

# **Bicycle Transportation Plan**

**for the  
Madison Metropolitan Area  
and Dane County  
2015**

Prepared by Staff of the Madison Area Transportation Planning Board  
A Metropolitan Planning Organization (MPO)  
With assistance from Staff of other Agencies



# **Bicycle Transportation Plan**

**for the**  
**Madison Metropolitan Area and Dane County**

## **2015**

Madison Area Transportation Planning Board (a Metropolitan Planning Organization)



*Prepared by Staff to the*

Madison Area Transportation Planning Board  
121. S. Pinckney St., Suite 400  
Madison, WI 53703

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*The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation. Information in this report is subject to change based on the final disposition of the federal transportation reauthorization bill Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21).*

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## **Resolution TPB No. 107**

### **Adopting the Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County**

**WHEREAS**, in 2000 the Madison Area Metropolitan Planning Organization, City of Madison, Dane County, and Dane County Regional Planning Commission all adopted the *Bicycle Transportation Plan for the Madison Urban Area and Dane County*, which has served as a guide for continued planning, development, and maintenance of bicycle facilities and implementation of bicycle safety education, encouragement, and enforcement programs; and

**WHEREAS**, the Moving Ahead for Progress in the 21st Century Act (MAP 21), the current federal surface transportation program authorization legislation, requires Metropolitan Planning Organizations (MPOs) to include bicycle and pedestrian components in their long-range regional transportation plans; and

**WHEREAS**, the Madison Area Transportation Planning Board (MATPB) – An MPO has adopted the *2035 Regional Transportation Plan Update for the Madison Metropolitan Area & Dane County*, which provides the overall framework for transportation planning and multi-modal transportation facility and service investments in the region and which includes a bicycle system element; and

**WHEREAS**, the *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County* (2015) has been prepared as an update of the 2000 *Bicycle Transportation Plan for the Madison Urban Area and Dane County* and as a refinement of the bicycle component of the *2035 Regional Transportation Plan Update*; and

**WHEREAS**, the *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County* was prepared with input from a technical advisory committee consisting of staff from City of Madison, Dane County, other urban area communities, UW-Madison, and the Wisconsin Department of Transportation (WisDOT), as well as a policy advisory committee consisting of local officials and members of the bicycling community; and

**WHEREAS**, planning work for the *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County* (2015) was performed in conjunction with *Madison in Motion*, the City of Madison's Sustainable Transportation Master plan, and other ongoing planning studies and builds upon other local bicycle facility planning efforts; and

**WHEREAS**, public comments were solicited through a page on the Madison Area Transportation Planning Board's website, public information meetings in Sun Prairie and Middleton, joint input sessions with *Madison in Motion*, and other events in Madison and Fitchburg; and

**WHEREAS**, a public hearing on the bicycle transportation plan was held on August 5, 2015 before the MATPB; and

**WHEREAS**, the plan is intended to provide a policy framework and facilities and program planning guide for the City of Madison and other local communities, Dane County, WisDOT, and other agencies and commissions in developing and maintaining a safe, convenient, and enjoyable bicycle network that is accessible and comfortable for individuals of all ages, races, backgrounds, and abilities and that links neighborhoods and communities with jobs, services, schools, shops, and parks; and

**WHEREAS**, the plan is also intended to educate citizens and policy makers on bicycle transportation and the needs of bicyclists; and

**WHEREAS**, the plan contains seven groups of strategies and specific recommendations to obtain this vision covering education, encouragement, enforcement, engineering, envisioning (planning), evaluation, and end-of-trip facilities/multi-modal connections; and

**WHEREAS**, the plan also includes a recommended future bikeway network functional classification system of routes, a detailed bicycle facilities plan, and a prioritized set of regional off-street paths:

**NOW, THEREFORE BE IT RESOLVED** that the Draft *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County* (2015), with the changes listed in the attached Addition/Revision Sheet, dated September 2, 2015 recommended as a result of the public review process, be adopted as a supplement to the *2035 Regional Transportation Plan Update*, the MPO's current long-range multi-modal regional transportation plan to be used as a guide for bicycle facility and program planning and development; and

**BE IT FURTHER RESOLVED** that the MATPB hereby endorses the plan's bicycle facility recommendations and recommended actions for making the Madison area and Dane County even better places to bicycle, contributing to the health of quality of life of the region's residents.

09/02/2015  
Date Adopted

  
Al Matano, Chair



## Legislation Details (With Text)

<b>File #:</b>	39314	<b>Version:</b>	1	<b>Name:</b>	Adopting the Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County
<b>Type:</b>	Resolution	<b>Status:</b>		<b>Status:</b>	Passed
<b>File created:</b>	7/14/2015	<b>In control:</b>		<b>In control:</b>	PEDESTRIAN/BICYCLE/MOTOR VEHICLE COMMISSION
<b>On agenda:</b>	9/15/2015	<b>Final action:</b>		<b>Final action:</b>	9/15/2015
<b>Enactment date:</b>		<b>Enactment #:</b>		<b>Enactment #:</b>	RES-15-00773
<b>Title:</b>	Adopting the Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County, as a supplement to the City's Comprehensive Plan, including the relevant recommendations and proposed bicycle facility improvements contained within the plan.				
<b>Sponsors:</b>	Mark Clear				
<b>Indexes:</b>					
<b>Code sections:</b>					
<b>Attachments:</b>	1. Draft-MPO-Bike-Plan-2015.pdf, 2. revision-addition-sheet.pdf				

Date	Ver.	Action By	Action	Result
9/15/2015	1	COMMON COUNCIL		
8/27/2015	1	LONG RANGE TRANSPORTATION PLANNING COMMITTEE		
7/28/2015	1	PEDESTRIAN/BICYCLE/MOTOR VEHICLE COMMISSION	RECOMMEND TO COUNCIL WITH THE FOLLOWING RECOMMENDATIONS - REPORT OF OFFICER	Pass
7/21/2015	1	PEDESTRIAN/BICYCLE/MOTOR VEHICLE COMMISSION	Referred	
7/21/2015	1	COMMON COUNCIL	Refer	Pass
7/14/2015	1	Department of Planning and Community and Economic Development	Referred for Introduction	

While adoption of this resolution does not represent a commitment to funding, it does identify a series of public actions that will require expenditures to be authorized by subsequent Common Council actions.

Adopting the Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County, as a supplement to the City's Comprehensive Plan, including the relevant recommendations and proposed bicycle facility improvements contained within the plan.

