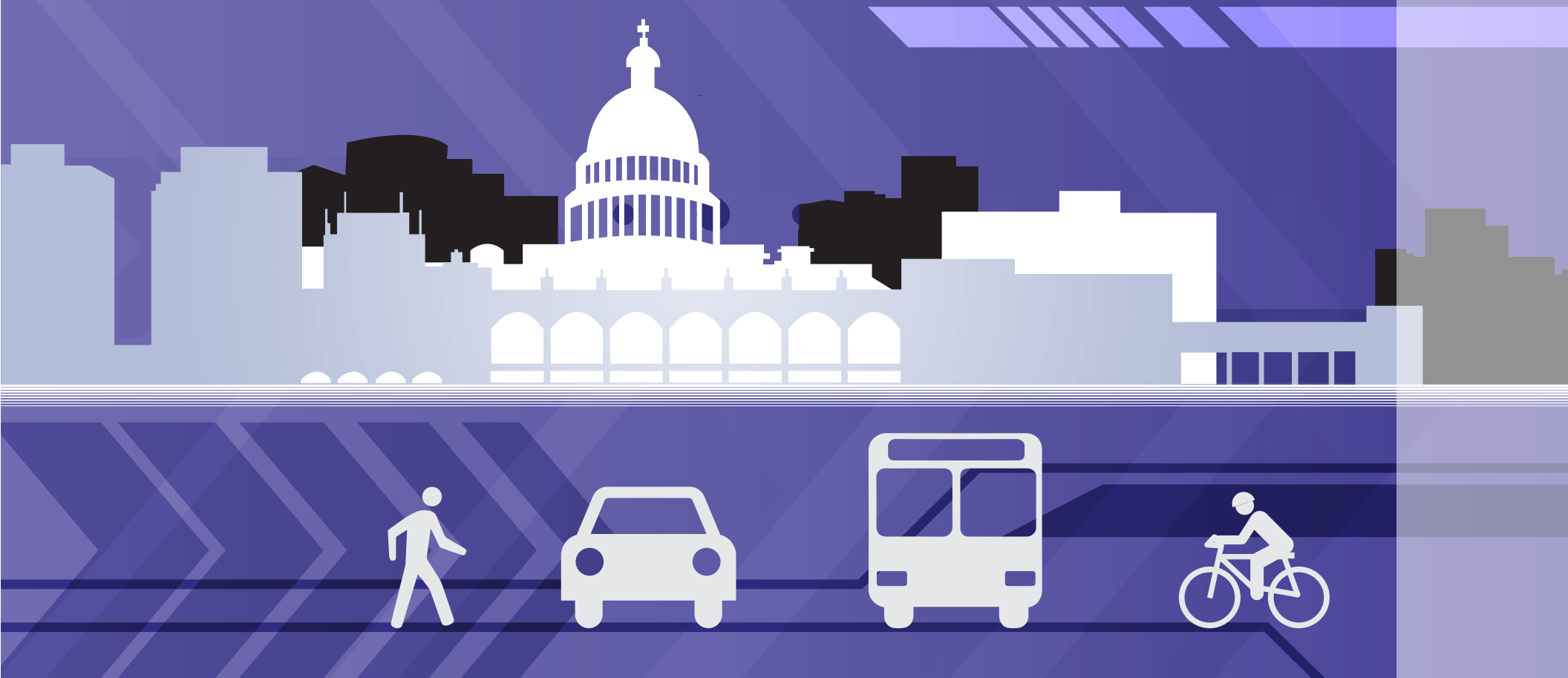
MADISON IN MOTION

Transportation Plan Background Document

2017



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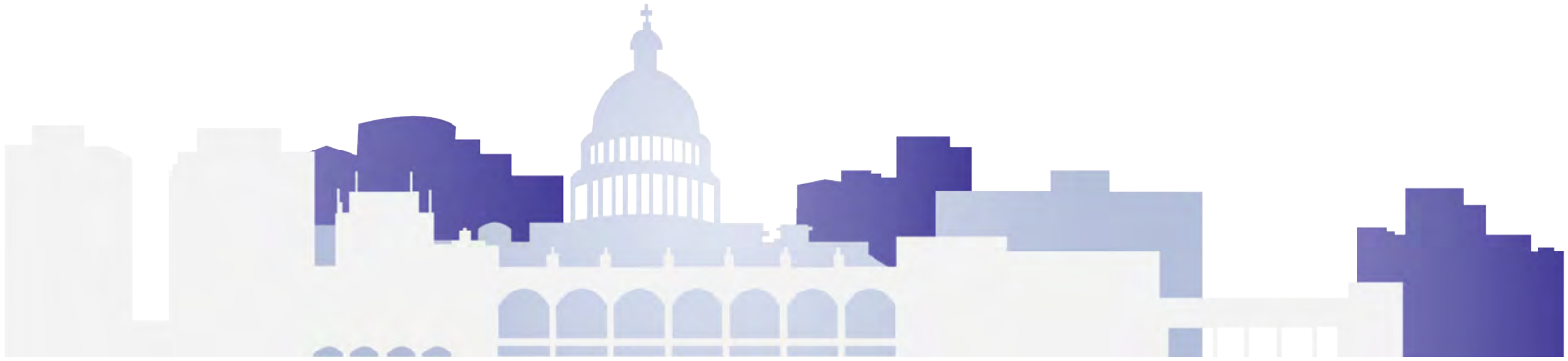

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May 17, 2017

I am pleased to present Madison in Motion, the City's sustainable transportation master plan. This plan goes beyond roads, busses and bikes; it recognizes the link between Madison's future land use and economic goal and recommends steps for the transportation system required to achieve it. It builds on the successes we have witnessed in recent years, such as record ridership on Metro busses and achieving Platinum status as for biking, and continues progress toward making Madison a more walkable, bikeable and transit-oriented city.

As we grow, the transportation system must provide mobility options for more residents, employees and visitors, but must do so in a way that supports our vision for Madison: a thriving downtown, vibrant main streets and strong neighborhoods, supported by a robust economy providing opportunities for all residents.

Madison in Motion contains a series of recommendations for transit, bike, pedestrian and street infrastructure to improve the safety, efficiency, comfort and experience of mobility in Madison. These include major efforts such as Bus Rapid Transit and enhanced on-street bike ways, to those less noticeable such as preventative street maintenance and traffic calming efforts. The plan aims to leverage technology wherever possible, from real-time transit information to improved traffic signal timing resulting from connected vehicles of the future. Building equity into transportation decisions was a recurring theme in the plan, including focusing new affordable housing in areas with high level of transit service and pursuing improved transit options for existing low-income areas.

On behalf of our residents and visitors, I want to thank those who participated in the Madison in Motion process, including the residents who provided comments and feedback, various City committees that reviewed and oversaw plan development, and staff who worked diligently to bring this plan to fruition. Your efforts will help keep moving Madison forward.

Paul R. Soglin
Mayor
City of Madison

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

Coordinated transportation investment can create a better, brighter future for Madison. Madison in Motion, the City of Madison's Sustainable Transportation Master Plan, provides a framework for future transportation decisions in the City, ensuring a future with improved walkability, bikability, transit availability. It envisions a compact city of walkable community nodes. This framework builds on previously adopted transportation and land use plans to improve agency coordination, connectivity, and transportation choices, while providing guidance to strengthen neighborhoods with appropriate future development. The Plan evaluate the current transportation system and identifies what the City and its partners must do in order to achieve the goal of becoming a more multi-modal City.

Despite its excellent transportation investments so far, Madison will not achieve its overall goal of a compact city comprised of walkable notes without further coordinated, significant policy intervention.

A CITY IN FLUX

Like all cities, Madison is ever changing. Growth over the next 40 years is expected to bring 100,000 new residents and 70,000 jobs to the city. In addition, Dane County is expected to have more jobs than workers, leading to an increase in commuter trips from surrounding counties. As a result, the transportation system will need to meet the increased demands that accompany growth.

In recent years, transit ridership has significantly increased, with only minimal increases in service, suggesting that transit investments may provide one opportunity at increasing the transportation systems capacity. In addition, more and more people are biking for commuting and recreation trips, improving connectivity within the City. As demographics change, so do transportation preferences and needs. Current global trends presented in this document paint a bright future for a multi-modal Madison.

Madison is a city well prepared for the future. The existing transportation system is relatively robust, and exhibits high proportions of people walking, biking, and taking transit when compared to other similar sized cities. In addition, demand for

bus service is high, which leaves little doubt that sustainable transportation modes are viable in Madison.

With the guidance of this Plan, Madison has the opportunity to make a reality from its vision for the future. A vision characterized with responsible development patterns, highly connected neighborhoods, excellent transportation choices for citizens, and a quality of life and sense of place that continue to attract residents and businesses over time.

GROWING PAINS

Despite a strong sense of vision, as Madison grows, the transportation challenges that accompany will become more complex, requiring the city's approach to evolve as well. A livable, sustainable city is built over the course of decades, not months. In addition to transportation, land use policies play a significant role in shaping cities, and must be aligned with the vision for the future. Major challenges influencing Madison's transportation future include:

- Madison's growth is regional in nature, requiring regional action beyond local plans.
- Transportation funding will continue to be a challenge that local and regional leaders must manage to best improve the transportation system.
- The current system, though well-used, is in need of a significant overhaul that includes regional expansion in order to serve Madison's future.
- Gaps in the current system that create barriers to connectivity for alternative modes of transportation.
- Madison's downtown area, a major destination in the region, is physically constrained by the isthmus, limiting opportunities for expanding transportation capacity.

These challenges require a holistic approach to improving the transportation system. The Madison in Motion plan provides a package of recommendations to ensure these challenges are met, while improving transportation options in the city.

DEVELOPING A PLAN

The Madison in Motion Plan was developed over a three year period, with technical steps interwoven with public involvement. From its beginning, the process prioritized the involvement of the greater Madison community to ensure the recommendations developed by the plan reflected the vision and desires of the City. Public outreach was organized in a way that allowed the public to provide input at ever key junction of the process, including idea development, scenario development, project selection, and recommendations. Some of the analytical processes that were intertwined with public outreach included:

An extensive review of existing conditions, including a review of significant assets in the City, to understand the current state of the system.

A Land Use Vision developed by understanding past adopted policies and plans, and incorporating land use patterns desired for the future of Madison.

A discussion on project funding prioritization, providing participants an opportunity to balance project goals under the realities of funding limitations.

As a result of extensive analytical processes balanced by

public input, the Madison in Motion process developed two land use scenarios, to show the regional impacts of different development trends on proposed transportation projects. The trend scenario reflected an uninterrupted continuation of current outward growth patterns, while the infill scenario assumes the adoption of polices to invite infill development, fostering increased connectivity amongst distinct activity centers.

Analysis of the two scenarios shows that the recommendations in this transportation plan perform 2.5% better in regards to vehicle miles travelled (VMT) reduction in the infill scenario, resulting in an increased balance in transportation mode splits.

Madison in Motion also looked to other cities for lessons learned – those of similar size and also learning from larger cities that have experienced growth and change. Medium cities have built-in advantages (e.g., affordability) and limitations (e.g., smaller resource base and less management capacity than larger cities), and also specific pressures (e.g., the need to attract and retain citizens based on economic diversity and quality of life measures). Several themes emerge:

- The importance of strong transit investment, especially rapid buses, BRT, and streetcars.
- The opportunity to capture the economic value of transit investments.
- The importance of proactively increasing quality of life and active commute options.
- The importance of learning to manage traffic and reduce demand.
- The importance of regional coordination.

PLANS FOR IMPROVING MADISON

Based on data analysis, public input, and a review of best practices in the United States, several recommendations are made for improving the transportation system. Individual projects and policies recommended by the plan are guided by the following high level recommendations:

- In most circumstances expansion is no longer the preferred transportation enhancement option, as the roadway system is at or near capacity. Madison will need to be proactive on congestion management measures due to geographic constraints limiting roadway expansion options.
- To accommodate recent ridership increases and future population and job growth, the City must improve transit capacity and service – beginning by implementing BRT, and continuing with further study of potential service improvements. In addition, regional coordination and effective funding strategies must be developed.
- Target growth patterns, including transit oriented development, will minimize congestion by increasing populations in areas with access to good transit.
- Bike and pedestrian networks are already popular alternatives, but require strategic interventions to provide network connectivity and further develop walking and biking as viable modes. While Madison was recently named a Platinum bicycling community, key improvements could make biking a real alternative for a larger proportion of residents.

Specific recommendations fall into the following categories:

- Improving the Public Transit System in Madison and throughout the Region
- Building and Maintaining Comfortable and Safe Bicycle Infrastructure
- Building and Maintaining Comfortable and Safe Pedestrian Facilities
- Building and Maintaining Streets and Roadways for All Users
- Creating and Managing On-Street and Off-Street Parking
- Ensuring Land Use & Transportation System Coordination
- Managing Transportation System Demand
- Improving Connectivity, Bridging Gaps and Enhancing Choice
- Improving Access to Affordable Housing, Employment and other Opportunities
- Enhancing Racial Equity and Social Justice
- Transportation Enhancing Public Health and Safety
- Transportation Enhancing Economic Development
- Using Emerging Technologies to Enhance the Transportation System
- Work with Regional Partners to Create a Seamless Regional Transportation System

Recommendations must also be forward-looking,

acknowledging changing transportation technologies and travel behavior. Long range transportation investment is more important than ever – but clearly the City will need to be iterative and nimble to piloting and responding to new transportation technology policy challenges and opportunities.

The tools provided in the recommendations of the plan provide opportunities to address major transportation challenges on the horizon. As the Madison in Motion Plan moves to approval, solidifying it as a roadmap to the future transportation system, the plan will provide citizens, local and regional leaders, and city staff with the tools to make critical decisions about future development.

This is a unique juncture in Madison's growth, and in the transportation industry. While initial steps have strongly positioned Madison as a highly livable city with competitive transportation options, the city must make the next phase of transportation investments to become a truly multimodal exemplar for all Madisonians – a vision within sight thanks to a strong regional vision and a firm foundation of smart transportation investments.

This section describes Madison's demographic background and transportation system, the capacity of which will need to expand to accommodate growing demand.

EXISTING CONDITIONS & TRENDS

1

Demographic Conditions

MADISON AND DANE COUNTY POPULATION

Madison's population has steadily grown over the last 30 years, with approximately 20,000 new residents per decade. This growth is expected to continue, with projections for 2040 adding another 40,000 people, an increase of 15%, bringing the total population to over 280,000 in the city[1]. Dane County is projected to add 100,000 residents in the next 25 years, bringing the total population to 600,000. While more of Dane County's growth is happening outside the City, Madison's growth has and is projected to continue surpassing the combined growth of Sun Prairie, Fitchburg, Middleton, Verona and Waunakee. The region's population growth has largely been outside of Madison's core and the greatest rates of increase are outside of the US 12-Interstate 90 expressway loop surrounding the city. Many of the more recently developed areas within the expressway loop are built out and no longer growing with some even losing residents due to smaller household sizes.

However, these trends are not universal. The Madison isthmus has witnessed population increases in many areas especially the downtown core, reflecting redevelopment and infill development that contributes to walkable community nodes. Between 2000 and 2010, the downtown core had the greatest increase in population density for the region with approximately four persons per acre[2].

With growth both locally and regionally, demand for access to the downtown core and University of Wisconsin, the primary regional job center and economic engine, will increase and require use of the same transportation infrastructure that central city neighborhoods use today. This underscores that Madison's vision for more compact, walkable community nodes is an achievable goal with appropriate supportive framework.

1 WI DOA Projections 2013 Vintage

2 Census 2000 and 2010, block group level

POPULATION & HOUSING

Madison is a growing city, experiencing significant growth in the number of residents and households. Madison's 2014 population was 245,691[3] , up 5.4% since 2010. The city contains nearly half of the county's population, which is growing at a similar rate of 5.8%. Both Madison and Dane County are growing significantly faster than the state as a whole (1.2%).

Madison has an average population density of 3,544 people per square mile. As Figure 1 and Figure 2 show, the downtown isthmus area currently has the highest concentration of residents, and has experienced the moderate amount of population growth between 2000 and 2014. Additionally, Figure 2 shows a significant growth in population in the periphery of the City, leading to higher demands on local road infrastructure.

Around 2011, Madison shifted from being a majority home owner community to a majority renter community. In 2014, there were approximately 50,000 owner households compared to 54,000 renter households. Possibly attributed to millennials not seeking or delaying homeownership and baby boomers downsizing to rental units, renter households have increased by 4% annually, compared to 0.5% for owner households. The increased rental demand has resulted in low rental vacancy rates yielding scarcer and more costly rental options. According to Madison's 2014 Housing Report, vacancy rates for rental properties have been at historic lows for the past several years. Since 2006, when the vacancy rate was 5%, rates have dropped to and remained at about 2% to 3%. In central areas, vacancy rates have remained below 4%[4] despite significant increase in housing supply, attributable to previously mentioned infill and redevelopment. This rapid market absorption is indicating continued demand for denser multifamily living in central areas with the highest level of transit service.

3 American Community Survey 2014 1 year estimate

4 Madison Gas and Electric Rental Unit Vacancy Statistics

Figure 1 Population Density (2014)

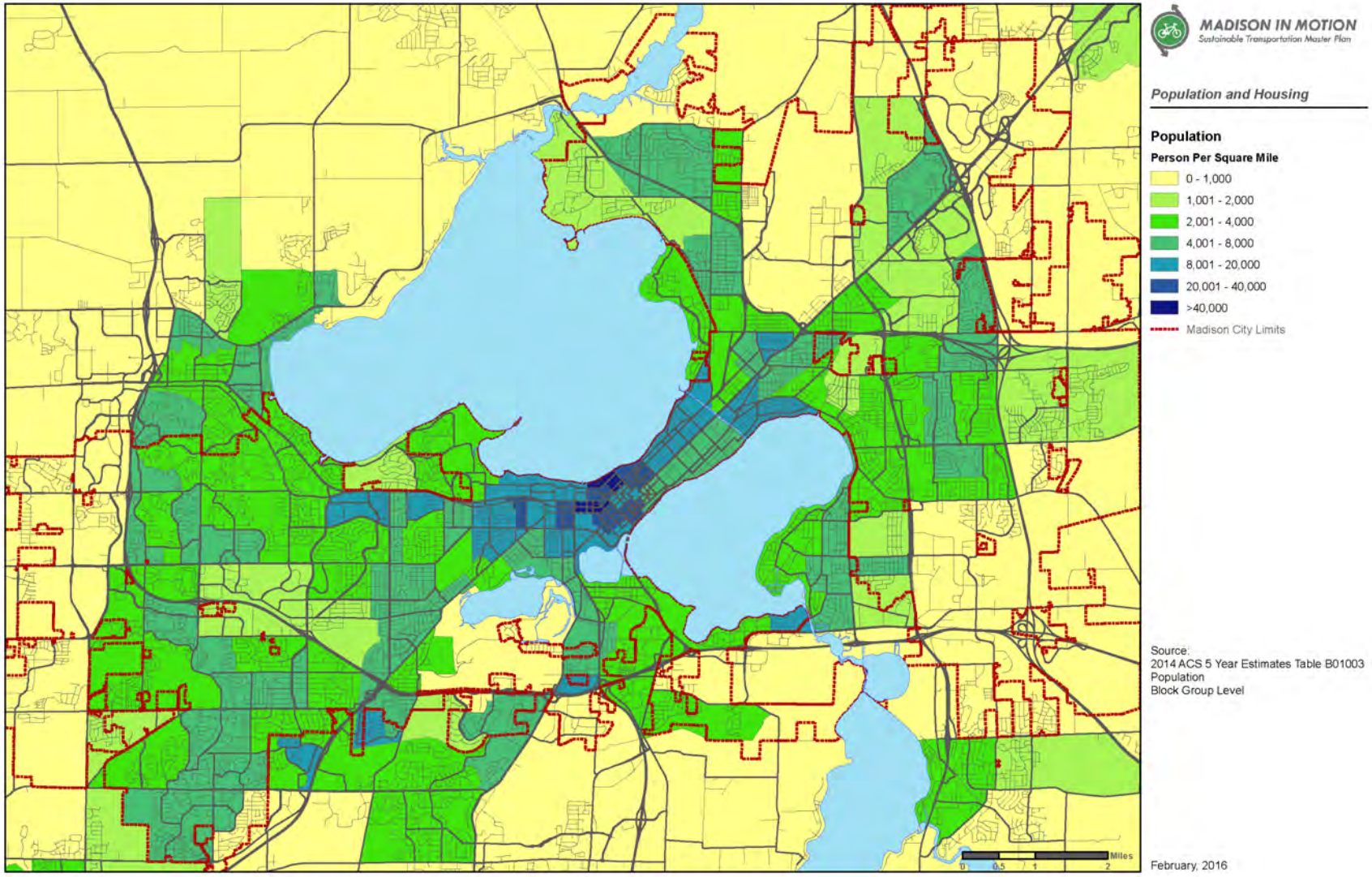
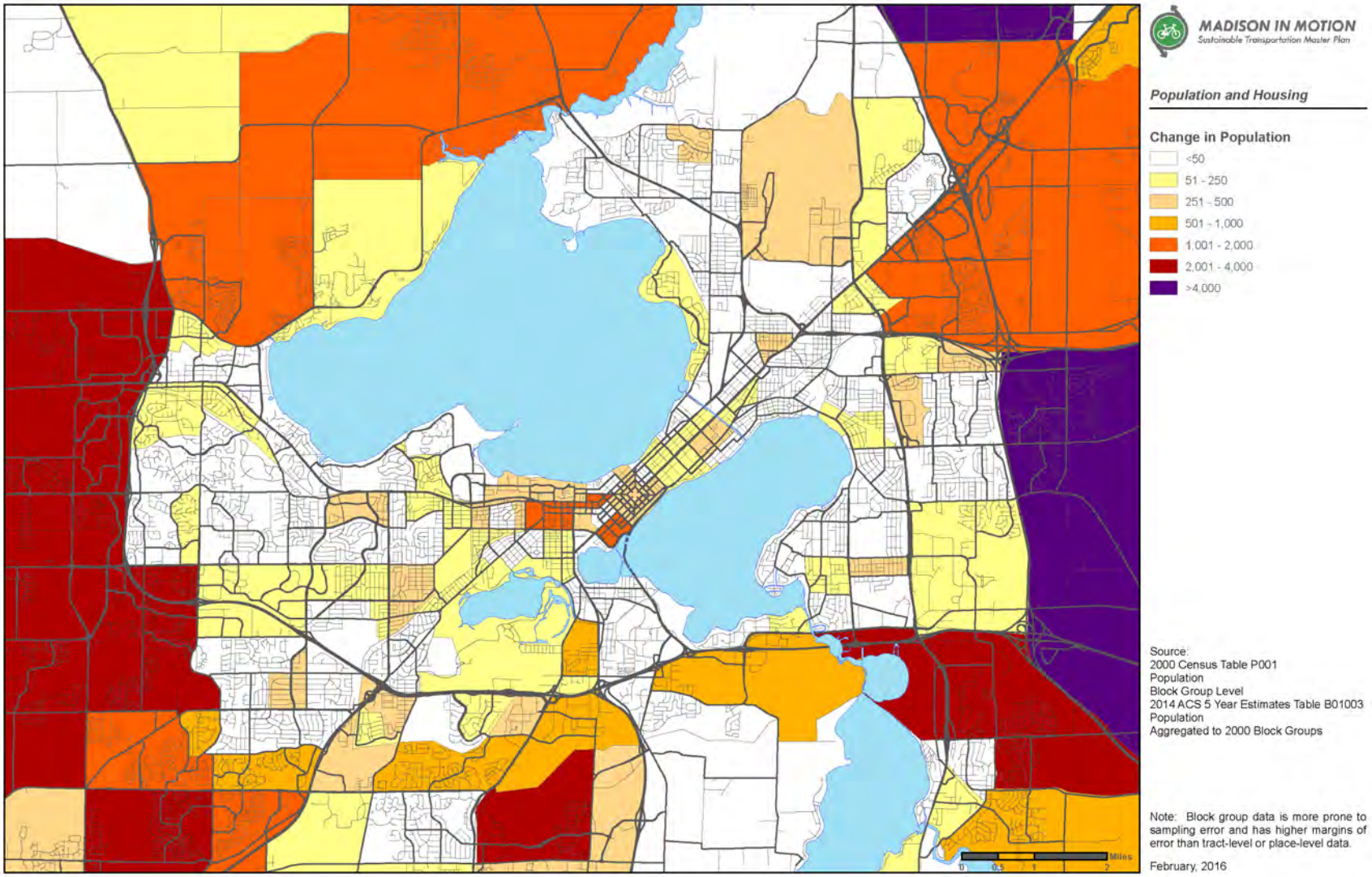


Figure 2 Population Change (2000-2014)



INCOME

Given the prevalence of students in the Madison population, income numbers are distinct from the remainder of the county. The median household income in Madison is $53,933[5] with approximately 19.6% of the population below the poverty level. Lower income households tend to be concentrated in specific locations, predominately along the south belt line as shown in Figure 3. Lower income households in these areas often face unique transportation challenges that must be addressed to better provide access to opportunity for all residents. Low-income households tend to be more transit dependent, while also exhibiting lower rates of auto-ownership. Many of these neighborhoods have land use and block patterns that are difficult to serve effectively with transit, resulting in longer commutes and potentially a need for more costly modes.

Recognizing that neighborhood affordability is impacted both by housing and transportation costs, the Center for Neighborhood Technology created the H+T (Housing + Transportation) Index to highlight areas that have the greatest total affordability and those where housing savings are offset by higher transportation costs. In Madison, many of the areas with the lowest H+T combined costs correspond with areas with high levels of transit service, along primary corridors and near transfer points (Figure 4).

5 U.S. Census Bureau. 2010-2014 ACS 5-year estimate.

Figure 3 Median Income (2014)

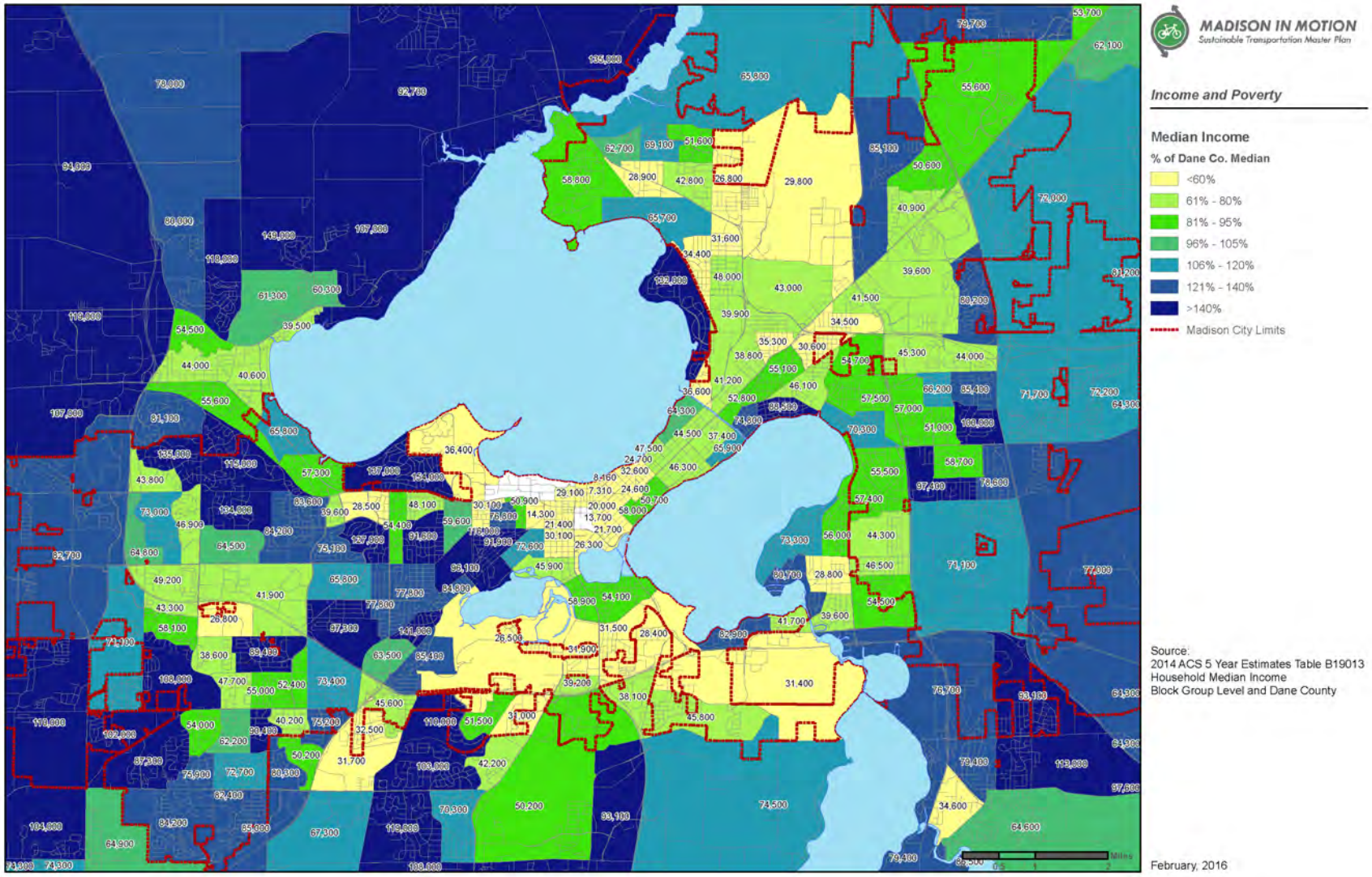
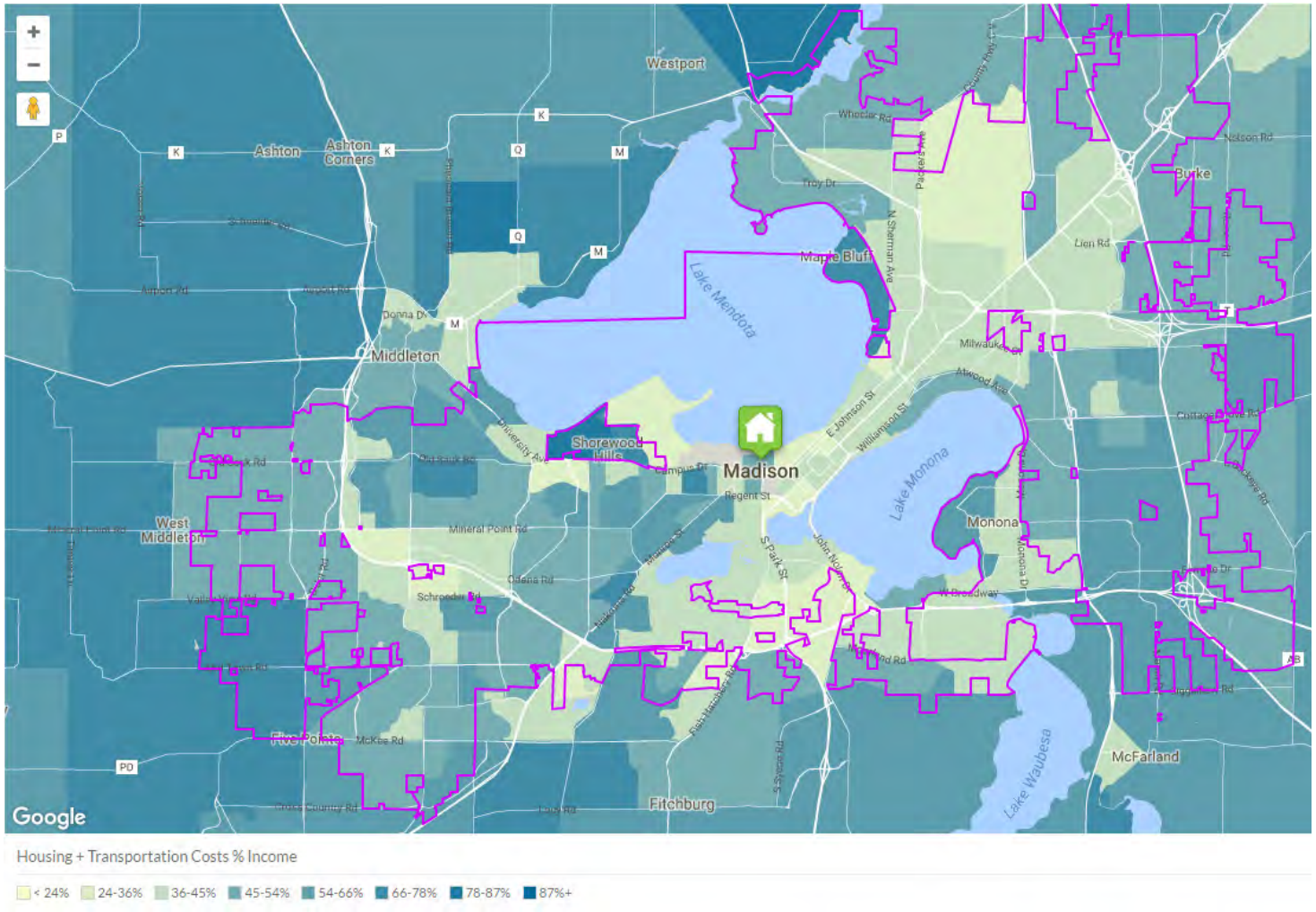


Figure 4 Housing and Transportation Cost as a percentage of Income



Source: Center for Neighborhood Technology. “H+T Index.” (2016).

