013, the East-West BRT project is recommended for funding in part by a federal Small Starts grant of $80 million.[21] The City of Madison is currently pursuing federal Areas of Persistent Poverty funding for planning the North-South BRT route. Map 4-h shows the proposed BRT system.

Concurrently with planning the East-West BRT system, Metro is engaged in a Transit Network Redesign. The Network Redesign is intended to improve transit equity throughout the region, to address long-standing service complaints regarding long travel times and transfers, confusing service, and rider safety. The BRT and Network Redesign projects acknowledge the effects of each other, but neither restricts the consideration of alternatives of the other project, and both projects have value with or without the implementation of the other.

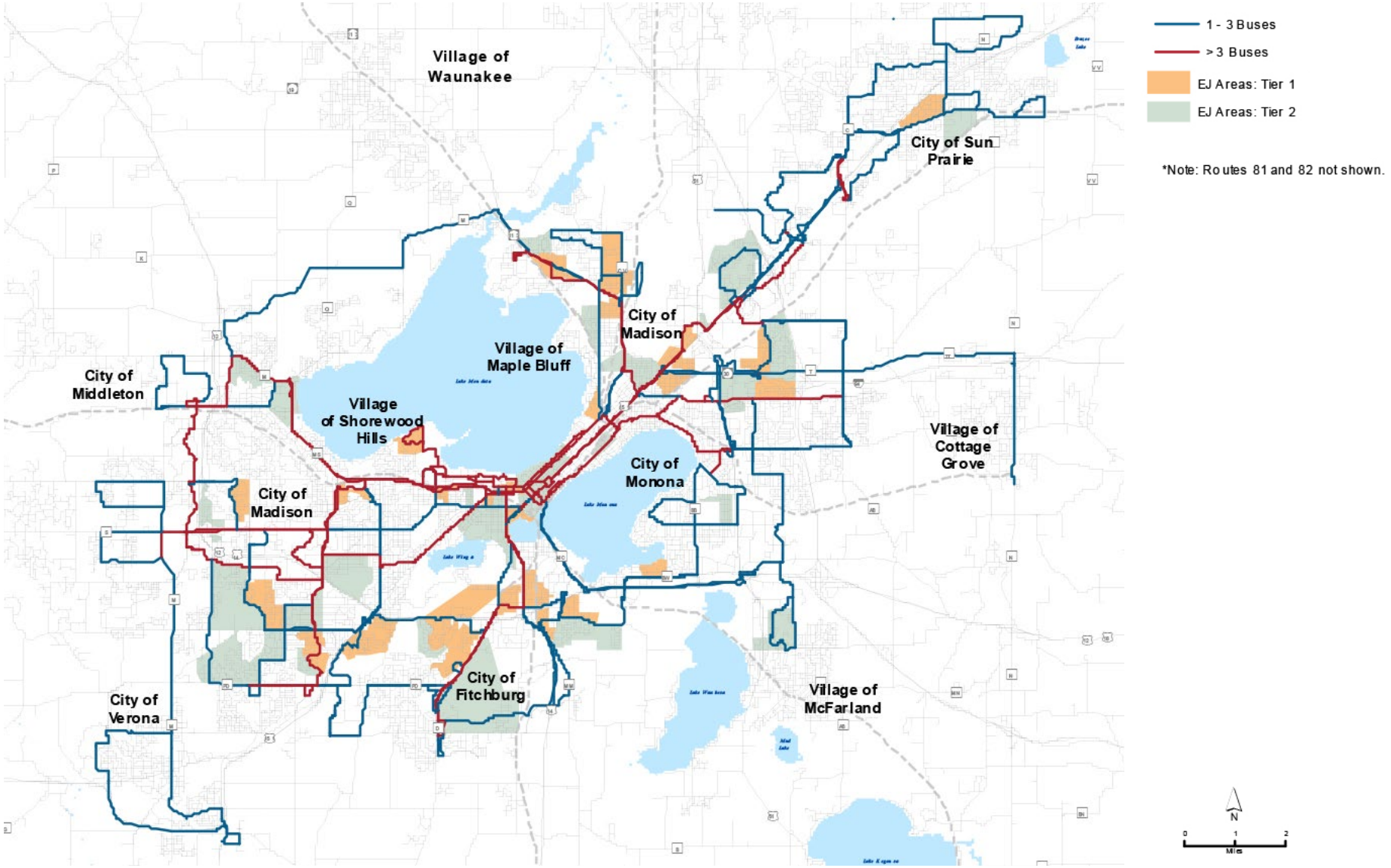
IMPROVE THE EXISTING LOCAL BUS NETWORK BY REDUCING TRAVEL TIMES, INCREASING FREQUENCY, INCREASING CAPACITY, IMPROVING SERVICE TO EJ AREAS, PROVIDING SERVICE TO NEW NEIGHBORHOODS, AND ENHANCING FIRST AND LAST MILE CONNECTIONS

With a growing service area and limited service outside peak periods and on weekends, transit travel times for longer distance trips are often not even close to being competitive with driving. Many cross-town trips take an hour or longer due to routing through neighborhoods and

[21] https://www.transit.dot.gov/sites/fta.dot.gov/files/2021-05/FY22-Annual-Report-on-Funding-Recommendations.pdf

Future Planned Regional Transit High Frequency Network (Mid-Day) Approximate Buses per Hour

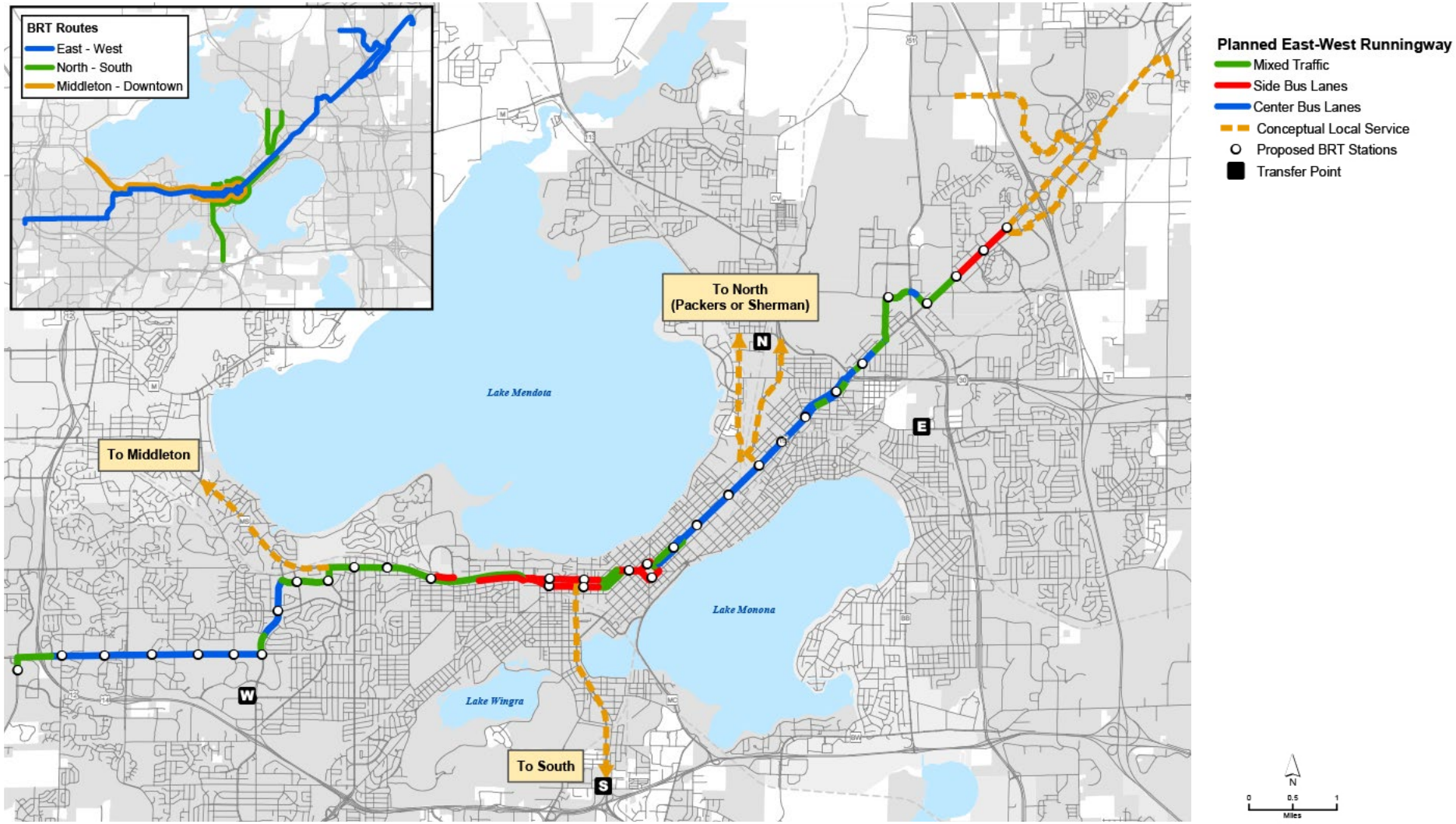
Madison Area, Wisconsin



Map 4-g Future Planned Regional Transit High Frequency Network (Mid-Day) Approximate Buses per Hour

Proposed East-West Bus Rapid Transit

Madison Area, Wisconsin



Map 4-h Proposed East-West Bus Rapid Transit

transfers. There is a need to shorten these trips, allowing riders to use faster, more direct service throughout the day. New performance measures with sustainable data sources should be adopted to measure success in achieving this recommendation.

Related to the need for reduced travel times is a need to increase the frequency of service in some parts of the network. High-frequency routes are generally defined as those in which a rider does not have to check a schedule before traveling to a transit stop – generally 15-minute service or better. Currently, a limited number of neighborhoods in the region are served with high-frequency service and are predominantly located in central Madison. High-density corridors need consistent, high-quality, frequent local all-day service. Such corridors include Monroe Street, Regent Street, Mills Street, Broom and Bassett Streets, and Atwood Avenue; other emerging corridors are being (re)developed so as to also warrant high-frequency service, including Cottage Grove Road, Parmenter Street, Century Avenue, University Avenue, Fish Hatchery Road, Park Street, and Main Street in Sun Prairie.

Along with frequency improvements, capacity improvements must be made on heavily traveled routes. Metro operates a fixed-route fleet of exclusively 40-foot transit coaches that seat about 35 and allow for about 20 standees. Pre-pandemic, several routes routinely suffered from overcrowded conditions, including instances where passengers were passed by because the bus was full. Metro has used "extra" buses on routes with chronic overcrowding to provide additional capacity, but this strategy is costly due to doubling the number of drivers and vehicles in operation on those routes during peak periods. Metro is engaged in establishing a new bus storage and maintenance facility on Hanson Road, which will allow Metro to increase the number of buses in its fleet, introduce larger articulated buses, and accommodate future high-capacity transit, new all-day service, and regional routes.