WHEREAS, in 2000 the City of Madison and the Madison Area Metropolitan Planning Organization adopted a *Bicycle Transportation Plan for the Madison Urban Area and Dane County*, which has served as a guide for continued planning, development, and maintenance of bicycle facilities and implementation of bicycle safety education, encouragement, and enforcement programs; and

WHEREAS, the *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County* was prepared by Madison Area Metropolitan Planning Organization (Madison Area MPO) staff as an update of the 2000 Bicycle Transportation Plan and a refinement of the Bicycle Element of the adopted Vision 2020 *Dane County Land Use & Transportation Plan*, which provides the overall policy framework for development and multi-modal transportation improvements within the Dane County region; and

WHEREAS, since 2000, the number of Madison residents commuting by bike has nearly doubled; and

WHEREAS, cycling provides significant health, economic, environmental and equity benefits to the City and its residents; and

WHEREAS, Madison has achieved League of American Bicyclists Bike Friendly Cities Gold status, and has set a goal of the Platinum designation; and

WHEREAS, one of the goals of the City's Pedestrian-Bicycle-Motor Vehicle Commission (PBMVC) has been to update and revise the 2000 Bicycle Transportation Plan; and

WHEREAS, MAP-21 - Moving Ahead for Progress in the 21st Century Act requires Metropolitan Planning Organizations (MPOs) to include bicycle and pedestrian components in their regional transportation plans; and

WHEREAS, the plan has been prepared with further input from City of Madison, other local community, and Dane County staff, commissions, and citizens; and

WHEREAS, public comments were solicited through wide distribution of information on the draft plan to interested parties, posting the draft plan on the City's Web page, presentations, a public meeting, and a public hearing before the MPO; and

WHEREAS, the plan is intended to provide a policy framework and facilities and program planning guide to City of Madison and other Dane County communities, agencies, and commissions in developing and maintaining a continuous bicycle transportation system that provides safe, convenient, and enjoyable access and mobility throughout the Madison urban area and Dane County; and

WHEREAS, the plan is also intended to educate citizens and policy makers on bicycle transportation and the needs of bicyclists;

NOW, THEREFORE BE IT RESOLVED that the *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County*, including the changes recommended as a result of the public review process, be adopted as a supplement to the City of Madison Comprehensive Plan, to be used as a guide for bicycle facility and program planning and development; and

BE IT FURTHER RESOLVED that the Common Council hereby endorses the plan's bicycle facility recommendations and the attached recommended actions for making the Madison area and Dane County even better places to bicycle through a comprehensive program of engineering (i.e., bicycle facility improvements and maintenance), education, encouragement, and enforcement; and

BE IT FINALLY RESOLVED that the appropriate City of Madison departments, divisions, commissions, and committees are hereby directed to incorporate in their respective future work programs those activities identified in the attached recommendations for which they are responsible.

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# Chapter 1

## Introduction



## A. Introduction

Bicycling is an important mode of transportation and recreational activity in the Madison area, within smaller communities, and in rural areas of Dane County. It is efficient and convenient, as well as environmentally friendly and accessible to people of most ages and incomes. A bike provides a high degree of independence, flexibility, and mobility.

Dane County has over 500 miles of shared-use paths which are popular for a variety of trip purposes including commutes, general purpose trips, and recreational rides. Local streets, rural town roads, and many county highways provide excellent routes for bicycling. Several major state bicycle trails traverse Dane County, as will the proposed U.S. Bicycle Route 30. The Capital City Trail runs from northwest Fitchburg to east Madison, the Southwest Path connects the UW campus and southwest side, the Highway 12 path runs between Middleton and Sauk City, and the new Cannonball Path serves Fitchburg and south Madison. Several of these paths converge in southwest Madison and northwest Fitchburg at a “bicycle interchange.”



Madison was extensively served by several railroad companies between the late 1800s and mid 1900s. Through various consolidations and abandonments, as well as parallel construction, these transportation corridors were preserved and continue to serve a major transportation function. See **Figure 1-1**.

Communities in Dane County have made significant progress in incorporating bicycle facilities into existing and planned urban thoroughfares. Bike lanes are ubiquitous on many collector and arterial streets. Modern and innovative designs have been deployed in challenging corridors, particularly in central Madison. Rural roads in Dane County are likely to be paved, and many have low traffic volumes making them excellent for bicycling. In addition many higher volume rural roads have paved shoulders that are wide enough to accommodate bicyclists.



The increase in bicycling facilities, combined with education and encouragement initiatives, has resulted in many more people bicycling for work, recreation, and other purposes. The number of commuters who traveled to work by bicycle in Dane County has almost doubled since 2000, according to U.S. Census Bureau data, increasing to 5.6% of workers living in the City of Madison and 3.1% of workers living in Dane County. Bicycle traffic counts on Madison-area shared-use paths show a similar level of increase in bicycling.

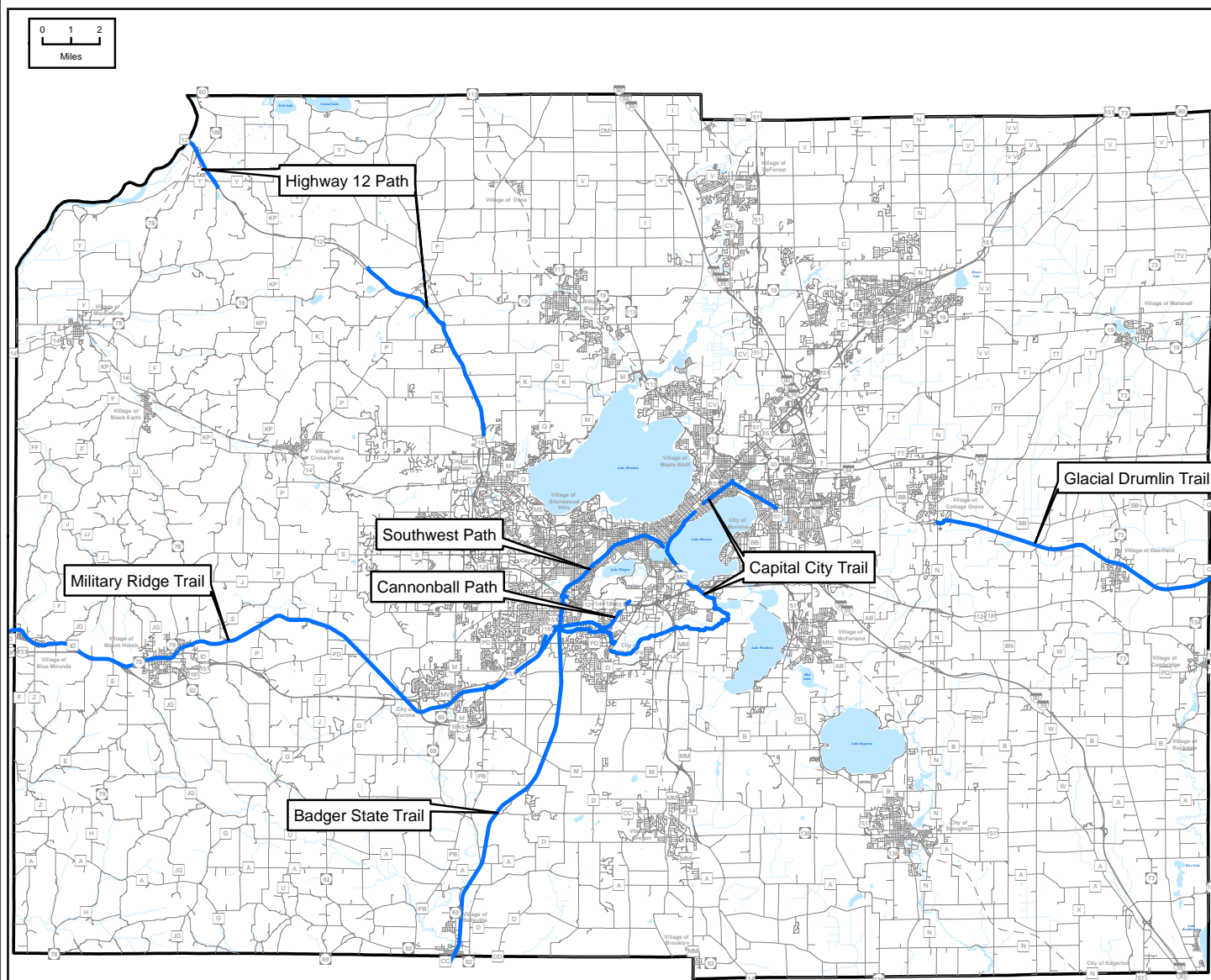


In recognition of these efforts, the City of Madison has been designated a Gold-level Bicycle Friendly Community by the League of American Bicyclists. The City of Fitchburg has received a Bronze designation, and UW-Madison has been designated a Silver-level Bicycle Friendly University. In addition, several Dane County businesses have been recognized as Bicycle Friendly Businesses.