AGE AND RACE

The presence of the university, and the student population that accompanies it, has impacted age patterns in Madison for decades resulting in individuals in their 20's accounting for the single largest portion of the population by age group. Between 1990 and 2010, this group grew by nearly 10,000. Additionally, population in the age range of 45 to 65 grew by nearly 24,000 with those in their 50's alone growing by nearly 15,000.[6] This reflects the expected influx of an aging population, as baby boomers begin reach retirement.

National trends suggest that young professionals are less dependent on driving, with fewer people securing drivers' licenses. These individuals tend to seek housing in denser, urbanized areas where neighborhood and community amenities are more concentrated, and transit is more accessible. Similarly, the older age groups may reevaluate their current housing needs, resulting in empty nesters looking to downsize are attracted to many of the same central areas as younger age group.

Madison's population is 75.3% white, 7.8% Asian, 7.1% Hispanic, and 7% Black. Between 1990 and 2010, nearly all growth (88%) was attributed to persons of color, with the Hispanic population increasing the fastest.

6 Census 1990-2010

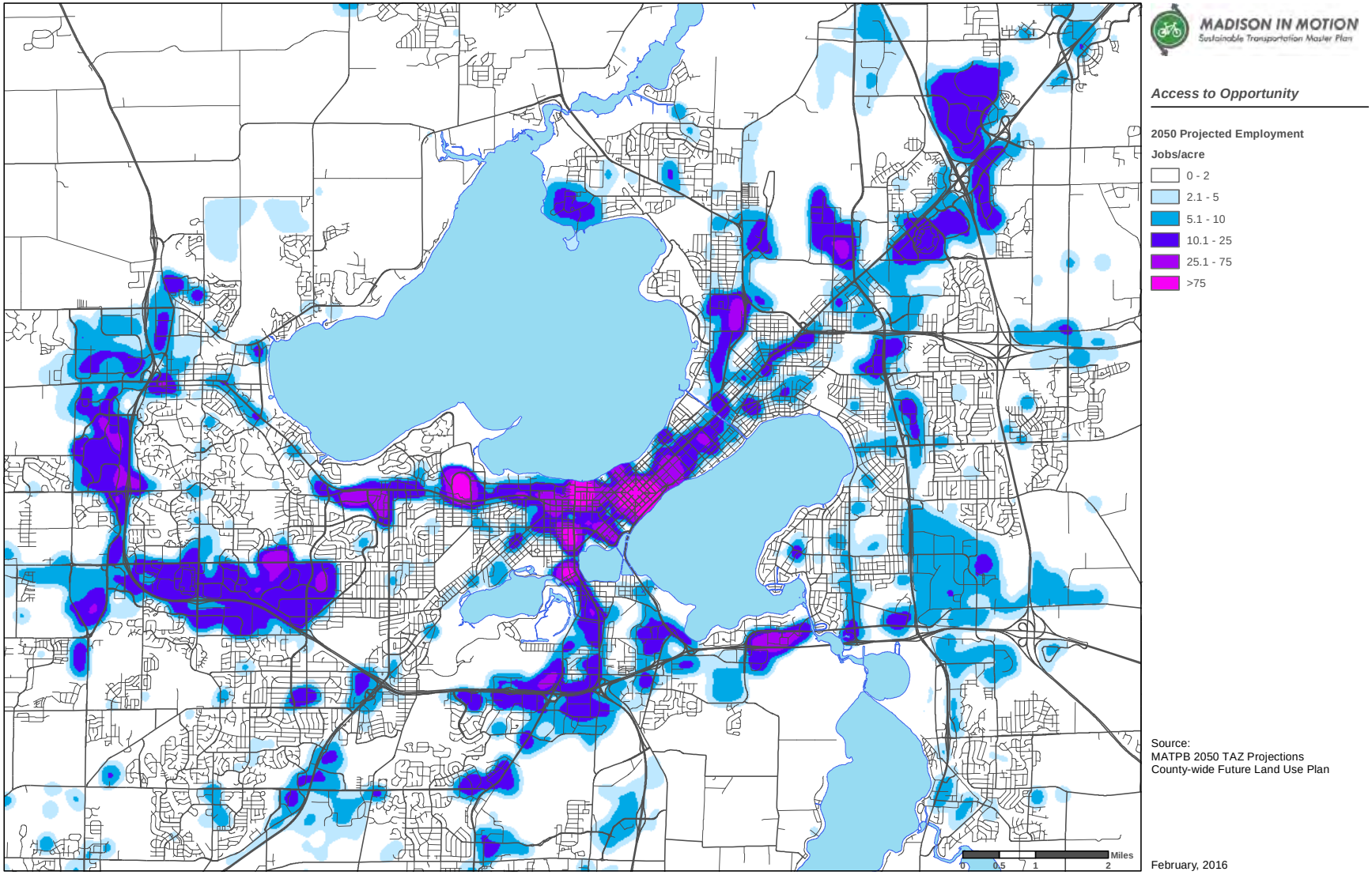
ECONOMY AND EMPLOYMENT

Madison has a strong and growing economy, with steady increases in employment observed in recent years. In particular, the healthcare, and innovation and technology sectors are continually expanding and expected to be generators of economic growth for the local economy. Census estimates for 2014 indicate more than 204,000 total jobs[7] (including part time) in the City of Madison, compared to a workforce population of 148,000, resulting in workers commuting from outside areas, which add to the demand on the local roadway system. The city has the added benefit of a pipeline workforce from nearby colleges including the University of Wisconsin, Madison College, and Edgewood College. The University of Wisconsin Madison campus is the city's largest employer, with nearly 22,000 employees.

Some major employment and retail centers are located on the city's periphery, creating disperse travel patterns. Epic Systems Corporation, a healthcare software company, is the largest private employer in Dane County and is located 11 miles from downtown Madison in the City of Verona. The large 1,000-acre suburban campus employs approximately 7,000 people and has significantly contributed to the County's employment growth over the past ten years. Over the next four to five years, Epic is expected to continue growing, projecting a need for an additional 1,000 workers annually. Although the company is not located in the city itself, many employees are from Madison and add to the demand for multi-family housing in downtown Madison. Metro has responded to this demand by providing direct transit access between Madison and the Epic campus.

7 Census Center for Economic Studies

Figure 5 Job Density (2013)



TRANSPORTATION BEHAVIOR

Madison's transportation system is sophisticated for a city its size: it has a high degree of transit use and a 15% share of work-based commuting on foot or by bicycle, and the city is a major hub of a state-coordinated intercity bus service that connects Madison to other major cities and towns throughout the Upper Midwest. However, the city's vision for future growth, based on the development of compact, walkable activity nodes, is not entirely consistent with Madison's system of transportation infrastructure today.

As discussed previously, the greatest concentrations of employment and economic activity in the Madison region are on or adjacent to the downtown isthmus, and this constrained geography balances many land uses: office and residential buildings, the Wisconsin state capitol, the University of Wisconsin campus, and established single-family neighborhoods.

Outside of the isthmus, Madison is a fundamentally newer city, and its transportation infrastructure reflects this. Lot sizes are larger, densities are generally lower, and streets have been designed primarily for moving automobiles. Although the city has made remarkable progress in improving conditions for bicyclists and pedestrians, critical street connections continue to reflect the automobile-oriented development patterns that became dominant in Madison—just as they did throughout the United States—in the second half of the twentieth century.

Mode Trends

As a legacy of development patterns and the changing cultural preferences that accommodated them, Madison today is predominantly dependent on automobiles for much of its transportation needs. However, compared to similarly sized cities without extensive transit systems, a relatively large percentage of the region's travel is made on transit. In addition, carpooling, biking and walking also well utilized alternatives region wide. Much of this modal balance is due to major activity centers being located downtown. While Madison's urban core supports walking and biking, and parking limitations encourage non-auto modes, the region has developed in a much different pattern than Madison's core, and as a result, provides fewer opportunities for alternative transportation.

Madison residents depend less on the automobile than residents of the region as a whole, with only 62.1% of its commuting population driving alone. A much higher share of commuters in the city walk, bike or take transit to work than in the region. With over 15% of the population commuting by foot or bike, the city of Madison boasts one of the highest shares of alternative transportation in the nation.

Madison's transportation network must serve more than just residents however. Of the jobs that exist in Madison, nearly 100,000 (47.5%) are held by those who are traveling more than 10 miles from home to their place of employment. The percentage of workers commuting less than 10 miles decreased from 58% to 51.8% between 2002 and 2010. Since 2010 the number of commuters traveling less than 10 miles has slightly increased, possibly attributable to significant housing developed in central areas closest to major employment nodes. Trips over 10 miles are likely too long to have significant number of workers use modes other than driving, placing a greater burden on the road system. This is reflected in modal data measured by workplace geography, where single occupancy vehicle mode splits are 10% higher for individuals

traveling from the periphery to jobs in Madison, when compared to Madison residents commuting to work.

The future of Madison's transportation system must rely on an even more balanced availability of transportation modes, to reduce the stress on an already constrained roadway system, especially along the confluence of routes into the downtown isthmus. Providing more mobility options will enhance the ability of streets to support the social, economic, environmental, and recreational functions of city streets.

Key mode share highlights include:

- About 5.3% of Madison residents bike to work, higher than most US cities and metro areas. Bicycling levels continue to rise, especially in core area and near key regional paths.
- About 10.3% of workers walk to work – very high for a city of this size, and larger.
- UW has even more balanced mode split numbers when compared to the City as a whole, with as many as 20-30% of students biking to work during good weather, as identified by from biennial transportation surveys. Transit use has increased among students, and auto use decreased. Staff and Faculty also contribute to diversified mode splits.
- Madison Metro has seen growing ridership, up to 15.2 million rides in 2014, a 40% increase in rides from 2004.
- Carpooling has decreased citywide, but high levels are still observed in lower-income areas, possibly attributed to lower transit access outside the transfer point system.

According to 2009-2011 ACS data, the average travel time to work for City of Madison and all Dane County residents was 19 minutes and 20.6 minutes respectively. The average travel time for workers who drove alone was 19.6 minutes for Madison residents and 21.2 for Dane County Residents. Travel times for workers who took public transit were substantially longer—27.8 minutes for Madison residents and 29 minutes for all Dane County residents.

The Role of Active Transportation

Bicycling and walking are essential modes of transportation for the City of Madison, and together they account for over 15% of all commute trips to work destinations. The greatest areas of bicycle and pedestrian demand are downtown and near the university, but other locations throughout the city may also have potential as pedestrian and bicycle friendly zones.

Clearly, walking and bicycling have a major role in transporting the city's population. The latest work commute data from 2014 indicates that 10.3% of the workforce commuted by walking, while 6.2% bicycled. There is no other city in the United States with a population of greater than 200,000 that has a higher bicycle commuting percentage. Similarly, the proportion of Madison residents who walk to work represents one of the highest percentages of any city its size or larger. Bicycling levels continue to rise in the city; bicycle commuting increased from 3.2% in 2000 to 5.3% in 2014. Bicycling and walking are also common forms of travel for other trips in addition to commuting.

Historical data from UW shows that the number of students biking to campus has fluctuated between 20% and 30% in good weather. The number of students choosing to walk or take transit has increased, while those driving alone are participating in a carpool has decreased.

Figure 6 Bicycle Travel Mode Split (2014)

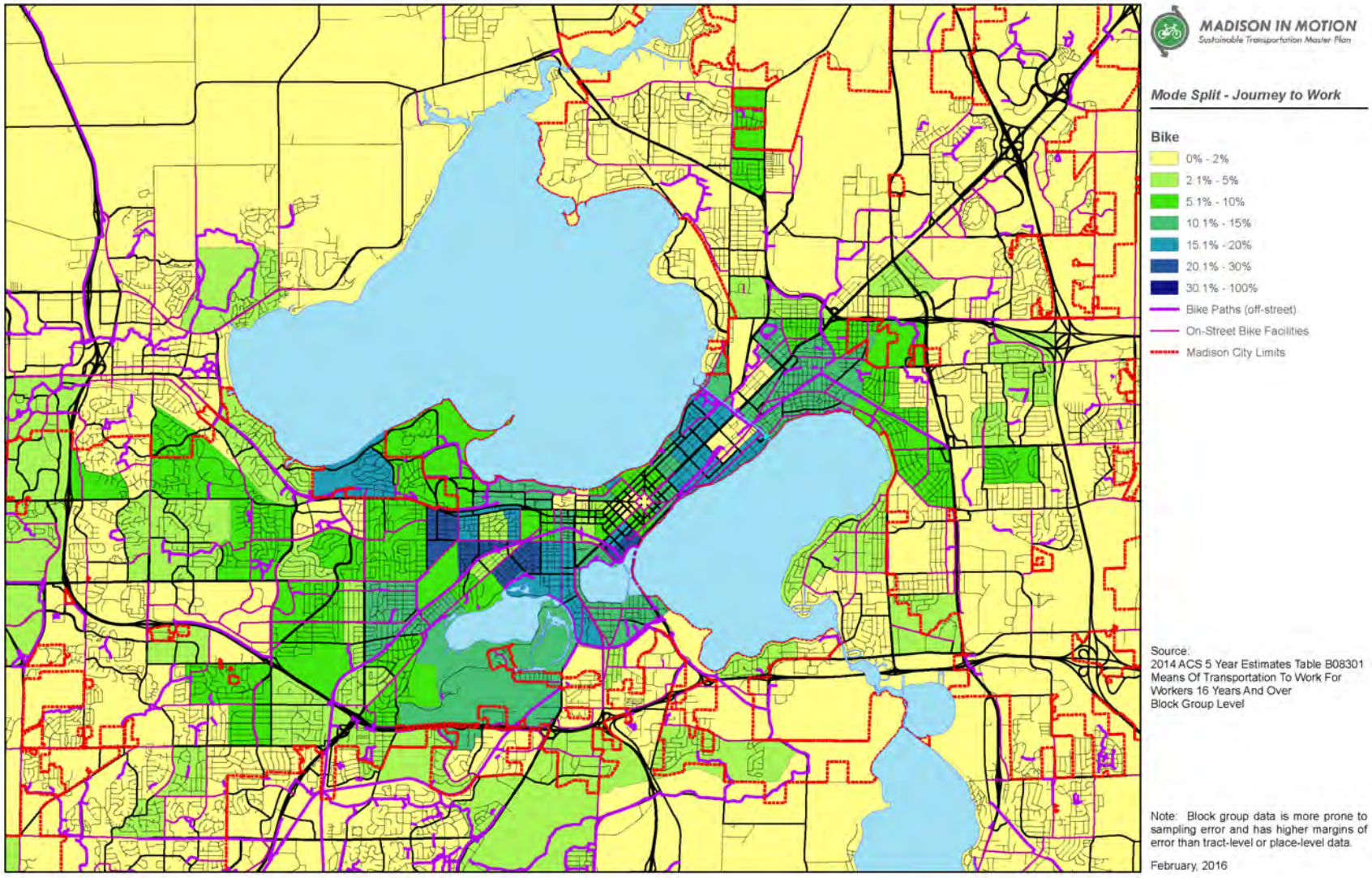
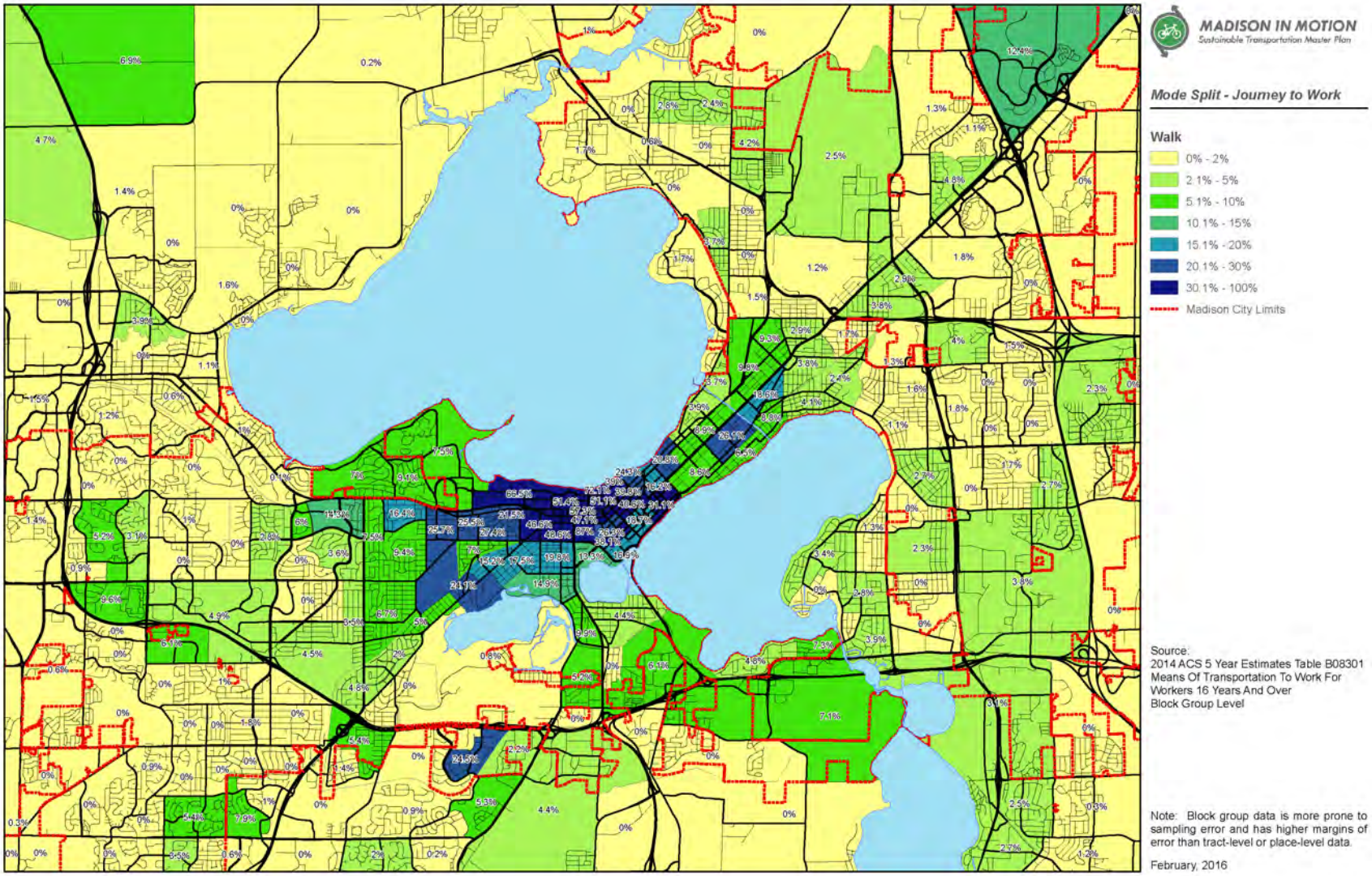


Figure 7 Walk Travel Mode Split Density (2014)



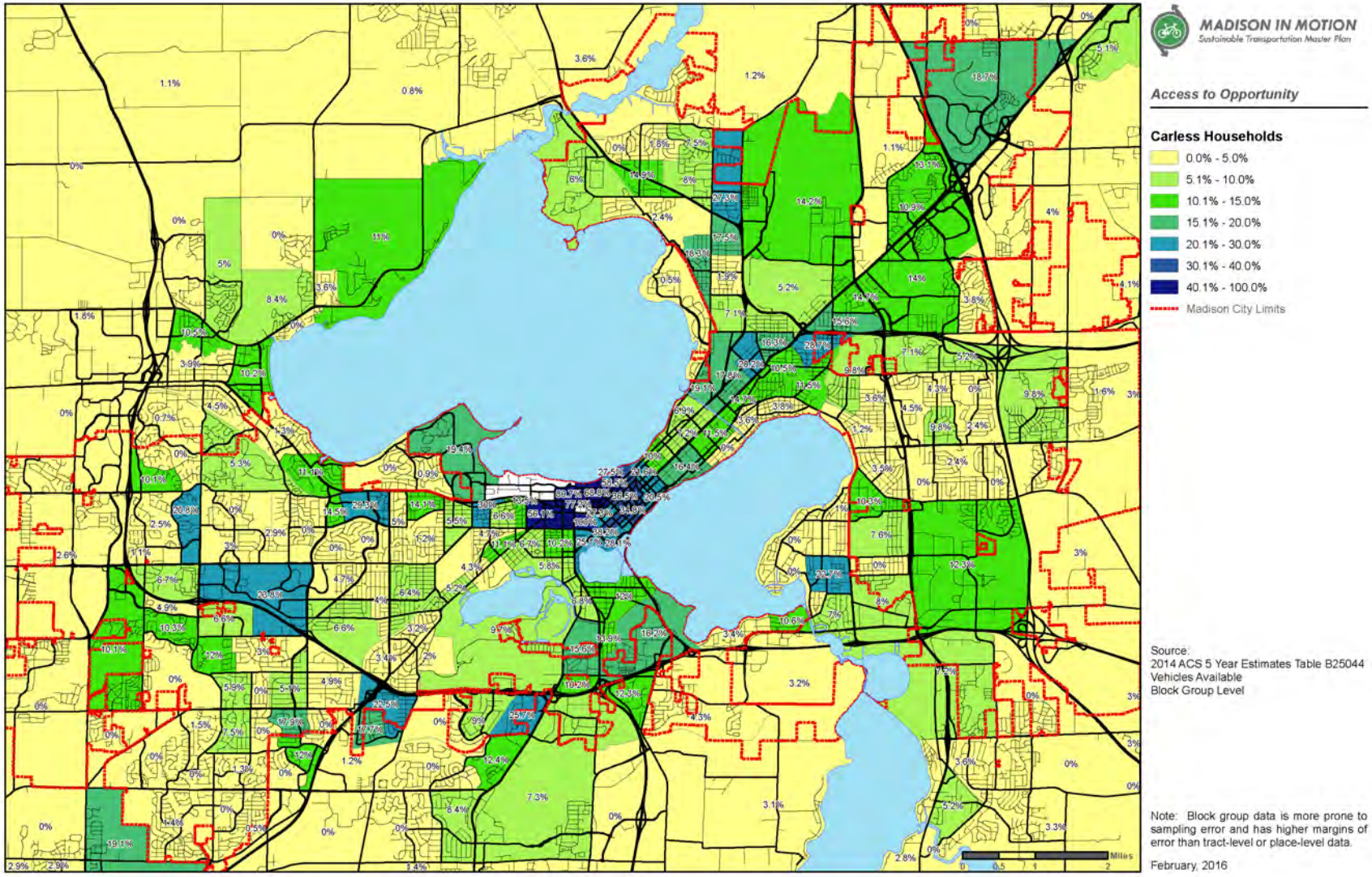
Zero Vehicle Households

There are areas in Madison where a significant percentage of households do not own or have access to a vehicle. Some may not own a vehicle by choice, others may not be able to drive due to age or physical ability, and others can't afford the high cost of car ownership.

Car-free households located near transit have a feasible transportation option. Those outside of the existing Metro Transit service area are limited to biking, walking, or carpooling. It is these areas that quality bicycle and pedestrian infrastructure is perhaps most critical. Quality bicycle and pedestrian infrastructure can complement transit, expanding its reach and increasing access to nearby destinations.

Vehicle ownership patterns in Madison are beginning to show residents are relying less on cars to meet their transportation needs. Across all household sizes, and for both renters and owners, the households with 3 or more cars are decreasing and 1 car households have increases in most categories. This may suggest residents are seeking other modes when they are available.

Figure 8 Zero Vehicle Households (2014)



Current Road System

HIGHWAY NETWORK

Madison is at the intersection of three Interstate highway routes, Interstates 39, 90 and 94, connecting the city directly to Milwaukee, Chicago, Rockford and Minneapolis. Owing partly to the limitations of Madison's geography, and to strong resistance from Madison residents to the Isthmus Freeway plan of the 1960's, these expressways were not built through the center of the city but instead form a partial loop around it, along with US Highways 12, 14, 51, and 151. The southern and western parts of this expressway bypass are referred to locally as the Beltline, which was originally constructed as a two-lane downtown bypass, but has been expanded to a six- to eight-lane freeway. The expressway system also includes feeder routes, such as the Highway 30 expressway stub that continues Interstate 94's route from Milwaukee and connects to Washington Avenue, providing a primary route into downtown Madison.

The Beltline

The Madison Beltline is the main east-west highway in the region and provides a critical connection for over 100,000 motorists every day. Because Madison does not have a full expressway bypass loop, the Beltline represents a confluence in the expressway system with regional traffic from the northwest suburbs and surrounding region sharing the road with traffic from the southwest, especially in the segment between the US 18 interchange and the Interstate 39/90 interchange. Likewise, the Beltline is a critical connection to downtown Madison for traffic coming from the southeast, as Lake Monona limits connectivity from these directions.

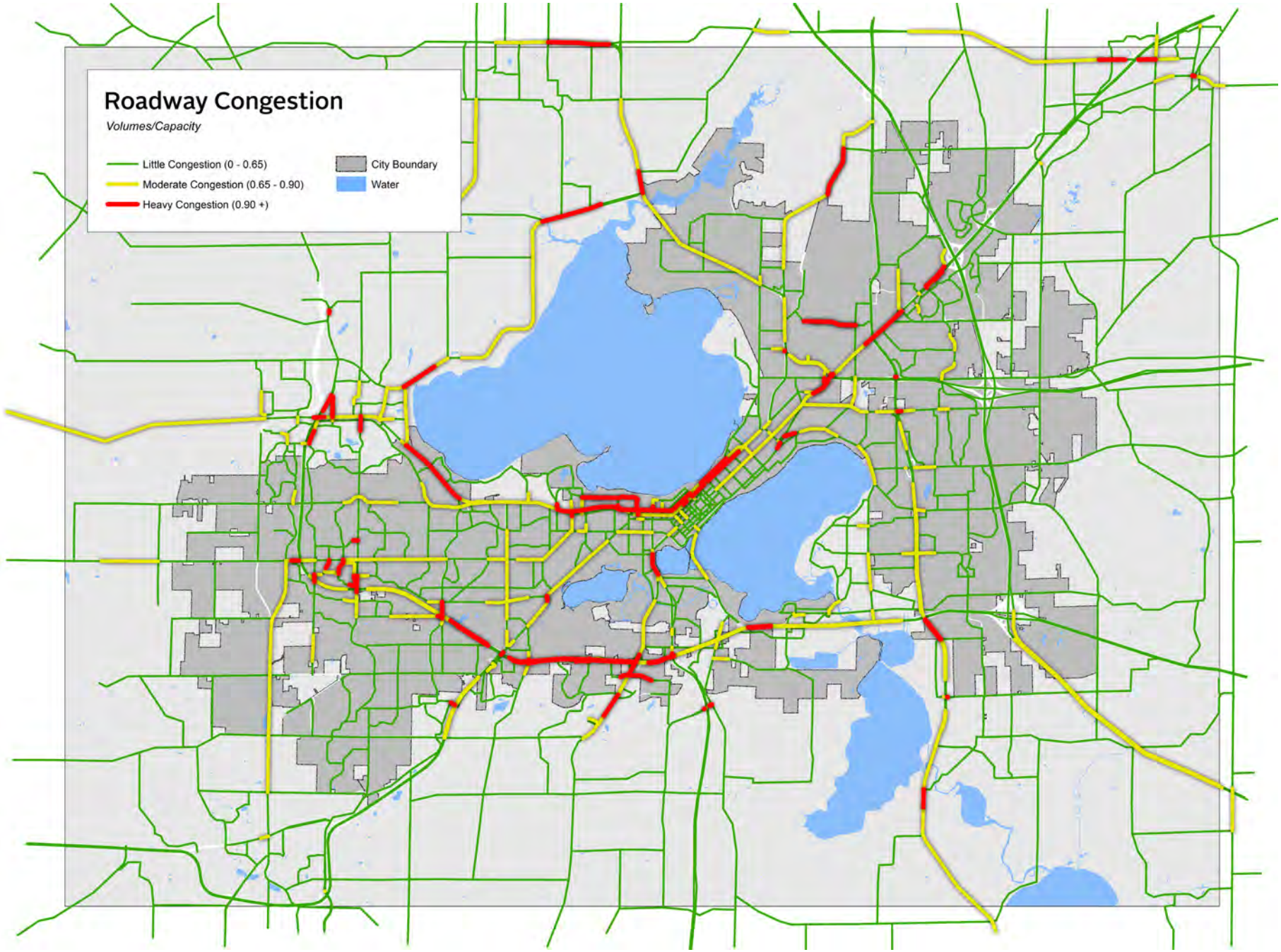
With existing congestion already high and projections for increasing demand in the future, both the Madison region and the Wisconsin Department of Transportation have concerns regarding the limited capacity of this highway. WisDOT is currently leading a study to evaluate the future of the Beltline and how the infrastructure can be enhanced to accommodate additional growth in the region.

Major corridors

One of the key challenges that Madison faces is the limited amount of connecting thoroughfares through the city. Corridors such as East Washington Avenue, Park Street, Monroe Street, and Regent Street are the key direct routes to and through downtown and the University of Wisconsin campus area. To put demand on major corridors into perspective, the three parallel arterials on the isthmus (East Washington Ave, Williamson St and the Johnson/Gorham couplet) carry over 110,000 cars per day, a combined volume more typical of highways than surface streets. Other corridors farther away from downtown, such as Cottage Grove Road and Midvale Boulevard, help with regional connectivity and overall transportation system capacity, but they eventually link to the few streets that passes through Madison's downtown core.

The diagrams on the following page illustrate how traffic moves and is distributed throughout the region, and underscores the critical importance of a key set of thoroughfare corridors. It is no surprise that these are also some of the region's most congested corridors, as shown in the roadway congestion map in Figure 9.

Figure 9 Roadway Congestion



Congested corridors

The nature of Madison's geography, with the most visited destinations clustered on a narrow strip of land, has led to a unique challenge for its roadway system — specifically the fact that a limited set of connecting thoroughfares brings all traffic to and from downtown to the rest of the city and region. This has influence street design on most roadways to favor automobile use to create as much capacity as possible. Despite such designs, several of these connecting streets continue to experience congestion, as shown in the map below. Beyond alleviating congestion, there is a demand to be able to use these corridors to provide connections into the heart of the city for other modes, including bicycles, pedestrians, and transit vehicles.

Local Streets

Although constructed on a grid-based system, downtown Madison's street pattern is heavily constrained by natural and manmade features. It generally follows the orientation of the downtown isthmus as far north as the Yahara River and as far south and west as the Canadian Pacific Railroad tracks. From these limits, the street network changes orientation in multiple directions, following natural features and the major spokes in the street network: along State Street through the UW campus, along Atwood Avenue on the north side of Lake Monona, and into other grid orientations following main streets farther away from the city center.

This series of grid patterns leads to a heavy degree of reliance on arterial and collector thoroughfares for connectivity, as these are often the only streets that cross rail corridors, water, parks, and cemeteries. The lack of direct, lower volume routes places a higher degree of non-automobile demand on arterials than what a well-connected grid network of streets might suggest. Many of these thoroughfares are relatively narrow with no available space for expanding the right-of way to easily accommodate these other uses. Based on traffic volumes and levels of bicycle and pedestrian demand, virtually every connecting street outside of the isthmus is a conflicted corridor of this type.

This highlights one of Madison's central transportation challenges. Demand for downtown and University area access has grown along with the city's footprint, but there is little opportunity for expanding city streets.

Current Transit System

Transit is a critical component of a multi-modal transportation system because it has the greatest person-carrying capacity. Buses and trains can carry many more passengers than a single vehicle, and take up much less space on the road while doing so.

The city and surrounding region's primary transit service provider is Madison Metro Transit, a division of the City of Madison government that provides scheduled bus service on 62 fixed routes and paratransit services in Madison and adjacent Fitchburg, Middleton and Verona. Metro carried nearly 15 million riders in 2014, with just over 51,000 riders on an average weekday.

For a service area population of about 250,000, this is a remarkable number – generally equal to an average of one in ten residents taking a round trip on transit each weekday. In comparison to other transit systems in cities of similar size and characteristics, Madison's system shows a relatively high level of usage.

As one might expect, the most heavily-used transit routes pass through downtown and the University area, carrying commuters from the east and west into downtown. Metro also provides campus shuttles for the University that are free to passengers. Metro's route network is designed around a series of transfer points, with the goal of enabling single transfer rides for the vast majority of trips. Within transfer point areas, many trips can be made with a single ride, and usage numbers in these areas reflect that.