Minority populations have historically experienced longer travel times and required more transfers to complete their trips than white riders have, with black riders being three times more likely to transfer than white riders.[22] The 2021-22 Transit Network Redesign proposes a system[23] that improves transit access for the majority of area residents; minority populations will see improved access with the new system as well.[24] For in-depth review of transit and Environmental Justice populations, see Appendix C. Continual improvement in transit access for these populations will require ongoing data collection and targeted allocation of resources.

[22] 2015 Metro On-Board Survey, https://www.greatermadisonmpo.org/planning/documents/OBSExecutiveSummaryMPO.pdf (p 12)

[23] The final proposed network, although still in development, will be based on the Ridership Alternative in the Metro Network Redesign Alternatives Report, https://www.cityofmadison.com/metro/documents/network-redesign/Alternatives-Report-pt1.pdf

[24] ibid (p 42)

When new neighborhoods are fully developed, full transit service should be provided with access to the rest of the urban area. Some neighborhoods in peripheral Madison, Middleton, Fitchburg, and Verona only have service during weekday peak periods and require service throughout the day to provide access to jobs outside the traditional first shift workday as well as trips serving other purposes. Sun Prairie arguably represents the largest need for all-day fixed-route bus service. With a 2020 population of about 36,000, Sun Prairie is currently served by a publicly subsidized shared-ride taxi system and a peak-period bus route (#23) with limited-stop service to downtown

Madison. While popular, the shared-ride taxi system is strained by the capacity limitations of serving one or two people at a time and does not provide a convenient and affordable trip to Madison. Sun Prairie is currently planning to replace route 23 service with a local service extension of the BRT system connecting to the Sun Prairie Park and Ride, and is investigating options for local bus service.

Finally, the transit system must be accessible for those that live and work near transit stops, but outside of reasonable walking distance. Connecting transit routes provide a good option, but their typical low frequencies and circuitous routes, combined with transfers, drive up travel times. Further, they sometimes have low ridership and can be expensive to operate, providing relatively low utility to the community.

Alternative first mile/last mile strategies are emerging that may be viable alternatives to new fixed-route service in low-density, peripheral areas. Improving pedestrian and bicycle access to transit stops provides riders with increased access to the transit network. Bike-share programs like BCycle are an option but they require a high density of docking stations to be successful and are not an option for everybody, especially during cold and rainy weather.[25] Public shared-ride taxi systems and other rideshare schemes may be effective in low-demand areas.

Point-deviation routes have not historically been widely deployed in the Madison area, but with Madison's peripheral neighborhoods growing and stretching Metro Transit's resources, they may fill a limited niche. Point-deviation routes typically follow a route with a conventional schedule, but are allowed to deviate slightly in order to serve riders. Stops off the standard route must be requested in advance, and reservations are typically required to be submitted in advance – although routing software and real-time vehicle location tracking enable some systems to accommodate ride requests with very little advance notice. In low-density areas, point-deviation routes have the potential to serve larger areas within a fixed budget compared to fixed routes.

In the example route shown in Map 4-i, a bus would travel between the Middleton Business Park and the South Ridge neighborhood along the dark orange line, but could make reasonable deviations to serve the light orange shaded area. Such a route may provide cost-effective all-day service to neighborhoods that currently have no all-day service, with reasonable travel times. The potential for application of this service model will be investigated in greater detail in the next Transit Development Plan update.

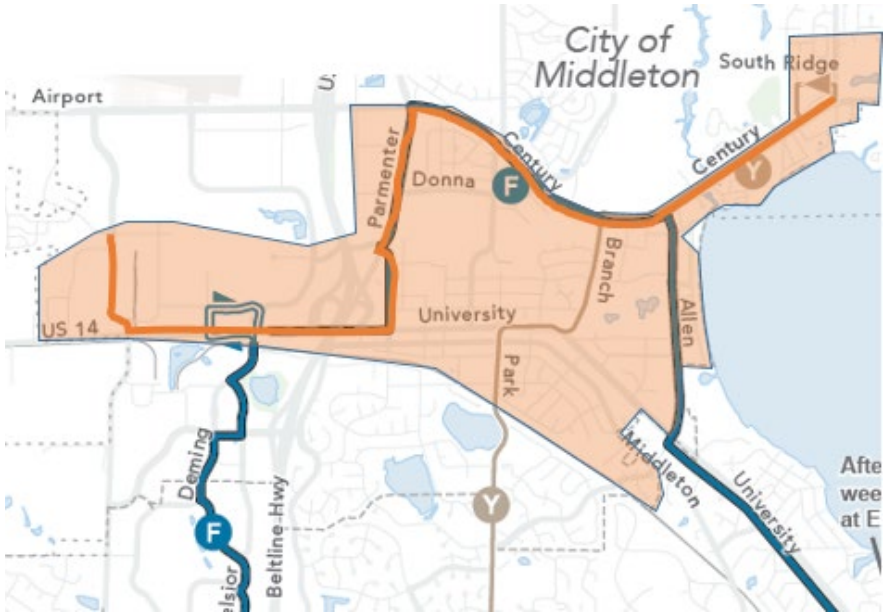
Other emerging first- and last-mile options include partnerships with transportation network companies such as Uber and Lyft; the provision of "mobility hubs" that offer bikeshare, kiss-and-ride facilities, park-and-ride facilities, transit access, and which are well-served by bicycle and pedestrian networks; and contracted services provided by private operators.

MANAGE AND IMPROVE THE QUALITY OF TRANSIT CAPITAL ASSETS

Aging infrastructure needs to be maintained and updated. Transit buses last 12 to 15 years and need to be replaced regularly. Metro currently uses an almost-entirely diesel-powered fleet, about 10% of which is hybrid diesel-electric; three battery-electric vehicles were added to the Metro fleet in 2021 and will enter service in 2022. Transitioning to a low-emission or emission-free fleet will improve

[25] BCycle closes its system in the winter, so these cycles are not available in some months even to those who would choose to ride them in inclement weather.

Hypothetical Middleton Deviated Route



Map 4-i Middleton Deviated Route

ridership, reduce Metro's dependency on petroleum fuel, and improve public health, air quality, and the pedestrian environment in bus route corridors. Metro adopted a comprehensive Transit Asset Management Plan in accordance with new federal rules in 2018. The plan covers all transit agency assets, including vehicles, facilities, equipment, and other infrastructure. New BRT infrastructure, including signal priority and other ITS infrastructure, dedicated bus lanes, off-board fare payment, and BRT stations, will be installed over the course of the next six to eight years in the east-west and north-south corridors, and will need to be maintained thereafter. In the long-term, additional BRT routes with supporting infrastructure are planned, further adding to maintenance needs.

IMPROVE REGIONAL ACCESS TO THE TRANSIT NETWORK

Regional transit service in the Madison area is extremely limited with bus service confined to the contiguous municipalities bordering Madison, excluding McFarland, and Verona. Employees living in DeForest, Windsor, Waunakee, Cottage Grove, McFarland, Stoughton, Oregon, and Cross Plains who work in the Madison area have effectively no public transit options outside of commuting to a park-and-ride lot or location within a community with service.

A new regional express service network will address the needs of people in these communities to commute to many jobs, particularly in central Madison. It will also provide access to people living within the existing transit service area to jobs in suburban employment centers. Employers in some of the communities have indicated they have difficulty filling entry level, lower wage jobs because of the lack of transit service. With direct, limited-stop service within Madison, the regional service will be time-competitive with driving and carpooling. Further, by accessing the city center along active arterial streets, the express network will provide opportunities for new express service for commuters in Madison neighborhoods.

New park-and-ride lots will help supply passenger demand for the new regional express service. Many suburban communities are not well laid out for one route to serve all neighborhoods – many commuters will be best served if they have the option of making a short trip by auto or bicycle and using transit for the majority of their trip. Park-and-ride lots may be newly constructed, publicly owned lots, or private lots (e.g., at a shopping center) with lease agreements. The latter is preferable if those options are available.

TAKE STEPS TO ENSURE FINANCIAL SOLVENCY OF THE TRANSIT AGENCY

A regional funding mechanism, such as a regional transit authority with taxing authority, is likely necessary to fully implement the vision of expanded transit service in the Madison region. A regional governance structure would also allow for improved planning, service efficiency, and more equitable decision-making. Lacking enabling legislation for a regional transit authority, the City of Madison should work with existing and prospective service partners, including communities, UW, and large employers to develop sustainable and equitable cost sharing agreements.

Public Transit Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Implement a Bus Rapid Transit system.**		
A	Complete project planning and design, leading to an initial BRT Project.	Short Term	City of Madison and other Local Governments, Metro, MPO
B	Complete project planning and design for the North-South (phase 2) BRT Project.	Short Term	City of Madison and other Local Governments, Metro, MPO
C	Expand the BRT network to fulfill the BRT Vision in the Madison area.	Mid-Term	Cities of Madison, Fitchburg, Middleton, and Sun Prairie; Metro, MPO
D	Expand the use of transit priority treatments, focusing initially on the BRT corridors.	Ongoing	Metro, MPO, Local Governments
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.	Ongoing	Metro, MPO
B	Measure and monitor the effects of service changes on low-income and minority populations; prioritize service expansions and adjustments that serve the needs of these populations.	Ongoing	Metro, MPO
C	Improve integration with bordering transit systems.	Ongoing	Metro, MPO
D	Continue to improve the convenience and ability to navigate the transit system by reducing travel times and simplifying the service.	Ongoing	Metro
E	Expand and enhance the network of frequent local service.	Ongoing	Metro
F	Improve and expand data collection and analysis to support service planning and track achievement of Performance Measures.	Ongoing	Metro, MPO
G	Prioritize improving or providing new service in corridors that are supportive of transit (i.e. high ridership potential).	Ongoing	Metro, MPO
H	Plan service changes with guidance from affected communities to ensure that route alignments and service hours will be useful for potential riders.	Ongoing	Metro, MPO
I	Measure outcomes of service changes and adjust service planning to continue to prioritize transit access for transit-dependent populations.	Ongoing	Metro, MPO
J	Adopt new Performance Measures with sustainable data sources to track progress in achieving network improvement as described in this section.	Short Term, then Ongoing	MPO