The Bicycle Transportation Plan aims to build on this success.

## Madison Metropolitan Area and Dane County

## Major Named Paths



Prepared by staff to the:  
Madison Area  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source Info:  
Bicycle Paths and Routes: 2014 (MATPS).  
Street Base: 2013, Orthophoto Derived (DCLJ).  
Functional Classification: 2014 (MATPS, WDOT).  
Hydrography: 1200, 1:24,000 (NCEM).  
Civil Division Limits: 2014, Annexation Records (DCLJ).

  
 Date Revised: 7/14/2015  
 Lambert Conformal Conic Projection  
 WSCRS- Danie, NAD 83(91)

**Figure 1-1 Major Named Shared-Use Paths in Dane County**

## B. Major Accomplishments 2000 - 2015

Much progress has been made since the publication of the previous *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County*, adopted in 2000. Dane County bicycle infrastructure has undergone immense growth and improvement, and we now face a different set of challenges. Whereas the 2000 *Bicycle Transportation Plan* primarily addressed the establishment of major bicycle routes, today's challenges include the extending and improving the network, filling in gaps, ensuring safe facilities for all users, and developing a regional wayfinding system to assist bicyclists in navigating the bikeway network.

Major new off-street facilities constructed since 2000 include the U.S. Highway 12 Path, University Avenue Path, Ice Age Junction Path, Badger State Trail, Wingra Creek Path, Cannonball Path, Yahara River Path, Starkweather Creek Path, and Upper Yahara River Trail (See **Figure 1-2**). In addition, several communities such as the cities of Sun Prairie and Fitchburg and villages of DeForest and Waunakee have built substantial local networks of shared-use paths. The off-street path network in Dane County is estimated to have grown from about 295 miles to 425 miles.

On-street facilities have also been expanded in most communities (see **Figure 1-3**). Dane County has increased the mileage of paved shoulders on the rural highway network, making it safer and more enjoyable to bike in rural areas. Similarly, the City of Madison has greatly expanded its network of bike lanes. The cities of Middleton and Fitchburg have also been leaders in retrofitting bike lanes onto streets. Overall, the network of streets and highways with bike lanes or shoulders is estimated to have grown from 415 miles in 2000 to 660 miles in 2015. Innovative infrastructure like bike boxes, green lanes, bike signals, and buffered bike lanes are now being used to improve safety and allow more bicyclists to feel comfortable riding on urban streets. In addition, all Metro Transit buses are outfitted with bicycle racks, and bicycle repair stations have been installed in areas with high bicycle volumes.

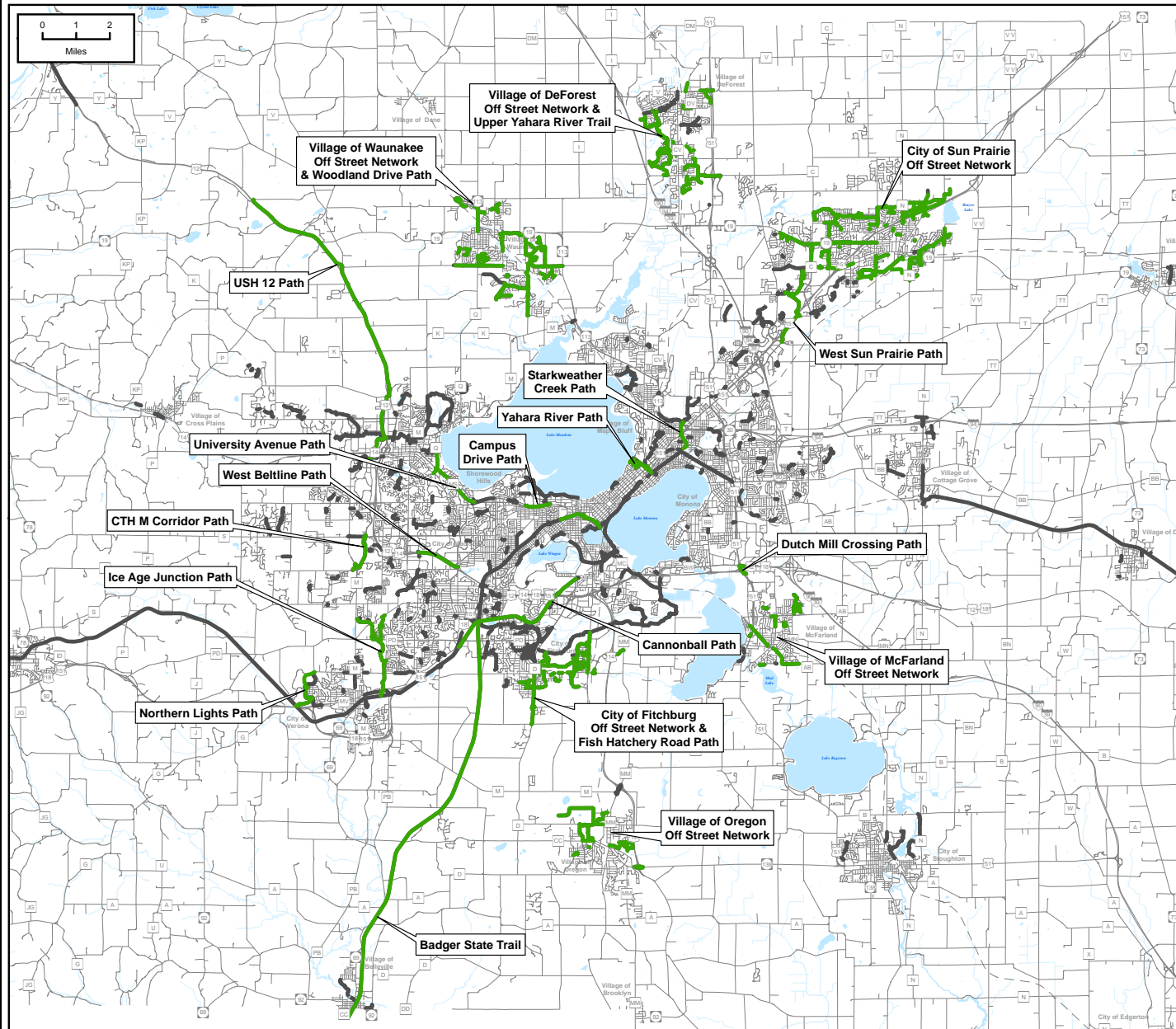
Since 2000, education, encouragement, and enforcement activities have expanded throughout Dane County. Many Dane County schools have started Safe Routes to School programs to make it safer and more appealing for children to walk and bike. The Wisconsin Bike Fed, in partnership with the Wisconsin Department of Transportation, began a program called Share and Be Aware. Share and Be Aware is a campaign to raise awareness among all road users regarding safety and the responsibilities of motorists, bicyclists, and pedestrians. Madison hosted its first Ride the Drive event in 2009 and now holds two events per year. Ride the Drive turns Madison's signature streets into a public promenade open to cyclists, walkers, and others for one day. The University of Wisconsin launched the University Bicycle Resource Center, a staffed facility with free educational courses, tools for bicycle repairs, and other transportation resources.