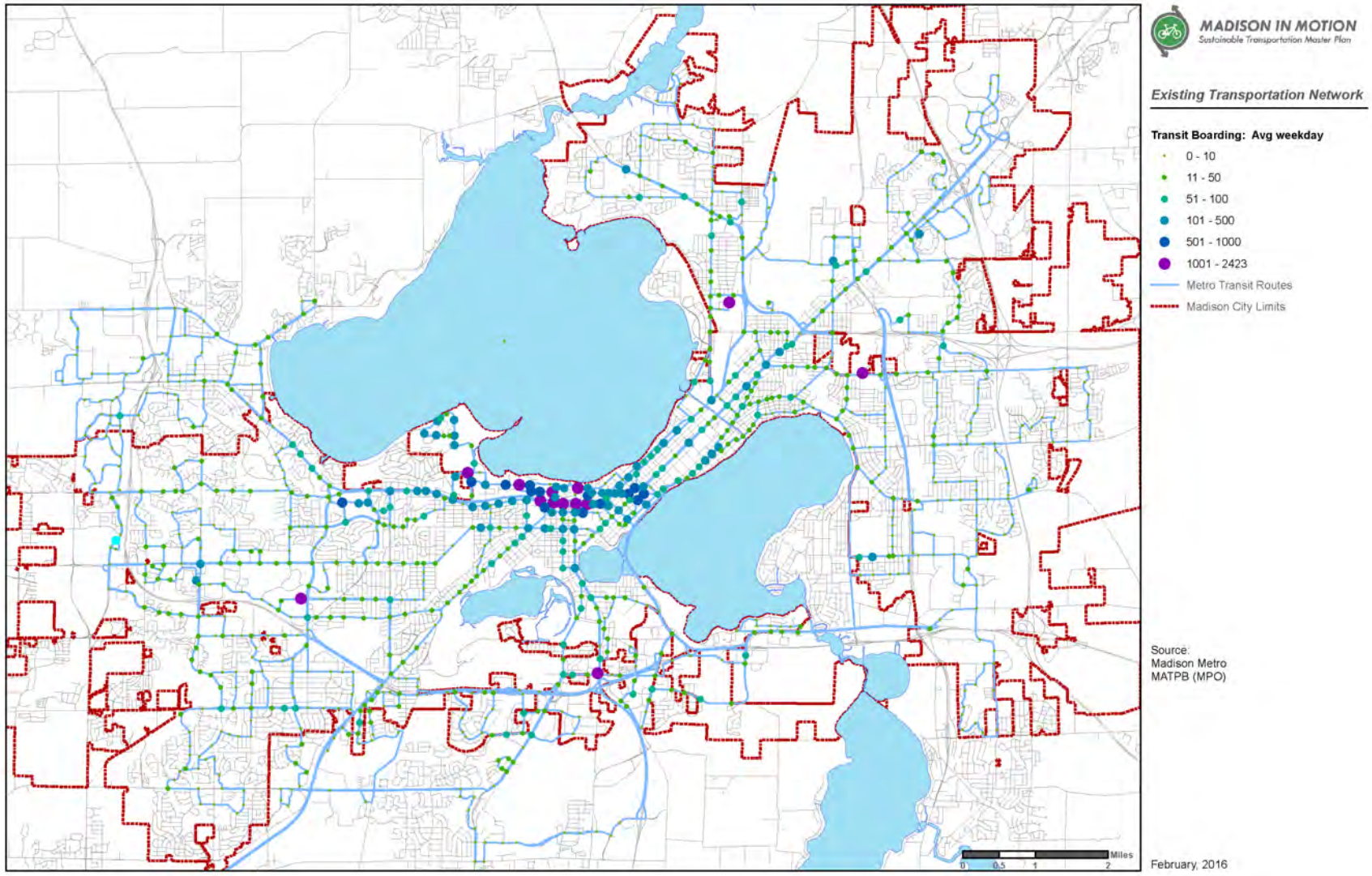
Service characteristics are considerably different outside of weekday peak hours and on weekends, with only about half of Metro's routes operating outside of peak hours, and only half of those operating on weekends. Nonetheless, in spite of only a quarter of the route system being operated on weekends, there are still around 18,000 daily trips made on Saturdays and 12,000 on Sundays.

An analysis of population and employment density identified areas throughout Madison that could feasibly support transit service based on those combined densities. The areas were then compared to the existing transit service routes to determine whether or not there are locations that may be underserved or areas with service that may not support it. This Composite Transit Index map illustrates the potential headways each area could support, whether or not there is an existing bus route, and if there is an existing (or planned) park and ride station in the vicinity.

Metro currently serves four park and ride lots including the North Transfer Point, the American Center, and Dutch Mill. The North Transfer Point's park and ride is heavily used, allowing users the opportunity to park and have a one-trip ride to many destinations in central Madison. Other park and rides are not as heavily used, and some commuters have created informal park and ride locations throughout the network, often in large parking areas of retail centers served by transit or central neighborhood streets.

There are other park and ride lots with no transit service, which are only lightly used for commuting purposes as carpool rates have fallen over the years.

Figure 10 Metro System and Ridership (2016)



Current Bicycle System

Bicycling plays a significant role in transporting Madison's citizens. There is no other city in the United States with a population of over 200,000 that has a higher bicycle commuting percentage. According to the 2014 American Community Survey (ACS) Journey to Work data compiled by the U.S. Census, about 5.3% of people bike to work. Madison leads other cities of its size in bicycle trip-making as bicycling levels continue to rise in the city. Bicycle commuting has increased steadily from 3.2% measured in the 2000 Census. According to the same data, 10.3% of city residents walk to work. This also represents one of the highest percentages of any city of its size or larger. Historical data from UW shows that the number of students biking to campus has fluctuated between 20 and 30% in good weather.

The city of Madison has been designated a Platinum Bicycle Friendly Community (BFC) by The League of American Bicyclists, and has been ranked as a BFC since 2006. Platinum status was awarded based on a number of factors, the percentage of arterials with dedicated bike facilities (50-75%) total mode share, and the percentage of Madison schools offer bicycling education.

The City of Madison and the Madison area already have an extensive network of bikeways, developed over the past 40 years. As of 2013, there were 46 miles of paths, 112 miles of bicycle lanes, and 116 miles of signed bicycle routes within the city. One of Madison's bike policies is to include bike facilities on all new and reconstructed major streets. On new streets and where right of way is available, paths are considered in addition to bicycle lanes to appeal to a greater range of cyclist. In some cases, bicycle lanes have been added through re-striping efforts such as Segoe Avenue or reallocating lanes such as West Washington Avenue.

The city has invested millions of dollars over the past 20 years in the construction of paths within separate corridors. These include the Capital City Trail (isthmus, E-Way, and Verona Road segments), the Southwest Commuter Path (leading to the Badger State Trail), the Cannonball Path, the Campus Drive Path/Black Hawk Path/expanded path segment west of Whitney Way all in the University Avenue corridor, the Ice Age Junction Trail, the Yahara River Trail, the Starkweather Creek Path, the Wingra Creek Path, and other minor path segments. These investments help encourage new bicycle ridership.

The City of Madison was an early experimenter with bike share, adopting the Red Bikes Project in 1996, which required modification over time. Madison B-cycle debuted in 2011, beginning with a small rollout and growing to its current 39 stations with 350 bikes spread around the downtown area.

Current bicycle facilities are visible in Figure 6.

BICYCLE LEVEL OF SERVICE

In recent years, as city leadership sought to encourage more bicyclists, there has been more interest in designing bikeways that appeal to a wide range of bicyclists. Many people do not feel comfortable riding close to busy traffic, even on a marked bikeway, preferring a low-stress riding environment. To make bicycling more appealing to a larger segment of the population, including novice riders, children, seniors, and others who prioritize comfort, bikeway planning needs to consider all range of bicyclists, including novice riders, children, seniors, and others who prioritize comfort.

One way to measure the comfort of roadways for bicycling is to calculate the Bicycle Level of Service (BLOS) grade for the roadway segment. The BLOS methodology is outlined in the Transportation Research Board's Highway Capacity Manual 2010. Variables such as bike lane width, traffic volume and speed are input into the BLOS model, which then assigns a grade of A through F to the roadway, based on how likely bicyclists are to perceive their level of safety and comfort, with A representing the best bicycling conditions and F representing the worst conditions. The Madison Area Transportation Planning Board (MATPB) used BLOS methodology to measure existing conditions as part of their 2015 Bicycle Transportation Plan (which was conducted concurrently with the Madison in Motion plan). More information on how they adapted the BLOS methodology, as well as information about the weaknesses or limitations of the method, can be found in the MPO's plan.

The MATCP's analysis of BLOS on the roadways in Madison can be seen in Figure 11. Most of the rated roadways measured in the city received a grade of C or above. Neighborhood streets were not rated and uniformly provide relatively high levels of service for the range of bicyclists but often travel out of direction and make wayfinding difficult in non-grid based street systems. Lower-volume roads or roads with bicycle lanes received grades of A and B, while high-volume roads without bicycle lanes received grades of E and F. Most of the C, D, E, and F scores are on high speed arterials that do not have bike lanes, such as Atwood Avenue, Mineral Point Road (partial), and Park Street (partial).

Collisions

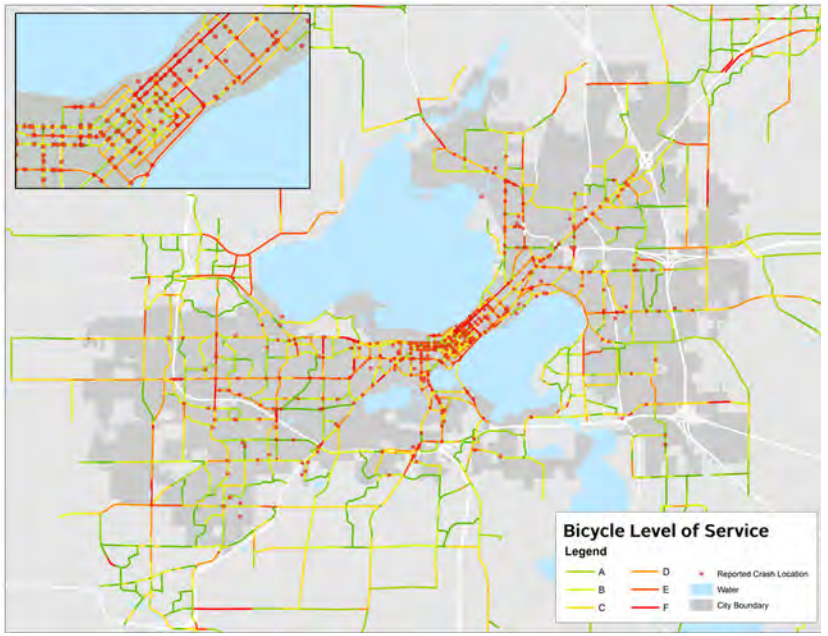
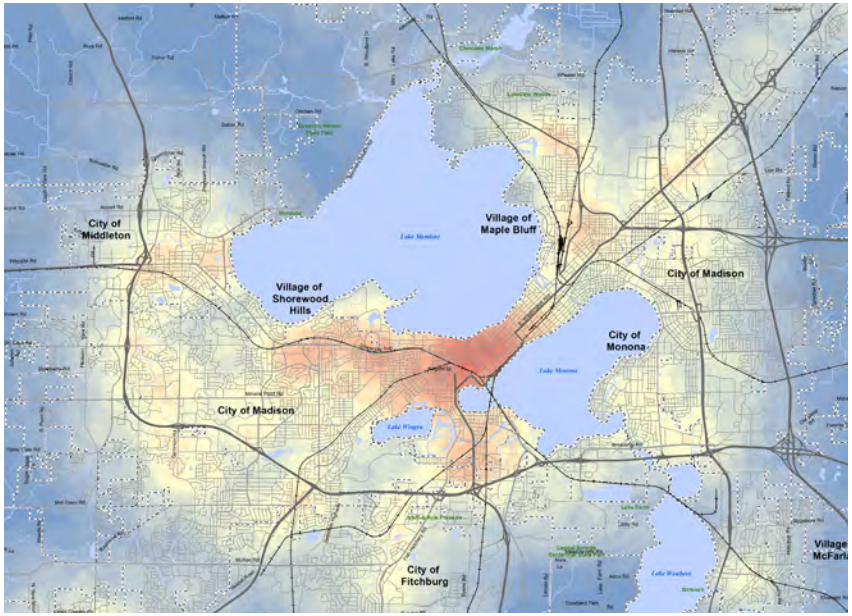


Figure 11 Bicycle Level of Service and Bicycle Involved

DEMAND FOR BICYCLING

The bicycle heat map analysis shown in Figure 12 broadly illustrates the demand for bicycle trips (both existing and latent). The demand for bicycling was estimated by taking into account land uses such as population density and major activity centers such as employers and shopping areas. The map highlights areas where significant levels of biking already occur (downtown/campus) because of the density of destinations and population resulting in shorter trip lengths. The map also highlights areas along University Avenue, Regent Street, Monroe Street, Park Street, Commercial Avenue, and Northport Drive that should have high demand for biking trips, even if there are not currently high-quality bicycle accommodations on those streets. This heat map's limitations are evident in the east isthmus and north Sherman Avenue, which should show more bicycling activity than the map seems to indicate, likely due to modeling impacts of the lakes.

Figure 12 Bicycle Demand Heat Map



Source: City of Madison, Toole Design Group, Nelson\Nygaard

BICYCLE CRASHES

Less than 20% of all bicycle crashes are the result of bicycle-vehicle collisions, but vehicle crashes often result in severe injuries and almost all fatal crashes involve vehicles. Bicycle fatalities have historically remained relatively low, but are becoming more common as bike usage increases. Crashes have been the most common in central areas with the heaviest bike traffic. Constrained street widths prevent facilities in these areas from being expanded to reduce bicyclist exposure on higher volume streets such as Gorham, Johnson, University Avenue, Dayton, Regent, Williamson, Park, and sections of East Washington. Many of these crashes occurred at intersections where bicyclists were turning or crossing these streets. Outside of central Madison, crashes tend to occur at high-volume intersections of arterial streets, and at pinch points such as interchanges with the beltline and interstate. Madison's crash rate per bicycle mile traveled is much lower than the rest of the state, indicating that the crash rate likely lowers where and when there are quality facilities and/or many other bicyclists.

BICYCLE SYSTEM GAPS AND BARRIERS

Over the past 40 years the City of Madison has been able to incorporate or retrofit bikeways into most the major streets in the city. At the same time, nearly 50 miles of path have been constructed. Most of the gaps in the Madison bikeway network are a result of barriers or streets that have very restricted rights-of-ways. The limitations can be summarized as the following:

Gaps with no Bicycle Service

Despite considerable efforts to include bicycle lanes in all major street projects several key segments of major streets that have not been rebuilt with bicycle lanes. Examples include: Mineral Point (part), Speedway, Odana, Monroe, Regent, Monona Drive (part) and Cottage Grove (part).

Low Bicycle Level of Service

There are a number of arterial streets that have been reconstructed with bicycle lanes. However, despite the presence of bicycle lanes, high traffic corridors can be stressful environments for bicyclists. Examples of streets with bike facilities and low bicycle level of service include: Johnson/Gorham, Fish Hatchery (near the Beltline Crossing), and part of Mineral Point near West Towne.

Crossings of Limited Access Highways

The Beltline and the Interstate act as major bicycle barriers in Madison: the Beltline, Stoughton Road (Highway 51), and Interstates 90/94/39 have few crossings and even fewer that could be considered bicycle friendly. The problem stems from prevalence of interchanges with street crossings of highways. In many cases, bike lanes are provided, but given high traffic volumes, the numerous crossings of ramps, and the complexity of turning movements and signals, they are rated relatively low for overall bicycle level of service. In addition, the limited access points to the highways have created a street and development pattern that is not conducive to adding more crossings.

Peak Travel Lane Streets

Several of Madison's narrow, traditional main streets (Monroe, Williamson, and a portion of Regent), lose a parking lane during peak travel times to become a travel lane. While these streets don't have defined bike facilities, cyclists often utilize the space between parked cars and drive lanes during non-peak hours. During peak hour, this space is lost and bicyclists must share a travel lane or detour to nearby facilities. While nearby facilities include off-street paths, they don't offer optimal access to destinations directly on those corridors. For bike traffic traveling the corridors, conditions are far better when and where bicyclists are not sharing the traffic lane but using space between the drive lane and parked autos.

Gaps in the Path System

There are several key segments of paths that are lacking continuity and require connections. Just a few of the most pressing examples include: the continuation of the Capital City Trail from its current limit at Hwy 51 through residential areas off Buckeye Rd and eventually reach the Glacial Drumlin Trail in Cottage Grove, the continuation of the Cannonball Trail to the north to connect to Fish Hatchery Road or the Wingra Path, the Sherman Flyer, and the Goodman Path.

BICYCLING SUCCESSES

The city's path and street bikeway network has grown extensively in the past 20 years, and innovative infrastructure like bike boxes, green lane segments, bike signals, and bicycle boulevards have made biking more appealing to a wider range of users. This has resulted in many more people bicycling in the city, as documented above, and the designation of Platinum-level Bicycle Friendly Community.

Several additional initiatives seek to improve biking and expand the culture of biking in the city. The MPO's Bicycle Transportation Plan 2015 for the Madison Metropolitan Area and Dane County details existing education, encouragement, and enforcement activities, and recommends improving and expanding those efforts. Some highlights include:

- Madison hosted its first Ride the Drive event in 2009 and now holds two events per year allowing citizens to bike down some of Madison's signature streets free of motor vehicle traffic.
- In 2011 Trek launched BCycle to start offering bike share services, and made Madison one if its first bike share systems. BCycle provides short term bicycle rentals at locations scattered throughout central Madison. Madison BCycle currently has 39 stations and 350 bikes.
- Madison citizens are engaged and supportive of initiatives to improve bicycling in the city. The Bicycle Federation of Wisconsin has a Madison office which has traditionally been involved in events to encourage biking among adults, including Bike to Work Week. The Bicycle Federation also runs the "Share and Be Aware" campaign to raise awareness among all road users regarding safety and the

responsibilities of motorists, bicyclists, and pedestrians.

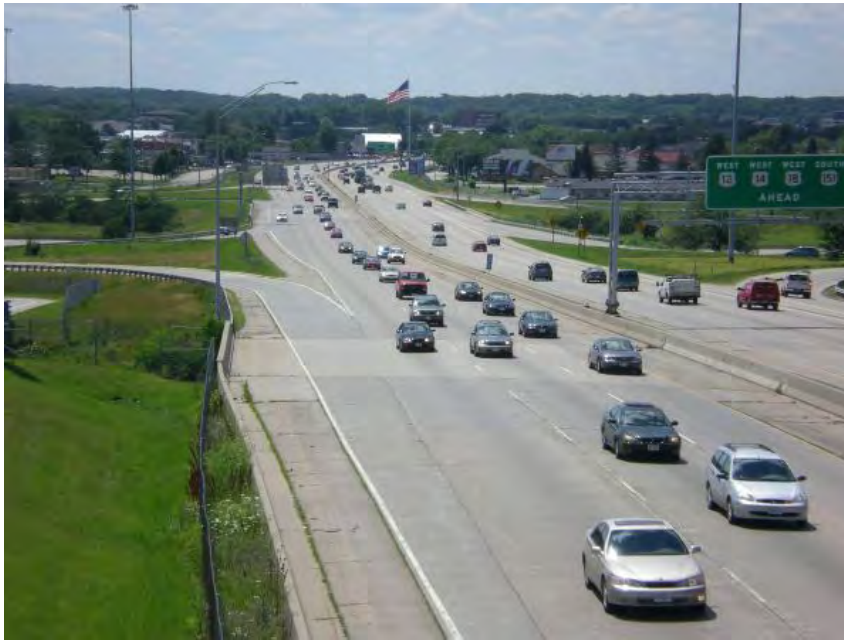
» The city employs three positions dedicated to bicycling related issues: a full-time Pedestrian/Bicycle Coordinator who focuses on planning and traffic engineering activities related to bicycle and pedestrian facilities in the city; a full-time Pedestrian and Bicycle Safety Educator who teaches bicycle and pedestrian safety at schools and neighborhood organizations, and a Bicycle Registration Coordinator who oversees the city's Bicycle Registration program. The University of Wisconsin-Madison also employs a full time Bicycle/Pedestrian Coordinator.

BICYCLING CHALLENGES

Despite this great progress, the city faces some significant hurdles to implementing the recommended bicycle facilities and continuing to grow the number of people who choose to bicycle for transportation. Locally and nationally, planning for bicycle travel has also undergone an attitude shift. Previous bicycle planning efforts primarily focused on establishing designated bicycle routes, adding bike lanes to streets and building major shared use paths. Although the city can attest to success in this regard, with bikeways greatly expanded during the past 25 years, challenges continue into the present day. The largest challenges that face Madison in the coming years is continuing to fill gaps in the system, building improved facilities that are comfortable to a wider range of cyclists and bridging major barriers in the system:

» When the Beltline (U.S. Hwy 12/14/18), Stoughton Road (U.S. Hwy 51) and I-90/39 were first constructed, they were surrounded by rural farmland. Now that the city has grown beyond them, there are streets on both sides of the highways that need to be connected via non-interchange crossings that are compatible with bike routes. The I-39/90 corridor also poses a barrier for bikeways. Many of the crossings are non-interchange crossings, but they carry high traffic volumes which deter many bicyclists.

Figure 13 Madison Beltline as a Barrier



» The city has routinely provided bicycle accommodations on arterial streets as they were reconstructed. However, in some cases, fitting in accommodations proved to be too difficult because of constrained street rights-of-ways, resulting in "bike deficient streets" as reported earlier in this chapter. Finding additional space to include bikeways on some arterial streets when they are reconstructed will continue to be a challenge for the city and may not always

be possible when space is at a premium. Narrowing drive lanes, eliminating lightly used parking lanes and road diets (i.e. 4-lane to 3-lane conversion) will be an option on some streets, but not all. Where other roadway demands prevent bike facility expansion, seeking alternative routing may be appropriate to enhance rider comfort.

Figure 14 Mineral Point Road as a Barrier

Source: Google

» Funding is also a concern. The 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21) Federal transportation spending bill significantly reduced the sources of funding for bicycle and pedestrian projects. MAP-21 combined three previous funding programs (Safe Routes to School, Transportation Enhancements, and Recreational Trails programs) into the Transportation Alternatives Program (TAP), and reduced the total amount of money appropriated to the State for projects that would be eligible for those previous programs. Wisconsin State law also restricts the city's ability to raise money by increasing its tax levy. The levy limits have placed great pressure on the city's budget.

» Although the share of travel by bicycle has been growing, it still only accounts for approximately 6% of commutes by Madison residents. In order to continue that growth, the benefits of travel by bicycle (health, enjoyment, recreation, and cost savings) must be comparable to those of driving (speed, convenience). Higher-density neighborhoods and mixed-use development can make walking and biking more convenient by bringing origins, and destinations closer to each other. Existing primary bikeways such as off-street paths and bicycle boulevards should be made more appealing, where possible by giving bicyclists the priority at intersections whenever possible, and controlling traffic volumes and speed.

Current Sidewalk System

COVERAGE

The City of Madison generally has a well-connected pedestrian network comprised of sidewalks and shared use paths, although there are areas of the city lacking pedestrian facilities. Sidewalks and shared use paths provide important connections for pedestrians throughout the city to residences, schools, retail areas, and other attractions such as libraries and parks. When sidewalks are not available, pedestrians must walk in the street or on unimproved surfaces, or use another form of transportation to reach their destination. Lack of pedestrian facilities especially impacts those in wheelchairs or with other mobility limitations, for whom unpaved surfaces are nearly impassible.

Within the City of Madison, there are nearly 1,000 miles of streets and roadway. More than 200 miles of those streets have no sidewalks at all, and nearly 100 more miles of streets have sidewalks on only one side.

Much of the downtown core, University of Wisconsin campus, and pre-war residential neighborhoods have sidewalks on both sides of their respective streets. Traveling outward, neighborhoods build between the 1950's and 1980's are less likely to have sidewalk. Neighborhoods built since 1990 generally have sidewalks on both sides, reflecting the city's sidewalk policy.

Figure 15 displays the approximate miles of streets in the city with sidewalks on either sides, one side, or no sidewalk. This data is visualized in Figure 16.

Figure 16 Sidewalk Conditions

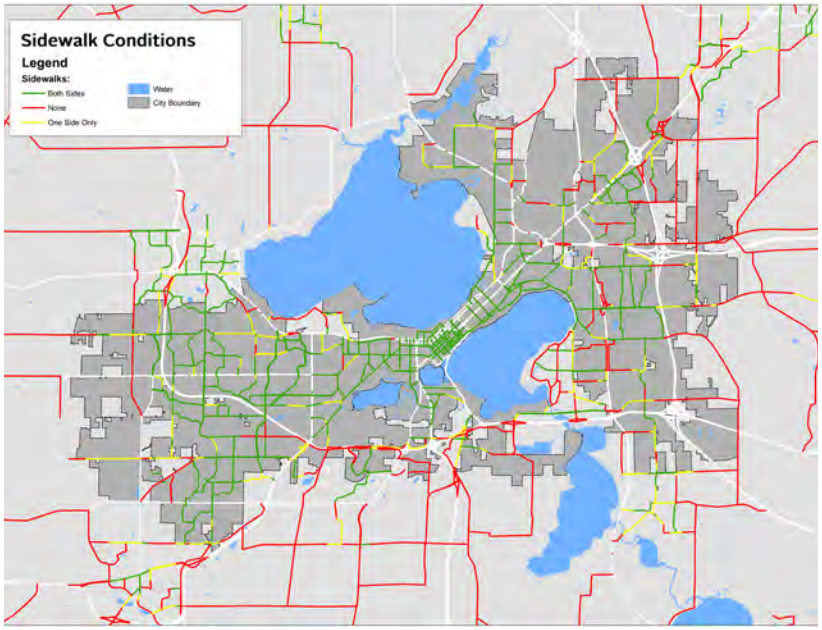


Figure 15 Miles and percent of streets in Madison with sidewalks

SIDEWALK STATUS	MILES	% OF TOTAL
Both Sides	532	64%
One Side	94	11%
None	202	25%

PEDESTRIAN SUCCESSES

Madison is ahead of most communities in the level of pedestrian facilities it provides. The city requires sidewalks on all new or reconstructed streets, and has worked hard to improve pedestrian crossings, especially near schools. The city has successfully lobbied for overpasses and underpasses as part of major state and federally-funded roadway reconstruction projects such as along the Beltline, East Washington Avenue, and on Campus Drive.

In 2003, the city launched a Neighborhood Traffic Management Program to provide a mechanism for neighborhood groups to work with the city to apply for traffic calming features such as curb extensions, median refuge islands, speed tables, and traffic islands. This popular program has successfully been used on local and collector streets across the city.

The city's Sidewalk Repair and Rehabilitation Program has kept the city's sidewalks in excellent condition. Each alderman district is scheduled for sidewalk repair and replacement every six to nine years. Individuals can also use the "report a problem" tool on the city's website to alert the city of a sidewalk concern.

Day to day maintenance of sidewalks, such as shoveling snow, is required of property owners in Madison. This generally works well, to the credit of Madison residents and the compliance practices the city has in place.

BARRIERS TO WALKING

A number of barriers to walking exist in the city. These barriers range from lack of sidewalks in some neighborhoods, to physical barriers, and difficult crossings.

Lack of Sidewalks

The lack of sidewalks is a significant barrier to walking. This is especially true for streets that carry moderate to high volumes of traffic which represent a more immediate need. An incomplete sidewalk network reduces connectivity can serve as a barrier to walking, particularly for people with disabilities and children.

Most arterials and collector streets in Madison currently have sidewalks, although there are notable exceptions, including Tompkins Drive by Glendale Elementary on the south east side; portions of Packers Avenue on the north side, gaps along University Avenue on the west side, and much of Hammersley Road on the southwest side. It is also important to provide sidewalks on streets that connect to schools and popular parks – both because of the overall number of pedestrians accessing many of these sites, and the large number of children accessing these sites. Areas of the city that have been annexed from adjoining towns, some post-war developments, and some newer subdivisions often lack comprehensive sidewalk coverage.

Physical Barriers

A number of physical obstructions serve as barriers to walking in Madison. These barriers are primarily freeways or highways, including the Beltline, Interstate 39/90/94, U.S. Highway 30,

and Stoughton Road. These highways have very infrequent pedestrian crossings in Madison, and effectively cut off all pedestrian access from one side of the highway to the other side. Where pedestrian crossings of these highways do exist, they often involve crossing ramps leading to and from the highway, or are noisy and generally unpleasant to use. Grade-separated bicycle and pedestrian crossings of these highways provide comfortable crossings for pedestrians, but often are not located where pedestrians may need them to be.

Development patterns may also create barriers to walking. Superblocks, resulting in long distances between intersections, limit the opportunities for pedestrians to cross and are typically meant to facilitate traffic flow and maintain vehicular speeds – resulting in a roadway environment that is less desirable for pedestrians. Suburban street patterns limit roadway network connectivity, with lower intersection densities limiting the opportunities to walk directly to destinations. Such networks are meant to facilitate vehicular travel in and out of a neighborhood, but limit the opportunities for pedestrians to reach destinations.

Crossings

Pedestrians experience their greatest safety threats when crossing streets, and having to cross busy streets can serve as a significant barrier to many pedestrians without appropriate enhancements.

Street crossings can broadly be classified as controlled or uncontrolled based on the presence of traffic controls such as stop signs or traffic signals. Pedestrian crossings at controlled intersections are generally good in Madison, although pedestrians must be aware of turning motorists who may not yield to them. Additionally, many signal controlled intersections in Madison cross multiple lanes of traffic, and crossings can be lengthy, particularly for the elderly or people with disabilities who may need more time to cross the street.

Crossings at uncontrolled intersections vary greatly in difficulty throughout the city. In Wisconsin, motorists are legally required to yield to pedestrians in marked or unmarked crosswalks, which is particularly important at uncontrolled intersections. In addition, pedestrians are not legally permitted to enter a crosswalk if it is difficult for a driver to yield. Despite these requirements, yielding behavior varies significantly from both driver and pedestrian perspectives. Anecdotally, motorists yield to pedestrians more often where pedestrian activity is anticipated and on narrower streets, such as those downtown area and along neighborhood main streets Williamson or Monroe Streets. However, even in these locations, crossing busier streets can be challenging, particularly when attempting to cross streets with multiple travel lanes in each direction with no center crossing island.

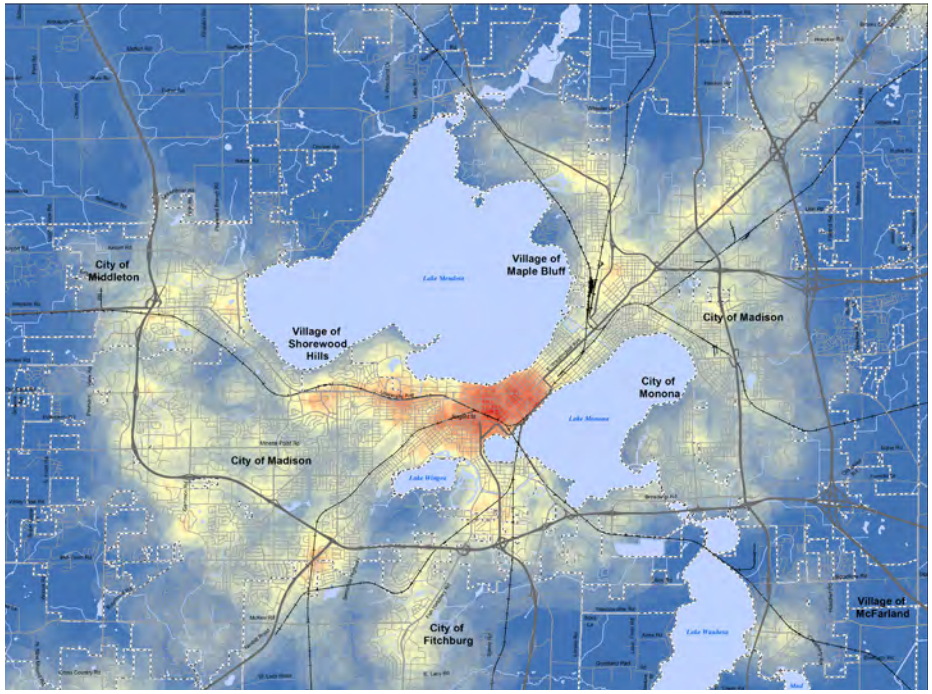
PEDESTRIAN CRASHES

The City of Madison keeps detailed records about pedestrian crashes. In the city's 2014 Crash Report, there were 61 documented crashes involving pedestrians. In 52% of the crashes, auto drivers failed to yield the right of way, while pedestrians failed to yield in 8% of the crashes. Pedestrians were in the crosswalk for 56% of the crashes and in the roadway for 30% of the crashes. Sixty nine percent of crashes occurred at either a signalized or stop-controlled intersection; 26% of the crashes did not occur at an intersection.

PEDESTRIAN DEMAND HEAT MAP

Figure 17 is a "heat map" that illustrates the latent demand for pedestrian trips. The demand for walking was estimated by considering population density, activity centers such as employers and shopping areas, and transit facilities. The map shows where significant walking (and biking) already occur (primarily in downtown and campus areas) because of the density of destinations and population in those areas. Areas along the University Avenue, Park Street, and Northport Drive corridors should have high demand for walking trips, but that demand is likely hindered by a lack of high-quality pedestrian crossings along those corridors. This type of heat map analysis provides a high level vantage point into gaps between predicted and actual demand, but is limited, as evidenced by the analysis of the Williamson Street and Monroe Street corridors. The model predicts lower pedestrian activity than is actually present, possibly due to land use voids such as the lakes.