Figure 4-g Public Transit Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	**Add service in developing neighborhoods.**		
A	As developing neighborhoods become built out, enhanced limited-service routes so that they provide regular service throughout the day.	Mid-Term, Ongoing	Metro, Local governments
B	Add new all-day service in unserved peripheral neighborhoods and suburban communities such as Sun Prairie, McFarland, and Verona.	Mid- to Long-Term	Metro, Local governments
4	**Enhance transit stops with improved pedestrian/bicycle access and amenities.**		
A	Coordinate with municipalities, businesses, and neighborhood associations to plan and provide funding for stop improvements.	Ongoing	Metro, MPO, Local governments
B	Utilize TID funding and other alternative financing mechanisms to fund stop improvements.	Ongoing	Local governments
C	Plan and reserve space for transit stops/stations as part of new developments where appropriate.	Ongoing	Local governments
5	**Explore alternative service delivery models to serve low-demand areas.**		
A	Analyze bus route productivity and identify service with low use and high travel times that may better serve neighborhoods with alternative transit models.	Short Term	Metro, MPO
B	Evaluate the potential for peripheral routes with small vehicles that can deviate from their route with the goal of providing service in low density areas at a lower cost and reducing multiple-transfer trips.	Short Term	Metro, MPO, Private Providers, Non-Profits
C	Investigate using transportation network companies and shared-ride taxi service to connect to transfer points, BRT, and regional express service.	Short Term	Metro, MPO, Private Providers, Non-Profits
D	Plan for the use of driverless shuttles in low-density transit markets and niche areas like business parks and campuses.	Short Term	Madison Traffic Eng, UW, Metro, MPO
6	**Maintain, expand, and enhance bus rolling stock and supporting facilities.**		
A	Renovate and remodel the existing Metro maintenance/bus storage facility and address maintenance issues.	Near Term	Metro
B	Build a new satellite bus facility to accommodate a larger fleet, including articulated buses and electric buses.	Near Term	Metro
C	Replace buses on a regular cycle to ensure reliability and comfort.	Ongoing	Metro
D	Expand the use of electric vehicles with a goal of having a fully electric fleet by 2050.	Ongoing	Metro
E	Introduce articulated 60-foot buses to the fleet to reduce overcrowding and accommodate BRT.	Ongoing	Metro

Figure 4-g Public Transit Recommendations and Supporting Actions *(Continued from previous page, continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
7	**Implement a regional express bus network.**		
A	Expand and optimize the existing regional express service.	Ongoing	Metro, Local governments, MPO
B	Operate new routes to suburban Madison communities primarily when they will be of use to local commuters, which may be during the morning and afternoon peak periods or which may correspond to multiple daily shifts.	Mid-Term	Metro, Local governments, MPO
C	Optimize the regional express transit service to provide service from Madison to suburban job centers as well as from residential areas to central Madison.	Mid-Term	Metro, MPO, local governments
D	Provide limited stops within City of Madison limits to provide fast service within Madison and connections to BRT and local service.	Mid-Term	Metro, Local governments
8	**Expand park-and-ride facilities in conjunction with BRT and express services.**		
A	Investigate opportunities for use of space at shopping centers, churches, and other private facilities as well as public facilities such as parks, where appropriate. See Map 4-n, Planned Future PNR System.	Ongoing	Metro, MPO, Local governments
B	Explore partnerships with local communities and agencies to maintain park-and-ride facilities.	Ongoing	Metro, Local governments
9	**Take steps to ensure financial solvency of the transit agency.**		
A	Ensure that funding for transit remains equitable and that decisions are made fairly, with communities represented appropriately.	Ongoing	Metro, Local governments
B	Explore alternatives to supplement or replace the property tax for local public funding, including a vehicle registration fee and sales tax (if state enabling legislation passed).	Near Term	Local governments
C	Implement a new regional transit authority or district with the mission of providing regional transit service if state enabling legislation is passed.	Mid-Term	Metro, Local governments
D	Explore the potential for alternate or emerging funding tools to ensure the long-term financial sustainability of the regional transit system.	Mid-Term	Metro, Local governments, MPO, WisDOT, Private employers

Figure 4-g Public Transit Recommendations and Supporting Actions *(Continued from previous page)*

Specialized Transit

Specialized transit services are coordinated to meet the transportation needs of seniors, disabled individuals, those with low incomes, or other unique groups such as veterans. The *Coordinated Public Transit – Human Services Transportation Plan*,[26] updated in 2019, provides more details on the existing services and service and coordination needs. The following highlights some of these needs and recommendations to address them. See figure 4-h for Specialized Transportation Recommendations and Supporting Actions.

EXPAND THE COVERAGE OF ACCESSIBLE FIXED-ROUTE, PARATRANSIT, AND ON-DEMAND TAXI SERVICES

The expansion of public all-day fixed-route bus service into unserved and underserved neighborhoods in peripheral Madison and neighboring communities like Verona, Monona, and Sun Prairie will allow people with special needs to travel in a safe and efficient way. The bus service will be wheelchair accessible and come with complementary paratransit service for those unable to use the fixed-route bus service.

Other paratransit or specialized transit service must continue to expand to those outside the bus and associated paratransit service areas. Wheelchair accessible county-wide taxi service is currently only provided by one taxi company,[27] and the cost to provide the service is high at a time when transportation network companies such as Uber and Lyft have introduced new challenges to established transportation providers remaining financially solvent. Wheelchair accessible shared-ride taxi service is available in Sun Prairie and Stoughton.

EXPAND WORKFORCE TRANSPORTATION FOR LOW-INCOME WORKERS

Low-income workers will continue to struggle to find reliable ways to get to work and help drive the economy. The YWCA's JobRide program plays a crucial role in filling this niche when public transit options are not available or practical. However, demand for the service exceeds budgetary and physical capacity of the system, and as outlying communities grow, demand will grow as well. Public and private, employer-sponsored vanpools offer another potential option for workforce transportation. See the TDM section of this chapter for more information.

[26] https://www.greatermadisonmpo.org/planning/documents/2019_CoordinatedPlan_FinalForWeb.pdf

[27] Union Cab Cooperative

LEVERAGE EMERGING TECHNOLOGIES TO LOWER OPERATING COSTS AND EXPAND TRAVEL OPTIONS

Emerging technologies, such as ridesharing service and autonomous vehicles, provide not only challenges to existing service delivery methods, but also opportunities for the future. New technologies must not be shied away from but embraced as they become proven service delivery models. Policies supportive of these technologies must be adopted and funding made available for private, non-profit providers to implement them.

CONTINUE EFFORTS TO BETTER COORDINATE SPECIALIZED TRANSPORTATION SERVICES

The City of Madison and Dane County coordinate successfully, minimizing service duplication. However, with the numerous public and private agencies and programs providing services there are still major coordination needs as documented in the *Coordinated Public Transit – Human Services Transportation Plan*. This includes not only coordinating transit service, but coordinating services such as job training and transit, eligibility requirements, and funding. In addition, local communities must consider transit service availability when siting senior housing, medical facilities, and other services.

ENHANCE MARKETING, OUTREACH, AND EDUCATION FOR SPECIALIZED TRANSPORTATION SERVICES

During the 2019 MPO-organized Specialized Transportation Conference, widespread lack of knowledge of available transportation services and programs was identified as a barrier to effectively serving eligible populations. Focus groups held as part of the public engagement for this RTP Update in 2021 reiterated this lack of information, and a Cambridge Senior Resource Network survey[28] conducted in 2020-21 documented the extent of the knowledge gap, with transportation services being the least-used and yet some of the most-desired services by respondents. The MPO-funded Dane County Transportation Services call center, currently staffed by one person, will be integrated with the Aging and Disability Resource Center (ADRC) call center in 2022, greatly increasing opportunities for transmitting this information to eligible riders.

[28] https://dane.legistar.com/View.ashx?M=F&ID=9314362&GUID=3129C726-C7EC-4D94-A1A2-F2E5F8B3B8D7

Specialized Transit Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Expand the coverage of accessible fixed-route bus and paratransit service and address other identified service related needs.**		
A	Update the Transit Development Plan, which will build on the Network Redesign Study to identify priority service improvements or expansions requiring additional service hours, and then implement the recommendations. Also, address needs identified in the Coordinated Public Transit - Human Services Transportation Plan.	Ongoing	Metro, MPO, local governments
B	Explore opportunities to expand paratransit or accessible shared-ride taxi service in urban areas beyond the fixed-route bus service area.	Mid-Term	Metro, MPO, Dane County, local governments
2	**Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.**		
A	Work collaboratively with private taxi operators to ensure accessible taxi service is available and costs for the service are shared equitably.	Ongoing	MPO, City of Madison, Private taxi operators, Non Profits
3	**Continue and expand specialized workforce transportation for low-income people.**		
A	Work with the YWCA to ensure funding remains available for people to get to work who don't have traditional options.	Ongoing	MPO, City of Madison, Dane County, YWCA
B	Continue to maximize efficiency by optimizing vehicles and timetables.	Ongoing	YWCA
4	**Leverage emerging technologies to lower operating costs and expand travel options.**		
A	Modify policies as needed to ensure that autonomous vehicles can operate for seniors and people with disabilities.	Mid-Term	MPO, City of Madison, WisDOT
B	Use emerging technologies such as rideshare and routing software to improve coordination of trips between multiple providers.	Near Term	MPO, City of Madison, Dane County, transportation providers
5	**Improve interagency coordination of the various specialized transportation services and private services.**		
A	Improve coordination of medical trips, including inter- and intra-community trips and from surrounding counties.	Near Term	MPO, City of Madison, Dane County, medical providers, transportation providers
6	**Expand efforts to educate potential riders about existing services.**		
A	Initiate and continue marketing campaigns to spread knowledge about existing transportation services through community partners, senior focal points, service agencies, and other stakeholders.	Near Term	MPO, City of Madison, Dane County, senior focal points, service agencies, residential care facilities

Figure 4-h Specialized Transit Recommendations and Supporting Actions

Bicycles

Although the region's bikeway network is well developed compared to peer metropolitan areas, gaps in the network persist, particularly outside the central Madison area. For some important corridors, on-street bicycle facilities may exist, which is important, but 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 facilities.

The *2015 Bicycle Transportation Plan for the Madison Metropolitan Area* identified streets that do not have bicycle accommodations or have insufficient bicycle accommodations in the Bicycle Network Plan. However, as these facilities are generally evaluated when opportunities arise, such as during street reconstructs, they were not prioritized. The 2015 Plan did prioritize a set of regional shared-use path projects. The 2050 RTP went one step further and identified missing facilities that represented major gaps and barriers in the bikeway network, including both street corridors and gaps in the urban area off-street network. In 2018, the MPO published the *Dane County Bicycle and Pedestrian Crash Study*, which documented the frequency, type, and severity of bicycle and pedestrian crashes in order to develop appropriate countermeasures. *Defining the Madison Area Low-Stress Bicycle Network and Using it to Build a Better Regional Network*, which documents the MPO's data-driven approach to evaluating traffic-related stress on bicycle routes, was also published by the MPO in 2018. This report, and the continued application and refinement of the methodology behind it, facilitated the identification of high-stress facilities that serve as barriers or gaps in the low-stress network. The 2021 *Pedestrian and Bicycle Facility Requirements, Policies, and Street Standards* report details locally-adopted bicycle and pedestrian facility requirements along with national recommendations and best practices to help local planning and engineering staff and elected officials make informed decisions regarding development and design standards, and to give them tools to make roadways safer for all users. A "living" addendum to this report was released in October 2021, and will be updated on an ongoing basis.

This update to the 2050 RTP builds on these prior planning and research efforts by updating the planned regional bicycle network, the "missing links" analysis of gaps and barriers in the bikeway network, the identification of priority regional paths, and the complete bicycle facilities plan. It also incorporates new data collection capabilities.