# Bicycle Transportation Plan

## Madison Metropolitan Area and Dane County

### Off Street Bicycle Facilities Constructed Since 2000



- Shared-Use Path
- Constructed Between 2000 and 2015
- Shared-Use Paths
- Constructed Before 2000

Note: Some perceived differences between 2000 and 2015 on street facilities are the result of new data management rather than physical changes.

Figure 1-2 Off Street Bicycle Facilities Constructed Since 2000

Prepared by staff to the:  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source Data:  
Bicycle Paths and Routes: 2014 (MTPB)  
Road Base: 2013, Completed Street (DCLD)  
Road Base: 2013, Completed Street (DCLD)  
Hydrography: 2010, 1:250,000 (DCLD)  
City of Oregon: 2014, Alexander Records (DCLD)

Author: JPB  
Map Date: 9/2/2015  
Map Scale: 1:250,000  
Map Projection: NAD 83, UTM Zone 18N  
Map Status: Draft

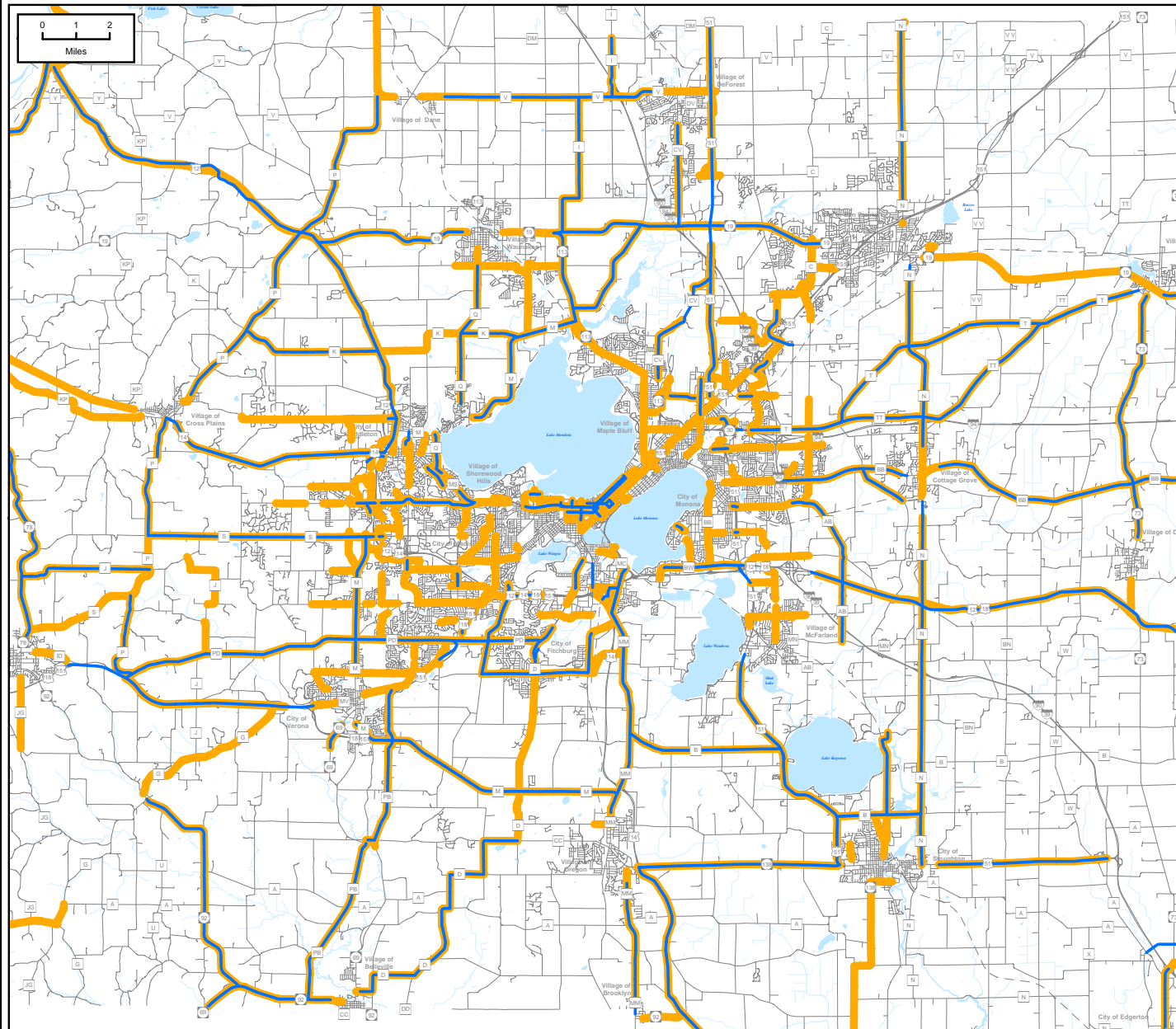


Date Revised: 9/2/2015  
Lambert Conformal Conic Projection  
NAD 83, UTM Zone 18N

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## On Street Bicycle Facilities Constructed Since 2000



- Bicycle Lane/Paved Shoulder Constructed Before 2000
  - Bicycle Lane/Paved Shoulder Constructed Between 2000 and 2015
- Note: Some perceived differences between 2000 and 2015 on street facilities are the result of new data management rather than physical changes.

Figure 1-3 On Street Bicycle Facilities Constructed Since 2000

Prepared by staff to the:  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source: TPO  
Bicycle Route and Route: 2014 (MADTPB)  
Base Map: 2013, Copyright: Dane County  
Aerial Imagery: 2014, Copyright: Google Earth  
Hydrography: 2010, 1:250,000 (DNR)  
DOT District Line: 2014, Copyright: Dane County

Author: JPB  
Map Date: 11/12/2015  
Map Scale: 1:100,000  
Map Projection: NAD 83, UTM Zone 18N  
Map Data: 2015, Copyright: Dane County, Madison, WI



Date Revised: 7/14/2015  
Lambert Conformal Conic Projection  
NAD 83, UTM Zone 18N

In 2011 Trek launched BCycle, making Madison one of many cities to incorporate bicycle sharing. BCycle provides short term bicycle rentals at convenient locations densely placed throughout its service area in central Madison. Users may purchase a one trip, one day, one month, or annual membership which allows them to use the ubiquitous red bikes for up to 30 minutes at a time for no additional cost. BCycle is point-to-point, so users can drop off the bike at any BCycle station. BCycle currently has 39 stations and 350 bikes in Madison.