Figure 17 Pedestrian Demand Heat Map



Source: City of Madison, Toole Design Group, Nelson\Nygaard

CURRENT SIDEWALK POLICY

The City of Madison has a long-standing policy that requires sidewalks to be constructed as part of new developments and when streets are reconstructed. For already-developed areas that don't have sidewalks, adding sidewalks along streets is a more complicated issue. There are three types of situations in which sidewalks would be added to already-developed areas:

- **As part of site redevelopment.** Where sidewalks do not exist, the city may require the installation of sidewalks during the permitting process of a larger redevelopment project.
- **As part of street reconstruction projects.** When the reconstruction of a street is required, the city will generally propose the addition of sidewalks if they are not present. In some cases, the city encounters opposition. Many property owners object to sidewalks because they have to pay costs associated with installing a new sidewalk, and must clear them of snow in the winter. City officials may be reluctant to approve the installation of the sidewalk if they face opposition from the neighborhood or the affected property owners. The City of Madison recently launched a pilot program where property owners pay for only 50% of the cost of adding sidewalks under certain conditions. This program helped reduce opposition to installing sidewalks on two reconstruction projects in 2015, and may make it easier for property owners to support the inclusion of sidewalks in future reconstruction projects.
- **As stand-alone retrofit projects.** Because of the opposition to sidewalk installation in general, the city has been reluctant to fill sidewalk gaps as stand-alone projects. The city has installed short segments of sidewalk without street reconstruction or redevelopment in some critical areas, but has not implemented a program to aggressively build missing sidewalk segments along collectors and arterials and near schools. Some high-priority street segments will not receive sidewalks for another 20-30 years if the city waits to install sidewalks as part of a larger reconstruction project.

Current Parking System

Parking in cities can be a contentious and multidimensional matter. Access to businesses, work, and other community destinations is obviously a priority. However, providing free parking in a city inevitably results in a number of other costs concerning quality of life and the environment. The availability of free parking doesn't encourage modes other than driving, which increases the number of cars and congestion on roadways throughout the city. Providing enough parking capacity for those who drive becomes another issue, as parking requires a great deal of space that is also valuable for other uses. In a city like Madison, with limits on space available for growth, land utilized for parking will be in high demand for redevelopment in the future. As parking lots are redeveloped, the parking supply will diminish, and the need for more efficient demand management will be much greater. Few other factors have such a dramatic influence on the downtown built environment as the quantity and type of parking available.

PARKING MINIMUMS

Most zoning districts in Madison do not have minimum parking requirements and all districts have parking maximums associated with various uses. This approach relies on the market to determine how much parking is actually needed, rather than a one-size-fits all standard that may not be context appropriate. While this policy mitigates some issues associate with excessive parking (breaking up blocks and lessening liveliness, and increasing building costs and rents), it can also increase demand on public parking facilities (both on and off streets) and overburden them if they are not carefully managed.

SUPPLY

The total parking supply in Madison has remained relatively consistent since the early 1970s. Public parking is overseen by the Parking Utility, an auxiliary enterprise agency of the City of Madison. The agency manages 3,675 spaces in 6 garages (all downtown), 475 spaces in 7 lots (mostly downtown, with 47 of those spaces in two downtown-adjacent lots), and 1,402 on-street metered parking spaces (mostly downtown).

It is not known exactly how many privately-owned spaces are available to the public citywide, but there are, 4,731 privately-owned but publicly-available downtown area parking spaces. This means the city controls about 46% of the downtown off-street parking supply and 53% of the total downtown parking spaces.

Figure 18 Publicly Managed Parking

PARKING TYPE	SPACES
Garage	3,675
Lots	473
On-street metered spaces	1,402
TOTAL	5,550

OVERALL OCCUPANCY

As in many cities, there is a perceived lack of available parking availability, both on- and off-street. There is not recent, on-street parking occupancy data available, though it is safe to assume it is likely highly used and has high occupancy rates in general. On-street parking tends to be used more often than off-street parking, because it is more visible, can be closer to destinations and can be free or less costly for shorter durations. The city's public garages vary significantly in their occupancy rates, largely attributable to their proximity to demand generators. Their peak occupancy, usually around noon, varies between 57 and 81% depending on the garage. While this means there are generally spaces available, it is standard for garages to consider 90% "full" due to lack of visibility of open spaces. Conservatively, it could be assumed that at peak occupancy, 9 to 33% of spaces are still available depending on the garage. At other times of the day, the garages are more than half empty.

The time limits and rates of on-street parking must relate to those of off-street options to ensure both types of facilities have availability for their intended audiences. On-street parking must turn over more frequently, allowing customers to patronize businesses and visitor parking for offices. Parking rates and time limits should be sufficient to direct longer

duration parkers to off-street facilities. Where the relationship between demand and cost is imbalanced, with street parking is free or cheap and garages more expensive, drivers often look first for on-street spots, creating the impression there is "no parking" and fueling calls for action to build more off-street parking – even when the off-street parking available still have plenty of excess capacity. Searches for on-street spaces can also increase traffic congestion as drivers circle blocks near their destination.

ON-STREET PARKING

Depending on context, on-street parking serves a variety of users, but it is largely intended to provide short-term parking and should be managed to ensure turnover occurs and at least some spaces are available. Meter rates, time limits and permits are Madison's primary tools for managing on-street parking resources.

Many downtown and central area commercial streets have parking meters to manage demand for about 1,400 spaces. Most of these meters are priced at $1.75 per hour, in operation from 8 am to 6 pm. A variety of time limits are employed to achieve specific objective in different areas (25 minutes, 1 hour, 2 hour, 3 hour, 10 hour), with 1 and 2 hour time limits most common. Generally, the meter program is intended to serve short-term parking needs, primarily for use by customers and visitors. The exception is designated "Park and Walk" spaces for longer-term parkers, with ten hour time limits and lower rates ($1.20 per hour). The fragmentation of time limits may cause some user confusion and some cities are responding by moving toward eliminating time limits in favor of varying price models to achieve demand distribution. Short time limits can sometimes seem arbitrary or restrictive to people parking, and sometimes results in a continuous shuffle of vehicles simply relocating to other blocks to avoid citations – causing extra driving in already-busy areas.

Within the downtown and other areas where there are both on- and off-street public parking, the rates and time limits must reinforce that long-term parkers utilize off-street facilities leaving more availability on-street for short-term users.

About half of the city's meters have been converted to multi-space meters, which take credit cards, and the remaining coin-operated single space meters will be converted over time. The full roll-out of digital parking meters offers new management options such as more detailed, variable pricing structures, and the use of new data sources to measure performance of the system. The city's newer multi-space parking meters do not yet accept payment by cellphone, but does support a mobile app payment platform. A trial program for mobile phone payment is being conducted in a surface lot. Most parking meters in Madison operate from 8 am to 6 pm, with some high demand areas, such as Langdon Street by Memorial Union enforced to 7 pm. The University of Wisconsin meters in the area are enforced from 7 am to 10 pm.

There are some commercial areas that would likely benefit from adding meter parking to better encourage turnover of spaces intended for short-term use. A study of business density and parking occupancy in potential locations can determine if adding parking management will help improve access and reduce circling.

On streets without meters, time limits are the primary tool for managing on-street use. Madison operates a Residential Parking Permit program (RP3), which allows residents to park beyond posted time limits in commuter impacted areas.

The Parking Utility issues around 7,500 residential parking permits in 24 zones each year, costing residents $21 per year. Some addresses are excluded from obtaining Residential Parking Permits because of restrictions established during the building approval process, typically for not providing a minimum number of off-street stalls. Some expansion of the RP3 program to additional streets may be needed, as some commuters are parking on unregulated residential streets and walking or using transit to reach their final destination. If commuter parking becomes so prevalent on these streets that residents are unable to find parking during the typical workday, expansion is likely appropriate. Wisconsin law allows people displaying a handicapped placard to park beyond posted time limits and at no cost in unmetered and metered stalls with time limits of 30 minutes or greater. In some other cities and states, drivers with disabilities are having an increasingly difficult time finding available parking spaces due to abuse of this privilege by able-bodied drivers wishing to gain access to free parking. Abuse of this kind is less common in Madison, though many spaces intended for short-term parking are used for extended periods of time by placard holders.

GARAGES AND LOTS

The supply of publicly-available parking in garages and lots downtown is provided, in a fairly even split, by private operators and the city.

The Madison Parking Utility provides five public parking structures and seven parking lots, totaling about 4,150 off-street parking spaces, predominantly in the downtown/campus area. Four of the garages are within 1-2 blocks of the State Capital, one on each side, and the other garage, which includes two structures, is near the University of Wisconsin campus.

Pricing

Hourly rates at city garages and downtown lots vary from $0.75/hour to $1.50/hour, typically lower than on-street metered spaces. Garages and lots may have special event rates, which are not significantly different from hourly rates, but prepayment enables faster exiting of users after an event concludes.

The city's garages tend to be priced slightly below the private parking garages in the area. For example, the Government East garage charges $1.50/hour compared to $4.50 and $3/hour at two nearby private parking facilities, and the city's Overture Center Garage charges $0.75/hour compared to the $1/hour rate charged at the two nearest private parking facilities.

All of the garages and one of the lots have monthly parking available, typically aimed at commuter parking. Monthly rates vary from $105-190 for residents and carpoolers, and $125-220 for non-residents and businesses. In addition to the benefit of a lower monthly rate, carpoolers are immediately entitled to a monthly spaces in all the garages, and one lot (avoiding a wait list).

Occupancy

Occupancy at each of the city-owned garages ranges considerable depending on location and time of day. Peak occupancy ranges between 57% – 81% depending on the garage. However, occupancy is much lower during much of the day. The Parking utility strives for a maximum occupancy of 90% or less; so, conservatively, there is at least between 9 – 33% visibly availability during the busiest times at the garages. During other times of day the garages are often over

50% unoccupied, and sometimes as low as 30%. The Capital Square North and Government East garages have the highest occupancy rates. All the off-street facilities tend to be busiest between 9 am - 2 pm, Monday-Thursday, and 10am - 1 pm and 7-9 pm Friday-Saturday.

Figure 19 Select Parking Occupancy Statistics

	MON-THURS. OCCUPANCY – ESTIMATED					FRI.-SAT. OCCUPANCY - ESTIMATED				
	Peak	9am	Noon	5:30pm	7:30pm	Peak	9am	Noon	5:30pm	7:30pm
Capitol Sq North	78%	63%	78%	24%	21%	63%	45%	62%	23%	33%
Overture Center	78%	60%	77%	30%	27%	67%	46%	68%	34%	50%
Government East	82%	63%	81%	32%	40%	70%	48%	64%	36%	66%
State Street campus	60%	32%	57%	36%	36%	67%	36%	61%	50%	61%
State Street - Capitol	45%	30%	45%	26%	33%	53%	30%	48%	29%	47%

Investment decisions

The city-owned garages are an average of 43 years old and many will need to be replaced or significantly repaired over the next 20 years. If the city were to phase replacement of all 6 garage structures over an extended period of time, the total cost would likely be between $115 million (above grade) to $220 million for below grade construction. Beyond fiscal considerations, the garage sites represent future opportunity to incorporate uses other than parking, as has been pursued with the Judge Doyle Square RFP process.

This large capital investment will require a major financing effort, presenting a juncture at which to consider the broader implications of transportation investments. A detailed study of downtown parking supply and future projected needs can help the city better understand downtown parking needs. Funding trade-offs should be considered, with the goal of determining which investment options will best serve the goals of downtown vitality and broader regional transportation goals.

Figure 20 Parking Structure Characteristics

	# SPACES	AGE	PRIORITIZATION FOR REPLACEMENT	ESTIMATED COST	PEAK OCCUPANCY M-TH DAYTIME (TYPICALLY AT NOON) - EST.	PEAK OCCUPANCY DAYTIME FRI-SAT - EST.
Government East	625	56	1	~$21M	82%	70%
State Street campus	1061	Lake: 50 Frances: 32	Lake: 2 Frances: 5	Lake: ~$24M Frances: ~$41M	60%	67%
State Street - Capitol	855	53	3	~$47M	45%	53%
Capitol Sq North	613	43	4	~40M	78%	63%
Overture Center	516	32	6	~$48M	78%	67%

Transportation Demand Management

Given Madison's high level of travel demand and significant infrastructure constraints, it's critical that the city go beyond rethinking street design to find ways to extend the person-carrying capacity of the transportation system. Policy approaches can reduce the demand during peak travel periods when the transportation system is most prone to congestion. Such strategies, called transportation demand management (TDM), aim to increase higher-occupancy travel, encourage non-motorized travel, shift travel to less congested periods of the day, and reduce the need for certain trips.

This approach is not new to Madison, but expanding TDM programs will maximize system capacity through optimization, not expansion.

One of the most successful TDM measures in the Madison region has been the Group Unlimited Bus Pass program negotiated between Metro and several of Madison's major employers and institutions. These unlimited pass programs accounted for 5.7 million rides in 2015, or 40% of all trips on Metro8. The University of Wisconsin and the Madison Area Technical College include the cost of unlimited ride passes for students in their fees each semester. UW extended this program in 2002 to include all of its employees and those at the University Hospital and Clinics, who are able to receive the pass at the highly discounted rate of $24 per year. These programs have been credited as one of the primary generators of increased ridership.

In addition to the city transit benefit, the University of Wisconsin has several transportation demand management

8 Metro 2014/2015 YTD Performance Measures presented at TPC, 2.10.16.

measures in place. UW has a large presence in Madison, spanning 936 acres alongside downtown, with a student enrollment of around 43,000, and nearly 22,000 faculty and staff. Their transportation demand management strategies include a campus bus, discount on B-cycle membership, and bike parking for students, faculty, and staff. The university encourages carpooling among staff and faculty, making it relatively easy to share a parking permit and providing backup safety net options—six additional daily passes and an Emergency Ride Home program. They also provide the same type of backup options (space assignments, Emergency Ride Home) on top of the Wisconsin State Vanpool program for staff.

The university regularly surveys students, faculty, and staff on their transportation behaviors. Their 2014 study indicate these TDM strategies have been successful, overall, with some room for improvement:

- Among students, 49% walk, 22% bike, 14% take transit, and only 5% drive alone – assuming good weather.
- Among staff, 52% drive along, 17% bike, 14% take transit, and 4% walk – again, assuming good weather.

These University figures can be compared to the citywide drive alone rate of 62% and the combined bicycle, pedestrian, and transit share of 28%. The distance from campus has a major impact on mode choice. There are several lessons learned from the University TDM programs: 1) TDM programs can be incredibly effective, 2) expanding such measures to other large employers could have a major impact on city transportation goals, and 3) density and proximity of destinations is hugely impactful on mode choice.

The Madison Area MPO coordinates ridesharing and commute alternative programs, including partnership with private employers and supporting these employers in developing their own programs, a ride-matching service with a database of over 1,500 commuters and a Web-based ride-matching serving allowing interested participants to enroll directly, and coordination with Metro Transit to promote transit use through discounted fare passes.

Other unique TDM-based approaches include the Smart Commute Initiative, organized by the Madison Area MPO with cooperation from four participating banks. This loan program helped to extend homebuyers' mortgage qualification levels based on savings gained from using transit instead of more costly options. It would allow lenders to increase the effective monthly income of potential borrowers by the transit savings amount, typically $200 per month for single wage earner households and $250 per month for two wage earner households if they purchased a home along a Metro route.

The need for these types of demand management programs are likely to increase in importance in Madison's future, particularly for downtown employers, but also potentially to manage demand on the regional roadway network.

Aviation, Freight, and Rail

AVIATION

Madison has scheduled commercial passenger air service through Dane County Regional Airport (IATA code MSN, ICAO code KMSN), located six miles northeast of downtown Madison. The airport served approximately 1.8 million passengers in 2016, with flights by Delta, American, United and Frontier. The airport provides direct service to over 10 destinations, but more than half of passengers travel to or connect at the major Midwestern hubs of Chicago (ORD), Detroit (DTW) or Minneapolis-St. Paul (MSP).

FREIGHT

Trucking

The city of Madison has designated routes for large trucks that are differentiated between local-serving and regional truck traffic. Traffic data indicates that much of the truck traffic moving through Madison utilizes the Beltline and other interstate highways. Some of the traffic continues into Madison using the designated local routes, and an even smaller portion uses minor arterials within the city that are not designated for truck traffic. Trucks account for a significant amount of wear and tear on the roadway and greatly increase required maintenance.

Freight Rail

The Class I Canadian Pacific (CP) and Class II Wisconsin and Southern (WSOR) Railroads provide freight service to Madison. Due in part to the shape of Lake Monona and the circuitous routes leaving downtown Madison from the south, the first two railroads constructed to Madison in the mid-19th century cross the lake and separate an inlet (today's Monona Bay). The shortcut that these bridges provided from the south side of the lake led to their informal use as a pedestrian crossing. Eventually this desirable direct route was opened to vehicle traffic with construction of the John Nolen Drive Causeway in the 1960s.

Most rail crossings lie at street grade which can create challenges. The isthmus geography allows a train to block several major arterials or intersections at once, creating problematic congestion at peak hour and creating problematic delays for emergency service responders at all hours. Cyclist can also encounter difficult at rail crossings. Tracks are often not perpendicular to the road and bike tires can get caught in the rails, causing the cyclist to crash.

Many of the existing rail lines through the city have off-street bicycling paths running within the rail right-of-way. Some of rail lines have been repurposed as rail-to-trail projects and are now solely multipurpose pathways. In locations where these paths do cross, it is necessary to provide adequate and safe crossings.

INTERCITY PASSENGER SERVICES

Madison does not have direct access to passenger rail service within its city limits. The nearest passenger rail station is in Columbus, and served only by Amtrak's Empire Builder route with one train per day per direction between Chicago and Seattle/Portland. For many, intercity busses offer better access to regional destinations than rail. The city is a major hub of an intercity bus network coordinated by the Wisconsin Department of Transportation and mostly operated by private companies. This system is one of the most extensive in the United States and includes service to Milwaukee, Chicago, and Minneapolis as well as connections to Columbus for Amtrak connections. Services is available to Minneapolis-St. Paul International Airport, Milwaukee's Mitchell Field and Chicago's O'Hare and Midway Airports, offering access to a broader aviation market with potentially lower airfares from these larger airports. Madison is also connected to many other university cities in Wisconsin, but service is only available Friday through Sunday.

Madison's intercity bus services do not access a central terminal facility, but instead generally offer curbside pickup at select locations around the city. Primary pickup locations include near the Capitol and UW campus and the Dutch Mill Park and Ride at Hwy 51 and the beltline. These locations do not have waiting facilities or shelter, and different intercity operators serving different points suggests that intercity bus transfers through Madison may be difficult and time-consuming. Stops near the Capitol or UW are generally well served by local transit, however Dutch Mill is only served by peak hour routes.

Bus passengers and Madison community members have long had a desire to construct a central bus passenger facility to better connect intercity and local transportation providers. Recent planning efforts have identified potential locations of a future terminal, however the preferred site was developed and is no longer available.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American urban mobility is changing quickly.

Lots of new options are appearing, many of them blurring the line between private goods and public transportation. All of these mobility options – not to mention those that will surely appear in the future – have different applications in people's lives, and their role will continue to grow and evolve as consumers try them on for size and compare them to traditional transportation options.

Here is quick snapshot of some current shared mobility options, as well as more standard offerings.

BIKE SHARING

DOCK-BASED*

A dock-based bike share system that allows users to check out a bike from a dock using a credit card or membership card. Bicycles can be returned to other docks within the system. This type of system currently exists in Madison and is operated by B-Cycle.

DOCKLESS*

Relying on GPS locators and smart phone technology, this system allows users to reserve a bicycle near them. Bicycles can be picked up and returned at any ordinary bicycle rack within a designated service area, which significantly expands access points, and simplifies the return process.

PEER-TO-PEER*

Bringing the sharing economy to bike share, this system connects bicycle owners to potential renters via an online interface. Using a special lock, owners can list their bicycle as available for reservation. Bicycles can be picked up and returned at ordinary bicycle racks within pre-determined service area.

CAR SHARING

ROUND-TRIP (Traditional)

Round-trip car sharing services are a type of car rental that is designed to be convenient for people who rent cars for short periods of time. These services are membership-based and typically charge by the hour. Reservations are made online and cars are unlocked with a specialized membership card. Cars are scattered throughout a service area, and must be returned to the same pick-up location.

ONE-WAY

One-way car sharing operates similarly to traditional car-sharing but cars can be "returned" by parking them anywhere in the service area – no return trip necessary. This makes the user experience more flexible.

PEER-TO-PEER

This system connects car owners with potential renters via an online interface. Owners list their available vehicles online, and typically install hardware to the vehicle to allow immediate access to renters. Reservations for vehicles are made online and vehicles are returned to the pick-up location, or at least nearby, when trips are completed.

CLOSED NETWORK

This system is a private car share service for a specific development. These work similarly to traditional car sharing services, the car is managed by a property owner, and available only to tenants.

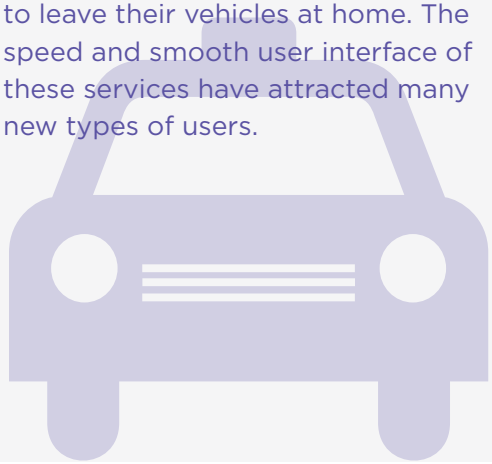
RIDESOURCING

TAXICAB/ LIMO

These services provide for-hire vehicles, which are staffed by professional drivers licensed to transport passengers. In Madison, licensed cab companies operate 24 hours a day, and serve all areas of the City.

TRANSPORTATION NETWORK COMPANY (TNC)

Such companies use an online/ mobile platform to connect passengers to drivers. Drivers use their own personal vehicles, and do not require a special license to transport passengers. Typically more affordable than taxicabs, TNC services make it easier for people to leave their vehicles at home. The speed and smooth user interface of these services have attracted many new types of users.



RIDESHARING

CARPOOLING

Carpooling is simply an arrangement between multiple people to make a trip in a single vehicle. A classic example of carpooling is coworkers who live near each other organizing to share a vehicle to work.

VANPOOLING

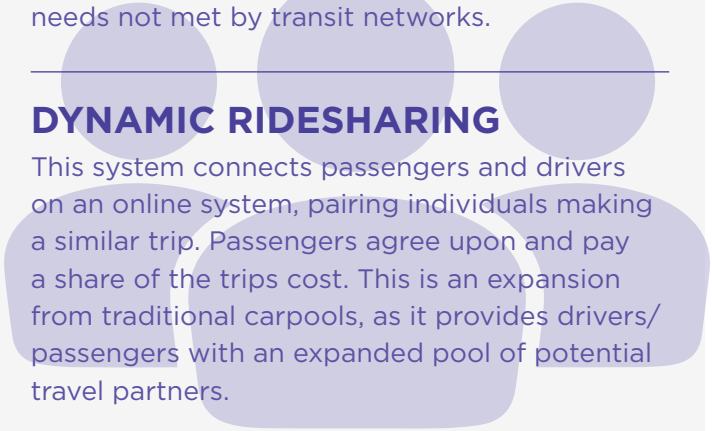
Vanpooling services are typically fee-based operations operated by a third party. The van travels on an agreed upon schedule to and from pick up/drop-off locations, and is operated by one of the commuters.

VANPOOLING SUBSCRIPTION SERVICE

These services require users to pay for each trip, provided door-to-door commuting service to people outside of traditional transit service areas and/or hours. Trips must be booked in advance, and subsidies may be utilized for lower-income users. This service fulfills travel needs not met by transit networks.

DYNAMIC RIDESHARING

This system connects passengers and drivers on an online system, pairing individuals making a similar trip. Passengers agree upon and pay a share of the trips cost. This is an expansion from traditional carpools, as it provides drivers/ passengers with an expanded pool of potential travel partners.



TRANSIT

PUBLIC TRANSIT

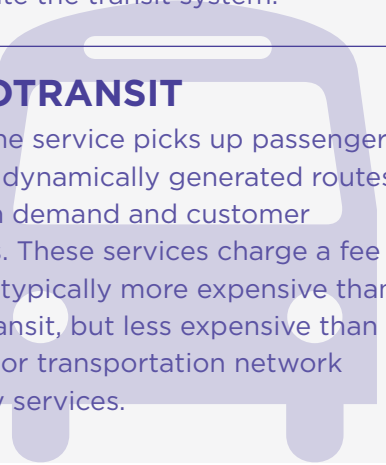
Public transit provides traditional fixed-route services, typically along high-volume corridors for the use of the general public for a minor fee. Encompassing buses, rapid transit, light rail, trolleybuses, passenger trains, ferries, and more, transit is the high-volume workhorse of transportation modes. Some public transit systems provide paratransit services for the elderly and handicapped in accordance with ADA requirements.

SHUTTLE

Shuttles are privately owned services that operate on a fixed route to pick up and drop off employees of a specific company or visitors to a major destination. These services can be planned to consider major transit locations along the route to accentuate the transit system.

MICROTRANSIT

This online service picks up passengers by using dynamically generated routes based on demand and customer locations. These services charge a fee per ride, typically more expensive than public transit, but less expensive than taxicabs or transportation network company services.



PLANNING PROCESS 2

The Madison in Motion Planning plan builds on past planning efforts and was guided by a public process rooted in collaboration with public officials and the greater Madison community. Input provided was incorporated into overarching goals, project ideas, and prioritization decisions to ensure outcomes met the needs and desires of the community.

Public workshops provided residents, business owners and employees and other stakeholders an opportunity to make opinions heard at critical junctions in the process. These workshops were publicized via social media and other media placements to reach a wide range of people.

Previous Planning Efforts & Ongoing Planning

In order to reflect overall city goals and community input, a thorough review of previously adopted plans and policies was conducted.

Madison in Motion is not intended to be a stand-alone document, but rather provides an opportunity to update previous efforts with new concepts to create consistency across planning documents and processes. The following sections provide an overview of past plans reviewed as part of the Madison in Motion Process.

CITY OF MADISON PLANS

Madison Comprehensive Plan

The city's Comprehensive Plan, adopted in 2006, establishes long term strategies and policies to guide future growth and development. The plan reviews existing conditions and trends, and provides recommendations for future land uses, transportation, community facilities, economic development, housing, and the protection of natural resources. It establishes a broadly framed long-term approach to goals, objectives, policies, and recommendations, intended to provide the framework for more detailed recommendations in other planning projects that expand on the general recommendations in the Comprehensive Plan.

The Comprehensive Plan was last amended in 2012. The next update should reference this citywide transportation plan and integrate major recommendations into the Transportation, Land Use, and other chapters as appropriate.

Madison Neighborhood Plans

Focusing in on areas with unique characteristics, Madison has developed 29 neighborhood plans (with 4 more in progress), which provide more detailed observations and recommendations. Many of the completed neighborhood plans have detailed transportation recommendations to improve specific streets and enhance pedestrian and bicycle systems in the plan area. These neighborhood plans should be reviewed whenever infrastructure projects are being undertaken in order to integrate as many of the detailed recommendations as possible.

Future neighborhood planning efforts should include detailed recommendations on improving pedestrian, bicycle, and vehicle networks consistent with concepts in Madison in Motion. In updating neighborhood plans, it is important to note that recommendations should not only benefit the neighborhood, but should aim for an integrated, connected transportation system for the broader city.

MADISON AREA TRANSPORTATION PLANNING BOARD (MPO)

2035 Regional Transportation Plan

The Regional Transportation Plan (RTP) has a 20 year planning horizon and is updated every five years. The most recent RTP was released in 2012, with a 2035 horizon. The RTP is an integrated, multimodal plan providing a framework for transportation planning and investment decisions in the region. It identifies projects, strategies, and actions to be implemented to meet regional goals.

The 2035 Regional Transportation highlights goals and projects for all aspects of the transportation system including land use/transportation coordination, active transportation, roadways, transit, paratransit, travel demand management, interregional travel, freight, rail, air travel, parking, and corridor preservation. Key recommendations include:

- Plan and develop a continuous, interconnected roadway system to distribute traffic within and through the region.
- Use TDM and TSM to manage congestion, in addition to strategic capacity improvements.
- Plan high-capacity rapid transit service.
- Create a representative regional transit authority (RTA) to fund and coordinate transit service.
- Improve and expand local bus service.
- Develop the regional bikeway system, prioritizing off-street projects for funding.
- Develop continuous, interconnect bicycle and pedestrian networks, and adopt land use ordinances and street design standards to ensure neighborhoods are designed to provide direct, safe connections within neighborhoods and to nearby destinations.
- Plan for an inter-city bus terminal.

Madison Transit Development Plan (TDP)

The city's 2013-2017 Transit Development Plan update was conducted by the MATPB and Madison's Common Council, and Metro was authorized to move forward with project planning and evaluation. The plan recommends a variety of transit improvements, including new Bus Rapid Transit service in the Madison area.

Transportation Improvement Program

Informed by the longer-term Regional Transportation Plan, the Transportation Improvement Program identifies and schedules transportation improvements and programs that will receive federal transportation funding within a five year time span. Projects must be included in the TIP to be eligible to receive federal funding assistance. Major programmed transportation improvement projects include: MPO ridesharing, Madison Municipal Building parking garage, a downtown Madison bike station, off-street bicycle and pedestrian paths, a BRT study, and a variety of roadway projects across the region.

Bicycle plan

The MATPB created a comprehensive bicycle plan for the Madison area and Dane County, with a planning horizon of 2050. The plan envisions a network that provides all people access to safe, convenient, and enjoyable bicycle infrastructure that links neighborhoods with major destinations. The plan aims to foster bicycling as a component of daily life in Madison through education and encouragement programs.

A variety of recommendations and actions are included, organized into the following categories: education, encouragement, enforcement, engineering, envisioning, evaluation, end of trip facilities, and multi-modal connections. A future bicycle network is identified, along with key gaps in the present network.

Performance metrics to monitor the long term success of the Plan include: safety (crashes, fatalities), usage (counts, mode share), connectivity (network gaps, user satisfaction, Bicycle Level of Service), equity (population within ¼ mile of premium bikeway, relative commute share of women and minorities), livability (Bicycle Friendly Community status, communities with dedicated funding for cycling), and longevity (proposition of facilities plowed in winter, path pavement quality).

Bus Rapid Transit – Transit Corridor Study Report

The Transit Corridor Study was developed to evaluate system and corridor level concept plans for bus rapid transit along key corridors in the Madison area. The study analyzed routing alternatives, identified passenger facility and fleet needs, assessed performance enhancing strategies such as transit signal priority, and estimated costs and ridership levels.

The four corridors most appropriate for initial BRT system are connected via a central spine through the isthmus and the University of Wisconsin. Based on study results and observations of peer systems, it suggests there is potential for successful implementation of BRT in the Madison area.

Intelligent Transportation System (ITS) Strategic Plan

The City of Madison, Metro, and the MATPB worked together to produce an Intelligent Transportation Systems (ITS) strategic plan. ITS refers a collection of technologies, systems, or

applications, such as sensors, computers, or communications systems, that enable multiple agencies to be better informed and better manage the transportation network. ITS and similar systems management and operations strategies are likely to play an important and growing role in addressing congestion in Madison, managing the increasing demand for transportation systems with limited capacity.

The ITS plan focuses on congestion management, noting that ITS may be particularly effective at addressing non-recurring events like crashes, construction zones, weather conditions, and special events. The report highlights the complementary pairing of ITS and TDM strategies in managing congestion in the region, against a backdrop of the city's geographic constraints and limited funding.

Aside from congestion management, ITS could provide other benefits, including improved traveler safety, emergency management, improved transit speed and reliability, parking management, inter-agency communication, and data management. The ITS report establishes a high level strategic plan to be integrated into other planning processes, and suggests setting up an ITS working group.

DANE COUNTY

Transport 2020 Rail Initiative

The Madison area Transport 2020 study investigated transportation needs in Madison's core travel corridors and the greater Madison metropolitan area and made preliminary regional transit system recommendations. The preferred alternative would enhance the existing local bus service, expand regional express bus service, and introduce a new commuter rail system.

The new commuter rail system would use existing railroad right-of-way, its main trunk running along an east-west route from Greenway Center to East Towne. The regional express bus service would expand service to connect suburban areas with local bus transfer centers, commuter rail centers, and downtown employment centers.

Under this plan, local bus service would be reconfigured with a new bus-connector route through the central city to better complement commuter rail and regional express bus service. The bus-connector route could be converted in the future to an in-street starter rail service, replacing buses with light-rail vehicles.