Map 4-j shows the planned regional bikeway network with primary routes in red (off-street) and orange (on-street) and secondary routes in dark blue (off-street) and light blue (on-street). Primary routes generally serve longer trips and connect regional destinations

Map 4-j Planned Future Bicycle Network Functional Class

and communities, while secondary routes fill in gaps in the network and tend to serve shorter trips and more local destinations. They also include some arterial roadways with higher traffic volumes that are equipped with bike facilities. Figure 4-i lists Bicycle Recommendations and Supporting Actions.

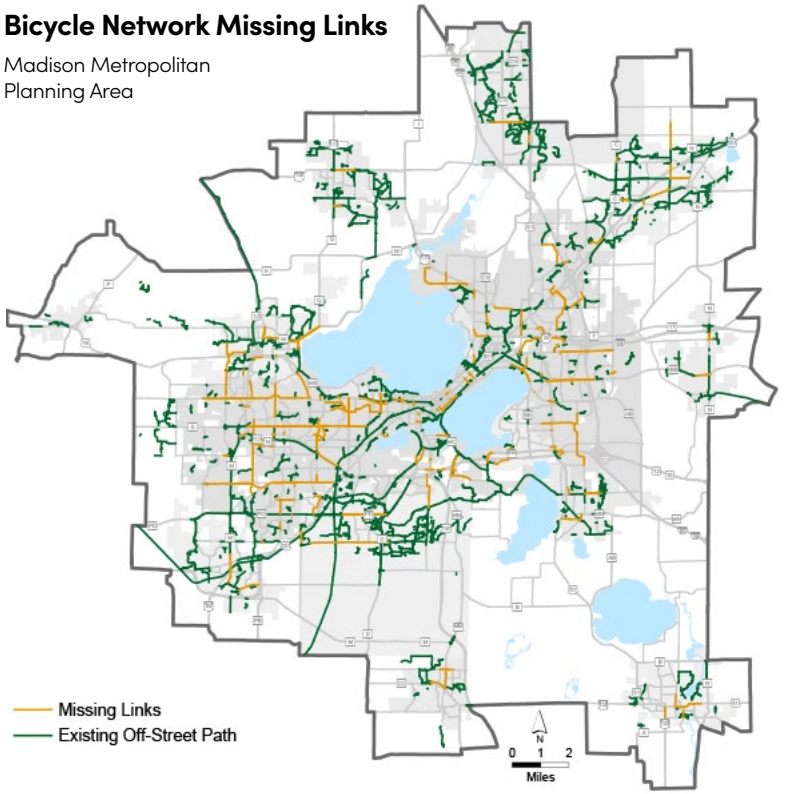
REDUCE BARRIERS TO BICYCLING

Reducing the physical, economic, and safety-related barriers to biking is the best way to increase the number of people willing to travel by bike.

Missing links, shown in Map 4-k are the most important locations where key routes on the low-stress bike network are interrupted by high-stress intersections or road segments, or where a new connection is needed to bridge an existing gap in the network; and where fixing these issues is a critical need to serve existing development.

Planned regional paths not classified as missing links are generally intended to connect communities or serve developing or planned neighborhoods. In contrast, the missing link analysis is focused on identifying corridors with existing demand for bicycling where high traffic stress or route circuity create barriers to bicycle use, and where new or improved bicycle facilities could be added when the opportunity arises. The analysis is intended to serve as an initial screening based on the existing and planned bikeway network. A more detailed engineering evaluation is needed to determine how best to accommodate bicycles within the corridors identified. While a detailed feasibility analysis of the identified corridors was not conducted, constrained street corridors with no available right-of-way and/or recently reconstructed streets are excluded.

Addressing missing links in the bicycle network will help complete the bicycle route system envisioned in the *Bicycle Transportation Plan*. High-stress roadways can often be remedied with new side paths or bike lanes—conventional, buffered, or protected. Where road network circuity inhibits direct travel by bike, new path or road connections can offer cyclists new short cuts that make travel by bike faster and more efficient.



Map 4-k Bicycle Network Missing Links

Similarly, ongoing efforts to improve intersection safety and local street network connectivity, and reduce conflicts between bikes, pedestrians, and transit and delivery vehicles will help to reduce bicycle traffic stress and make bicycling a more appealing option across the metropolitan area.

Economic barriers present another obstacle to increasing bicycle usage. In addition to the cost of a bicycle, helmet, maintenance, lights, lock, and weather-appropriate clothing, four state-owned trails in the Madison area – the Military Ridge State Trail, the Badger State Trail, the Glacial Drumlin State Trail, and portions of the Capital City State Trail – require bicyclists to carry a permit. While the fees for state trail passes help pay for trail maintenance and new construction, they also pose a barrier to entry and negatively impact transportation equity. For potential users who either lack the ability to purchase their passes online or cannot afford the $25 annual or $5

daily pass, these facilities may as well not exist. Local governments, the county, and the MPO should work with the Wisconsin State Park System to explore alternate funding mechanisms that would allow these facilities, which are critical components of the regional bicycle network, to be used by bicyclists free of charge.

EXPAND THE REGIONAL SHARED-USE PATH NETWORK AND EXPAND ON-STREET ACCOMMODATIONS

The *Bicycle Transportation Plan* described a network of major regional shared-use paths that will connect communities with high quality biking infrastructure. Examples of regional paths include the popular Capital City Trail, Southwest Path, Ice Age Junction Path, and Lower Yahara River Trail. Typically long and continuous, they connect communities and regional destinations and often serve as high-volume bike arteries in the Madison area.

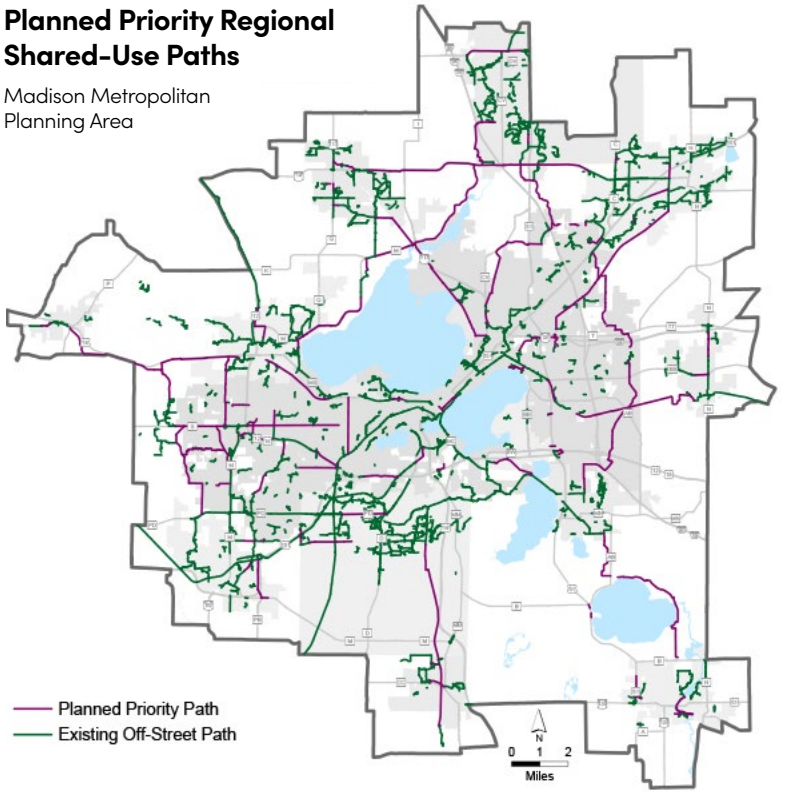
The Lower Yahara River Trail opened to the public in 2017 with a new bridge and boardwalk over Lake Waubesa, substantially shortening and easing a bicycle trip between Fitchburg or central Madison and McFarland. This trail is planned to be extended about 10 miles south to Stoughton. Dane County and local communities have made progress in implementing parts of the North Mendota Trail that will provide a path around Lake Mendota. A large portion of the trail will be built as part of the MPO funded County Trunk Highway M reconstruction project in 2023-'24.

The City of Madison, Village of Cottage Grove, and Dane County have been working to close the gap between the Capital City Path in Madison and the Glacial Drumlin Trail in Cottage Grove, creating a complete route between Madison and Milwaukee.

Other major recommended regional paths will link DeForest, Windsor, Sun Prairie, Oregon, and Cross Plains to the Madison area's existing path network and provide a new route around the north side of Lake Mendota. These paths are in various stages, with some segments complete, others programmed for construction, and others still in conceptual stages. They will address major regional deficiencies in the bike network, connecting communities that are currently isolated for people travelling by bike.

On-street accommodations for bicycles are found on a number of regional roadways, such as arterials and collectors that serve high volumes of motor vehicle traffic. In many instances, these facilities provide the most direct route to and from a variety of destinations. Providing safe on-street bicycle facilities ensures that more riders are able to comfortably ride on these regional roadways. The network should be expanded as roadway reconstruction projects occur and facilities should be considered whenever new arterial or collector streets are constructed.

Map 4-I illustrates the major regional priority shared-use path projects that will help complete the planned regional network and fill important gaps in the urban area network (see Figure A-e in Appendix A for project listing). Many of these projects will remedy missing links in the bicycle network, while others will provide the first off-street routes linking suburban communities to the Madison



Map 4-I Planned Priority Regional Shared-Use Paths

area path network. Some planned priority paths may be constructed as protected on-street facilities, where conditions make off-street facilities infeasible.

ENCOURAGE BICYCLING BY ENACTING BICYCLIST-SUPPORTIVE POLICIES AND IMPROVING BICYCLIST SAFETY

To ensure that users of all ages and abilities are comfortable using the bicycle network, appropriate facilities must be provided, and both cyclists and motorists must be provided with ample education and encouragement opportunities. 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 signage.