### **C. State of Bicycle Funding and Policy**

The construction and maintenance of bicycle facilities has become routine business for many jurisdictions in Dane County. For example, the Dane County highway department regularly adds paved shoulders on rural highways when they are reconstructed when the cost is reasonable and traffic volumes are moderate to high, and the city of Madison and other communities regularly include bike facilities when streets are reconstructed. Several communities, including the cities of Madison, Fitchburg, and Sun Prairie, have dedicated local funding specifically for bike projects. In addition, Dane County provides grants to communities for trail projects through its new PARC & Ride program.

State and federal funding is also available for bike infrastructure projects. The Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law by President Obama on July 6, 2012, replacing the previous surface transportation authorization bill (SAFETEA-LU). MAP-21 ushered in several significant changes for bicycle transportation. Most notably, the Transportation Enhancement program (which funded bicycle and pedestrian infrastructure projects) and the Safe Routes to School program (which funded bicycle and pedestrian projects around schools) were consolidated and replaced with the Transportation Alternatives Program (TAP). TAP, a mix of formula and discretionary funds, ultimately provides a lower level of federal funding than was available in the past. Further, states have the option to reallocate part of TAP funding away from bicycle and pedestrian projects, which is currently done in Wisconsin. Under MAP-21, the Madison Area Transportation Planning Board, as a large MPO (that is, one that serves an urban area with a population over 200,000), receives a direct allocation of TAP funding which it then distributes to local agencies through a competitive process. The MPO also receives a direct allocation of flexible Surface Transportation Program – Urban funding, which has been used to fund bicycle facilities in conjunction with street construction projects. Both on- and off-street facilities are being incorporated into several MPO-funded street projects, including County Highway M on the west side of Madison.

In 2009, Wisconsin Act 28 created Statute 84.01(35), Wisconsin's pedestrian and bicycle accommodations law addressing complete streets. The statute required that the Department of Transportation ensure that bicycle and pedestrian facilities are included in all roadway projects using state or federal funds except in very specific instances as outlined in administrative rule Trans 75. This law reinforced and

expanded federal policy on bicycle and pedestrian accommodations. Wisconsin complete streets legislation was repealed in the 2015 budget bill. However, federal complete streets policies remain in effect and WisDOT expects to retain some form of complete streets policy. The details of that policy are being determined as the *Bicycle Transportation Plan* is being developed.

As the Madison area has transitioned from the building phase of its bicycle network to a maintenance and expansion phase, new funding challenges have surfaced. First, Dane County and municipalities are struggling to budget for needed maintenance, replacement, and upgrades of shared-use paths as local resources are limited. Second, the availability of land for low-impact, low-cost bicycle facilities has run out and communities are looking for solutions in constrained corridors that have more costly and extensive infrastructure needs, such as the Lower Yahara River Trail, which requires extensive boardwalk through wetlands and a bridge over Lake Waubesa.

#### **D. Bicycle Plan Purpose, Scope, and Planning Process**

The *Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County* is a comprehensive bicycle plan intended to serve as a blueprint for continuing to improve bicycling conditions and safety and to increase bicycling levels throughout Dane County. It seeks to provide a framework for cooperation between state agencies, Dane County, and local governments in planning for and developing bicycle facilities and programs. It is intended to educate citizens and policy makers on bicycle transportation issues and the needs of bicyclists as well as present guidelines for planning, designing, and maintaining bicycle facilities. The plan serves to update and supersede the *2000 Bicycle Transportation Plan for the Madison Metropolitan Area and Dane County*. The planning horizon is 2050.

This plan's focus is on bicycling for transportation purposes. Recreational bicycling is supported and encouraged, but the focus of this plan is to improve bicycle transportation within Dane County. Of course, most bicycle facilities are used for both utilitarian and recreational purposes, and many bike trips are enjoyable and useful at the same time.

Bicycle facilities planning begins with identifying the core bikeway network, shown in the Bicycle Functional Classification maps. This network includes "primary" routes that serve higher volumes of bicyclists and connect major destinations as well as "secondary" routes that complete the grid. Next, analytical tools are available to identify the suitability of the roadway system for biking, identify bike crash and bike count locations, and analyze current commuting patterns. This analysis is used to identify gaps and barriers in the bicycle network. The plan then identifies rural and urban on-street bicycle facility needs in the Bicycle Network Plan.



Planned off-street shared-use paths are prioritized based on their function within the regional bicycle network. The bicycle plan does not prescribe specific on-street facilities, like bike lanes and paved shoulders, nor does it prioritize them, because these facilities are highly dependent on specific corridor needs and are typically incorporated into roadway reconstruction projects. The facility recommendations are strongly influenced by other existing and ongoing planning projects, including the City of Madison's comprehensive transportation plan *Madison in Motion*. Further, the *Bicycle Transportation Plan* identifies broader facilities and facility planning policy recommendations.

Along with facility improvements other important elements in improving bicycling include, education, encouragement, enforcement, and related programs. These efforts can improve the skills and confidence of bicyclists which will allow them to ride safely in traffic. The plan makes recommendations for building upon current activities as well as emphasizing the importance of providing facilities and programs for all.

## **E. Plan Development and Adoption Process**

The *Bicycle Transportation Plan* was developed by Madison Area Transportation Planning Board (MPO) staff and was guided by a technical advisory committee and policy advisory committee, including representation from the MPO policy board. The technical advisory committee consisted primarily of technical staff representing communities throughout Dane County. The policy advisory committee consisted of policy makers, advocates, and other citizens with diverse backgrounds and interests.

The facilities component of the plan was developed with input from local staff, and it attempts to incorporate facility recommendations identified in prior county and local planning efforts such as comprehensive plans, neighborhood plans, and parks and open space plans. Refinements or additions to these plans were made in some cases. Planning work within the City of Madison was closely coordinated with *Madison in Motion*, the city's Sustainable Madison Transportation Plan. *Madison in Motion* is a concurrent transportation plan that will identify and describe what the City of Madison must do for Madison to become a more walkable, bikeable, and transit-oriented city. The plan will address the transportation needs of neighborhood businesses and activity centers, and it will incorporate connecting Madison with other communities throughout the larger region.

Public input was gathered through an innovative online mapping tool, combining existing and planned facilities and facilitating comments through a geospatial interface. In addition, public meetings were held in Madison, Sun Prairie, and Middleton.

The plan was adopted by the MPO policy board on September 2, 2015 and the City of Madison on September 15, 2015.

## Chapter 2

# Benefits and Needs of Bicycling



Bicycling has many benefits, ranging from saving people money, to allowing people to incorporate exercise into their daily routine, to connecting people to jobs and contributing to a healthier environment. Biking is also fun and serves as a great recreational activity for people of all ages. To take advantage of these benefits and participate in bicycling, people need adequate facilities and supporting policies.