The regional commuter rail initiative presented in this plan has support in other local planning efforts. However, efforts to advance this initiative have stalled in Dane County and the City of Madison at this time.

North Mendota Parkway

Dane County has long considered creating a major route connecting Highways 12 and 113 north of Lake Mendota. The parkway would be comprised of existing roads and new construction and would provide an alternative east-west route for commuters on Highway M and could shift some traffic from the isthmus. . The project is not likely to have a major impact on reducing Beltline traffic.

The project has not been prioritized for funding, though it may be gaining momentum in that direction. The County has finished some planning approvals so as to be prepared for potential future funding. More recently, the County has advanced some planning funding. A construction funding source is not yet identified.

Dane County Comprehensive Plan

A Dane County Comprehensive Plan was developed following a 2000 state Smart Growth law requiring comprehensive plans. The Comprehensive Plan was last amended in 2012 and is meant to guide decisions for the next 20 years.

The plan supports inter-regional coordination and long-term regional transportation efforts (high speed rail, regional commuter rail), while encouraging municipalities to build out bike and pedestrian networks and design for walkable urbanism. In discussing roadway changes, the plan recommends prioritizing maintenance and enhancement of existing infrastructure before adding new facilities or capacity, and recommends utilizing demand management techniques to help manage limited roadway capacity.

WISCONSIN DOT

Beltline

The Beltline carries the highest amount of east-west traffic compared to other arterials in Dane County. A 2008 Madison Beltline Safety and Operation Needs Assessment documented a number of deficiencies associated with the Beltline. In 2011, a study of long-term solutions was authorized, to address roadway safety concerns, increasing travel demand and congestion, and limited accommodations for and integration of alternative travel modes.

Beltline congestion has an impact on transit performance. Five Metro Transit routes travel on the Beltline and 36 routes cross Beltline interchanges. The Beltline creates some barriers for bicycle and pedestrian infrastructure that needs to pass across.

The Wisconsin DOT is continuing the planning study, which will be followed by a National Environmental Policy Act (NEPA) study.

US-51/Stoughton Road

The Wisconsin Department of Transportation is currently studying USH 51 to find long-term alternatives to address the corridor's safety and congestion issues, as well as address gaps in bicycle and pedestrian facilities alongside it. A Needs Assessment was finished in 2003, followed by a Traffic, Safety, and Needs Identification Analysis in 2012, which studied possible long-term corridor solutions. The Environmental Impact Statement is being created, building off of identified alternatives.

USH 51 currently runs at grade. Three alternatives (low build, depressed roadway, and adding interchanges) are under consideration, a combination of which may be implemented, likely adding lanes and capacity.

Regional coordination

There are over 50 different jurisdictions involved in planning and development efforts in the Madison region. The State of Wisconsin, Dane County, the City of Madison, and the Madison Area Transportation Planning Board are some of the larger players. Madison's neighboring municipalities also impact planning in the region, as do the numerous other small towns and villages outside of Madison's MPO planning jurisdiction. Moving forward, Madison will need to take a strong lead in regional discussions to ensure that planning decisions made outside of its jurisdictional boundaries do not create adverse impacts for its quality of life.

Outreach Processes

NEIGHBORHOOD AND STAKEHOLDER GROUP OUTREACH

During the Madison in Motion process, the city and planning team identified key community leaders, property owners, agency partners, and other individuals and organizations that could provide unique perspectives regarding the challenges facing Madison. A diverse group of community organizations were contacted as part of this outreach effort to provide insight on pressing issues faced by the community over a series of interviews and focus group meetings.

VISION MEETINGS

Two public visioning events were held to understand the public's input on the current and future transportation systems, preferred land use patterns, and vision for the future of the city. The process and results of each event is outlined below.

Visioning Meeting 1

The first Visioning Meeting was held on December 19, 2013, and provided an opportunity to present preliminary findings from the research conducted up to that point. The presentation included a project overview, an explanation of Madison's unique transportation context, and a description of key trends, opportunities, and challenges that the city faces moving forward.

Public participation exercises provided an opportunity for attendees to comment on concerns and opportunities related to each transportation mode. Participants were asked to comment on the Draft Transportation and Land Use Mission Statement and Goals. The workshop materials and maps were also made available online to offer another channel for participation.

Over 250 comments were gathered from the mapping exercise at the event, while an additional 70 comments were provided online. Many comments provided insight into location-specific concerns for all modes of transportation, typically associated with safety. The Beltline was also noted multiple times as a barrier to walking and biking. Comments revealed a strong

interest in growing the transit ridership rate, improving the experience of the existing bus system, and adding forms of high-capacity transit. Overall, comments were supportive of the draft goals of the plan, its mission statement, and the focus on increasing biking, walking, and transit.

Visioning Meeting 2

Held on April 24, 2014, the second Visioning Meeting was kicked off by Mayor Soglin, who provided remarks about the importance of this planning process. The Madison in Motion team followed by presenting on the following:

- The relationship between transportation and land use
- Project assumptions, trends, areas of change, and the compilation vision used to guide the planning process
- Summary of the big ideas in Madison transportation and land use plans
- Review of the two Vision Scenarios, and reinforcing the idea of adding 100,000 new Madison residents by 2050

After the presentation, there were several public participation exercises. The first was designed to collect the public's perspective on locations that the city has identified as likely candidates for redevelopment and infill. Garver Feed Mill, Stoughton Road, and E. Washington Avenue east of the interstate were identified as locations for future development. Several potential locations were also offered by participants as ideas for multimodal hubs, including W. Washington Avenue and Regent Street, Verona Road at the Beltline, Fish Hatchery at the Beltline, and the Arboretum at the Beltline.

In another exercise, attendees were invited to comment on, add to, or revise the assumptions, trends, big ideas, and opportunities that were described in the presentation. Some participants suggested including additional forces: increased pressure on natural resources, continued demand for a variety of housing types, and declining state and federal support for transit.

Participants were also asked to provide feedback on where they thought an additional 100,000 residents of Madison should live. Overall, there was a strong preference to locate the next new residents in the Urban Corridors and the Central City. About 38% of all of the stickers were placed on locations

on the map characterized as Urban Corridors, 30% in Central City locations, about 20% in Regional Retail and Employment Centers, and less than 10% in the East and West New Growth Areas.

In the final exercise, attendees were invited to comment on the Vision Scenarios. Generally, participants showed support for the vision compilation, though some noted they would like to see a greater focus on changing demographics, improving equity, and inclusivity in the planning process. In regards to the individual scenarios, participants recognized that Scenario A would work best for some areas of the city, though noted that it was too car-oriented and would limit the opportunities for changing the citywide transportation system. Scenario B received strong support, and was seen as a preferable based on sustainability concerns. It was noted that it would be challenging to change the habits and attitudes of residents.

Highlights from the discussions included:

- Support for multimodal transportation hubs
- Many new and creative big ideas were suggested
- Strong preference for new growth in the Urban Corridors and Central City (as opposed to the East and West New Growth Areas)
- Support for the vision compilation
- Mixed support for Scenario A and strong support for Scenario B

OVERSIGHT COMMITTEE MEETINGS

The Transportation Master Plan Oversight Committee was organized to ensure the project met the needs and expectations of the City of Madison. With monthly meetings, the Oversight Committee provided insight regarding project process and feedback to guide the project. The following provides an overview of key topics discussed, which assisted in the development of the plan:

- Review of public events as they occurred to further digest and understand feedback
- Discussion of existing land use and transportation goals
- Refinement of mission statement
- Desired project branding
- Development of land use scenarios with guidance from land use asset analysis, project vision statement and goals.

Working closely with the Oversight Committee helped the Madison in Motion team further unpack issues that were surfaced during public input events.

Plan Approval Process

The Plan was adopted by the Common Council on February 28, 2017. The Plan was received positively by the Council, due in part to the significant public outreach component of the development process.

Prior to adoption of the plan, it was reviewed by the following committees, which provided feedback to ensure the document was reflective of the Madison community.

- Board of Public Works - Jan. 4, 4:30, Room 108 CCB
- Transit and Parking Commission - Jan. 11, 5:00, Room 302 Madison Central Library
- Economic Development Committee - Jan. 18, 5:00, Room GR 27 CCB
- Sustainable Madison Committee - Jan. 23, 4:30, Room 351 CCB
- Pedestrian-Bicycle-Motor Vehicle Commission - Jan. 24, 5:00, Room 201 CCB
- Long Range Transportation Planning Committee – Jan. 26, 5:00, Room 108 CCB
- Plan Commission - Feb. 6, 5:00, Room 201 CCB
- Board of Estimates – Feb. 13, 4:30, Room 354 CCB
- Madison in Motion Oversight Committee (lead) – Feb. 16, 5:00, Room GR 27 CCB

MADISON IN MOTION MISSION AND GOALS

3

As previously stated, the Madison in Motion Planning plan brings together past planning efforts and was guided by a public process to integrate the voice of the Madison community. The Mission statement and goals presented in this chapter were developed with significant input and buy-in by community members.

Project Mission Statement

The primary mission of the Sustainable Madison Transportation Master Plan (TMP) is to inform Madison officials about the community's need for a more walkable, bikeable, and transit-oriented city.

The TMP will describe all elements of the City's transportation system. The TMP will then identify and describe what the City and others must do for Madison to become a more walkable, bikeable and transit-oriented city. The TMP will also identify how to improve the City as a great place to locate businesses and to work. The TMP must help the City create and maintain a healthy local economy where transportation plans support economic development strategies. The Plan must address the transportation needs of neighborhood businesses and activity centers outside the downtown area, and address connecting Madison with other communities throughout the larger region. This means we will have:

- Strong, well-connected neighborhoods with neighborhood commercial/activity centers along transit corridors throughout a healthy city.
- Excellent transportation choices for all residents in all neighborhoods.
- A range of mobility choices and connections for all modes of transportation between neighborhoods and the Downtown.
- A highly livable city where land use and transportation are integrated, creating a City where employers want to locate and people want to live, work, and visit.

Building a sustainable, people-friendly city starts with a transportation system that provides robust mobility options for people. A sustainable transportation system considers all users, especially individuals with limited mobility and transit-reliant populations (including the elderly, people with disabilities, children and youth). The transportation system must work for these residents. Increasing the convenience, ease, and appeal of walking, bicycling, and transit will make Madison a healthier and safer place to live.

The City of Madison's and Dane County's population and economy are projected to grow significantly in the next several decades. To accommodate this growth, and to avoid sprawling growth that consumes farmland, we must integrate land development and economic growth with transportation, carry more people through our transportation networks and maintain our tradition of strong, connected neighborhoods. We must also continue to make the downtown business district attractive to employers, workers, and customers, and thus avoid infrastructure investments that drive land uses into our valuable farmland resources. As the City grows, we must prioritize investments in maintaining the infrastructure we have while improving pedestrian, bicycle, and transit infrastructure. We must ensure a rich, interconnected network of multimodal streets, making our neighborhoods more attractive and functional. We must also adopt effective strategies in the

Project Goals

Developed in collaboration with the public, the Madison in Motion Plan established 8 goals to guide decision-making processes during and after the project's completion.

1

EXPAND MOBILITY CHOICES

Expand transportation infrastructure **to support a greater range of options** for all user types.

2

IMPROVE SAFETY AND HEALTH

Future transportation system investments must contribute to **healthy living and good quality** of life for all residents.

3

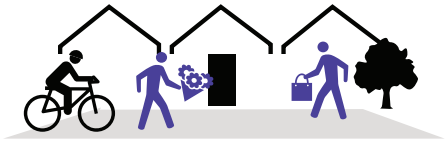
CREATE TRANSPORTATION EQUITY FOR ALL RESIDENTS

The future transportation system **must address the needs of all users**.

4

ENHANCE NEIGHBORHOODS

Future transportation system investments should contribute to the **creation of strong, vibrant neighborhoods**.



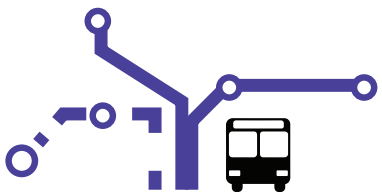
provision and pricing of parking to ensure the downtown and neighborhood business districts remain competitive with peripheral locations. Free and low-cost forms of transportation ensure that families on tight budgets may redirect disposable income to other personal or familial endeavors. In addition, to ensure a high-level mobility within the City of Madison, improvements in freight transportation, intercity transit, and air travel must be made to keep Madison competitive in areas of commerce and tourism.

Cities are vital when they bring people together for work, play, learning, shopping, the arts, and community. Public streets, sidewalks, bike pathways, and other civic spaces serve a variety of peoples' needs. A pedestrian, bicycle, and transit-rich city supports life, commerce, social interaction, and leads to a happier, more productive public domain. The Sustainable Madison Transportation Master Plan will strike the careful balance that will result in a universally-accessible and functional transportation system, with a realistic strategy for implementation over the next 25 years, and beyond.

5

PROMOTE BENEFICIAL GROWTH

Future transportation system investments should **promote environmentally and fiscally sustainable development** that provides benefits to the entire City.



6

PROMOTE ENVIRONMENTAL SUSTAINABILITY

Transportation projects and policies will not generate adverse impacts on air and water quality. Instead, **projects will seek to improve both**.

7

MAINTAIN FISCAL RESPONSIBILITY

The transportation system should **be affordable for current and future generations**.

8

FOSTER ECONOMIC DEVELOPMENT

Transportation projects should **promote economic opportunity and community prosperity**.


NO TRUCK
STOPPING
STANDING
PARKING
ENTIRE STREET
SPEED
LIMIT
15
$19.99

LAND USE AND TRANSPORTATION SCENARIO ASSESSMENT

4

Land Use Vision Development Process

As noted, several planning and policy documents were reviewed during the Madison in Motion process in order to develop a compilation vision and provides a contextual basis for the master transportation planning process. Goals and visions from past plans were synthesized into the draft compilation vision. Input was also received from the Madison in Motion Oversight Committee, City Staff, and community members to ensure the compilation vision provided an appropriate context for analysis.

The compilation vision addressed the following topics: Place & Personality, Physical Form, Economic, Transportation, Social & Cultural, and Environmental. Bringing together a diversity of topics, the vision ensured that the City led a holistic planning process for the duration of the Madison in Motion project, reflected in the overall project mission, included in Chapter 3 of this document.

Land Use Vision

Land Use Visions were developed to demonstrate this relationship between transportation infrastructure and land use patterns, and the resulting benefits from transportation projects. Much of the Madison in Motion Plan reinforces the importance of balancing effective transportation and land use patterns. Development of the Land Use Vision was guided by the compilation vision, as well as by the following analysis to ensure land use trends were evaluated comprehensively:

- **Asset Analysis** – Identified the most significant assets in the region, including natural, economic, and cultural assets. This provided a foundation for developing a vision for future land use.
- **Key Opportunities** – Tying together existing plans and ideas for development in Madison, this process identified potential building opportunities that will define the future of the City.

The Land Use Vision process provided the base for developing two alternative Land Use Scenarios, which envision how

Madison could grow between now and 2050. Both scenarios assume that the population of Madison would grow in population by 100,000 and that the population growth would be accompanied by an additional 80,000 jobs. However, each scenario reflects different growth patterns. These scenarios are further described in the following section.

Land Use Scenarios

Two Land Use Scenarios were developed through the Madison in Motion process, providing potential snapshots of the future. Scenarios showed the impacts of current policies, as well as a new growth vision in order to guide policy and project recommendations, and assist in measuring the effectiveness of recommended projects in different settings. Figure 21 shows the different impact that each scenario would have on population and employment growth within identified growth areas.

Despite the difference in growth patterns, both scenarios are intended to reflect the implementation of the Comprehensive Plan, showcase commitment to great transit and active transportation networks, and achieve the goals of the Sustainable Madison Transportation Plan. The two scenarios developed are explained in further detail below.

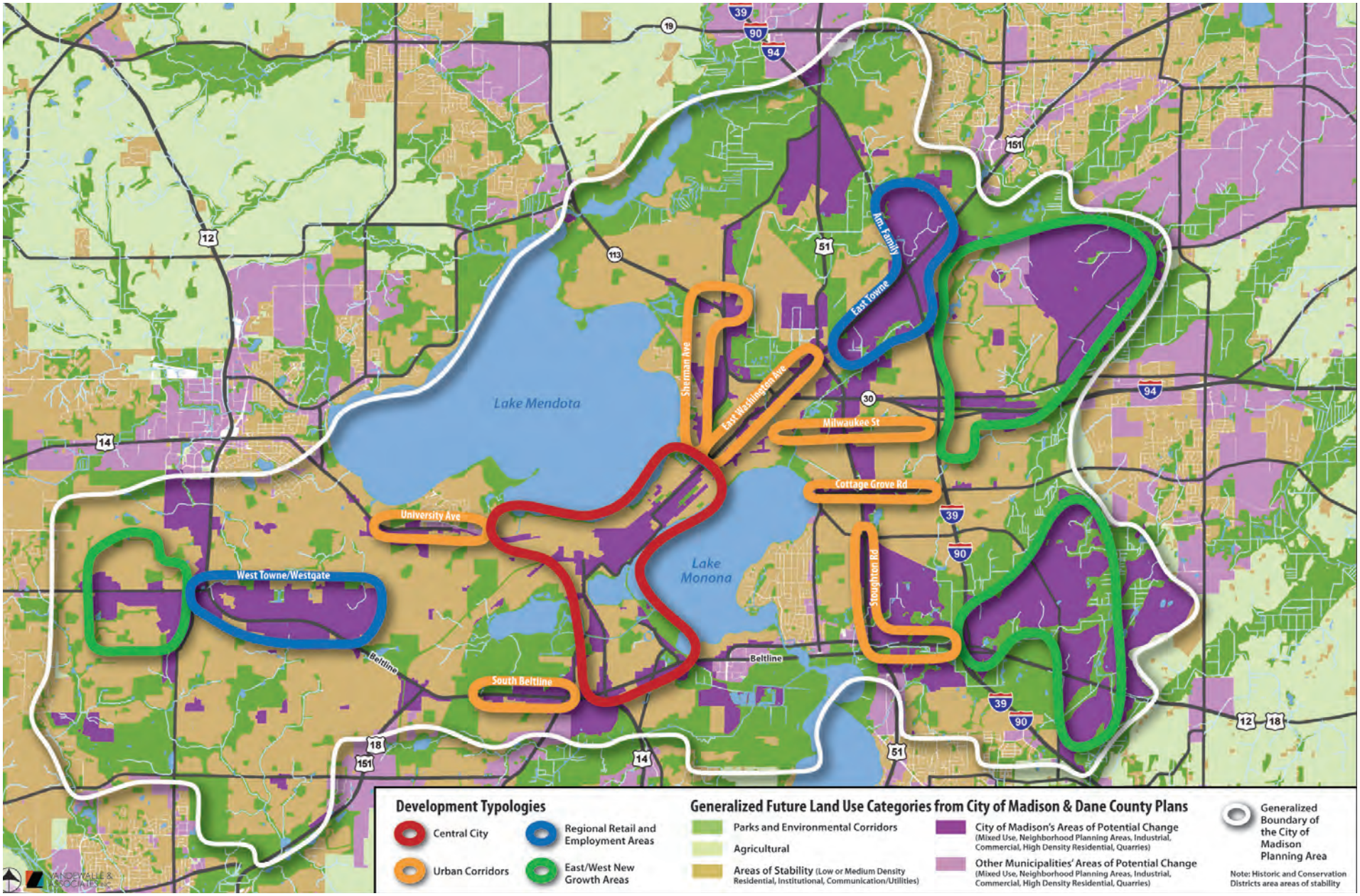
SCENARIO A

The Trend Scenario assumes that current land use and development patterns continue uninterrupted, furthering what the City of Madison is doing today. This scenario is characterized by a continuation of sprawling land use patterns: 70% of the growth occurs on the periphery of the City Center, while only 30% of growth is a result of infill development. This scenario would be likely to put increased stress on the roadway system, and limit the impacts of transit and active transportation initiatives, as sprawling land use patterns encourage driving by placing destinations farther from one another.

SCENARIO B

Scenario B, the Infill Scenario, goes beyond current land use plans in order to maximize transportation options for travelers. The scenario is based on the assumption that policies to encourage infill development are adopted, and would be characterized by increased density in key growth areas. According to the Infill Scenario, 70% of the population growth would be a result of infill development, while only 30% of growth would take place in the peripheral areas. This scenario would reduce total VMT and emissions in the region when paired with improved connectivity for alternative transportation networks (transit, bicycle, pedestrian), creating a healthier and less congested Madison. By fostering the development of destinations within activity clusters, transit and active transportation modes become viable alternatives to driving.

Figure 21 Land Use Scenario Alternatives



Evaluation of Scenarios

CRITERIA

Both scenarios were evaluated by the same set of criteria, developed in order to measure the effectiveness of projected growth patterns and planned transportation investments. In addition, the evaluation criteria address each of the nine goals developed in collaboration with the community during the Madison in Motion planning process. The evaluations provide a starting point to inform and guide policy decisions regarding future growth strategies for the city of Madison, and how transportation funds should be allocated to create a city that meets the visions of the Madison community.

During the evaluation, each scenario was scored on according to performance in metrics established for each goal. A high level review of how each scenario performed under each metric is provided below in Figure 22.

Figure 22 Scenario Evaluation

GOAL 1: EXPAND MOBILITY CHOICES			
1.1: Modal Options	Opportunities to use non single occupancy vehicle modes, including bicycle, transit and pedestrian components, evaluated by direct access, proximity, and connectivity	◗	●
1.2: Street Congestion	Reduction of traffic congestion improving air quality by reducing automobiles' idle time and reducing time spent in travel	◗	◗
1.3: Street Network and Connectivity	Connections to the existing network providing new ways to accomplish the same trip or connecting areas that currently have no direct connections	◗	●
GOAL 2: IMPROVE AND PROTECT SAFETY AND HEALTH			
2.1: Operational Safety	Improvements to reduce crashes occurring at critical intersections	◗	●
2.2: Walking and Biking Accessibility	Connections for pedestrians and bicyclists to reach parks, schools, and other community facilities, promoting safe opportunities for exercise	◗	◕
2.3: Density of Modal Options	Overall density of bike lanes and pedestrian networks, and opportunities to connect with transit	◗	●
2.4: Impacts of Vehicle Miles Travelled	Changes in Vehicle Miles Travelled based on differing land use scenarios	◗	●
2.5: Access to Healthy Food Sources	Access to full-service grocery stores, community gardens and farmers markets as a source of fresh and healthy food	◗	◗
GOAL 3: ASSURE EQUITY FOR ALL SYSTEM USERS			
3.1: Job Access	Increased accessibility to employment opportunities for low-income and minority communities	◗	●
3.2: ADA Accessibility	Improvements to current ADA deficiencies	◗	●
3.3: Aging Populations	Improvements to mobility options for aging populations	◗	●
3.4: Health and Safety Risk	Increased access in areas of historically poor health outcomes or high levels of personal crime activity	◗	●
GOAL 4: ENHANCE NEIGHBORHOODS			

4.1: Appropriateness to Context	Proposed facilities relation to current and future surrounding land use	◗	●
4.2: Contribution to Complete Streets	The existence of non single occupancy vehicle modes including bicycle, transit and pedestrian components	◔	◔
4.3: Quality of Public Realm	Assessment of the amount of street tree coverage added to estimate increases in canopy, length of buffered pedestrian walkways, and potential air quality improvements	◗	◗
4.4: Community Preference	Reflection of community support for community projects included in Scenario	◗	◗
GOAL 5: PROMOTE BENEFICIAL GROWTH			
5.1: Concurrency with City Mobility	Measures whether or not a scenario rewards long-distance trips with the goal of VMT reduction	◗	●
5.2: Policies in Redevelopment Areas	Adoption of policies promoting less parking and reduce the need to meet on-site parking requirements of zoning	◗	●
GOAL 6: ASSURE ENVIRONMENTAL SUSTAINABILITY			
6.1: Impervious Surfaces	Assesses the estimated impervious surface area added by the roadways in a scenario	◗	◗
6.2: Air Quality	Measures potential for reduced greenhouse gas emissions such as CO2 associated with idling and congestion	◣	●
GOAL 7: MAINTAIN FISCAL RESPONSIBILITY			
7.1: Unique Financing	Scenarios are given preference if a specific financing source was dedicated for projects	◗	◗
7.2: Project Costs	Developed to analyze the unit cost of projects in a scenario with a preference to projects considered “low hanging fruit”	●	◗
7.3: Maintenance Responsibility	Measures how scenarios addresses the major maintenance responsibility of existing infrastructure	◗	◗
7.4: System Efficiency	Projects that serve to squeeze more capacity from existing infrastructure, including TSM, access management, etc.	◗	◗
GOAL 8: ENCOURAGE ECONOMIC DEVELOPMENT			
8.1: Economic Development	Qualitative assessment of cost and value estimates of projects included in each scenario	◗	●
8.2: Facilitate Goods Movement	Candidate projects evaluated to identify ability of trucks to reach local retail, industrial activity, and multimodal distribution facilities	◗	◗

Scenario Evaluation

Scenario A scored a total 14.25 points out of 32 maximum, nearly 8 points less than the total score allotted to Scenario B. The average score per goal for Scenario A, was 1.28 points less than for Scenario B.

Much of the discrepancy between the two scenarios is a due to the increased reach that transportation investments have in a denser environment, as what could result from a land use plan that brings infill development to Madison.

It is important to note that the Madison in Motion planning process does not call for the implementation of either scenario. This evaluation simply provides a starting point for discussions regarding the future growth patterns and transportation investments of Madison. The future reality of Madison would likely be a mesh of both scenarios, to ensure the needs and desires of all residents.

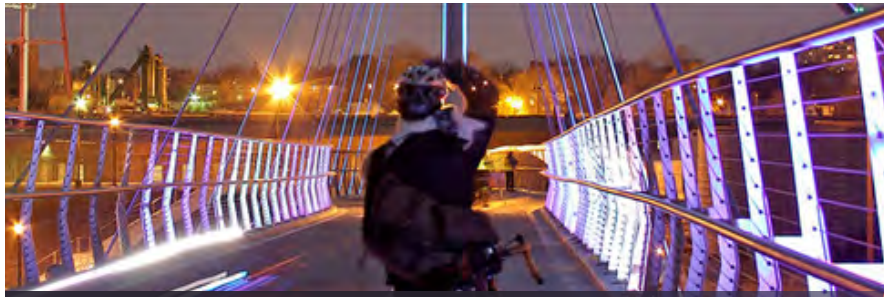

SPEED LIMIT
25
NO PARKING
ROAD WORK AHEAD
INTO STATE STREET
NOT IN SERVICE
864
noodles

5

CASE STUDIES

This chapter provides examples of case studies.

CASE STUDIES



Hiawatha Bridge on the Midtown Greenway
SOURCE: Tony Webster on Flickr

MINNEAPOLIS, MN

Minneapolis, Minnesota is nationally-recognized for its high quality alternative transportation network. It was recently named the most bike friendly city in America , earning the title with its 129 miles of on-street bikeways, 97 miles of off-street bikeways, and a much-used bike sharing program. The high quality of the bicycle infrastructure even makes it possible for residents to commute by bike in the winter.

The strong focus on biking and walking is supported by a robust network of BRT and light rail corridors. The light rail service connects the Twin Cities, but Minneapolis is currently working to expand light rail service to surrounding suburbs. This effort is aided by the state's Fiscal Disparities Act, a unique regional tax base sharing mechanism that has made it easier for metro regions used to build and fund regional services[4]. The collaborative tax-sharing method has made it possible to build high-quality BRT, light rail, and commuter rail systems that connect Minneapolis with its suburbs.

http://www.ci.minneapolis.mn.us/bicycles/
http://www.regionalplans.org/featured-regional-planning-programs-and-issues/tax-base-sharing/

Minneapolis' multimodal transportation efforts also benefit from application of transportation demand management tools. Over the last 11 years, the Minneapolis-St. Paul area has opened high occupancy toll (HOT) lanes using electronic transponder technology referred to as MnPass, in which buses and high-occupancy vehicles can travel for free during peak hours, along with single-occupancy vehicle drivers who are willing to pay a dynamically-priced fee.

HIGHLIGHTS

- Regional collaboration boosted transit planning efforts.
- Sustained investment in biking infrastructure has resulted in a world-class system, improving the quality of life of the city and serving as a point of attraction.

Hiawatha Light Rail Line
SOURCE: Miguel on Flickr

Portland's Tikkum Crossing Transit Bridge
SOURCE: Sam Churchill on Flickr

PORTLAND, OR

Portland has a first-rate multimodal transportation system, especially considering its size. The quality system has been in the works for decades, and the city has been steadily building toward a vision of multimodal transportation.

The city also has successfully guided land use policy much more effective than most American cities. These coordinated efforts have made Portland a notably livable city, with one of the most diverse mode splits among cities, especially for its size. The consistent focus on multimodal transportation has yielded a comprehensive transportation system that includes a fixed-route bus system, a multi-line light rail, a streetcar, a commuter rail system, an aerial tram, and a strong network of innovative bike infrastructure.

The robust network of bicycle infrastructure earned Portland the Platinum Level Bicycle Friendly Community Award from the League of American Bicyclists. Portland's bicycle system development was supported and complemented by strong community interest in bicycling. For example, the first bike share program in the United States, The Portland Yellow Bike Project, started as a community-run program without any public-sector involvement or support.

Portland Bike Box
SOURCE: NN

HIGHLIGHTS

- Portland was ahead of the curve in making long-term investments in sustainable transportation infrastructure over the last several decades.
- The bicycle system is exceptional not just in the quantity and comfort of infrastructure – but notably the willingness to overcome key physical (and political) barriers and make the challenging connections in the system.
- Portland's and Oregon's, responsible land use policies have supported sustainable transportation, with a focus on active transportation, ensuring a high quality of life for residents.

http://bikeportland.org/2015/11/06/league-of-american-bicyclists-says-portland-state-is-platinum-167614
http://c2.com/ybp/story.html

Portland Transit Mall
SOURCE: Melanie Curry

Pronto Bike Share Station
SOURCE: Sam Churchill on Flickr

SEATTLE, WA

Seattle is growing by over 2% per year in recent years with its sizable tech industry growing at an explosive rate. Seattle is surrounded by water, so increasing roadways or building new highway systems is not practical. Investment in sustainable transportation is becoming increasingly important.

Seattle has turned to investments in BRT, light rail, bicycle and pedestrian infrastructure, and car-sharing programs to mitigate traffic congestion and reduce demand on the region's aging infrastructure. In 2015, voters approved Move Seattle, a $930 million transportation levy to improve transportation conditions in the city. While this program is only in the beginning stages of implementation, it demonstrates that Seattle voters and policy makers recognize that the only way for the city to continue to grow is through strong investment in sustainable transportation.

Transportation planning for Seattle is split among several regional and city-level agencies, including Sound Transit, King County Metro, and Seattle Department of Transportation. Sound Transit and King County Metro provide regional services such as BRT, fixed-route bus service, and light rail. However, Seattle relies on transit to a much greater extent than surrounding cities, so

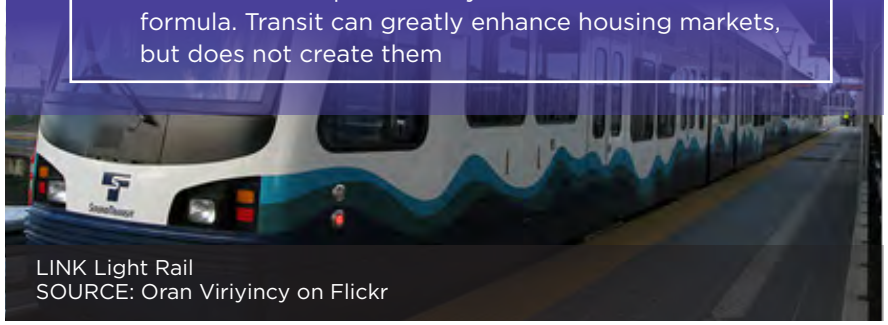
http://metro.kingcounty.gov/am/budget/

the City of Seattle has purchased additional service from King County Metro to fully meet intra-city demand.

Multimodal transportation planning has not been a painless process in Seattle; limited right-of-way and different infrastructure needs for transportation modes has made it difficult to provide safe high-quality infrastructure for all modes on arterial roadways. In recognition of these constraints, Seattle is moving towards providing parallel networks of infrastructure for bicyclists on lower-speed greenways. This should help reduce conflicts between bicyclists, streetcars, and automobiles.

HIGHLIGHTS

- Like Madison, geographic constraints make connections more challenging.
- In 2015 voters approved a major funding source for transportation improvements.
- Seattle is experiencing major congestion issues that other cities would be wise to get ahead of faster than Seattle was able to.
- Despite initial success, the question of who pays and how to capture the value of these investments to help pay for them remains as the city plans extensions and new lines.
- The city has had relative success with TOD – though each area is unique and they've learned there is no set formula. Transit can greatly enhance housing markets, but does not create them



LINK Light Rail
SOURCE: Oran Viriyincy on Flickr

MetroRail Commuter Train
SOURCE: www.city-data.com

AUSTIN, TX

Austin currently has almost 900,000 residents and is one of the fastest growing cities in the country, with growth sometimes hitting nearly 3% per year in recent years. Amid all that growth, Austin is struggling to create a first-class multimodal transportation system. Austin's current transportation system features commuter rail, fixed-route bus service, and limited BRT service. However, most residents remain car dependent and the city experience major congestion during commuting hours. The transit, biking, and pedestrian options needed to ameliorate these trends are not yet substantial enough to reduce the percent of people commuting by car. In 2014, voters rejected a light rail plan due to concerns about funding and fiscal responsibility. A recent roll-out of BRT service has struggled to maintain a ridership base because bottlenecks on arterial roadways make it difficult for buses to run on time.