Bicycle Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Reduce barriers to bicycling.**		
A	Evaluate roadways and intersections with a history of bike crashes, near misses, bike safety concerns/complaints, or designs known to create safety issues and plan and implement improvements.	Ongoing	WisDOT, Dane County, local governments
B	Plan for and complete the local collector street network where barriers prevent direct travel.	Ongoing	Local governments
C	Reduce conflicts between bikes and buses, delivery trucks, and pedestrians.	Ongoing	Local governments
D	Eliminate the state trail pass requirement for Wisconsin State Park System trails.	Near-Term	Wisconsin State Park System, Dane County, local governments, MPO
2	**Expand the bikeway network with new shared-use paths and on-street facilities.**		
A	Construct new off-street shared-use paths and on-street facilities to complete the planned bikeway network, focusing on filling missing links in the low stress network as identified in Map 4-k and completing regional priority paths connecting communities and major destinations.	Ongoing	Dane County, Local governments
B	Construct new shared-use paths in developing neighborhoods so that the land is secured and facilities are available as soon as new residents move in.	Ongoing	Dane County, Local governments
C	Retrofit existing corridors like railroad and utility rights-of-way with bicycle facilities as appropriate.	Ongoing	Local governments
D	Provide enhanced or premium bicycle facilities in key urban arterial corridors within right-of-way where feasible.	Ongoing	Local governments
E	Expand the use of bicycle boulevards, bicycle priority streets, and other priority or bicyclist protection treatments such as at intersections.	Ongoing	Local governments
F	Prepare and implement local bicycle plans.	Ongoing	Local governments
G	Include wide paved shoulders on rural highways where appropriate and economically feasible.	Ongoing	WisDOT, Dane County

Figure 4-i Bicycle Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	**Maintain and modernize existing bicycle facilities.**		
A	Repave and repair bicycle facilities on a regular, data-driven basis to provide safe and comfortable riding surfaces.	Ongoing	WisDOT, Dane County, local governments
B	Include bicycle facilities on new bridges and highway crossings that may have bicycle traffic in the future, recognizing the very long lifespan of these facilities.	Ongoing	WisDOT, Dane County, local governments
C	Use innovative bike facility designs that meet or exceed state and national guidelines.	Ongoing	Local governments
D	Develop and implement local policies and practices to clear snow, ice, and debris from bike facilities.	Ongoing	Dane County, Local governments
4	**Provide adequate bicycle parking.**		
A	Require bicycle parking as a condition of new development.	Ongoing	Local governments
B	Provide public bicycle parking in business districts, on campuses, and at high-use transit stations.	Ongoing	Local governments
C	Provide end-of-trip bicycle amenities and facilities such as indoor/heated storage, bicycle repair facilities and services, showers, and lockers to support bicycle commuters.	Ongoing	Local governments, employers, developers, non-profits
5	**Improve bicyclist safety.**		
A	Conduct studies of intersections and other areas with high crash rates, near misses, or documented safety issues to identify appropriate countermeasures.	Ongoing	Local governments, MPO
B	Update the MPO study of vehicular crashes involving pedestrians and bicyclists to obtain up-to-date information on common patterns for crashes. Utilize the information in crash prevention efforts.	Near-Term	MPO, City of Madison Traffic Engineering
C	Research and adopt innovative safety treatments.	Ongoing	WisDOT, MPO, local governments
D	Support local efforts to identify corridor level systemic safety improvements, and work with WisDOT to identify changes to safety program criteria to allow funding of such projects.	Near-Term	WisDOT, MPO, local governments
6	**Continue bike share, education, and bicyclist supportive policies.**		
A	Continue supportive policies like producing bicycle maps and accommodating bicycle-themed events.	Ongoing	MPO, Local governments, NGOs
B	Implement wayfinding system for bicyclists using the Bicycle Wayfinding Design Guidelines for Dane County.	Ongoing	Dane County, Local governments
C	Plan for, support, and implement the strategic expansion of the bike share program by increasing the coverage area and the density of stations, as well as exploring potential year-round operation.	Ongoing	BCycle, Local governments, MPO
D	Support and expand education and encouragement programs that promote safety and encourage all residents to bicycle for commuting and other trips.	Ongoing	MPO, Local governments

Figure 4-i Bicycle Recommendations and Supporting Actions *(Continued from previous page)*

Pedestrians

Sidewalks provide many benefits, including safety, mobility, and healthier communities. Sidewalks, along with street crossing facilities, such as curb ramps, crosswalks, signals, and grade-separated crossings, are the building blocks of the pedestrian transportation network. Safe and convenient street crossings are critical parts of pedestrian-friendly environments, as those are the primary locations of conflict with motor vehicles. Street crossings are also the most common place for pedestrians to get on or off sidewalks. Accessible curb ramps and safety features are necessary so that disabled people and others with limited mobility can access the pedestrian network.

The highest priority locations for new sidewalks and crossing facilities in developed areas include:

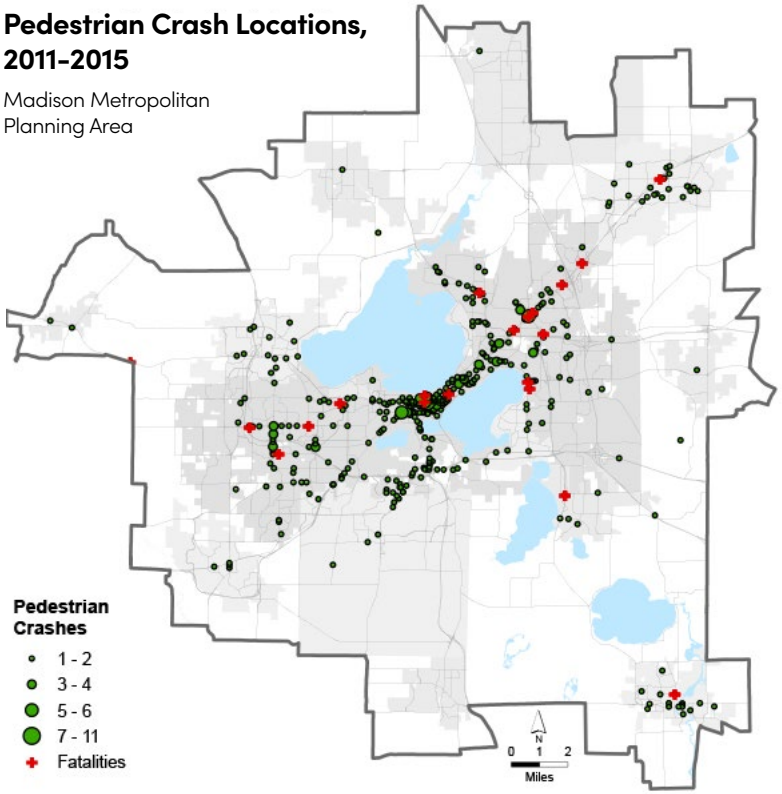
- Urban arterial and collector streets where sidewalks are missing from one or both sides, and are needed to serve existing development
- Pedestrian barrier crossings identified as deficient in the Pedestrians section of Chapter III
- Other locations where a lack of accessible street crossing facilities or sidewalk gaps significantly limit the utility of the existing network.

Installing sidewalks and crossing facilities as land is developed is the easiest and most efficient way to ensure that the pedestrian network continues to expand to keep pace with community growth.

Appendix G includes a pedestrian toolbox that illustrates the different types of pedestrian facilities and treatments that can be used to encourage walking and improve pedestrian safety. Of course, good facilities alone are insufficient to encourage walking without destinations nearby, or if the streetscape is uninviting. Pedestrian supportive land use is addressed in the Land Use and Transportation Integration section. Figure 4-j lists major pedestrian facility recommendations with supporting actions to address them.

CONSTRUCT SIDEWALKS ALONG ALL NEW URBAN STREETS AND RETROFIT REGIONAL ROADWAYS WITH ACCESSIBLE PEDESTRIAN ACCOMMODATIONS

All urban streets other than some limited-access and grade-separated roadways should have at least one sidewalk; two if there are destinations on both sides of the road. Sidewalks and other pedestrian facilities need to be designed to provide accessibility to all pedestrians, including people with disabilities and older adults. People with physical impairments and older adults have a wide range of abilities and needs, and often travel by foot as their primary mode of



Map 4-m Pedestrian Crash Locations, 2011-2015

transportation and/or connection to public transit. Just as we design roadways for use by a wide range of vehicles, we should design sidewalks, walkways, crossings, signals and other types of facilities for use by a wide range of pedestrians.

IMPROVE THE SAFETY AND USABILITY OF THE PEDESTRIAN NETWORK

At the beginning and end of every trip, users of all modes are pedestrians. Thus, it is important to ensure a safe and usable pedestrian network. High conflict intersections should be examined and potential pedestrian crossing improvements evaluated when appropriate. Map 4-m illustrates the location of many of these high conflict intersections. Sidewalks need to be maintained for year-round use, similar to that of roadways. In areas where roadway geometry and street designs cause unsafe pedestrian conditions, traffic calming treatments should be installed to ensure pedestrian safety.

Pedestrian Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Provide sidewalks and appropriate pedestrian amenities in developing neighborhoods.**		
A	Require sidewalks on both sides of all streets in new urban developments.	Ongoing	Local governments
B	Adopt and utilize land use ordinances to ensure new developments provide for adequate pedestrian circulation and are integrated with adjacent land uses.	Ongoing	Local governments
C	Connect bordering, developing neighborhoods with sidewalks and shared-use paths.	Ongoing	Local governments
D	Prepare and implement local pedestrian plans.	Ongoing	Local governments

Figure 4-j Pedestrian Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
2	**Retrofit regional streets with modern, safe, and accessible pedestrian accommodations.**		
A	Prioritize addition of missing sidewalks on arterial and collector streets with higher demand for walking.	Ongoing	Local governments
B	Identify pedestrian needs and gaps as well as safety problems through walking audits and other methods and implement solutions.	Ongoing	Local governments
C	Reduce or eliminate cost share required of property owners to retrofit in sidewalks in existing neighborhoods.	Ongoing	Local governments
D	Prepare and implement ADA transition plans to retrofit existing non-conforming facilities to ADA standards.	Ongoing	Local governments, MPO
E	Identify and install accessible pedestrian signal systems and other ADA accessibility treatments where a need is demonstrated.	Ongoing	Local governments
F	Provide for a pleasant pedestrian experience with wider sidewalks with appropriate separation on high-volume regional roads with pedestrian attractions.	Ongoing	Local governments
3	**Improve safety and usability for pedestrians at intersections and crossings.**		
A	Evaluate pedestrian improvements at major street crossings and implement as opportunities are available.	Ongoing	Local governments, MPO
B	As intersections are designed and reconstructed, use modern high quality design to improve safety.	Ongoing	Local governments
C	Use pedestrian design tools to improve crossings such as enhanced and colorized marked crosswalks, refuge islands, and rapid flashing beacons. See Pedestrian Facilities Toolbox in Appendix G.	Ongoing	Local governments
D	Identify and prioritize new grade-separated crossings (streets or shared-use paths) of highways and other barriers (See Pedestrian Barriers and Crossings map in Chapter III).	Ongoing	WisDOT, Local Governments
4	**Maintain sidewalks and pedestrian facilities for year-round use.**		
A	Provide and enforce snow removal policies, particularly around intersections and bus stops.	Ongoing	WisDOT, Local Governments
B	Implement program to identify and repair broken and substandard sidewalks.	Near Term	Local Governments
5	**Design new streets and retrofit existing streets to reduce speeding.**		
A	Ensure that local street standards do not require unnecessarily wide streets.	Ongoing	Local Governments
B	Retrofit existing overly wide streets to reallocate space for other uses as part of reconstruction.	Ongoing	WisDOT, Dane County, Local Governments
C	Incorporate traffic calming features into new local streets where appropriate.	Ongoing	WisDOT, Dane County, Local Governments
D	Implement traffic management programs to address speeding and cut through traffic problems on existing streets.	Ongoing	WisDOT, Dane County, Local Governments

Figure 4-j Pedestrian Recommendations and Supporting Actions *(Continued from previous page)*

Transportation Demand Management

Transportation demand management (TDM) aims to reduce vehicle miles traveled and peak period roadway congestion by maximizing the availability and use of alternatives to driving alone. TDM promotes walking, bicycling, public transit, ridesharing, telework, flexible schedules, micro-mobility (e.g., bike share and e-scooters), and shared mobility (e.g., bike share and car share). TDM contributes to quality of life in the Madison region in many ways, including by expanding access to more affordable and equitable modes of transportation; minimizing the environmental impacts of transportation; and reducing demand for future roadway and parking expansions by using existing infrastructure more efficiently.