## A. Economic Benefits of Bicycling

Bicycling is an affordable transportation mode that helps commuters save money and provides access for many people, including low-income individuals, to jobs, shopping, and entertainment. People who can replace an automobile with a bicycle or delay the replacement of a car see the biggest benefit; however, just using a bike for some short trips saves money that would otherwise be spent on gas and maintenance.

**Table 2-1** shows illustrative costs for owning and using a small car, using public transit, and owning and using a bike. Actual costs vary substantially from person to person.

**Table 2-1**  
**Illustrative Annual Costs for Selected Modes**

	Auto	Transit	Bicycle
Capital / Depreciation	\$1,500	\$0	\$50
Maintenance	\$750	\$0	\$100
Fuel / Fares	\$1,250	\$700	\$0
Insurance / Licensing	\$700	\$0	\$2.50
Parking and tolls	Varies	\$0	\$20
<b>Total Annual Cost</b>	<b>\$4,200+</b>	<b>\$700</b>	<b>\$173</b>

Illustrative costs include the purchase of a basic vehicle that lasts 10 years and 15,000 miles per year for auto. Maintenance costs are estimated at \$0.05 per mile for auto (*Your Driving Costs*, AAA, 2013 for a small sedan). Bike costs include a \$500 bicycle that lasts ten years with a state trail pass and four-year City of Madison bicycle registration and annual Dane County trail pass.

Bicycle trips create regional economic benefits. The City of Madison's isthmus corridor is home to thousands of jobs as well as the University of Wisconsin-Madison campus; it is a major economic driver of the region. High bicycle use among people who live and work in central Madison relieves pressure on the strained parking and roadway networks.

A 2010 study estimated the economic value of bicycle recreation and tourism in the state of Wisconsin to be \$924 million (*Valuing Bicycling's Economic and Health Impacts in Wisconsin*, Nelson Institute for Environmental Studies Center for Sustainability and the Global Environment, 2010). This projection includes expenditures on equipment, lodging, food and drinks, entertainment, transportation, and government fees. Dane County, like the rest of Wisconsin, is known nationally for high-quality recreational riding both on roads and on long-distance trails. A wide range of bicycle events like Ironman Wisconsin are hosted in Dane County. Restaurants, hotels, and other local businesses benefit from these activities.



## **B. Benefits of a Balanced Transportation System**

Accommodating bicycle travel helps the Madison area achieve a more balanced transportation system. It reduces the strain on road and transit networks that are constrained by capacity during peak periods. It allows the City of Madison and other entities to achieve their goals of increasing alternative travel mode shares.

Further, bicycling improves other alternative modes. People are able to use public transit for more trips if they can use a bike to extend the coverage of transit service, especially for reverse commute trips to workplaces in the periphery. Pedestrians benefit from shared-use paths and are welcome on these facilities, and providing bike lanes on streets removes bicyclists from sidewalks where they conflict with pedestrian movement.

## **C. Equity Benefits of Bicycling**

The economic benefits of riding a bike are most important for people with low incomes. Residents in low-income households that are connected to a high-quality bikeway network have more opportunities to access jobs and schools and improve their lives than residents who are isolated and disconnected. Low-income families that are forced to own and maintain a car, or a second or third car, are spending money on transportation that they could be spending on food, housing, or education.

Chapter 10 demonstrates that several concentrations of low-income and minority households exist around the perimeter of the Madison area. Barriers between these areas and economic opportunities prevent people from walking or biking to jobs that in some cases are not very far away. Children and teenagers that rely on buses to get to school may not be able to access the same after-school activities like sports events and extracurricular activities that their peers enjoy.

Improving bicycling infrastructure to low-income and minority neighborhoods is not a replacement for other strategies to address equity problems in Dane County, but it is a cost-effective way to improve transportation and access and effect compounding health and economic benefits.



## **D. Health and Environmental Benefits of Bicycling**

Motor vehicles release hydrocarbons, nitrogen oxides, carbon monoxide, and carbon dioxide as well as particulate matter that degrade air and water quality and affect human health. These emissions can cause a variety of health problems and carbon dioxide is a major contributor to global warming. Bicycle use not only directly reduces emissions as an alternative to motorized transportation but also further reduces emissions by alleviating motor vehicle congestion.

Physical inactivity has become a serious concern in the United States. In Wisconsin, 29.8% of the population is obese, up from 11.8% in 1990 (*State of Obesity*, 2013). To combat this trend and improve overall

health and fitness, the Centers for Disease Control and Prevention (CDC) suggests 2.5 hours of moderate aerobic activity, such as biking, per week for adults.

## **E. Bicyclists' Needs**

Bicyclists are a diverse group in terms of age, ability, and riding habits. Some people bicycle to meet their daily needs, commuting to work and running errands, while others bicycle primarily for exercise and recreation. The experience and confidence of bicyclists vary greatly; some cyclists are willing to ride on busy roads while others are uncomfortable riding with traffic. The goal is to improve bicycling for all riders, from age 8 to age 80 and from beginner to expert. Meeting the needs of all types of bicyclists is fundamental to increasing bicycle use and improving safety.

Roadways serve as an important backbone for the bikeway system. The roadway system already exists and therefore presents the greatest opportunity for improving bicyclists' mobility and access needs. Substandard or lacking facilities on major streets deny access to bicyclists, result in a fragmented bikeway system, and create hazardous conditions for bicyclists, pedestrians, and motorists. Accommodating bicyclists on arterial and collector streets is critical because these roadways:

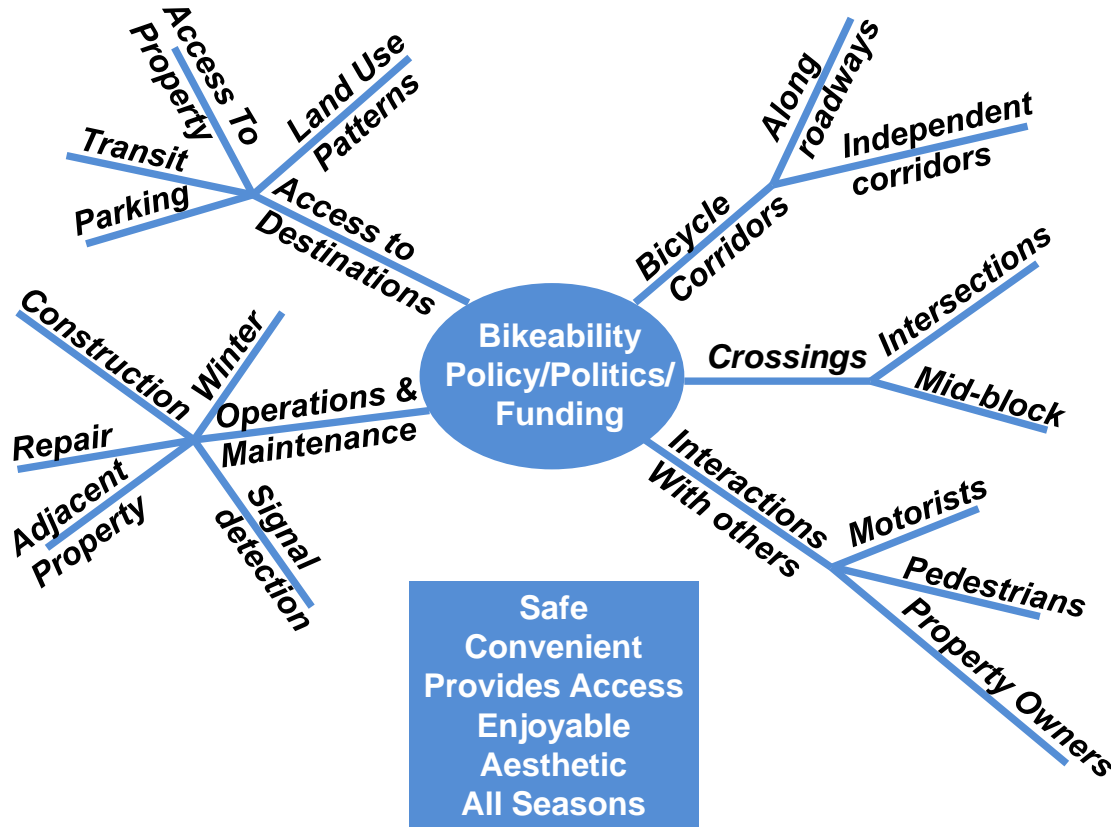
- Serve mobility needs with direct, continuous routes;
- Provide access to homes and destinations that bicyclists need to reach;
- Provide controlled crossings of other major streets; and
- Cross obstacles such as freeways, railroads, and water bodies.