The mismatch between land use policy and the available resources of the transportation system clearly demonstrate that there must be a clear and strong relationship between transportation planning and land use planning for a city to avoid these transportation headaches while growing. Development in Austin tends to "leapfrog" at the edges of the city and the policies and codes governing development along transit corridors makes densification difficult.

HIGHLIGHTS

- Other fast-growing cities would be wise to get ahead of their transportation needs, which will grow exponentially. The trade-offs needed can be more challenging over time, so early planning is advised.
- Transportation planning can be fruitless without the land use patterns to support more sustainable modes of transportation.

Capital Metro Bus
SOURCE: I-Ride Capital Metro

Pronto Bike Share Station

SOURCE: Sam Churchill on Flickr

SALT LAKE CITY, UT

While Salt Lake City itself has a population of only 191,000, it has the transportation system of a much larger city because of the infrastructure investments that were made to prepare for the Winter Olympics in 2002. The city leveraged the event to make major investments in its transit system. Salt Lake City has a light rail system that with three service corridors that connect Salt Lake City to its suburbs, and several BRT corridors that encourage commuters to leave their cars at home.

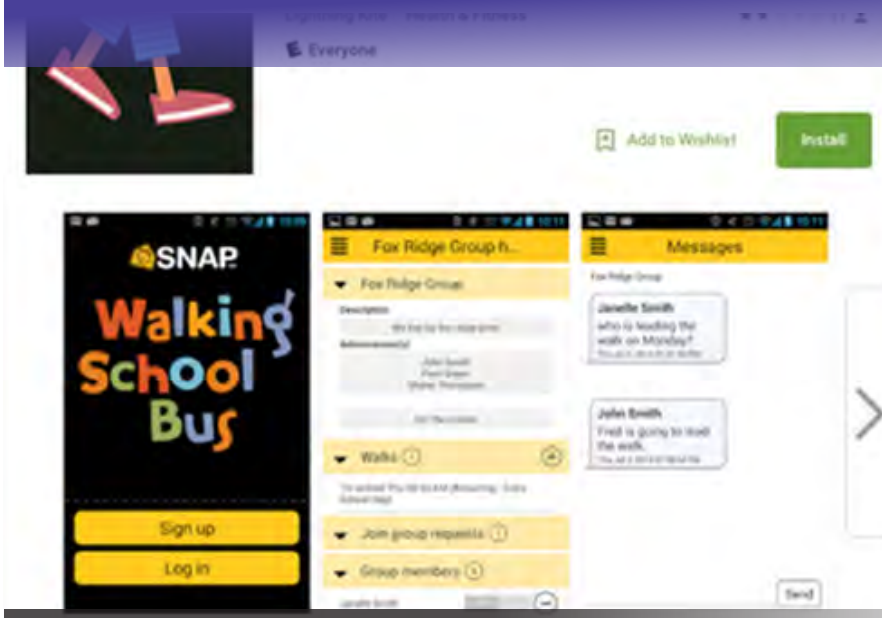
Although the Utah Transportation Authority (UTA) was named the Outstanding Transportation System of 2014, the system has a difficult time maintaining high enough ridership levels to remain fiscally sound.[9] Much of this difficulty has to do with the fact that the transportation system was planned to meet short-term demand generated by the Olympics rather than integrated more incrementally with Salt Lake City's size and growth. Salt Lake City and UTA are working to integrate the rail lines into the urban fabric and are focusing on building connections between rail corridors, but improvements will take time.

http://www.railwayage.com/index.php/passenger/salt-lake-city-success.html
http://www.sltrib.com/home/2726852-155/as-uta-aims-to-increase-ridership

Salt Lake City has successfully used technology and informational apps to provide residents with valuable information. For example, the UDOT Walking School Bus App lets parents register their children for walking groups. Parents receive notifications on their phones when the walking group leaves school and arrives at the neighborhood. While using the app this school year, parents and children walked about 88,000 miles, reducing 91,000 car trips, burning 8.8 million calories and reducing 37 million grams — roughly 41 tons — of carbon dioxide emissions. Parents say that they are more willing to let their children walk to school because the app lets them know that their children are safe.

HIGHLIGHTS

» Creating a successful transit system goes beyond the system planning – requiring integration with the city, and proactive land use policies.



Walking School Bus App

CASE STUDIES: CITY CHARACTERISTICS OVERVIEW

	MADISON, WI	MINNEAPOLIS, MN	SEATTLE, WA	PORTLAND, OR	SALT LAKE CITY, UT	AUSTIN, TX
POPULATION						
City population (2014)	245,691	394,424	637,850	602,568	189,267	864,218
Population change (2010-2014)	5.4%	6.4%	9.8%	6.1%	2.4%	12.5%
Density, 2010 (Persons per sq. mi.)	3,037	7,088	7,1251	4,375	1,678	2,653
Urbanized area (UZA) population	413,049	2,714,959	3,172,957	1,907,887	1,053,638	1,464,998
TRANSPORTATION						
City mode split (to work)						
Drove alone	63%	61.6%	51%	58%	67.2%	73%
Carpool	8.4%	8%	8.4%	9.5%	12.3%	10.3%
Transit	8.9%	13.5%	19.6%	11.8%	6.6%	4.2%
Walk	9.6%	6.8%	9.3%	5.7%	5.5%	2.6%
Bike	5.5%	3.9%	3.7%	6.3%	2.8%	1.4%
Other	0.7%	1.0%	1.3%	1.2%	1.6%	1.7%
Work from home	3.8%	5.2%	6.7%	7.6%	3.9%	6.7%
City transit ridership (2014)	15,492,317	84,535,513	183,763,473	105,783,337	46,279,409	34,178,526
UZA Transit ridership (2014)	15,492,317	97,602,886	207,789,573	112,523,023	46,279,409	34,178,526


3 VIA DIVISION
3
956
ONE WAY

MADISON'S TRANSPORTATION FUTURE

6

This chapter provides high level recommendations for Madison's transportation future organized by thematic goals. The recommendations are further subcategorized into the following:

- Policy and Best Practice Recommendations;
- Action Items (next 1-5 years); and,
- Action Items (6-10 years and beyond).

Specific transportation projects recommended to be implemented as part of the near-term and long-term capital budgets and plans are discussed in Chapter 6. Examples of such projects include street reconstruction projects, traffic calming improvements, pedestrian crossing improvements, public transit facility projects, transit service modifications, etc.

Improving the Public Transit System in Madison and throughout the Region

Policy and Best Practice Recommendations

i. Continue to utilize cost effective technologies that make using transit easier. Improving vehicular location technologies can provide more precise information to transit riders monitoring their bus via mobile apps.

ii. Coordinate with Metro Transit to implement payment or pass systems that are readily available and have the potential to interact with other transportation payment systems, such as smart cards that can be used to access parking garages, parking meters, B-cycle (or other bike-sharing services) and/or potential future car sharing services.

iii. Metro Transit should continue to seek to maintain the provision of ADA paratransit service above the current ADA minimum standards, which will help to adequately meet the needs of its customers (contingent upon continued robust regional funding.

iv. Incorporate transit priority elements like bus lanes, transit signal priority, and in-lane bus stops in street design, consistent with appropriate professional design standards.

v. Explore a wide range of transit pass options and expand locations where they can be purchased. Evaluate the potential for pass options beyond a 10-ride or monthly pass (including the use of contactless smart cards). To the extent possible, expand pass programs, and study creating a pass program for residential buildings. Install vending kiosks at transfer points and at other high-use facilities to provide a more convenient point of sale.

Action Items (next 1-5 years)

vi. The City of Madison, Dane County, the Wisconsin Department of Transportation, Madison Area Transportation Planning Board (MPO), the University of Wisconsin, and other local units of government and agencies (including those communities that currently contract for Metro Transit services, such as Fitchburg, Middleton, Verona, Shorewood Hills and the Town of Madison) should work cooperatively to take all necessary steps toward Bus Rapid Transit (BRT)

project development and service implementation, in accordance with all applicable local, state and federal regulations.

vii. As a component of detailed BRT planning and project development, Metro Transit should undertake a route restructure planning process, to evaluate a variety of ways to provide different transit services, such as improving overall system performance, improving travel times, and/or reducing transfers. Potential improvements could include layered local and express service, feeder routes to support BRT, and park and ride facility expansion.

viii. Require, as appropriate, that a variety of Bus Rapid Transit infrastructure or other system accommodations be dedicated by developments located along designated BRT corridors or adjacent to BRT station areas, in conjunction with applicable regulations and/or zoning required for development approval.

ix. Secure funding for additional Metro storage and maintenance capacity (i.e., new maintenance facility), in order to accommodate additional transit vehicles needed to meet existing service demands and potential service expansion. Evaluate the potential to include such a facility as a component of a start-up Bus Rapid Transit project and federal funding application.

x. Metro Transit should continue to develop and implement its five-year transit service plan - the Transit Development Plan (TDP) - in close collaboration with the Madison Area Transportation Planning Board (MPO), as a means of implementing the City's public transit objectives and policies.

xi. Through the Transit Development Plan process, identify ways to improve existing transit service performance, including simplifying routes, optimizing stop spacing and staggering timing of buses (to reduce overcrowding).

xii. Through the Transit Development Plan process, Metro should continue to coordinate with other providers of specialized transportation service throughout the region, in order to provide the best service for passengers while eliminating duplicative service. Continue mobility training programs and incentives and investigate other innovative ways to encourage the migration of passengers from paratransit to fixed-route service. Continue to work with paratransit riders, employers, staff, and service agencies to efficiently schedule trips and combine rides when practical.

xiii. Evaluate potential for point-deviation transit systems, similar to the YWCA van system or Transportation Network Companies (TNCs), especially to serve lower-income neighborhoods and employment nodes not well-served by current Metro service (where traditional fixed route transit service provides lengthy travel times or requires transfers). Evaluate a range of on-demand transit services for certain areas and last mile connections, including the use of a variety of vehicle sizes and route structures (see matrix: Ridesharing and Innovative Transit Methods, page 6-5).

xiv. Develop a parking/park-and-ride management and financial plan as a means to help improve the viability and effectiveness of public transit services in the City. Study the potential for new park and ride facilities supported by direct service to major employment centers, specifically investigating the donated/leased space model used by several transit agencies.

Investigate opportunities to partner with other agencies (Dane County, WisDOT, and/or other Dane County communities) to implement and/or operate park-and-ride facilities.

xv. Expand the use of vanpools throughout the region, to provide high quality intercity and inter-regional public transportation options for employees living in areas not currently served by public transit.

xvi. Working with community leaders, businesses, Dane County and other local units of government, create a process that evaluates opportunities to institute a new regional transportation or transit governance entity - as a mechanism to finance and manage public transit services in the Madison metropolitan area and Dane County. Create a strategy to advocate for State legislation allowing such an entity.

xvii. Study possible transit funding sources for feasibility and effectiveness including: user fees such as fuel taxes or vehicle miles traveled charges; vehicle registration fees; public financing mechanisms such as sales taxes or bond measures; private sector financing programs such as developer fees or assessment districts; city infrastructure fees, or public-private partnerships.

xviii. Develop a long-range intercity bus service plan to ensure the continued provision of intercity bus services to and from the City of Madison, ensure the proper location of transit stations and bus staging areas, and address the impacts of intercity bus services and their facilities on residential neighborhoods.

xix. Work with the City of Madison Planning Division, Traffic Engineering Division, Metro Transit, and the University of Wisconsin-Madison, and others to locate a site for a new intercity bus terminal. The new bus terminal should be in a location that is easily serviceable by transit without adding new routes. Evaluate opportunities to integrate Metro Transit connections and mixed-use development into the terminal facility.

Summary Table: Ridesharing & Transit Methods

Sharing Category	Sharing Subcategory	What is it?	Example (local examples in **bold**)	Works well for . . .	Doesn't work well for . . .	Pros	Cons
Bike Sharing	Dock-Based*	Short-term bike rental. Check out a bike from a dock with your credit card or membership card, return it at a dock.	**B-Cycle**	Short errands; short trips between stations; commutes from one station to another; walkable/ bikable areas with high population/ employment density.	Longer rides; longer trips to a stationless area; areas with low population/ employment density; areas that lack walking/ biking amenities.	Dependable; affordable for customers; convenient (if fairly close to a station).	Stations are expensive to install; employees have to manually "re-balance" bikes to maintain availability of both bikes and docking spaces; no helmets available with bikes.
	Dockless*~	Stationless short-term bike rental. Bikes have GPS locators - use an app to locate and reserve a bike. Enter a PIN to unlock a bike. Bikes can be "returned" and locked at ordinary bike racks throughout a given service area.	Sobi	Short errands; short commutes within the service area; walkable/ bikable areas with high population/ employment density.	Longer rides; one-way trips outside of service area; areas with low population/ employment density; areas that lack walking/ biking amenities.	No need to "re-balance" bikes between stations; no need for expensive docking stations; affordable.	Less dependable than dock-based because bikes can be anywhere within service area; bikes take up "regular" bike rack spaces; no helmets available with bikes.
	Peer-to-Peer*~	A system to connect bike owners with people who want to rent a bike via an on-line platform. Owners get a special lock, list a bike as available for rental, and renters reserve and check out a bike via the on-line service. Bikes can be "returned" and locked at ordinary bike racks throughout a given service area.	Spokefly	Short errands; short commutes within the service area; walkable/ bikable areas with high population/ employment density.	Longer rides; one-way trips outside of service area; areas with low population/ employment density; areas that lack walking/ biking amenities.	Does not depend on government/ non-profit for startup and operation.	Generally more expensive than dock-based and dockless options; less dependable than dock-based because bikes do not have to be returned to a specific location; bikes take up "regular" bike rack spaces; maintenance is responsibility of bike owners; no helmets available with bikes.
Car Sharing	Round-Trip (traditional)*~	Decentralized, membership-based hourly car rental. Cars are scattered around a given service area. Use an on-line platform to reserve a car. Unlock a car with a membership card and drive. The car must be returned to the checkout location.	**Zipcar**	Occasional "second car" use without having to own two cars; mid- to high-density population/ employment areas; walkable areas; short- to medium-length round trips (errands); occasional use of larger vehicles for hauling items.	Longer trips (hourly fee can become more expensive than a daily rental car); one-way trips; commuting/ trips with significant downtime in the middle; low population density areas; pedestrian-unfriendly areas.	Dependable; convenient for errands if a car is close by; can save money if used instead of buying a second car.	Lack of flexibility since cars have to be returned to a specific space; not useful for commuting and therefore has little impact on traffic during highest volume times.
	One-Way*~	Decentralized, membership-based hourly car rental. Use an on-line platform or call to locate a car - no reservations needed. Use membership card to access a car. Cars can be "returned" anywhere in a designated service area.	car2go	One-way trips within service area; occasional "second car" use without having to own two cars; mid- to high-density population/ employment areas; walkable areas.	Longer trips (hourly fee can become more expensive than a daily rental car); low population density areas; pedestrian-unfriendly areas.	More flexible than Round-Trip services; convenient for errands if a car is close by; can save money if used instead of buying a second car.	Would require change to state law to operate in WI (cars would need to be allowed to park for free in public metered stalls)[1]; generally more expensive than round-trip services; car locations can become unbalanced; convenience dependent on privately-determined service area.
Car Sharing	Peer-to-Peer*~	A system to connect car owners with people who want to rent a car. Owners sign up to have their cars listed on the service and have hardware installed to allow a renter to access the car. Renters rent a car via PC or app and return the car to the pickup location.	Getaround	Occasional "second car" use without having to own two cars; walkable areas; short, medium, and long (generally up to 200 mi/day) trips.	One-way trips; commuting/ trips with significant downtime in the middle.	Hourly and daily rates can be cheaper than traditional round-trip car-sharing or traditional car rental; can be more convenient than traditional car rental.	Availability is more based on peoples' willingness to list their cars than the potential for profit due to serving a large customer base in a densely populated area; car maintenance is the responsibility of the owner - less standardized than traditional car sharing or car rental.
	Closed-Network	Private car share for a specific development. Works similar to traditional round-trip car sharing, but the car is managed by a property owner and only available to tenants of a specific development.	**4119 Portage Rd. Project**	Reducing car ownership for large residential developments - occasional "second car" use; providing flexibility for employees who use transit to run errands during the day (if provided in an office building).	Longer trips; one-way trips; commuting/ trips with significant downtime in the middle.	Can be sold as an amenity to tenants; can work well even in pedestrian-unfriendly areas because vehicle is common to a specific site and tenants don't have to walk to an offsite vehicle; less dependent on area density or the market than traditional round-trip car sharing.	Lack of access to a wider network with a variety of vehicles; subject to individualized terms and conditions that may be less favorable than traditional round-trip car sharing.
	Taxicab/Limo	The "traditional" ridesourcing method: for-hire vehicles staffed with professional drivers licensed to transport passengers. In Madison, licensed cab companies must operate 24 hours a day and serve all areas of the City.	**Union Cab**	Pre-booked one-way trips to areas with poor/no transit service; trips to/from areas with paid parking (especially airport).	Impromptu/unscheduled trips since rides can't be hailed in the City (app-based TNCs are sometimes have the ability to respond more quickly).	Set prices mean riders know what they will pay regardless of time of day; dependable if booked in advance.	Expensive; more difficult to use on short notice in comparison to TNCs; less sophisticated technology limits utility for some segments of the population.

Ridesourcing	Transportation Network Company (TNC) *~	A company that uses an online platform to connect passengers with drivers using their personal vehicles.	**Uber**	Short to mid-range one-way trips.	Longer commuting trips; everyday commuting.	Flexible; easy to use with a smartphone.	Expensive; lack of a transparent pricing structure (can have "surge" pricing that makes it more expensive than a traditional taxicab); availability depends on private driver willingness to participate at certain times; less vetting of drivers than taxicab companies.
Ridesharing	Carpooling	Private arrangement between people to make a regular journey in a single vehicle.	**MPO Rideshare**	Commuting for groups of 2+ people who live and work in relatively close proximity to each other; commutes not covered by regular transit service.	Connecting people with existing transit; nonstandard working hours; low-density/ decentralized employment areas; non-employment trips.	Convenient; cost-effective; "guaranteed ride home" generally offered for free in case of emergency if signed up through a rideshare organization.	Dependent upon availability and timeliness of driver; dependent upon others with a car in fairly close proximity that share the same employment hours close to your destination.
	Vanpooling	A fee-based service (biweekly fees in the case of the State of WI Vanpool) where commuters share a van provided by a third party. The van runs with an agreed upon schedule and pickup/drop-off location(s) , and is driven by one of the commuters.	**State of WI Vanpool**	Commuting for groups of 8-15 people who live and work in relatively close proximity to each other; mid- to long-range commutes not covered by regular transit service.	Shorter commutes; connecting people with existing transit; nonstandard working hours; low-density/ decentralized employment areas.	Convenient; cost-effective; "guaranteed ride home" generally offered for free in case of emergency.	Must meet minimum ridership number to start a vanpool; generally depends on a centralized work location for riders.
	Vanpooling Subscription Service	A pay-per-ride service that provides door-to-door commuting to people outside of traditional transit service areas or hours. Rides must be booked in advance, and can be subsidized for lower-income people.	**YWCA JobRide**	Commuters who live or work outside of traditional transit service areas; commuters with nonstandard work hours.	Non-commuting trips.	Convenient; dependable (can book rides in advance); affordable for lower-income commuters.	Expensive to run - must be heavily subsidized; capacity constraints.
Ridesharing	Dynamic Ridesharing~	An on-line service to connect people making similar trips, where passengers pay a share of the trip cost. Essentially a technology-enhanced method of carpooling, with the potential for different passengers every day based on demand.	Tripda	Commuting for groups of 2+ people who live and work in relatively close proximity to each other; commutes not covered by regular transit service.	Connecting people with existing transit; nonstandard working hours; low-density/ decentralized employment areas; non-employment trips.	Can serve as a way to match drivers with space in their vehicles with other commuters, saving money for commuters and earning money for drivers.	Dependent upon availability and timeliness of driver; dependent upon others with a car in fairly close proximity that share the same employment hours close to your destination; less dependable than "traditional" carpooling.
Transit	Public Transit	Fixed-route, (generally) high-volume shared passenger transport for use by the general public for a fee.	**Metro Transit**	Mid- to high-density population/ employment areas; walkable areas; commuting.	Low density population/ employment areas; isolated employment/ residential areas; commuters with nonstandard hours.	Dependable; affordable.	"Feeder" routes/ low ridership routes are expensive to run and inefficient; fixed-route system lacks flexibility.
	Shuttle	Private transit service that generally operates on a fixed route to deliver employees to a specific company.	Google Bus (San Francisco-based service to deliver Google employees to its campus)	Employment campuses with parking constraints or employees who do not want to own a car.	Non-employment based trips; low-density residential areas; pedestrian-unfriendly areas.	Dependable; affordable; flexible timing and routes; convenient for employees; can reduce car trips to employers not served by public transit.	Generally implemented in response to a lack of adequate public transit; can "steal" public transit commuter rides if implemented parallel to transit.
	Microtransit*~	On-line based service that picks up passengers by using dynamically generated routes based on demand and customer location. Generally has a per-ride fee that is more expensive than public transit but less expensive than taxicabs or TNCs.	Bridj	Commuting to and from areas not served by public transit; short and midrange commutes.	Low density population/ employment areas (depends on a certain minimum ridership); pedestrian-unfriendly areas; long commutes.	Less expensive than taxicabs or TNCs; flexible timing and routes; can reduce car trips to employers not served by public transit; can serve as "first-mile" feeder transit to major public transit routes; can eliminate second car ownership for families that use a second car purely for commuting.	For-profit microtransit has the potential to compete with the highest-volume public transit routes, thus reducing use of the highest volume transit lines; for-profit services must follow money, which can conflict with social equity/ economic development goals of serving lower-income areas; can actually increase traffic if vans are driving back and forth to pick up fares.

* Generally requires a credit card.
~ Generally requires a smartphone or computer.
1: AB 322 and SB 235 to allow this were introduced in the 2015-2016 session, but did not receive a vote. City staff will continue to monitor legislation that would allow this type of service.

Updated 12/10/15

Building and Maintaining Comfortable and Safe Bicycle Infrastructure

Potential cyclist may be reluctant to bike on-street in traditional bike lanes, especially on streets with higher traffic volume or speed.

Policy and best practice recommendations

i. Ensure Madison in Motion consistency with the recommendations contained in the Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County (2015), and implement the recommendations contained in that Plan.

ii. Continue to expand bicycle networks throughout the metropolitan area, with priority given to eliminating system gaps and developing additional facilities in areas where anticipated use is high.

iii. Identify opportunities to improve existing facilities, such as removing bike boulevard stop signs, widening undersized bike lanes on higher volume and speed streets, widening bike paths and giving priority to bicycles at appropriate path/street crossing locations (including raised path crossings) and advanced marking for mid-block crossings.

iv. Continue to incorporate innovative bike facilities, such as cycle tracks, buffered bike lanes and innovative intersections, where appropriate and opportunities arise.

v.

vi. Continue to construct off-street paths, with priority placed on those that eliminate existing gaps in the network.

vii. Remove major barriers to bicycling, whether by adding infrastructure at key spots or improving crossings of large roadways and other transportation infrastructure.

viii. Continue to improve intersections by adding safety improvements, bike-specific signals, diagonal crossings (where appropriate), and bicycle-sensitive actuation for traffic signals.

ix. Improve bicycle storage (including on-demand lockers and additional capacity), transit integration, and last-mile connections, for seamless integration with the larger transportation system. For example, examine ways to improve bicycle access on transit vehicles, bicycle storage facilities at major transit hubs, and innovative transportation linkages between major transit hubs and destinations (such as bike sharing, circulator transit services, etc.).

x. Identify and apply guidelines for innovative treatments, so Madison's bike infrastructure can benefit from

piloting different treatments and evolve based on what is appropriate for local conditions. Examples include emerging facility treatments being refined in other communities and design resources (e.g., protected bike lanes and intersections, new types of signalization, etc.).

xi. Continue to explore how emerging technologies can help improve bicycle safety and increase bicycle mode split. Examples include more reliable bicycle detection, vehicle-to-infrastructure/vehicle-to-vehicle (V2I/V2V) technologies and the use of electric-assisted bikes. Promote the use of new technologies related to bicycles, address relevant regulatory issues and support emerging technology training for City staff.

xii. Improve winter bicycle maintenance policies, reviewing winter biking routes, facilities plowing, and parking on streets with bike routes and bike lanes. Study winter maintenance practices to ensure the most appropriate facility is developed in new areas, balancing cost, usage characteristics, and winter/summer use patterns. Consider making winter bike facility maintenance a line item in responsible departmental budgets to ensure adequate capital and operational funding is provided to clear facilities, and is sufficient to deliver the desired standard of maintenance.

xiii. Ensure that public and private bike storage facilities are cleared in winter. Improve the reporting process (report a problem) for maintenance of bicycle facilities.

xiv. Evaluate the creation of bicycle centers at key locations throughout the City (bicycle centers may include secure bicycle parking, lock-up facilities, bike maintenance areas, and shower facilities).

xv. Provide parallel bicycle paths within the highway right-of-way along limited access highways.

xvi. Coordinate with regional partners to ensure further development and refinement of a system of shared use paths, bicycle lanes on arterial and collector streets, and neighborhood street-level connectivity.

xvii. Improve the bike parking component of the zoning ordinance, to ensure adequate bike parking in the isthmus. Require the property owner to manage snow clearing and general maintenance.

xviii. The City's bicycle boulevard program has been in place and continues to evolve. Explore the potential to add additional treatments along current bicycle boulevards, and the creation of new boulevards as appropriate (with an increased level of treatments to encourage bicycle traffic).

xix. Improve cycling integration with transit. Investigate improved bike parking facilities at transfer points and major transit stops. Explore new options for increased bike capacity on current and future buses.

Action Items (next 1-5 years)

xx. Expand the bicycle route network, including a primary and secondary network, new off-street multi-use paths, and new on-street facilities including buffered bike lanes and cycle tracks. Create a system that balances needs of people prioritizing comfort and safety and those prioritizing efficiency and speed (see Bicycle Route Network Map, page 6-10).

xxi. Implement bike route wayfinding for cyclists by adopting the Bicycle Wayfinding Design Guidelines for Dane County (2016), and

provide appropriate funding for its implementation. The City should continue to work with the Madison Area Transportation Planning Board (MPO) and Dane County to implement a bicycle wayfinding system that is consistent on bikeways throughout the county, with special priority given to bikeways that have been identified as primary routes. Improve and/or simplify bicycle signage.

xxii. Continue the policy of providing bicycle accommodations on all collector and arterial streets whenever possible, and encourage adequate funding to be provided in appropriate City agency budgets in order to properly install and maintain these facilities. When these streets are scheduled for reconstruction or resurfacing, bicycle facilities need to be considered at that time (see Street Typology concepts, page 6-19 to 6-20); Develop specific roadway cross-sections for rural roads in developing areas of the City that may/will be converted to an urban section, in order to ensure that developers construct the proper cross-section relative to the desired urban context.

xxiii. Conduct a bicycle system route evaluation and create a map that identifies the current low-stress bicycle network (i.e., multiuse paths, protected bike lanes, low-traffic local streets, etc.), in order to help identify gaps in the continuity of the low-stress network and/or other problem areas.

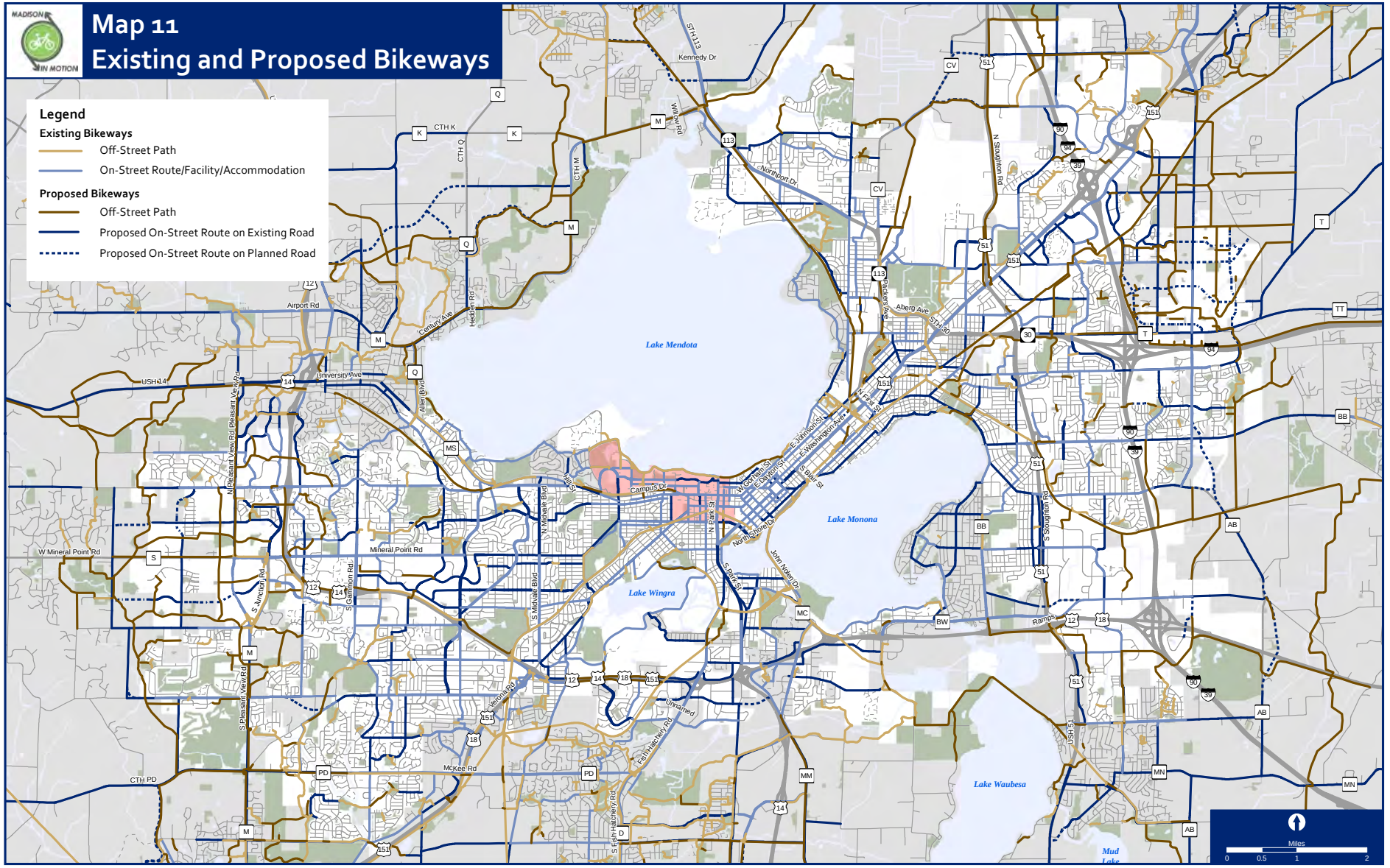
xxiv. Conduct a bicycle facility capacity evaluation and plan for the isthmus, in order to determine the appropriate bicycle facility design based on usage.