Regionally, TDM is implemented by aligning land use strategies, transportation infrastructure, programming, and public and private sector investments. The MPO integrates TDM into its plans, policies and programs, and works with local communities and other partners to advance TDM strategies. TDM is one of two goals in the MPO congestion management process (CMP), supported by performance measures and targets that include reducing vehicle miles traveled per capita, increasing transit ridership, and expanding the low-stress bicycle route network. The MPO also administers RoundTrip, a TDM program that provides ride-matching services and uses information, encouragement, and incentives to raise awareness and promote the use of alternatives to driving alone among individuals and employers.

The TDM recommendations and supporting actions in Figure 4-k focus on advancing TDM relative to planning and programming; ridesharing and shared mobility; incentives, marketing, and encouragement; and public and private sector partnerships. For additional recommendations related to public transit, bicycling, pedestrians, and parking, see those sections in this chapter.

DEVELOP A STRATEGIC PLAN FOR THE MPO TDM PROGRAM AND INCREASE CAPACITY FOR REGIONAL TDM PLANNING AND PROGRAMMING

The MPO's RoundTrip program provides an established foundation for expanding TDM efforts in the Madison region. RoundTrip works with partners including WisDOT, Dane County, Metro Transit, UW-Madison, and others to fund and promote services, including an online ride-matching platform; emergency ride home program; annual TDM marketing campaign; and resources for employers and agencies interested in encouraging alternatives to driving alone.

As the region grows, RoundTrip must also grow to incorporate new best practices, meet increasing demand, and address changing needs and opportunities. A strategic plan for the program will engage partners in establishing a shared vision and evaluating priorities for the future. Growth in budget and staffing capacity will expand opportunities for partnerships and services, including assistance for local communities in pursuing TDM project funding. Over the long term, a TDM plan for the Madison region as a whole can bring communities together to establish shared TDM goals; align plans, policies, and programs; and define roles and opportunities.

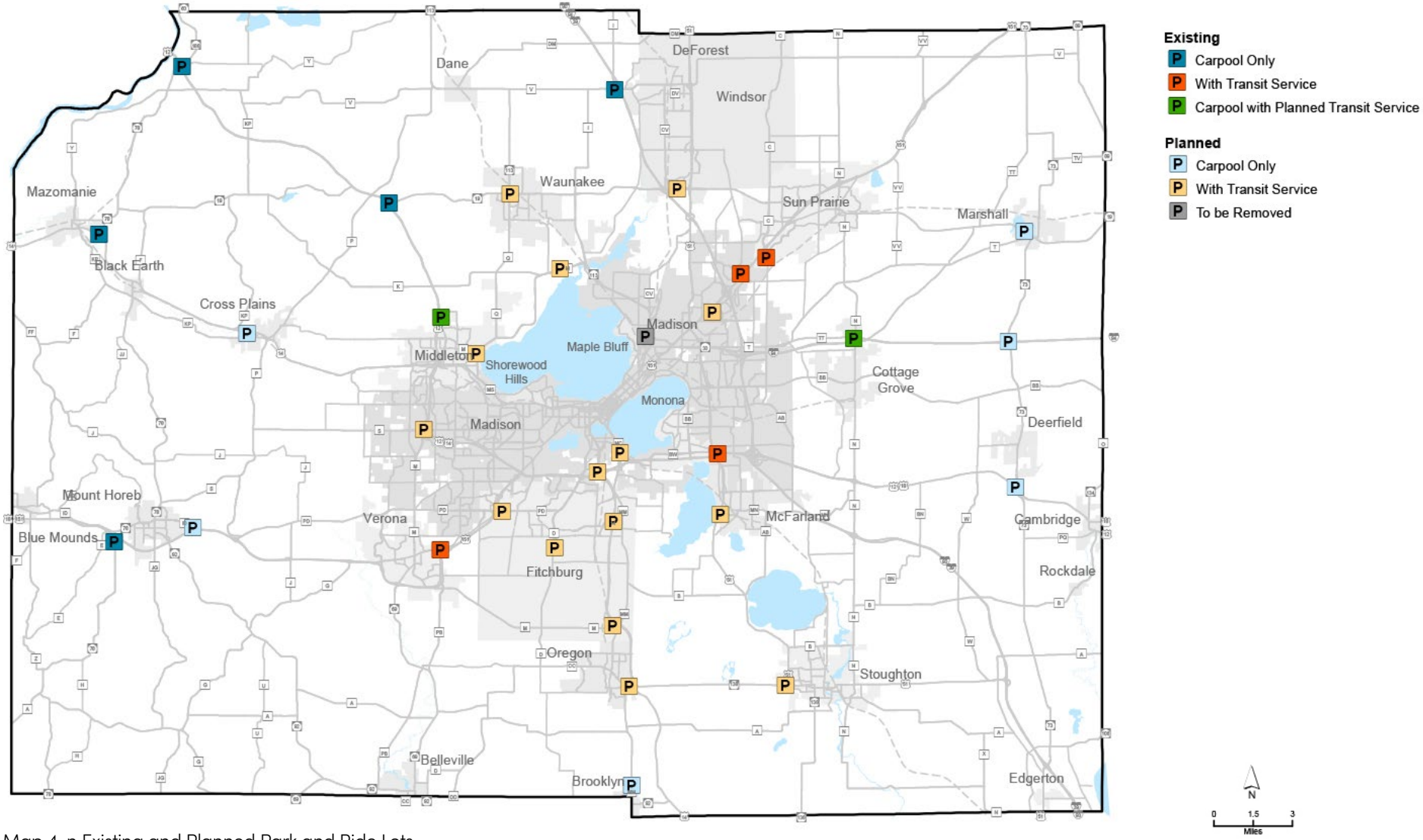
EXPAND THE AVAILABILITY AND USE OF FACILITIES AND SERVICES THAT SUPPORT SHARED MOBILITY IN THE MADISON REGION

For long-distance commuters, facilities and services such as park and ride lots or facilities and vanpools offer options for trips that cannot be fully served by transit or bicycle infrastructure. Park and ride usage in Dane County should be expanded by offering more lots connected to the bikeway network and served by transit, preferably with limited-stop service. This will require the cooperation of multiple agencies to ensure that lots or facilities are easily accessible and meet the needs of different commuters.

Map 4-n shows existing and planned park and ride lots in Dane County, including two existing lots with planned future transit service, and fifteen new planned lots with transit service. One existing lot with transit service is planned for removal with the implementation of bus rapid transit (see Transit recommendation). Park-and-ride lot locations are in most cases general.

Existing and Planned Park and Ride Lots

Dane County, Wisconsin



Map 4-n Existing and Planned Park and Ride Lots

Partnering with private property owners to make use of under-utilized parking (e.g., at a shopping center) through a lease or other agreement is generally preferable and more cost efficient than building a new lot.

Vanpool options within the region should also be expanded beyond the Wisconsin Department of Administration (WisDOA) vanpool program in order to serve more non-state workers, provide service at different times and expand access to worksites beyond downtown Madison and the UW-Madison campus.

If an additional regional vanpool program is developed, an appropriate managing agency and sustainable funding must be identified. WisDOT would be a logical agency to run a statewide program, potentially in partnership with MPOs. Employer-based vanpool programs may also be developed by one or more employers working together to serve specific locations.

Shared mobility services such as bike share and car share provide affordable, flexible options that encourage use of the larger multimodal network. Demand for shared micromobility, including bike share and emerging options such as dockless scooters and e-skateboards, is growing rapidly and will require ongoing attention by local governments. Convenient car share systems that reduce demand for personal vehicle ownership and drive-alone commutes should be supported. In order to making these and other modes as easy and convenient as possible, agencies should improve and invest in technologies such as the statewide ridematching platform and mobility as a service (MaaS) platforms.

WORK WITH MUNICIPALITIES, EMPLOYERS, AND INSTITUTIONS TO IMPLEMENT AND PROMOTE STRATEGIES TO REDUCE DRIVE-ALONE VEHICLE TRIPS

TDM is most successful in locations where legal requirements drive investments at the property level, and public-private partnerships provide supportive resources, programs, and services. To jumpstart investments in infrastructure and programming by employers and property owners, municipalities should integrate TDM requirements as a condition of approval for large developments, including specific measures, flexible implementation options, and processes for reporting and monitoring.

As demand for TDM grows, Transportation Management Associations (TMAs) are a powerful tool that can support coordinated, efficient implementation of TDM strategies within employment centers and other defined geographies in the Madison area. TMAs are typically non-profits that pool member resources and rely on strong public-private partnerships, but vary widely in size, organization, and membership. TMAs provide

services such as marketing, incentives, programming, advocacy, and administration.

The RoundTrip program, which is available to assist employers and property managers with site-based TDM strategies, is an important regional partner and resource. In addition to promoting walking, bicycling, public transit and ridesharing, the rise in telework and flexible schedules during the coronavirus pandemic has provided a unique opportunity to encourage these options to reduce drive-alone commute trips, congestion, and on-site parking demand.

EXPAND THE AVAILABILITY, USE, FUNDING, AND MARKETING OF FINANCIAL INCENTIVES AND ENCOURAGEMENT PROGRAMS

Financial incentives are among the most effective TDM strategies, particularly when implemented with a "carrot and stick" approach that dis-incentivizes driving alone while increasing the appeal of other modes. To promote this approach, it is critical to expand employer adoption of programs and strategies such as the Metro Commute Card, parking cash-out, occasional parking, and commuter challenges. Celebrating employers through recognition programs will expand awareness and build a culture of excellence around workplace-based TDM. Increasing funding for marketing, encouragement programs, and support services such as emergency ride home will contribute additional momentum, and expand opportunities for individualized behavior change programs such as SmartTrips trip planning and Love to Ride bicycle challenges.

SUPPORT TRANSPORTATION OPTIONS AT SCHOOLS THROUGH INFRASTRUCTURE AND PROGRAMMING

Vehicle congestion around schools is an issue affecting traffic flow, air quality, and safety, particularly for bicyclists and pedestrians. Safe Routes to School (SRTS) programs are an effective way to encourage families to walk and bike to school; promote safe multimodal access; and increase physical activity among children. Since the inception of the federal SRTS program, many communities in the Madison region have undertaken SRTS projects, but sustainable funding is necessary to ensure their continuity and expansion. A countywide program that focuses on schools in areas most at-risk for adverse health, safety, and environmental outcomes, is currently funded by the MPO through 2026 under the federal Transportation Alternatives program.