Neighborhood streets have low traffic volumes and slow speeds which make them ideal for bicycling, although they are often not continuous and may have frequent stops which make them less convenient for longer trips. Many of these streets have no need for physical bicycle facilities but may benefit from traffic calming, wayfinding, and path connections that create direct routes and a navigable grid for cyclists. Similarly, in rural areas, roads with low traffic volumes (generally less than 1,000 vehicles per day) can be shared by bicyclists and motorists safely without the need for shoulders or separate paths. County and state trunk highways with moderate traffic volumes can accommodate experienced cyclists with paved shoulders that have a usable width of four feet or more.

Conflicts between roadway users frequently occur at intersections and driveways. Intersection design should create space and travel paths for bicyclists that are direct, continuous, and logical. Bicycle-sensitive loop detectors, bike boxes, colorized lanes, and separated crossings can make intersections work for bicyclists. Off-street shared-use paths provide the highest level of investment for bicyclists. Bicyclists need facilities to be maintained. Debris and snow that blocks bicycle facilities can inhibit their use. Pavement surfaces need regular maintenance to function comfortably and safely.

Like motorists, cyclists need convenient, secure, well-designed parking. Other support facilities such as showers, lockers, and repair stations should be available to make it easier for people to make trips by bicycle. Bicyclists also rely on a network of bike shops that offer parts, accessories, and service. Connections with other modes, such as public transit and driving, are critical for many people traveling longer distances.

Figure 2-1 Bikeability Mind Map



Source: Arthur Ross, City of Madison Traffic Engineering

Education and encouragement activities are a must to increase bicycle usage. High quality maps, events, and programs draw attention to new facilities and biking in general, promoting a culture of acceptance and support. Enforcement of traffic laws is needed to keep cyclists and other road users safe.

## Chapter 3

# Plan Vision, Goals, and Strategies



## A. Plan Framework

The bicycle plan framework consists of a vision statement, goals, general strategies and specific recommendations to achieve those goals, and performance measures to monitor progress.

The plan's **Vision** provides overarching, big picture guidance. This is a summary of how bicycling should function in 2050.

The plan **Goals** are more specific desired outcomes. They provide a framework for fulfilling the vision. The goals identified for the bicycle plan relate to safety, usage, connectivity, equity, livability, and longevity.

A set of **Strategies** provides the conceptual tools and methods for achieving the goals, commonly referred to as the "E's". The strategies laid out in the bicycle plan are **E**ducation, **E**ncouragement, **E**nforcement, **E**ngineering, **E**nvisioning, **E**valuation, and **E**nd-of-trip facilities and multi-modal connections.

The **Recommendations** serve as a set of specific tools and suggestions for carrying out the strategies. In addition to policy recommendations, the bicycle plan presents concepts for improving on-street bicycle facilities and prioritized regional shared-use paths.

Finally, **Performance Measures** are identified. Performance measures are quantifiable statistics that allow planners to measure progress as recommendations are implemented.



## B. Plan Vision

The bike plan is guided by the following vision:

*People living in the Madison metropolitan area and Dane County will be connected by a safe, convenient, and enjoyable bicycle network that is accessible and comfortable for individuals of all ages, races, backgrounds, and abilities. This well-maintained network will link neighborhoods and communities to jobs, services, schools, shops, and parks, as well as transit for access to longer distance destinations. Bicycling will be fostered as an integral part of daily life through education and encouragement programs and supportive land development patterns, contributing to the health and quality of life for all residents. Newly developed areas will be planned and built as "complete neighborhoods" with these qualities deliberately included in them.*



## C. Plan Goals

Six goals were adopted to achieve this vision of a safe, comfortable, and supportive bicycling network and communities:

### Safety

Improve safety for bicyclists, reducing the number of bicycle crashes and eliminating all bicycle fatalities.

*Ensure that bicycling is safe for individuals of all ages and skill levels, from age 8 to 80. Integrate bicycle safety into all jurisdictional agencies.*



Source: Madison Metropolitan School District

### Usage

Increase bicycle usage and the mode share for bicycling for all trips.

*Increasing bicycle use improves safety and health for commuters as well as for people making other trips.*

### Connectivity

Create a convenient and enjoyable bicycle transportation network that connects people with the places they need and want to go.

*Increasing bicycle use requires that all neighborhoods and communities are connected by a safe, convenient, and comfortable bicycle network. Street and multi-use path networks in the Madison area and Dane County contain gaps for bicyclists that often force bicyclists to use high-volume and high-speed roadways, trespass, break traffic laws, or choose a different mode. These gaps need to be fixed.*



### Equity

Provide equitable access to the benefits of bicycling.

*Every individual, regardless of age, gender, income, or race, should have access to bicycle facilities that allow for safe and convenient transportation. Low-income neighborhoods that are isolated from high quality transportation facilities like shared-use paths need to be brought into the system.*



## Livability

Enhance the quality of life for all Dane County residents through bicycle transportation investments and a welcoming environment that builds vibrant, healthy and prospering communities.

*Focus bicycle infrastructure on dense, mixed-use urban environments as well as scenic, useful routes between cities. Build inviting world-class bicycle ways that attract tourism and bolster the economy.*

## Longevity

Build a network of bicycle facilities that can be sustainably maintained with projected resources.

*Consider the life cycle cost of bicycle infrastructure projects, and prioritize projects that demonstrate a need and will continue to provide value. Local municipalities should be able to justify using local funds and available equipment to maintain facilities through the winter.*

## D. Plan Strategies

This plan has adopted seven “E’s” to organize and identify strategies that work to attain the plan goals and support the vision of a safe, comfortable, and supportive bicycle network. The traditional “5-E” approach is expanded to include Envisioning (Planning) and End-of-Trip Facilities and Multi-Modal Connections. The seven E’s are shown below.