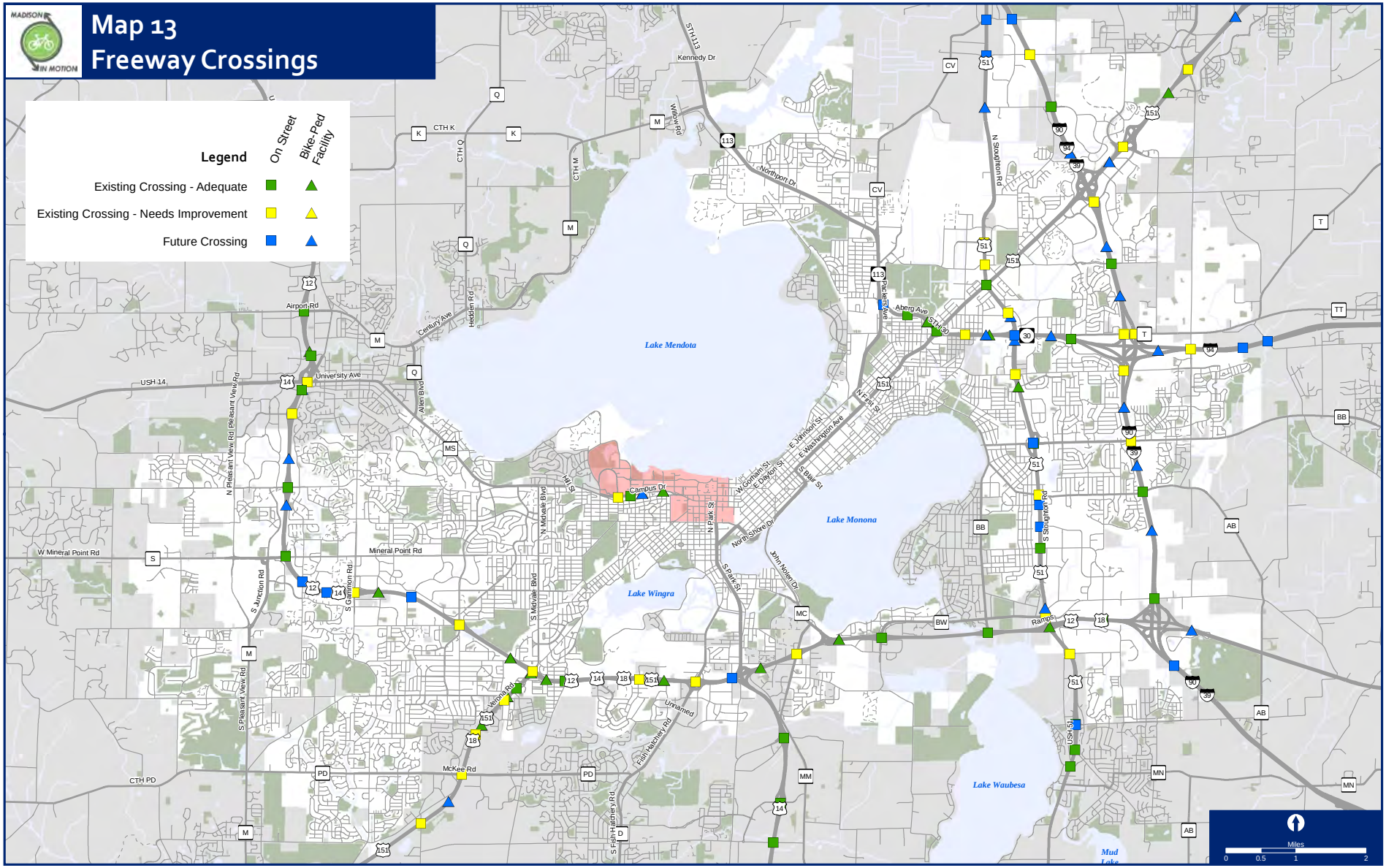
xxv. Study the potential for new park and bike facilities, preferably located along major paths and within three miles of primary employment centers. Like park and rides, investigate donated/leased parking space model. Ensure adequate bicycle parking at various locations along the bike paths.

xxvi. Add new bicycle and pedestrian crossings as part of major roadway projects: investigate new bicycle and pedestrian crossings recommended for Interstate 39/90, for the Beltline (including several with new streets), for Stoughton Road (including several with streets), and for USH 151. Continue to work closely with Dane County, Wisconsin Department of Transportation, and the Federal Highway Administration to ensure improvements to existing crossings of highways, as well as the creation of new crossings (see Roadway Barrier Map, page 6-11).

xxvii. Assist B-Cycle with their expansion plans. Integrate B-Cycle facilities into planning and implementation of existing and planned Activity Centers throughout the City. Consider the use of tax increment financing to pay for the capital costs of B-Cycle stations in tax increment districts where system expansion is merited.

xxviii. Conduct a bikeway facility audit for the City, to help identify implementation priorities for the bicycle route network. A bicycle system audit can improve safety, comfort and ease of system navigation for cyclists. The audit can also identify locations that may be improved with such facility treatments as improving striping and painting, improved wayfinding and signage, modified roadway intersections, enhanced signalization and protected bike facilities.


Map 11
Existing and Proposed Bikeways
Legend
Existing Bikeways
Off-Street Path
On-Street Route/Facility/Accommodation
Proposed Bikeways
Off-Street Path
Proposed On-Street Route on Existing Road
Proposed On-Street Route on Planned Road
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Mud Lake
Kennedy Dr
CTH K
CTH Q
CTH M
Airport Rd
University Ave
USH 14
Mineral Point Rd
W Mineral Point Rd
McKee Rd
CTH PD
Campus Dr
North Shore Dr
John Nolen Dr
Aberg Ave
Packers Ave
Normport Dr
Willow Rd
N Stoughton Rd
S Stoughton Rd
USH 51
Allen Blvd
Hedden Rd
Century Ave
N Pleasant View Rd
S Pleasant View Rd
S Junction Rd
S Gammon Rd
N Midvale Blvd
S Midvale Blvd
Vienna Rd
Fish Hatchery Rd
S Fish Hatchery Rd
N Park St
S Park St
E Johnson St
E Washington Ave
W Gorham St
E Dayton St
Blair St
Ramps
Unnamed
Miles
0
0.5
1
2


Map 13
Freeway Crossings
Legend
On Street
Bike-Ped Facility
Existing Crossing - Adequate
Existing Crossing - Needs Improvement
Future Crossing
Lake Mendota
Lake Monona
Lake Wingra
Lake Waubesa
Mud Lake
Kennedy Dr
Northport Dr
Airport Rd
University Ave
USH 14
Century Ave
Heddon Rd
Allen Blvd
Campus Dr
W Gorham St
E Dayton St
E Johnson St
E Washington Ave
N Blair St
N Park St
North Shore Dr
John Nolen Dr
S Park St
N Midvale Blvd
S Midvale Blvd
Mineral Point Rd
W Mineral Point Rd
S Junction Rd
S Gammon Rd
N Pleasant View Rd
S Pleasant View Rd
Verona Rd
McKee Rd
CTH PD
Fish Hatchery Rd
S Fish Hatchery Rd
Unnamed
Ramp
N Stoughton Rd
S Stoughton Rd
Aberg Ave
Packers Ave
Willow Rd
CTH K
CTH Q
CTH M
STH 113
USH 151
Miles
0
0.5
1
2

Building and Maintaining Comfortable and Safe Pedestrian Infrastructure

Sidewalks used by people of all ages and physical abilities, and used on some part of every trip.

Policy and Best Practice Recommendations

i. Continue the City's sidewalk installation policy in new development areas and existing neighborhoods. Install sidewalks on both sides of all streets in all new subdivisions. Install retrofit sidewalks on both sides of all existing streets, as they are reconstructed. In limited instances, exceptions to this policy may be recommended by the Board of Public Works and approved by the Common Council. Such exceptions to the installation of sidewalks include unique topography or if the installations will result in the loss of a significant number of trees in the terrace.

- **Recommendation for New Developments:** The City should continue to enforce its ordinance requiring developers to install sidewalks along both sides of the street in all new developments at their own expense.
- **Recommendation for Site Redevelopment:** When sites are redeveloped along existing roadways without sidewalks, require the developer to install sidewalks on the site if they do not currently exist.
- **Tier 1 Streets and Sidewalks:** Tier 1 streets are those classified as arterials and collectors, streets upon which local bus service is provided, streets where there exists a high level of pedestrian activity for school access and streets that provide connections to neighborhood commercial/ community services. As such, Tier 1 streets should be given the highest priority for the addition of sidewalks in existing neighborhoods.

ii. Maintain sidewalks, walkways, transit boarding pads, and connections to and within transit shelters for year-round use, including appropriate snow removal. Continue to enforce sidewalk snow removal and maintenance ordinances.

iii. Continue to improve intersections and crossings, both controlled and uncontrolled, using innovative treatments such as:

- Pavement markings and treatments such as striping, painted crosswalks (possibly using red color), and decorative paving so the change in material, color, and texture signifies pedestrian priority;
- Raised crosswalks to signify

pedestrian priority;

- Innovative lane channelization, pedestrian refuge areas, and visually enhanced mid-block crossings;
- Curb extensions to effectively shorten walking distance and put the pedestrian in a more visible position to begin crossing the street;
- Signal improvements to assist with pedestrian crossings, including: pedestrian countdown signals, flashing pedestrian crossings at uncontrolled or mid-block crossings, and pedestrian-activated crossings;
- Signage at high pedestrian crossing locations to remind vehicles to yield to pedestrians at unsignalized intersections.

iv. Improve roadway landscaping, including:

- Providing adequate trees and terracing to reduce the visual and noise impact of motor vehicles on people traveling on foot adjacent to a roadway, enhance pedestrian comfort, and enhance perceived pedestrian safety;
- Improved storm water management treatments to improve water quality, help reduce peak volume, and provide a more comfortable and aesthetically pleasing pedestrian experience.

v. When streets are reconstructed ensure design supports a pleasant pedestrian experience. Providing wide, planted terraces on residential streets (8'-12' is ideal) creates an attractive buffer from the roadway while creating an optimum root environment for street trees.

vi. Where terraces are paved on the city's main streets, consider structured soil techniques, such as silva cells, to improve the health and canopy of trees and their associated ecological benefits in urban environments.

vii. On all City streets where sidewalks are installed (or retrofitted) and where terraces are paved, consider the use of permeable pavement to provide enhanced stormwater management.

viii. Continue studying how the urban canopy within the public right of way can be improved to increase stormwater management efforts, air quality and neighborhood character.

Action Items (next 1-5 years)

ix. Maintain, update and implement a Pedestrian System Plan to identify and prioritize sidewalk needs (e.g. pedestrian ramps, crosswalk enhancements, streetscape enhancements, sidewalk expansions, etc.).

x. Continue to implement a program for funding pedestrian improvements in existing neighborhoods.

xi. Work closely with the University of Wisconsin to identify priorities and implement pedestrian enhancements in and around the UW campus area.

xii. Create a planning process to identify and map existing barriers to pedestrian mobility (such as highways without adequate crossing facilities), identify where key linkages are missing, and prioritize locations where new crossings are most needed.

xiii. Create a planning process to inventory pedestrian facilities in the downtown area. Identify the optimum width of paved sidewalk and terraces, appropriate to the surrounding urban context. Inventory and analyze pedestrian facility capacity needs in the downtown and

identify the specific minimum width for paved sidewalk and terraces, for both sides of all streets and blocks in the downtown.

xiv. vPrioritize Tier 1 Streets for sidewalk additions without street reconstruction. Compare pavement condition data to identify high-need streets that are unlikely to be reconstructed soon. These pedestrian corridors may be appropriate for sidewalk installation prior to street reconstruction (insert Tier 1 Sidewalk Facility Map, page 12).

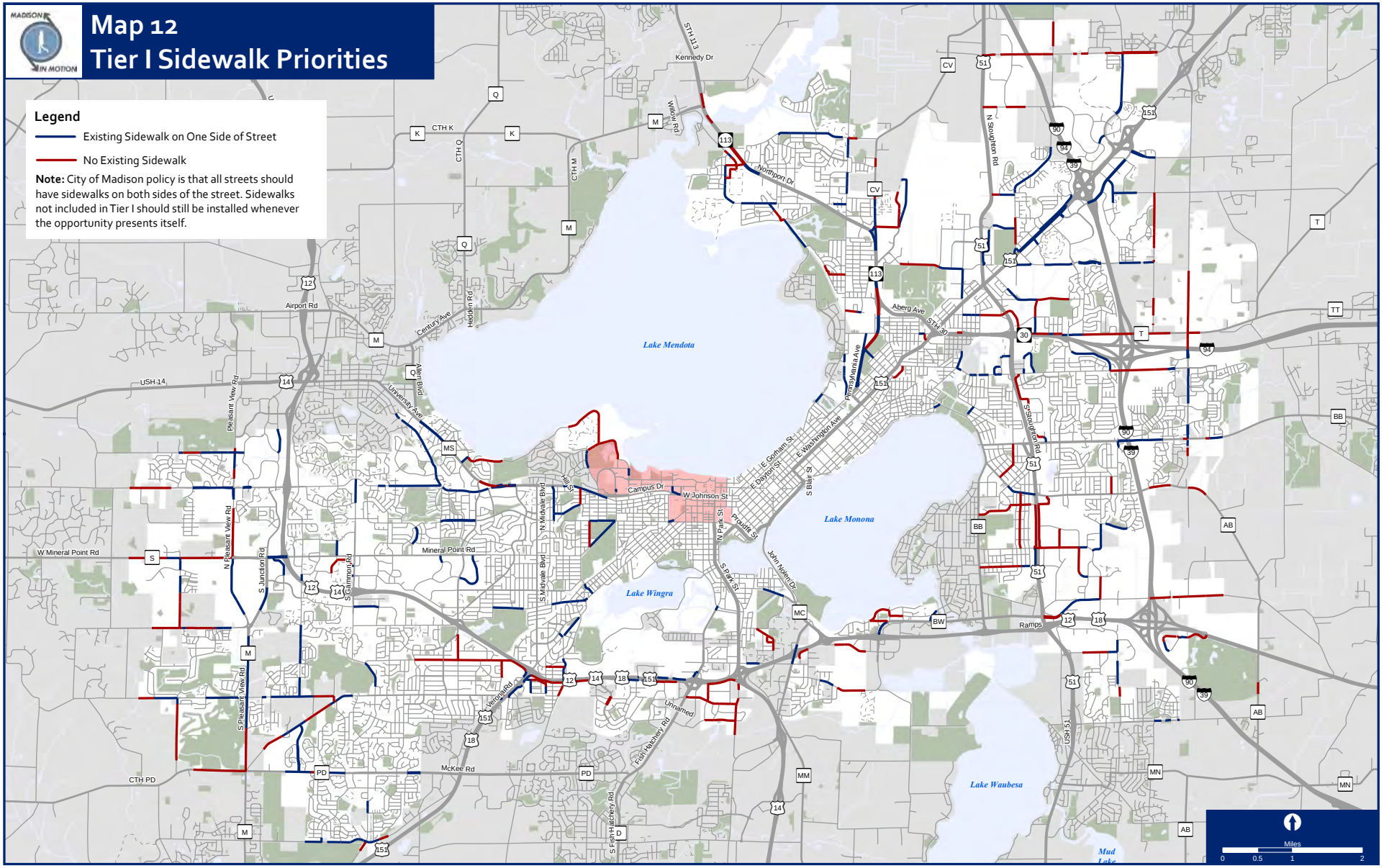
xv. Identify potential funding to ensure that new and retrofit sidewalks are built. Help to reduce the financial burden of building sidewalks on property owners in already-developed neighborhoods, by reducing the cost share percentage applied to property owners.

xvi. Pilot "shared streets" in locations with narrow roadways, high commercial activity, high pedestrian volume, and low vehicle volumes, to try out the appropriate paving treatment, programming, design features, regulations, and locations; assess the outcome (for possible expansion of a shared streets program) and explore alternative mechanisms to finance the program.

xvii. Investigate how emerging technologies, such as pedestrian-vehicle conflict warning systems for turning vehicles, can help improve pedestrian safety. Promote the use of new technologies related to pedestrians and support training in new technologies for City staff.

xviii. Evaluate modifications to parking garage exit design standards, for public and private garages, to increase pedestrian safety.

Map 12
Tier I Sidewalk Priorities



Building and Maintaining Streets and Roadways for All Users

Complete Streets are streets that work for everyone in the community, regardless of how they get around.

Policy and Best Practice Recommendations

i. Incorporate Complete Streets design components when constructing new and reconstructing existing streets and roadways (see Street Typologies, page 6-19 to 6-20):

- Add pedestrian refuges, medians, and curb extensions, where needed, to improve the safety and attractiveness of walking.
- Narrow lanes to calm traffic and create space for additional uses of the right-of-way, reduce the pedestrian crossing distance between curbs, and reduce pedestrian exposure to traffic.
- Consider "road diets," with two-way left turn lanes (TWLTLs), where appropriate, pedestrian islands and bicycle facilities, to improve roadway safety and better accommodate bicyclists and

COMPLETE STREETS NOTE:

City of Madison Resolution ID 16250 reaffirms the City's commitment to Complete Streets, and further directs staff of various agencies to follow, to the extent possible, Complete Streets concepts for all new developments, redevelopments, new street construction and street reconstruction projects. Complete Streets is a roadway facility design approach that is intended to ensure that streets are designed to enable safe access for all users, pedestrians, bicyclists, motorists and transit riders, of all ages and abilities, to be able to move safely along and across the street. Madison has a long history of following complete streets concepts without naming these as such.

While it is desired to fully accommodate all modes of transportation within the roadway cross-section, there are numerous competing uses for the street right-of-way. Specific facility treatments for each mode as components of reconstructed roadways (particularly in built-up urbanized areas of the City, like Monroe Street and Williamson Street) will need to be determined as part of roadway corridor plans, where competing interests for right-of-way (parking, sidewalk width, terraces and related amenities, bike mobility, vehicular traffic, building placement, etc.) are debated in the context of robust stakeholder involvement, careful consideration of all City objectives (including community equity implications), and a full evaluation of the impacts upon residences and businesses in surrounding neighborhoods.

pedestrians.

- Consider converting one-way streets to two-way operation, where such action would not compromise other City objectives or result in detrimental impacts upon residences and businesses in surrounding neighborhoods.
- Evaluate and implement (where appropriate) traffic calming tools like traffic circles, speed tables, and speed boards as part of the City's Neighborhood Traffic Management Program (NTMP).
- Incorporate appropriate bicycle facilities for traffic speed, volume, roadway function and urban context (including shared streets, bike lanes, buffered bike lanes and cycle tracks).

ii. Adopt a "Fix-It First" policy for City of Madison streets and roadways, ensuring that pavement quality is maintained at an appropriately high level. A "Fix-It First" policy prioritizes the maintenance of roadway facilities over expansion, although some capacity expansion is warranted to accommodate orderly development (primarily on the periphery of the City). Such maintenance activities include chip seal/crack sealing, resurfacing and reconstruction. Continue to monitor street condition and utilize cost effective maintenance procedures.

iii. Reconstruct streets when they reach the end of their useful life and incorporate utility repairs or upgrades during reconstruction. Integrate Complete Streets elements into ongoing roadway construction and improvement projects. Continue to monitor street conditions and utilize cost effective maintenance procedures. Continue to implement cost-effective maintenance practices that extend the life of roadways.

iv. Install street trees along street terraces, within medians and within channelization islands, in order to help improve the aesthetics of

the streetscape and potentially encourage slower traffic speeds (by narrowing the driver's visual perspective). Ensure that such facilities allow for safe visibility and that proper maintenance resources are provided for these facilities.

v. Construct new arterial and collector streets (in and adjoining new neighborhoods) as growing areas of the City are developed, and utilize official mapping throughout the City as a tool to ensure the proper design and development of such future roadways. Facilitate rural-to-urban roadway cross-section conversions in newly-developing areas and retrofits in older areas of the City where rural cross-sections are still present.

vi. Private residential streets should generally not be allowed, due to their negative impact on the connectivity of the City's street network and their creation of isolated neighborhood pods that lack integration with the rest of the community. Explore creation of an ordinance to establish specific, narrowly-tailored criteria for the construction of private residential streets (similar to the City's general prohibition of cul-de-sacs unless specific conditions are present).

vii. To the extent possible, enhance the roadway system capacity by using Transportation Systems Management (TSM) and other innovative techniques, such as improving intersection design, driveway/access modification, lane channelization, signal timing and other strategies.

viii. On arterial streets in the City, maintain the traffic-carrying capacity of the roadway to the extent possible, especially in areas where capacity reduction would result in detrimental impacts upon residences and businesses in surrounding neighborhoods.

ix. As opportunities for reconstruction of existing streets arise, identify existing roadways with excess capacity (i.e., those with unutilized on-street parking lanes). To the extent possible, for construction of new streets and reconstruction of existing streets, narrow the street and reallocate space to more productive uses than under-utilized asphalt, such as widening the terrace, installing or expanding boulevards, or expanding bike or pedestrian facilities.

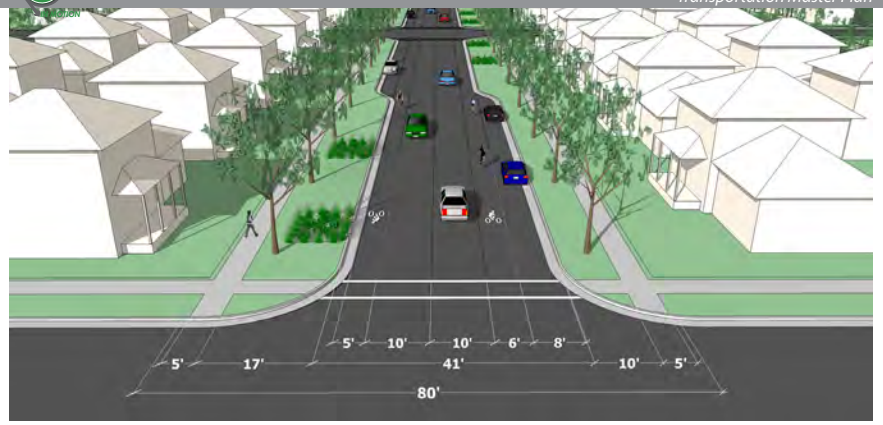
Action Items (next 1-5 years)

x. Implement the City of Madison's street/roadway, bicycle and pedestrian facility projects contained in the Madison Area Transportation Planning Board (MPO) Transportation Improvement Program (TIP). A summary of the City's TIP projects is included in the Projects Section, on page 7-3.

xi. Utilize the City of Madison Traffic Engineering Division Neighborhood Traffic Management Program (NTMP) to evaluate potential traffic calming projects throughout the City. Consider traffic calming tools like traffic circles, speed humps, and speed boards.

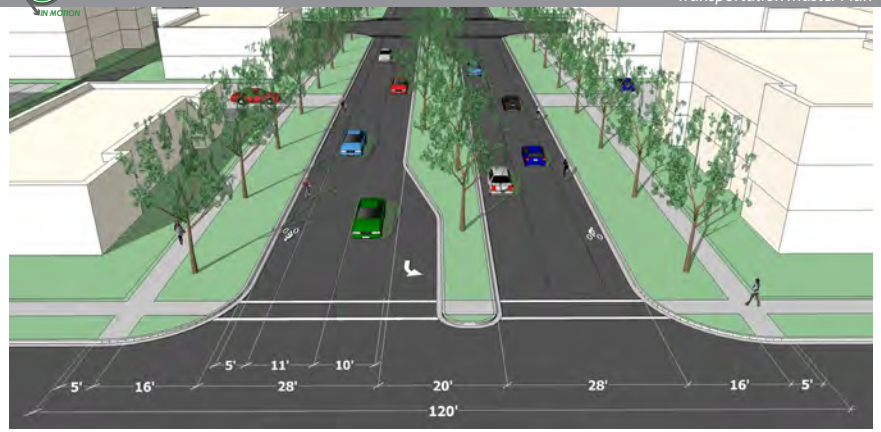
Local Street

Street Typologies
Sustainable Madison
Transportation Master Plan



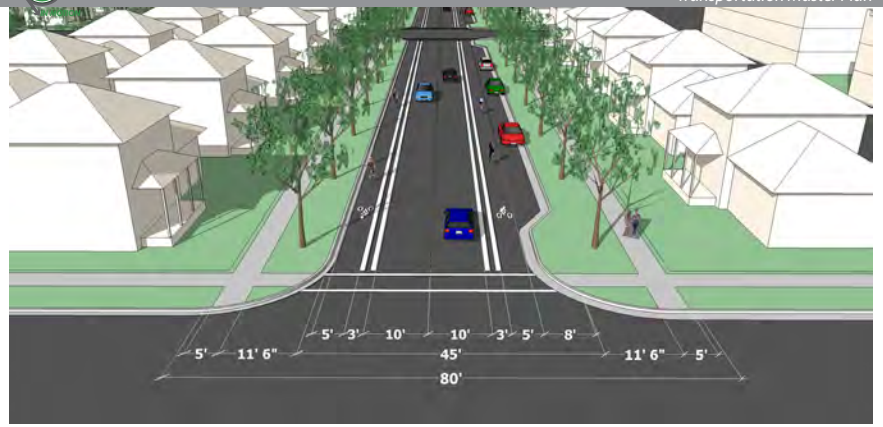
Collector - Chicane Parking

Street Typologies
Sustainable Madison
Transportation Master Plan



Arterial

Street Typologies
Sustainable Madison
Transportation Master Plan



Collector - Buffered Bike Lane

Arterial - Raised Bike Lanes

Arterial - Cycle Track

Arterial - Buffered Bike Lanes

Arterial - Raised Bike Lanes with Parking

Creating and Managing On-Street and Off-Street Parking

As a growing, medium-sized city, parking pressures and the perception of too-few spaces grow as quality of life concerns for cities.

Policy and Best Practice Recommendations

i. As city parking structures near the end of their useful life, evaluate parking capacity needs and the feasibility of incorporating public parking into larger, mixed-use development projects.

ii. Manage downtown and central area on-street and off-street parking occupancy, time limits and rate structures to ensure they are facilitating desired usage patterns and sufficient vacancies. Balance the needs of businesses with those of residents.

iii. Consider the development of a formal park and ride system, as a component of a high-capacity or express regional transit network (with express or limited stop transit service to employment centers) through partnerships with commercial property owners with under-utilized parking capacity during core employment commuting hours. A formal park-and-ride system is intended to increase transit use and reduce commuter parking in surrounding neighborhoods.

iv. Evaluate the efficacy of a "Park Once" program to help reduce automobile traffic and parking in the downtown and other areas of the City. Evaluate the use of dedicated shuttles from parking facilities on the edge of downtown and peripheral parking locations, such as the Alliant Energy Center and other locations, to help manage automobile traffic accessing the downtown. Evaluate the use of circulator transit services in the rapidly densifying downtown area and other locations in the City, to help manage automobile traffic.

v. Discourage new long-term commuter parking for single-occupant automobiles in the downtown.

vi. Ensure new parking facilities are designed to minimize or eliminate negative impacts of parking infrastructure on the surrounding area, such as traffic circulation or aesthetic impacts. Build parking facilities that reach high aesthetic standards.

vii. Promote provision of shared-parking facilities to avoid oversupply of parking.

viii. Continue to proactively study current and future parking demands and supplies, using innovative techniques such as Park+ software, to help understand parking impacts of future development on existing land uses and ensure that parking

policy, supply, demand, and impacts are all adequately weighed when considering projects that have an impact on parking.

ix. Evaluate a variety of public ownership or management options for structured parking associated with new commercial developments to encourage shared use of parking and maximize the benefit of any City investments in parking (such as is being considered in the Capital East district).

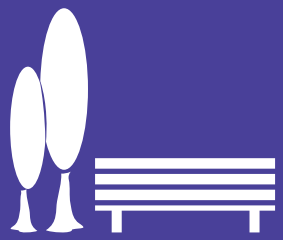
x. In central areas where parking demand generated from future development is anticipated to be high, such as in the Capital East District, explore the potential for new public parking facilities as a way to facilitate use of off-street parking at all times.

Action Items (next 1-5 years)

xi. Continue to review and update parking pricing and management strategies. Evaluate dynamic pricing models for parking, to determine if different pricing methods could improve parking availability in high demand areas (such as near the UW Campus, State Street and the Capitol Square area) and increase parking revenue. Continue to coordinate parking management policies with other transportation strategies, such as transit and travel demand management.

xii. Permit Tax Increment Financing to be used, on a case-by-case basis, to finance public and private parking facilities, to support new development and to encourage shared parking arrangements.

Ensuring Land Use and Transportation System Coordination



Land use and transportation plans must be coordinated and work together to achieve the City's goals.

Policy and Best Practice Recommendations

i. Encourage the development of high-density, mixed-use Activity Centers, primarily along major existing and future planned transit corridors. Activity Centers should typically include an appropriately dense mix of housing types (including affordable units and larger units for families with children), high levels of transit service, transit supportive commercial uses (such as grocery stores, child care and neighborhood-serving retail), and community facilities (such as libraries, neighborhood centers and/or senior centers).

ii. Update and implement the City of Madison Comprehensive Plan Transportation Goals, Objectives and Policies though the implementation of a variety of state, regional and local planning, project development and implementation processes.

iii. Evaluate expanding land banking funds for areas surrounding key transit nodes, transit corridors and existing/future Activity Centers.

iv. Target infill development to areas and corridors that have, or will have, high levels of transit service.

v. Focus new housing for transit dependent populations, including affordable and senior housing, along corridors with high levels of existing and planned transit service.

vi. Closely coordinate anticipated land use, density and neighborhood/urban character with appropriate street design. Provide appropriate level of on-street parking to meet demand without unnecessarily widening pavement.

Action Items (next 6-10 years and beyond)

vii. Identify the locations of future Activity Centers, both in the City and in peripheral locations throughout the region (see Activity Center Map, page 4-7). Collaborate with neighboring municipalities being served by Metro to maximize transit oriented development outside the City.

viii. Prepare individual Activity Center Plans, working proactively with neighborhood groups and other area stakeholders (with priority placed on those locations most likely to experience near-term redevelopment).

ix. Identify spatially mismatched areas of very high transit service and existing lower-density development to determine if higher density redevelopment along these transit corridors or around transfer points would be appropriate (examples include Whitney Way, Mineral Point Road and Sherman Avenue). Consider "up-zoning" specific nodes to encourage higher-density development in these areas, where appropriate.

Managing Transportation System Demand

Madison has both short- and long-term potential to see significant mode shift with more Transportation Demand Management measures.

Policy and Best Practice Recommendations

i. Institute employer-based Transportation Demand Management (TDM) measures as part of a comprehensive City-wide TDM program, in order to enhance the desirability of non single-occupancy vehicle (SOV)-based transportation modes – including public transit, ridesharing, bicycle and pedestrian transportation.

ii. Support ridesharing to relieve traffic congestion, reduce parking demand, reduce energy use and improve air quality. Give priority to facilities and services which encourage ridesharing for work and school trips.

iii. Incentivize employers to provide employees with Metro commute passes, especially in high frequency transit areas, retail and service sector jobs, and projects receiving city assistance.

iv. Pursue policies that result in commercial developments separating the cost of parking from leases, and thereby assign the full cost of providing and maintaining parking to those who use it.

v. Continue to make periodic pricing adjustments to City-managed parking facilities to make sure prices are in line with the market.

Action Items (next 1-5 years)

vi. iDevelop a prototype Transportation Management Association (TMA) in the City of Madison, at an appropriate area of the City (such as downtown Madison, the Capitol East District or UW Research Park), as a mechanism to organize individual employers and administer TDM initiatives.

vii. Develop and pilot TDM programs with the largest Madison-area employers.

viii. Evaluate potential further reductions in the zoning ordinance's minimum and maximum parking requirements based on proximity to high-frequency transit service.

ix. Evaluate employer-based TDM measures in order to increase the use of alternatives to the single-occupancy vehicle and to reduce the need for parking. Research TDM requirements in zoning ordinances across the US and recommend approaches to the ZTAST Staff Team for incorporation in our zoning code.

Improving Connectivity, Bridging Gaps and Enhancing Choice

One clear and distinct message from the Madison in Motion process is Madison should continue to be a community of choice – both in terms of mobility and lifestyle.

Policy and Best Practice Recommendations

i. Implement enhanced public transit service to Dane County Regional Airport, serving both passengers and employees.

ii. Expand availability of subsidized or market-priced 10 ride cards and transit passes to low income riders by installing transit pass vending kiosks at transfer points, public buildings and undeserved areas.

iii. Identify potential bicycle/pedestrian connections to break up existing superblocks (defined as city blocks that are larger than traditional city blocks, with limited crossing and access points). An example of this type of connectivity improvement would be a potential connection of East Campus Mall to Brittingham Park.

iv. Continue planning for improved connectivity across major transportation barriers between key destinations (such as the downtown business district and Law Park).

v. Evaluate sites for potential improved connectivity when redevelopment of larger parcels occurs. Examples include the Royster Corners development on Cottage Grove Road or the potential redevelopment of the Voit Farm parcel along Milwaukee Street.

vi. Utilizing data from Metro Transit's recent equity report, ensure transportation improvements equitably benefit low-income households, on both a system and neighborhood level.

vii. Improve connections across barriers such as the Beltline, Interstate 39/90 and other multilane, higher-speed roadways, in order to better connect surrounding neighborhoods and encourage non-auto modes. Utilize new bridges, new underpasses (public street or bicycle/pedestrian crossings) or improvements to existing street crossings to improve connectivity (see Roadway Barrier Map, page 6-11).

viii. Encourage better integration of transit and bike usage by improving bicycle storage facilities at transfer points and major stops. Consider installing bicycle parking stalls adjacent to bus stop sign poles, where possible.

Action Items (next 1-5 years)

ix. Create a planning process to evaluate a variety of "First-Mile/ Last Mile" transportation facilities and services, as a way to boost transit system use by enhancing convenience and service.

x. As an element of the Transit Development Plan process, investigate the feasibility of integrating payment systems for buses, B-cycle (or other bike-sharing services), potential future car sharing services, and city-owned parking garages, and/or other potential transportation modes.

xi. Promote car sharing by integrating facilities and services into city facilities and private development.

Improving Access to Affordable Housing, Employment and other Opportunities

Housing and transportation costs are two of the largest budget items in most households.