Transportation Demand Management Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Develop a strategic plan for the MPO TDM program and increase capacity for regional TDM planning and programming.**		
A	Develop a time-bound strategic plan for the MPO TDM program that integrates equity and aligns strategies with best practices in behavior change.	Near Term	MPO
B	Establish a dedicated budget for the TDM program beyond staffing costs, in order to expand capacity for marketing, programming, and partnerships.	Near Term	MPO
C	Educate eligible entities about the availability of STBG-Urban funding for TDM programs and services, and assist in the development of local projects.	Ongoing	MPO, Local Governments
D	Work with local communities, Dane County, WisDOT, and public and private sector stakeholders to develop a TDM plan for the Madison region.	Long Term	MPO, WisDOT, Dane County, Local Governments
2	**Expand the availability and use of facilities and services that support shared mobility.**		
A	Develop partnerships to expand the regional network of park and ride lots and increase the number of lots with multimodal access and infrastructure such as secure bicycle parking.	Ongoing	WisDOT, Dane County, Local Governments, Metro
B	Expand vanpool options by growing the WisDOA vanpool program and supporting the development of additional vanpool programs, both regional and employer-based.	Near-Mid Term	WisDOA, WisDOT, MPO, Local Governments, Transportation Providers
C	Expand the use and availability of bike share and car share systems.	Ongoing	WisDOT, MPO, Local Governments, Transportation Providers
D	Evaluate and plan for emerging shared micromobility options.	Ongoing	MPO, Local Governments
E	Expand the use and availability of TDM-supportive technology, including ridesharing platforms and mobility as a service (MaaS).	Ongoing	WisDOT, MPO, Local Governments, Transportation Providers

Figure 4-k Transportation Demand Management Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	**Work with municipalities, employers, and institutions to implement and promote strategies to reduce drive-alone vehicle trips.**		
A	Encourage and assist local communities to adopt policies requiring the preparation and implementation of TDM plans based on specific standards and criteria as a condition of approval for large developments.	Near Term	MPO, Local Governments
B	Support the development of transportation management associations (TMAs) to facilitate coordinated, efficient TDM activities in major employment centers.	Mid Term	MPO, Local Governments, Non-Profits
C	Encourage and assist employers interested in developing or expanding commuter benefits programs that promote alternatives to driving alone.	Ongoing	MPO, Non-Profits, Local Governments, Employers
4	**Expand the availability, use, funding, and marketing of financial incentives and encouragement 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.	Ongoing	MPO, Metro, Local Governments
B	Expand employer participation in programs that celebrate commute options leaders, including Dane County Climate Champions and Best Workplaces for Commuters.	Ongoing	MPO, Dane County, Local Governments
C	Increase funding for regional TDM marketing activities to expand existing strategies and support new approaches such as "SmartTrips."	Near Term	MPO, Dane County, WisDOT, Metro, UW
D	Increase funding for support services such as Emergency Ride Home, and encouragement programs such as Love to Ride and local commuter challenges.	Near Term	WisDOT, MPO, Dane County, Local Governments
E	Increase awareness and use of local TDM programs and resources among minority and traditionally underserved communities, including non-driving adults.	Ongoing	MPO, Local Governments, Non-Profits
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.	Near Term	MPO, Non-Profits, School Districts, Local Governments
B	Work with schools to encourage alternatives to driving alone among students, parents, staff, and teachers for trips including and beyond the school commute.	Mid Term	MPO, Non-Profits, School Districts, Local Governments

Figure 4-k Transportation Demand Management Recommendations and Supporting Actions *(Continued from previous page)*

Parking

When appropriately priced and designed, parking contributes to the vitality of urban areas by supporting economic activity in retail and entertainment districts and facilitating access to employment centers. When parking is underpriced and scaled to accommodate the highest peak demand, however, it can lead to inefficient, sprawling land use that increases the appeal of driving and decreases the appeal of walking, bicycling, public transit, and ridesharing. Discouraging these other modes, which are more affordable and efficient than personal vehicles, leads in turn to increased vehicle miles traveled and congestion in communities, and negative impacts to public health, safety, quality of life, and the environment. See Figure 4-I for Parking Recommendations and Supporting Actions.

USE PARKING MANAGEMENT STRATEGIES TO REDUCE CONGESTION AND PARKING DEMAND, AND MODIFY PARKING REQUIREMENTS FOR NEW DEVELOPMENT

Strategic parking management encourages multi-modalism and ensures the vibrancy of communities through effective pricing and efficient land use. Today, more public and private entities are taking steps to right-size their parking facilities and better manage existing supply. These steps include relaxing or eliminating minimum parking requirements, implementing software-based Smart Parking systems, and utilizing dynamic pricing and commuter incentives to moderate demand. Infrastructure and policies that reduce excessive parking and encourage other modes of travel are particularly important to ensure walkable, human-scaled environments in downtowns and other mixed-use activity centers.

ENSURE THE FLEXIBILITY OF ON- AND OFF-STREET PARKING FACILITIES TO ACCOMMODATE CHANGING DEMAND

Flexible approaches to parking management and design are also important in light of rapidly changing technology, mobility services, and social norms that may reduce future demand. These factors include emerging technologies such as autonomous vehicles and mobility-as-a-service (MaaS) platforms; expansions in access to ridesharing, micromobility, and shared mobility services; and changes initiated by the coronavirus pandemic, including new norms around telework and flexible schedules, and new programs allowing outdoor dining, takeout pickup, and bicycle parking in on-street parking spaces. To ensure flexibility, new parking design should support conversion to other uses as demand changes, and owners should evaluate existing facilities for new or additional uses when reaching the end of their viability.

Parking Recommendations and Supporting Actions

	Recommendations and Supporting Actions	Timeframe	Implementing Party
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.	Near Term, Ongoing	Local governments, private owners
B	Encourage multimodal commutes by eliminating long-term parking payment options such as monthly and annual permits, which promote daily driving.	Near Term	Local governments, private owners
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.	Near Term, Ongoing	Local governments
D	Develop downtown parking management plans and consider eliminating free long-term parking in downtowns.	Mid Term	City of Madison
E	Discourage employer-subsidized parking, or if parking is subsidized, encourage employers to provide a financial incentive of at least equivalent value to employees who forgo single-occupancy parking, such as parking cash-out or multimodal benefits.	Near Term, Ongoing	MPO, local governments, private owners
2	**Modify parking requirements for new development to encourage multi-modalism and innovative design, while addressing potential spillover impacts.**		
A	Consider eliminating minimum parking requirements to ensure an appropriate balance between parking needs, other transportation options, and continuity of the built environment.	Near Term	Local governments
B	Allow deviation from parking minimums, particularly in dense urban areas with good transit service, to accommodate innovative project designs that maximize access to alternative modes and incorporate TDM strategies.	Near Term, Ongoing	Local governments
C	Encourage unbundled parking in new residential and commercial developments, priced at market rate, to distribute the cost of parking equitably.	Near Term, Ongoing	Local governments
D	Conduct a regional study on parking to assist communities in adequately pricing and right-sizing parking requirements and facilities.	Near Term	MPO, local governments
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.	Near Term, Ongoing	Local governments
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.	Ongoing	Local governments

Figure 4-I Parking Recommendations and Supporting Actions

Inter-Regional Travel

In an increasingly connected world, inter-regional travel opportunities must be maintained and expanded. While intercity-bus options are currently available, buses lack a common terminus and often lack good connections to local bus routes. Further, inter-city passenger rail service is unavailable locally, requiring a drive of approximately 40 minutes from downtown Madison to reach the nearest Amtrak station in Columbus or a longer bus ride to Milwaukee or Chicago. The needs and recommendations in Figure 4-m include strategies and investments that preserve and enhance intercity bus services and add passenger rail service.[29] See Figure 4-m for Inter-Regional Travel Recommendations and Supporting Actions.

CONSTRUCT AN INTER-CITY TRANSIT HUB

The lack of a centralized inter-city bus terminal is the most immediate need for improving inter-regional travel by bus. A new facility needs to be centrally located with convenient access to the University of Wisconsin campus as well as downtown Madison. A modern, attractive facility would feature ticket sales and other needs and amenities for passengers. Several examples of well-located and designed terminals can be found in nearby and peer cities such as Milwaukee (Milwaukee Intermodal Station), Saint Paul (Saint Paul Union Depot), La Crosse, Grand Rapids, and Champaign-Urbana.

While a new inter-city bus terminal would initially only serve buses, consideration needs to be given to future rail service to ensure convenient integration with existing and future services. Inter-city bus operators should be able to reliably access the new terminal without regular interference from traffic and other delays; however, future passenger rail connecting Madison to the Twin Cities is highly unlikely to serve downtown Madison or the UW- Madison campus directly. It is possible commuter rail service from Chicago could be extended to downtown Madison. Given the difficulty in finding a location for a station it is most important the bus terminal be centrally located with convenient connections to local transit service. A facility has been proposed to be located at the Lake Street parking garage, to be built in conjunction with reconstruction of the garage and housing development above. This would be a great location from a customer and transit service accessibility standpoint.

SUPPORT IMPROVED INTER-CITY TRANSIT

Madison is well-served by inter-city bus service, still, several gaps remain. Demand for travel to the Twin Cities will likely support far more service than is currently provided by the several daily round trips provided by Megabus, Greyhound, Jefferson Lines, and

[29] As required at 23 CFR 450.324(f)(8)

FlixBus. More frequent buses, particularly on the express routes, would make the bus an attractive alternative to driving. Increased frequency to northeastern Wisconsin is also needed. Only one daily round trip is available between Madison and Fond du Lac, Oshkosh, Appleton, and Green Bay. The population served by this route would be better served by several daily round trips. Additionally, bus services to Iowa (Dubuque, Davenport, Des Moines, etc), Omaha, St Louis, and Kansas City are inconvenient. Improved service could consist of new, longer routes with direct service to these cities, increased frequency, and better connections.

Until passenger rail service is available in Madison, increased access to Amtrak must be provided by increasing the frequency of inter-city service and connectivity to Amtrak stations. Thruway bus service, a coordinated joint ticketing service connecting to Amtrak, currently provides connections to rail service from Madison with a route to Columbus and a connection at Chicago's Union Station. Connections to south and east coast trains in Chicago are convenient with frequent service to Chicago Union Station, but connections to west coast trains like the Empire Builder, California Zephyr, and Southwest Chief require out-of-direction travel or long waits. Badger Bus also provides non-Thruway service to the Milwaukee Intermodal Station, which is served by Amtrak's Empire Builder and Hiawatha services and planned Twin Cities - Milwaukee - Chicago (TCMC) Regional Rail service (2024).

IMPLEMENT INTER-CITY PASSENGER RAIL SERVICE

Prior to 2010, an expansion of the popular Amtrak Hiawatha Service was planned to downtown Madison. The service, which was planned as high-speed by US standards, would have had seven trains per day departing Madison, arriving in Chicago with stops in Milwaukee and other cities in between. This project was awarded federal stimulus funds, however, the funds were returned by the state prior to construction.

Planning for inter-city passenger rail service should be resumed as a priority. The IIJA provides for unprecedented levels of federal funding for passenger rail projects nationwide, including $41 billion for Amtrak and $43.5 billion for intercity passenger rail. In addition to Amtrak service connecting to Minneapolis / St Paul and Milwaukee, extension of Metra or similar service directly to Chicago should be evaluated and pursued if feasible. Planning, environmental review, design, and construction should be pursued aggressively while these funds are available. When rail improvements are needed along previously identified corridors, considerations should be made for the types of improvements that will be compatible with passenger service.