Policy and Best Practice Recommendations

i. Integrate affordable housing planning with transit planning, transit-oriented development planning, and Activity Center planning. Identify ways to enhance the accessibility of affordable housing by public transit services, especially for people with disabilities and other vulnerable populations (e.g. children, seniors, low-income communities).

ii. Explore ways to improve communication regarding vacancy, development, and housing trends to stakeholders (policy makers, developers, neighborhoods).

Action Items (next 1-5 years)

iii. Implement the recommendations contained in the City of Madison Biennial Housing Report, consistent with the directives of the Madison Common Council.

iv. Coordinate with the City's Community Development Division and Affordable Housing Initiative to target affordable and senior housing development in areas with high levels of existing and future planned public transit service, such as near transfer points or on major transit corridors, and in close proximity to community services and other neighborhood amenities.

v. Target major employers (especially in retail and service sectors), for participation in Metro's employee pass program, describing how it could benefit employees and business operations.

vi. Expand the availability of the low-income transit pass program to all eligible persons, coordinating closely with existing human service providers.

vii. Create development district initiatives (consistent with the City's Economic Development Strategy and Housing Strategy recommendations) to encourage affordable rental housing in areas well served by transit and in proximity to desired amenities

- Utilize financial tools to encourage development (e.g., TIF, affordable housing fund, land banking fund, etc.)
- Utilize neighborhood planning and urban design districts to achieve affordable housing objectives

Enhancing Racial Equity and Social Justice

For lower income households, a "transportation choice" becomes a "transportation essential."

Policy and Best Practice Recommendations

i. Ensure transportation improvements equitably benefit low-income households, on both a system and neighborhood level. Utilize the Racial Equity/Social Justice (RESJ) evaluation tool on Madison and Motion, as well as individual recommendations and projects contained within the Plan as recommended projects and studies are carried out.

ii. Focus new housing for transit dependent populations, including affordable and senior housing, along corridors with high levels of existing and planned transit service.

iii. Integrate affordable housing planning with transit planning, transit-oriented development planning, and Activity Center planning. Identify ways to enhance the accessibility of affordable housing by public transit services, especially for people with disabilities and other vulnerable populations (e.g. children, seniors, low-income communities).

iv. Target affordable housing development in areas with high levels of existing and future planned public transit service, such as near transfer points or on major transit corridors.

Action Items (next 1-5 years)

v. Expand the availability of the low-income transit pass program to all eligible persons, coordinating closely with existing human service providers.

vi. Make it easier to purchase 10 ride cards and transit passes for those who would use them most by installing transit pass vending kiosks at transfer points, at high-use stations, and in areas convenient to low income riders.

Transportation Enhancing Public Health and Safety

The type of transportation system we choose to build doesn't just affect our commute time, it also has direct, multi-faceted impacts on the health of citizens.

Policy and Best Practice Recommendations

i. Incorporate Health Impact Assessments (HIAs) into transportation and neighborhood planning processes, to help identify linkages between the built environment and public health.

ii. Work with WisDOT to implement the recommendations contained in the Wisconsin Strategic Highway Safety Plan (2014-2016), particularly those pertaining to improving driver alertness and reducing driver distractions.

iii. Evaluate ways to encourage more use of active transportation modes, such as walking, bicycling and public transit. Identify and address barriers to the use of these modes (see Transportation Demand Management section, page6-24)

Transportation Enhancing Economic Development

Madison has many advantages working to its

Policy and Best Practice Recommendations

i. Coordinate transportation investments with desired redevelopment and economic development outcomes. Investments in transportation should create value by fostering development and redevelopment that generates a high return (in terms of property taxes per acre), in relation to the investment of public funds in infrastructure and services.

Action Items (next 1-5 years)

ii. Implement the recommendations contained in Connect Madison (the City's Economic Development Strategy), consistent with the directives of the Madison Common Council.

iii. Organize and convene the business community to create a private sector driven coalition to research and advocate for investment in a modern urban transportation system and to help to make the economic case for investing in a modern and efficient transportation system.

iv. Develop and administer a transportation needs survey for the Madison business community. Work with partners – chambers of commerce, business associations, and other communities served by Metro – to identify specific transportation needs, with a focus on a regional transit system connecting people to jobs.

v. Create a City of Madison interdisciplinary staff team to focus on integrating emerging transportation-oriented technologies and services with regional economic development goals. Consider creating private sector partnerships in the evaluation of new transportation technologies.

vi. Explore opportunities to establish "Innovation Districts", "Development Districts", "Activity Centers" or similarly-termed planned development areas, in conjunction with the objectives and policies of Connect Madison (the City's Economic Development Strategy) and Madison in Motion.

vii. Explore opportunities to partner with Dane County, the State, and the regional business community on potential long-range airport improvements, including improving public transit access to the airport and working to make the airport a catalyst for commercial development activity.

Using Emerging Technologies to Enhance the Transportation System

Transportation technology is changing how people get around and the tools available to manage the transportation system.

Policy and Best Practice Recommendations

i. Evaluate the use of enhanced, smart traffic signals that can adjust settings in response to traffic and optimize system operation for all street users. For example, such signals can extend green lights for buses and other vehicles, respond to vehicle- and bike-embedded sensors, mitigate congestion in real-time, and enhance pedestrian crossings.

ii. Evaluate transit ITS improvements (such as GPS monitoring and real-time bus location information), to improve the transit user experience.

iii. Continue to integrate technology and information/ITS aspects into the parking system to better direct people to available parking, reduce circling, improve customer satisfaction, and proactively monitor and manage the parking system. Integrate ITS technology related to traveler information and management of transportation systems.

iv. Adopt a framework for how to respond to and facilitate consumer transportation technologies that improve vehicle safety.

v. Establish priority corridors for transportation system management improvements, such as automated traffic systems, in transit planning or for congested corridors.

vi. Monitor changing demographics and preferences around transportation and location choices to better anticipate upcoming changes in demand.

vii. Monitor how technological advances change preferences for shopping and other consumer activities over time, and how those changes affect various aspects of transportation infrastructure and the built environment – such as delivery/drop off needs and impacts on traffic, parking, bicycle and pedestrian mobility, etc.

viii. Continue to use improved sensors, connectivity, and data management tools to enhance transportation, transit, and parking system performance.

ix. Continue to monitor the development of ITS initiatives and trials, such as Infrastructure to Vehicle technology, for its potential for real-time management and safety improvements.

Action Items (next 1-5 years, 6-10 years and beyond)

x. Implement the recommendations of the Regional Intelligent

Transportation Systems (ITS) Plan for the Madison Metropolitan Area (January 2016). Recommendations of the ITS Plan will be incorporated into the Madison in Motion. However, with the rapid evolution of new transportation technologies, especially with the recent advances in autonomous vehicles, connected vehicles and electric vehicles, it is in the City's best interest to indentify and implement pilot projects on these new technologies when possible, to better position the City to make use of next-generation transportation systems and to promote mobility, public health and safety, economic growth, equity, and a clean environment.

xi. Implement wifi on all Metro buses.

xii. Establish a framework for incorporating and managing real time information regarding transportation options, such as transit, parking, taxi, rideshare, and traffic data.

xiii. Develop policies and ordinances to obtain data and information from newly developing sources, such as Transportation Network Companies (TNCs), to aid in City evaluation of transit services, traffic flow, and peak demand times.

xiv. Create a City of Madison interdisciplinary staff team to focus on integrating emerging transportation technologies and services with regional economic development goals. Consider creating private sector partnerships in the evaluation of new transportation technologies.

xv. Work with the MPO and state of Wisconsin to enhance vanpool/carpool technologies to better match riders with rides.

xvi. Review the impact of technology changes, such as autonomous vehicles, on municipal revenue sources - parking fees, garage revenue, tow fees, etc.

xvii. Evaluate necessary changes to City parking infrastructure to better serve electric vehicles.

xviii. Evaluate the impact autonomous vehicles and Transportation Network Companies will have on provision of parking as the technology continues to progress. For example:

- Should parking garages be designed to allow for conversion to other uses in case autonomous vehicles and TNCs reduce parking demand?
- Do on-street parking areas need to be redesigned to allow for additional pick-up/drop-off areas for TNCs and autonomous vehicles?

xix. Develop and adopt a framework to analyze technology-based transportation innovations as new technology continues to develop. The framework should encourage innovation, respect consumer choice, maximize public benefit, and support other policies and best practices established in this plan. For example, framework criteria could include whether or not the technology:

- Enhances accessibility, especially for people with disabilities and other vulnerable populations (e.g. children, seniors, low-income communities);
- Improves public safety and personal security;
- Enhances transit system seamlessness and improves customer experiences;
- Allows for the City to enhance transportation/transit benefits and manage/mitigate negative impacts;
- Has a positive impact on active transportation and creating/maintaining a healthy community;
- Creates additional auto trips and congestion; and,
- Improves peoples' quality of life.

Work with Regional Partners to Create a Seamless Regional Transportation System

Transit will be a vital component to the transportation system and allow Madison's growth and economic vitality to continue.

Action Items (next 1-5 years)

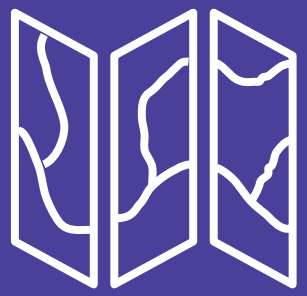
i. Create a process that evaluates opportunities to institute a new regional transportation or transit governance entity, as a mechanism to finance and manage public transit services in the Madison metropolitan area and Dane County.

ii. Study possible transit funding sources for feasibility and effectiveness including: user fees such as fuel taxes or vehicle miles traveled charges; public financing mechanisms such as sales taxes or bond measures; private sector financing programs such as developer fees or assessment districts; city infrastructure fees, or public-private partnerships.

Action Items (next 6-10 years)

iii. Working with Dane County communities, explore ways to evaluate current State of Wisconsin laws and regulations pertaining to the use of development impact fees. Identify ways to expand the variety of capital and operating expenditures that are impact-fee eligible, in order to more effectively address the unique transportation impacts created by development projects in different urban contexts.

Relationships to non-City Plans and Related Planning Activities



Trips don't stop at municipal borders.

Policy and Best Practice Recommendations

i. Ensure that City of Madison elected officials, policy makers and agency staff are active participants on policy and technical advisory committees of multi-agency transportation planning and project development processes that affect the City.

Action Items (next 1-5 years)

ii. Update and implement the City of Madison Comprehensive Plan Transportation Goals, Objectives and Policies though the implementation of a variety of state, regional and local planning, project development and implementation processes.

iii. Implement the transportation system recommendations contained in the Madison Area Transportation Planning Board (MPO) long-range regional land use and transportation plan.

iv. The City of Madison should remain a strong partner in the planning, design and implementation of all WisDOT arterial roadway facilities in the region, including the Beltline, Interstate 39/90, USH 51 Stoughton Road highway corridors and other state highways.

Measuring and Monitoring Transportation System Performance

Action Items (next 1-5 years, 6-10 years and beyond)

i. The City of Madison should work with local and regional partners (including the Madison Area Transportation Planning Board, Wisconsin Department of Transportation and other area jurisdictions) to develop and maintain a transportation system performance measurement and monitoring program, to monitor transportation mode share changes over time. The performance measurement program should establish a base year 2016 dataset, utilizing the National Household Transportation Survey (NHTS) and providing necessary resources to increase the sample size (to ensure statistical validity) and to also allow for geographic targeting of data collection within certain locations of the City (to ensure that economically disadvantaged or other potentially underserved populations are reached). The City should also enhance its current data collection program to collect transportation system user volumes at specific locations throughout the City, including motor vehicle counts, transit user counts, as well as bicycle and pedestrian counts, and monitor changes over time. In addition, the City should continue to develop and refine new performance measures over time (as well as consider evolving measures), as new data sources and data collection techniques become available and reliable. Special emphasis should be given to performance measures that are specifically tailored to individual transportation modes, demographic groups and geographic locations in the City.

ii. The City of Madison should coordinate with and assist the Madison Area Transportation Planning Board, as appropriate, as it develops and monitors the transportation system performance measures at the regional level.

PROJECT AND POLICY IMPLEMENTATION

7

Implementation of Recommendations

Recommendations contained in the Madison in Motion Plan encompass a wide range of recommendation categories.

- Policy & Mission Statements
- System Visions (Maps of Routes and Networks)
- Facility Design Best Practices/Innovative Service Delivery
- Reference to Standing Planning Processes
- Follow-Up Planning and Refinement
- Implementation Actions/Specific Projects

These recommendations are implemented in a variety of ways – through ongoing detailed planning and development processes, established transportation management programs and other transportation implementation mechanisms. As such, many of the Plan's recommendations will require the initiation of more detailed planning and/or project development processes – either stand-alone planning processes or as part of these established programs.

Policies and best practices recommendations contained in Madison in Motion will help guide the implementation of specific transportation projects, and the maps and route networks are intended to help inform where specific facilities and services should be targeted. Madison in Motion's Mission Statement and other Plan objectives and policies can be found in Chapter 3.

ESTABLISHED PLANNING AND PROJECT DEVELOPMENT PROCESSES

In terms of the established planning process, many are administered by the City of Madison. However, some planning and project development processes that affect the City are managed by other local, regional or state agencies and entities.

Some examples of how various transportation facilities and services in the City of Madison are implemented, and their respective planning and project development processes include:

- Design and development of local streets in new neighborhoods as part of the City's Neighborhood Development Planning (NDP) processes.

- Implementation of transit system improvements – including a route addition or modification, installation of a new bus shelter or construction of a new park-and-ride facility – through Metro Transit's 5-year plan, the Transit Development Plan (TDP).
- Evaluation, prioritization and implementation of traffic calming measures through the City of Madison Traffic Engineering Division's Neighborhood Traffic Management Program (NTMP).
- The planning and project development of new high-capacity transit service in Madison and other Dane County communities, including new express bus service, Bus Rapid Transit service, and improvements to the local bus system.

The City of Madison recognizes the importance of these established processes as a mechanism for implementing the City's vision. It is critically important that the City's transportation system goals, objectives and policies are integrated into these ongoing planning and project development processes. It is also important that all affected parties and interests, stakeholders, neighborhood representatives, elected officials and other City policy makers are highly involved in these planning and implementation processes. The City of Madison consistently strives to ensure full public and stakeholder participation in its planning/development processes and transportation implementation programs, and the City urges other regional and state entities to ensure appropriate Madison involvement.

Pipeline Projects

This section outlines projects that are included in the 2016-2021 Transportation Improvement Plan (TIP) for roadways, bicycle and pedestrian facilities. Projects represented here are those that are most likely to be constructed or funding within this time period. Each project will be required to undergo a design phase to finalize the details of what will be included in future road work, and as such, project details are currently limited. Projects that are not scheduled to be completed by 2021 are not included in this section, as they are generally dependent on development of adjacent land, larger reconstruction projects, or acquisition of right of way or easements

Specific 1-5 year priority budget recommendations are outlined in detail in the Matrix in Appendix A.

BICYCLE AND PEDESTRIAN FACILITY PROJECTS

Figure 23below provides a list of off-street, shared use paths, considered premium bicycle facilities that attract the greatest use from the widest range of users, planned for development in the near future.

Figure 23 Bicycle and Pedestrian TIP Projects

PROJECT NAME	CONSTRUCTION YEAR	LENGTH (MILES)	DESCRIPTION
Capital City Trail	2016, 2017	1.7	Construction of new segments of the Capital City Trail will extend the popular bike route from its current limits at Cottage Grove Rd and Hwy 51 to east of I-39/90. In subsequent years, the trail is planned to connect to the Glacial Drumlin Trail, connecting Madison to Cottage Grove.
Good Neighbor Trail	2021	1.4	The Good Neighbor Trail is planned to connect central Madison to west side neighborhoods and Middleton. Following the rail corridor from approximately Old Middleton Rd and Eau Claire Ave, the City will construct the trail to the city limits.
Goodman Trail	2021-2023	3.6	Construction of the Goodman path will connect near east side locations including Eastown, the Northeast neighborhood and Sun Prairie. This construction phase will extend the path from Hwy 30 to east of the interstate to Nelson Rd near the entrance to the American Center.
Huxley Cutoff	2020	0.3	The Huxley Cutoff will continue an on-street route from the Sherman neighborhood as an off-street path by the Oscar Meyer site to Commercial Ave. It will also improve bike access to the North Transfer Point from the south.
Ridgewood Path	2021	0.8	The Ridgewood path will begin at Ziegler Rd traveling north through Sycamore Park before paralleling the rail corridor and joining the Goodman Path.
Ice Age Junction	2016, 2017	1.6	This path travels parallel to S. Pleasant View Rd, connecting westside neighborhoods with Verona and the Ice Age Trail. This segment spans Midtown Rd, with a bridge over McKee Rd scheduled for 2017.
Pleasant View Path	2022	1.5	Also paralleling Pleasant View Rd, this path will extend from Mineral Point Rd north to Blackhawk Rd, improving connections to Old Sauk Trails and destinations on Greenway Boulevard.
West Beltline Path	2016-2018	1.4	The segment of the West Beltline Path planned for construction extends from Junction Rd west of the Beltline to the existing trail segments which begin at Grand Canyon. Included in this phase is also an underpass of Gammon Rd, where multiple lanes and highway ramps pose a challenge to bikes and pedestrians. Subsequent extensions will allow the path to connect with the Southwest Path to travel into central Madison.
Junction Ridge Overpass	2019	n/a	The overpass will improve connectivity between Junction Rd destinations and the neighborhood surrounding High Point Rd with the bridge located at Sauk Creek Park.
Menomonie Lane Bridge	2019	n/a	The bike and pedestrian bridge will directly connect the Menomonie Ln neighborhood to the Cherokee Conservation Park, crossing a waterway that connects to the Yahara River.

PEDESTRIAN STREET PROJECTS

The term complete street generally applies to most major street projects, as they generally included dedicated bike and pedestrian infrastructure when they are reconstructed. The following streets, however, have land uses and characters which foster activity and vibrancy. Most have dedicated bike facilities but when space constraints prevents them, alternatives such as off street paths or bike boulevards are often present.

Figure 24 Pedestrian Improvement Projects

PROJECT NAME	CONSTRUCTION YEAR	LENGTH (MILES)	DESCRIPTION
Atwood Ave	2017, 2021	1.1	Atwood Ave is scheduled for two construction projects in the coming years. The first is a partial reconstruction and pavement replacement of the Schenk's Corner intersection in 2017. The latter is a reconstruction of Atwood from Fair Oaks to Cottage Grove Rd. Several Metro routes use the heavily traveled Atwood corridor that has one outbound and two inbound lanes east of Fair Oaks Ave. Both construction areas lack bike facilities, though most bike traffic is handled on the nearby Capital City Trail. There is a desire to incorporate on-street facilities, but space constraints pose a challenge.
Capitol Square	2016	0.6	The concrete pavement on the Capitol Square will be replaced, along with needed utility upgrade. No significant design changes will occur to the streets which have heavy bike, pedestrian and transit usage.
Outer Loop	2017	0.1	The next segment of the outer loop to be constructed is from Martin Luther King Jr Blvd to Webster. Currently it street is 2 lanes with parking removed at peak hour to add a third lane. It's likely the bike lanes will be reconfigured to shift when parking is removed, as has been done with other outer loop segments.
Martin Luther King Jr. Blvd	2017	0.2	The street connecting the Capitol and Monona Terrace is scheduled for reconstruction in 2017. The street hosts many users, with very high level of pedestrians and cyclist. It's regularly closed for events including farmers markets and concerts. Its current design utilizes innovates features included a raised pedestrian midblock crossing between the City County Building and the Madison Municipal Building. It is not anticipated the road will change form significantly.
Johnson Street (Baldwin to First St)	2019	0.5	The next phase in the Johnson Street reconstruction is the segment between Baldwin and First. Bike facilities in this area are lacking, and traffic counts over 30,000 make this a challenging section, surrounded by well used on and off street facilities.

PROJECT NAME	CONSTRUCTION YEAR	LENGTH (MILES)	DESCRIPTION
Monroe St (Odana to Regent)	2017	1.7	This 66' main street corridor currently is a two lane road with parking that transition to a travel lane during peak hours, carrying between 15 and 20,000 cars per day. There are no bike facilities on the street, but most bike traffic is carried on the nearby Southwest Path. From Regent to Leonard, Monroe St will be reconstructed, and the remainder will be repaved. At this time, there is no specific design planned as there is an on-going neighborhood involved design process. Given space constraints, it is unlikely the future configuration will function much different from the current design.
Regent St (Mills to Park)	2018	0.2	With high pedestrian and traffic volumes and a narrow width, this 4 lane undivided roadway has constrained design options when it is reconstructed in 2018. Pedestrian crossing can be difficult on Regent so particular attention may be paid creating gaps in traffic, maintaining a signed traffic speed and narrowing the corridor to the extent possible.
West Washington (Beford to Regent)	2016	0.2	Concrete replacement is schedule for a small section of West Washington where the Southwest Path intersects the corridor. Minor design changes are expected.
Williamson/ Wilson (Blount to Franklin)	2018	0.2	Complimentary to the Blair St reconstruction, Williamson/Wilson will be reconstructed along with intersection improvements aimed to improve bike and pedestrian usability and traffic flows at one of the most heavily used gateways to the downtown core. The intersection brings together US 151 (Blair, John Nolen) and the Wilson/Williamson corridor, along with the Capital City Trail and a rail corridor, while being a major entrance to Law Park.
Park Street	2019, 2020	1.8	Several construction projects are planned in the coming years for the major transit corridor with traffic counts over 40,000 in some segments. In 2019, the stretch between Olin and the rail corridor south of Wingra Creek is scheduled for reconstruction. Currently the corridor has wide curbside lanes that can accommodate cyclist but no striped or dedicated facility; it is likely a dedicated facility will be added as part of the reconstruction. Park Street is also one of the corridors that the planned Bus Rapid Transit line will use, so the future design may reflect specialized transit features. Other segments of Park St are scheduled for concrete repair and replacement in 2019 and 2020.

COMPLETE ARTERIAL PROJECTS

Complete Arterials carry high volumes of traffic while supporting other modes including walking and biking. Many complete arterial project improve formerly rural roads to current standards that improves safety for increased traffic volumes, creates facilities for bikes and pedestrians and are designed to support transit in the future.

Figure 25 Complete Arterial Projects

PROJECT NAME	CONSTRUCTION YEAR	LENGTH (MILES)	DESCRIPTION
Anderson St (Wright St to Stoughton Rd)	2016	0.3	The four lane arterial serves Madison College and links the east and west sides of the airport. It carries an average of 16,000 cars per day through that segment and is used by Metro Route 20. It currently has no dedicated bike facilities but they are scheduled to be added, as well as a missing sidewalk section, as part of the reconstruction.
Blair St (Johnson to John Nolen)	2019, 2020	0.5	Blair Street south of East Washington is scheduled for pavement replacement in 2019, and between East Washington and Johnson St in 2020. South of East Washington, Blair Street is also US HWY 151 and carries 22,000 cars per day in a narrow 66'. Currently there are no transit or bike facilities. North of East Washington, Blair is one way with lower volumes.
Buckeye Rd (Monona to HWY 51)	2018	0.8	The Buckeye Rd reconstruction will correct several issues with the roadway, including lack of curb and gutter, add dedicated bike facilities and add missing segments of sidewalk. West of HWY 51, Buckeye carries around 5,000 cars per day and is served by Metro Routes 16, 37 and 38.
Cottage Grove Road (I-90 to Sprecher Rd)	2018	1	Currently Cottage Grove Road has a variety of characters, from 2-3 lanes with and without bike facilities. Reconstruction is planned to result in a divided four lane road with bike lanes or other appropriate facility. Cottage Grove is planned to be a major east west corridor supporting anticipated growth in the Sprecher and Cottage Grove Neighborhood Development Areas.
County Highway M	2016	2.7	CTH M has two project zones, at Midtown Rd and CTH PD. Like Cottage Grove Road, this reconstruction project expands a formerly rural road to provide capacity for surrounding development. The arterial is planned to be reconstructed as a 4 lane divided road with on- and off-street bicycle facilities.
Gammon Rd (Mineral Point to Beltline)	2017	0.4	This section of Gammon Road is heavily travelled, with traffic volumes from 25,000 to 35,000 accessing Beltline, Westtowne and surrounding retail development. There are only limited bike facilities currently, with a bus bike and right turn lane on the east side of the street only. Planning documents suggest the addition of on-street bike facilities when the street is reconstructed.
High Point Road Bridge	2016	0.2	The High Point Road Bridge over the beltline is planned to be reconstructed to 4 lanes, with bike lanes and improved pedestrian facilities compared to the current structure. Currently the bridge is a pinch point on High Point, with a 2 lane bridge with 4 lane road segments on both sides.

PROJECT NAME	CONSTRUCTION YEAR	LENGTH (MILES)	DESCRIPTION
Hoepker Road	2020	0.2	The existing 2 lane rural road is planned to be expanded to a 4 lane divided road with bike facilities and sidewalks. Future but not scheduled improvements include expanding the bridge and sections east of the interstate to a similar cross section. These changes will help support growth of the mixed use neighborhood as planned in the Pumpkin Hollow NDP.
Maple Grove Rd (Mckee to East Pass)	2018	0.1	This project will construct median and establish the southbound lanes on this neighborhood arterial in a more consistent way compared to its current state.
Mckee Rd	2017, 2018	2.8	McKee Road has to zones of construction, with the area between Muir Field Rd and CTH M being reconstructed in 2017 and from CTH M to Nine Mound Rd in 2018. This road is predominately a 2 lane rural road supporting significant traffic volumes that are expected to increase as more development occurs in the area. A four lane divided arterial with improved pedestrian and bike facilities is planned for reconstruction.
McKenna Blvd. (Gammon to Hammersley)	2016	0.4	McKenna is currently a four lane non-divided arterial carrying nearly 20,000 cars per day. This particular segment seperates the Park Ridge Neighborhood from Elver Park, creating difficulty for neighborhood residents to reach the park. The planned design will divide the roadway, adding pedestrian refuges and making crossing easier. Bike lanes will also be included in the new design.
Mineral Point Rd	2020, 2021	1	Mineral Point Road has two segments scheduled for work in the lifetime of the current TIP. Between the Beltline and High Point Rd, Mineral Point carries nearly 30,000 cars per day on a four lane divided roadway with on-street bike lanes. The pavement replacement is schedule for 2020 and should not significantly change the road design. In 2021, the segment between South Point and Pleasant View is scheduled to be reconstructed. It's currently a two lane rural road and is planned as a four lane divided arterial with bike and pedestrian facilities.
Pleasant View (Mineral Point to US 14)	2022	2.65	Currently a mix of 2 lane rural and 4 lane divided with bike facilities, the corridors is scheduled for reconstruction to accommodate greenfield growth on the west side.
Sprecher Rd	2020, 2021	1.7	Sprecher Rd has two project areas, one between Milwaukee St and CTH T. In this segment, the road under I-94 and north will be converted from a rural road to a 4 lane divided road with on-street bike lanes and sidewalks, matching the section south of the interstate. Between Sharpsburg and Buckeye, Sprecher is planned to be realigned east of its current location, with a 4 lane divided roadway with bike lanes and sidewalks. This will also improve the safety of the intersection with Buckeye.
University Ave (Campus Dr to Shorewood Blvd)	2022	0.7	One of the busiest surface streets in Madison, this segment is served by 12 Metro bus routes and has traffic counts near 55,000. There are no on-street lanes but a bike route travels on and off street just to the north. The roadway's concrete is scheduled for reconstruction in 2022.

BRIDGING GAPS

The projects in Figure 26 establish new connections, improving access to existing neighborhoods.

Figure 26 Gap Bridging Projects

PROJECT NAME	CONSTRUCTION YEAR	LENGTH (MILES)	DESCRIPTION
Darbo Webb Connection	2016	0.1	This project will create a new street connection between Darbo Dr at Clyde Gallagher Ave to Webb Ave. This will provide more direct access to the Department of Corrections office building and reduce traffic on neighborhood streets.
Jeffey Trail (Raymond Rd Connection)	2016	0.2	This project will establish a long-planned but not constructed link between Jeffey Trail and nearby Raymond Road. This will improve connectivity on the local road network and provide quicker access for emergency services.
Royster Clark	2016	0.3	As part of the Royster Clark site redevelopment, new local streets will be constructed to support new uses and improve the connectivity of the development with the surrounding neighborhood.

TRANSIT

Metro has several actions that will need to be studied more in depth before they can be undertaken as projects to meet growing demand for transit service. Below are items that should be or continue to be studied to speed implementation in collaboration between Madison and Metro:

- Bus Rapid Transit
- Route Analysis and Possible Restructure
- Metro Facility Expansion
- Park and Ride Study
- Pursue a regional funding mechanism
- Express bus to outlying areas

Funding Mechanisms

BICYCLE FACILITY ENHANCEMENT FUNDS

During the 2016-2021 time frame, funds will be made available annually to enhance existing bicycle facilities. Below are two funding mechanisms and the types of enhancements eligible for those funds.

Bikeways and Improvements Fund:

This fund focuses on maintenance and minor improvements to existing bikeways, predominately off-street paths.

Pedestrian and Bike Infrastructure Enhancement Fund

A general fund for bike and pedestrian improvements. Examples of projects include:

- Diagonal crossing of street intersections for off-street paths to simplify use
- Signal and traffic control improvements, such as bike specific signals, dedicated signal phases and giving off-street paths right of way priority over low-volume streets.
- Green lanes and bike boxes to improve visibility of bike facilities at key locations
- Wayfinding signage

STREET ENHANCEMENT FUNDS

The following funds are annual expenditure items intended to be utilized to calm traffic to context appropriate speeds and improve the environment of the street for pedestrians.

Neighborhood Traffic Management

This program is used for traffic calming measures on local and neighborhood streets. Traffic circles and speed tables are features commonly installed through this program.

- Traffic circles are small (8-12' in diameter), raised and roll-curbed islands in the middle of controlled intersections. Smaller than a roundabout, they are just large enough to cause deviation from straight line travel, forcing the driver to slow when approaching and avoiding it. They are generally landscaped and are not intended as pedestrian refuges. These are often used on neighborhood collector streets to manage traffic speed.
- Speed tables or speed humps are elevated sections of roads, with ramps raising the road surface 3-4 inches over the surrounding area. They are effective at reducing speed in midblock sections by providing a noticeable, but not jarring, bump to the driver. In Madison, speed humps are most commonly used on bike boulevards and residential streets with transit lines.

Pedestrian Improvements on Arterials

As the name implies, the fund is intended to make the pedestrian environment on major streets more appealing and easier to use. Curb extension, crossing striping and/or treatments, refuge islands and midblock crossings are examples of improvements installed as a result of this fund.

- Curb extensions, or bump outs as they are also called, extend the sidewalk into the parking lane to narrow the corridor to the approximate width of the drive lanes. Tightening the corridor helps control speeds while shortening crossing distance for pedestrians. They are most often used at intersections but can be added midblock.
- The marking of crosswalks can greatly impact their visibility and help drivers be more aware of areas where pedestrian crossings are frequent. Continental striping uses wide stripes parallel to the direction of vehicle travel to improve visibility over standard striping. Crossings with very high pedestrian use can be treated with a solid red color to further mark the changes, such as we done at select intersections on the Johnson St reconstruction.

- Refuge islands are small islands located in the middle of pedestrian crossings that provide safer space to wait while traffic clears. These can be especially helpful for users who travel at slower speeds, such as the elderly, who may not be able to cross the intersection in one phase.
- Midblock crossings provide a dedicated location for pedestrian crossing where high demand for crossing exists. Often used with curb extensions, these facilities improve the ease and safety of crossing.
- Signal installation or upgrades can improve ease of use for pedestrians on busier streets. Countdown timers inform pedestrians the time left in the signal phase, helping them to understand if crossing is safe. Rectangular rapid flashing beacons (RRFBs) are pedestrian activated signals that inform drivers of a user's intent to cross.

Sidewalks

The City has three funds which deal with sidewalk installation and maintenance. The sidewalk program is the largest and managed by Engineering. Safe Routes and Safe Routes to School funds are managed by traffic engineering and prioritize sidewalk installation around schools and other higher need areas.

ONGOING MAINTENANCE, REPAIR AND RECONSTRUCTION FUNDS

The following Funds are annual expenditures found in the TIP focused on maintaining and extending the life of, and eventually rebuilding, Madison's streets.

Local Street Reconstruction

Most neighborhood street reconstructions are funded though this annual expenditure. Reconstruction of local streets often involves upgrading and expanding utilities beneath the roads.

Rural to Urban Conversion

Rural to urban conversion involves reconstruction of neighborhood streets that lack curb, gutter, sidewalks and other features found in Madison's street standards. Most of these streets were built in areas of towns that were later annexed into the city.

Bridge Repair and Replacement

Funds various repairs and upkeep of bridges owned by the City.

Pavement Management

Curb Repair and Resurfacing: The City's pavement management is focused on extending the life of existing roads through surface reconditioning and repairs. Chip sealing, which can extend road life by 30 years or more before subsequent reconstruction is required, is one of the activities undertaken through this fund. Curb repair often takes place when a street is resurfaced.

Railroad Crossings

This annual expenditure funds Quiet Zone improvement and repairs and maintains rail crossings.