Inter-Regional Travel Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Initiate planning for and build an inter-city bus terminal.**		
A	Construct a new high-quality inter-city bus terminal in central Madison that has convenient access to downtown Madison and the UW-Madison campus.	Mid-Long Term	City of Madison
B	Ensure that inter-city bus passengers can conveniently transfer to BRT and local buses.	Mid-Long Term	City of Madison, Metro
2	**Support new and improved inter-city bus service.**		
A	Improve service frequency to Minneapolis / St Paul and Appleton / Green Bay.	Near-Term	WisDOT, Private Providers
B	Improve connections to Amtrak services like the Empire Builder.	Near-Term	WisDOT, Private Providers
C	Provide direct service to Davenport, Des Moines, Omaha, and other cities to the west.	Near-Term	WisDOT, Private Providers
3	**Maintain and preserve the rail network and plan for future passenger rail service.**		
A	Identify inter-city passenger rail routes to Milwaukee, Chicago, and Minneapolis / St Paul.	Near-Term	WisDOT, MIPRC, Amtrak
B	Identify station location(s) for passenger rail service.	Near-Term	WisDOT, City of Madison, Amtrak
C	In cooperation and in coordination with WisDOT, acquire, maintain, and preserve rail corridors to ensure practical viability of future rail services.	Near-Term	WisDOT, railroad companies
4	**Implement passenger rail service to and through the Madison area.**		
A	Implement direct Amtrak passenger rail service to the Madison area connecting to Milwaukee, Chicago, Minneapolis / St Paul, and the national rail system.	Mid-Long Term	WisDOT, MPO, City of Madison, FRA, MIPRC, Amtrak
B	Support Madison's inclusion in the Twin Cities - Milwaukee - Chicago (TCMC) Regional Rail service.	Near-Term	WisDOT, Amtrak
C	Implement rail service connecting the Madison area to Chicago.	Mid-Long Term	WisDOT, SLATS, MPO, Others
D	Support the implementation of WisDOT's rail plan, which includes passenger, freight, and crossing safety considerations.	Ongoing	MPO, local governments, railroad companies

Figure 4-m Inter-Regional Travel Recommendations and Supporting Actions

Freight, Air, and Rail

While manufacturing is a relatively small percentage of Dane County's economy compared to others in the state, the efficient movement of freight into, out of, and through the county is still an important to the regional economy. Freight, air, and rail access improve the financial condition of area residents as well as businesses, given the increasing role online shopping and home deliveries. Policies related to these modes should enhance the financial interests of all in the region. See Figure 4-n for Freight, Air, and Rail Recommendations and Supporting Actions.

INCREASE THE LOCAL FOCUS ON FREIGHT PLANNING

Freight-focused planning efforts should be incorporated into local planning efforts to ensure promotion and preservation of freight uses along freight corridors and targeted expansion of freight-related infrastructure.

MITIGATE RAIL CONFLICTS WHILE MAINTAINING THE VIABILITY OF RAIL SERVICE

Safety concerns at rail crossings should be studied and remedied with the help of private rail operators. Land use conflicts, such as rail crossings in residential areas, should be mitigated through the use of improvements that allow designation of "quiet zones." Rail corridors should be acquired when abandoned to preserve the corridors for future freight and passenger rail service and other transportation uses. When improvements to rail infrastructure are needed, governmental agencies should work with private operators to accommodate heavier loads at higher speeds.

ENSURE COMPATIBILITY OF LAND USE PLANNING NEAR AIRPORTS

The area in which an airport operates can have a number of negative externalities such as increased noise, light, and air pollution. Care should be taken to ensure compatibility of land uses by accounting for existing and future airport master plans in development of local comprehensive plans. Further, the airport master plan should account for future land use plans encapsulated in local comprehensive plans.

Freight, Air, and Rail Recommendations and Supporting Actions

Recommendations and Supporting Actions		Timeframe	Implementing Party
1	**Maintain and promote new industrial uses along freight corridors.**		
A	Work with stakeholders to determine significant transportation issues that negatively impact freight generating or receiving businesses within the region.	Ongoing	MPO, WisDOT
B	Work to cluster like industrial uses to promote efficiency of the freight network.	Ongoing	Local governments
2	**Maintain and expand existing infrastructure on the multimodal freight network, prioritizing projects that improve safety, increase efficiency, and minimize lifetime costs.**		
A	Investigate and implement vehicle-to-infrastructure technologies to increase safety and reduce delay in freight corridors.	Medium Term	WisDOT, Dane County, Local governments
B	Consider how new technologies may impact the demand for future transportation facilities when planning improvements to the network.	Ongoing	WisDOT, Dane County, Local governments
C	Continue enforcement of truck weight regulations to reduce premature deterioration of roadways and bridges.	Ongoing	WisDOT

Figure 4-n Freight, Air, and Rail Recommendations and Supporting Actions *(Continued on next page)*

Recommendations and Supporting Actions		Timeframe	Implementing Party
3	**Increase focus on freight planning for regional and local transportation facilities.**		
A	Continue to incorporate freight considerations into corridor and planning studies.	Ongoing	WisDOT, Dane County, Local governments
B	Implement the Wisconsin State Freight Plan, planning for or implementing recommendations coming from the plan.	Ongoing	WisDOT, Local governments
C	Ensure local and regional freight-centric projects are listed in Wisconsin State Freight Plan to maintain eligibility for enhanced federal funding match.	Ongoing	WisDOT, Dane County, MPO, Local governments
D	Consider first and last mile(s) implications for freight when approving site plans for freight generating or receiving facilities.	Ongoing	Local governments
4	**Maintain the availability of rail facilities for current and future uses.**		
A	Preserve rail corridors for freight uses, acquiring excess land when available to ensure availability for future transportation services.	Ongoing	WisDOT
B	Plan for improvements to accommodate future high speed, high volume passenger service on routes to Milwaukee, Chicago, and St Paul, such as positive train control, double tracking, and electrification.	Long Term	WisDOT
5	**Mitigate conflicts between rail and other uses.**		
A	Identify high-conflict rail crossings and mitigate conflicts, when possible.	Ongoing	WisDOT, Dane County, Local Governments
B	Continue to implement quiet zones in residential neighborhoods within urbanized areas.	Ongoing	Local Governments
C	Work with rail companies to grade-separate future high-use rail crossings where feasible, such as Stoughton Road crossing.	Ongoing	WisDOT, Dane County, Local Governments
6	**Ensure compatibility of uses near airports.**		
A	Ensure land use plans within airport influence areas are compatible with existing and planned airport plans.	Ongoing	Local Governments
B	Ensure Airport Master Plans consider existing and future uses identified in community comprehensive plans.	Ongoing	Dane County
C	Continue to implement the Airport Master Plan.	Ongoing	Dane County
7	**Improve multi-modal access to airports.**		
A	Improve multi-modal access to airports.	Ongoing	Dane County, Local governments, Metro

Figure 4-n Freight, Air, and Rail Recommendations and Supporting Actions *(Continued from previous page)*

Evaluating Plan Progress

The Infrastructure Investment and Jobs Act (IIJA) requires MPOs to develop a system performance report, and monitor and evaluate federally required performance targets as part of integrating a performance-based planning approach into the development and implementation of the RTP. The System Performance Report can be found in Appendix B. Beyond the federally required measures, the MPO has developed supplemental measures to measure and evaluate regional priorities. It is anticipated that the list of performance measures will evolve over time as new data and measurement techniques become available. The current federal and regional measures are listed in Figure 4-o and 4-p. The tracking, evaluation, and reporting of these performance measures and targets will be used to gauge progress in achieving the national and regional goals, help to further inform decisions about investments and strategies, and will describe how well the regional transportation system is performing over time.

The MPO began producing an annual performance measures report in 2015 to track regional performance, including the federally required performance measure in accordance with federal guidelines. The development of the annual performance measures report was temporarily halted in 2020 due to the significant impacts of Covid-19. The MPO will resume tracking performance measures in 2022 in an interactive online format.

Federal Transportation Performance Measures

Performance Measure Area	Performance Measures
PM 1 - Safety	
Number of Fatalities and Serious Injuries	Number of Fatalities
	Number of Serious Injuries
	Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries
Rate of Fatalities and Serious Injuries	Rate of Fatalities per 100 Million Vehicle Miles Travelled (MVMT)
	Rate of Serious Injuries per 100 Million Vehicle Miles Travelled (MVMT)
PM 2 - Infrastructure Condition	
Condition of Pavements on the Interstate System	Percentage of Pavement of the Interstate System in Good Condition
	Percentage of Pavement on the Interstate System in Poor Condition
Condition of Pavements on the National Highway System (NHS) Excluding the Interstate	Percentage of Pavement of the Non-Interstate NHS System in Good Condition
	Percentage of Pavement of the Non-Interstate NHS System in Poor Condition
Condition of Bridges on the NHS	Percentage of NHS Bridges Classified as in Good Condition
	Percentage of NHS Bridges Classified as in Poor Condition

Figure 4-o Federal Transportation Performance Measures *(Continued on next page)*

Performance Measure Area	Performance Measures
PM 3 - System Reliability	
Performance of the Interstate System	Percentage of the Person-Miles Traveled on the Interstate that are Reliable
Performance of the NHS Excluding the Interstate	Percentage of the Person-Miles Traveled on the Non-Interstate NHS that are Reliable
Freight Movement on the Interstate System	Truck Travel Time Reliability Index
Transit Asset Management (TAM)	
Transit Asset Management	Percentage of Revenue Vehicles Exceeding Useful Life
	Percentage of Non-Revenue Service Vehicles Exceeding Useful Life
	Percentage of Facilities Exceeding the Transit Economic Requirements Model (TERM) Scale
	Percentage of Track Segments Having Performance Restrictions
Public Transit Safety Program (PTSP)	
Public Transportation Safety Program	Number of Reportable Fatalities
	Rate of Reportable Fatalities Per Vehicle Revenue Miles
	Number of Reportable Injuries
	Rate of Reportable Injuries per Vehicle Revenue Miles
	Number of Reportable Safety Events
	Rate of Reportable Safety Events Per Vehicle Revenue Miles
	Mean Distance Between Major Mechanical Failures

Figure 4-o Federal Transportation Performance Measures *(Continued from previous page)*

Supplemental RTP Performance Measures

Performance Measures	
New development built in centers and along transportation corridors*	Transit On-Time Performance
New development built in already-developed areas*	Frequent Transit Service Network Job and Household Access
BCycle Utilization & Service Area	Buses at or Past Replacement Age
Regional Low-Stress Bike Network	Job Access by Mode
Mode of Transportation to Work	Vehicle Miles Traveled
Transit Ridership	Vehicle Hours of Delay

*Regional Development Framework (RDF) Measures

Figure 4-p Supplemental RTP Performance Measures