**Education** strategies are programs and materials that give people the skills and confidence to ride.

**Encouragement** strategies are programs and materials that foster a supportive community for bicycling.

**Enforcement** strategies create a safe environment for riding by ensuring that road users follow traffic laws.

**Engineering** strategies create safe and comfortable places to ride.

**Envisioning (Planning)** strategies plan for future communities and facilities that are supportive of bicycling.

**Evaluation** strategies are tools for analyzing the performance of bicycle networks and programs.

**End of Trip Facilities and Multi-Modal Connections** provide bicycle parking and connect users to other modes.



## E. Plan Recommendations

Policy recommendations that relate to the plan strategies are discussed in Chapters 8 and 9 of this plan. Recommendations are starting points from which local government authorities and private entities can enact changes as well as help them maintain current policies that are consistent with this plan's vision. The recommendations take the strategies into much greater detail and apply them to the Madison area and Dane County.

## F. Performance Measures

Performance measures identified for each plan goal are shown below. Measuring the performance of the bikeway system is important in monitoring whether the programs and facility improvements that are implemented are actually working to help achieve the goals. These metrics can be tracked by Madison Area Transportation Planning Board (MPO) and other agency staff. Many of these measures are explored in greater detail in chapters 4, 5, and 10.

### Safety

**Crash Rates.** Bicycle crashes are difficult to quantify (see Chapter 4). Crashes involving bicyclists that result in injury, death, or significant property damage can be tallied from police reports, but there are countless other crashes that are never reported, including those that do not involve a motor vehicle. Further, if the number of crashes goes up every year, it may simply mean that more people are bicycling. A useful metric for bike crash rates that can currently be calculated is reported as crashes per bicycle commuter, based on Census data. Currently in Dane County, there are an estimated 8,200 bicycle commuters (see Commute Mode Share, below), and there are about 167 crashes involving bicyclists reported annually (Traffic Operations and Safety Laboratory, University of Wisconsin, 2009-2013 average). This equates to a crash rate of 20 reported crashes per 1,000 bicycle commuters. The number of reported crashes has been steady since at least 2000, but bicycle use has gone up, so the overall bike crash rate is trending down.

**Fatalities.** In most years, 2 or fewer bicyclists are killed in Dane County (Traffic Operations and Safety Laboratory, University of Wisconsin). This number has held fairly constant for at least the last 15 years.

### Usage

**Bicycle Counts.** Counting bicyclists is challenging because they are not easily detected. Bicycle counts are regularly collected by the City of Madison and the Wisconsin Bike Fed. Other manual counts are occasionally available from other studies, such as the *Beltline Highway Planning and Environmental Linkages* study and the Stoughton Road planning process. Bicycle count data from the City of Madison indicates that bike use is increasing; other sources have not been measured regularly for a long enough time to observe trends.

**Commute Mode Share.** The estimate of people who report that they commute to work by bike is available from the American Community Survey from the U.S. Census (see Chapter 5). This measure only accounts for work commutes, but it is very easy to obtain. The commute mode share can be expressed as the number of people biking to work or as a percentage of workers. The survey is distributed at regular intervals throughout the year, so it represents an average of seasonal conditions. The current bike commute mode share estimate for Dane County is 8,200 commuters, or 3.0%, and 7,100 commuters, or 5.3% for the City of Madison (2013 American Community Survey five-year data, U.S. Census). The bike commute mode share has been steadily increasing.

## **Connectivity**

**Documented Network Gaps.** The planning process for this bicycle plan identified 202 gaps and barriers in the bikeway network (see Chapter 4). As these gaps and barriers are filled in and removed, this number should go down. As new gaps and barriers are created or discovered, new points will be added.

**User Satisfaction.** Little data currently exists for analyzing user satisfaction of the bikeway network. However, the evaluation recommendations in this plan include enhanced bicycle user input.

**Bicycle Suitability.** Bicycle level of service (BLOS) or other bikeway suitability measures can be maintained and updated in the future. Chapter 4 discusses the bicycle suitability analysis that was done for urban streets and rural highways. Currently, 75% of the urban collector and arterial streets that have been analyzed are rated at LOS C or better, and 62% of the rural county, state, and federal highways that have been analyzed are rated as “most suitable” or “may be suitable”.

## **Equity**

**Population with Premium Bikeway Access.** The population served by premium bike facilities can be obtained using Census data and the bikeway network (see Chapter 10). For this purpose, premium bikeways are considered to be shared-use paths that are part of the primary or secondary bike functional class network and certain on-street facilities like protected bike lanes, counter-flow bike lanes, and bike priority streets. The density of these facilities, expressed as miles of premium bikeways per square mile, can also be measured for small areas such as Census block groups or the MPO’s traffic analysis zones. Currently, 47% of Dane County residents live within ¼ mile of a premium bikeway.

**Relative Commute Mode Share of Women, Minorities, and Income Levels.** As the Madison region addresses equity issues, the commute mode share of different races should equalize because people of different races and incomes will have access to the appropriate transportation mode of their choice (see Chapter 5). Currently in Dane County, bike commuting among the different races does not show a significant imbalance. However, low- and high-income workers are more likely to bike to work, and men are significantly more likely to bike to work than women.

## Livability

**Bicycle Friendly Community Status.** Currently, three entities in Dane County have received bicycle friendly status from the League of American Bicyclists: the City of Madison (gold), City of Fitchburg (bronze), and University of Wisconsin (silver). However, several other entities are striving to obtain ratings for the first time or to improve upon their current ratings.

**Communities with Dedicated Funding for Cyclists.** Several communities currently have a dedicated budget for bicycle improvements and maintenance.

## Longevity

**Proportion of Facilities that are Plowed in Winter.** Many bike facilities are plowed through the winter. The number has grown with the increase in winter bicyclists. Some facilities are not maintained in the winter due to low winter use, limited budgets, competing winter uses like snowmobiling, and other reasons.

**Path Pavement Quality.** The City of Madison rates the pavement quality on its shared-use paths on a 1-to-10 scale similar to roadways. Currently, about 90% of the paved paths with a rating are rated 7 or above, meaning that they are in fairly good condition with only routine maintenance required.



Chapter 4

# Bicycle Facilities and Conditions and Deficiency Analysis



## A. Introduction

Bicycle facilities that function well improve safety and attract users. Major urban arterial streets that include bicycle facilities provide bicycle access to businesses and residences and are critical to a complete bikeway network. Cyclists who are comfortable riding in traffic can generally be accommodated by these facilities. Many people, however, are not comfortable riding close to busy traffic and are looking for a cycling environment that is low-stress. This group, which includes novice riders, children, seniors, and many others who prioritize comfort, arguably comprises the majority of riders and potential riders.

Many low-volume local and collector streets play a critical role in carrying bike traffic. These continuous, connected street networks provide alternatives to the arterial street system, and often no explicit bicycle facilities are needed. Wayfinding systems help users navigate through these neighborhoods. Rural areas are similar in that wide paved shoulders are needed on highways with high traffic volumes, but some of the best bicycling routes are on connected, low-volume collector and local roads. The highest level of comfort, however, is provided on a shared-use path separated from the road system.

## B. Bicycle Facilities Toolbox

A variety of bicycle facilities work together to comprise the bikeway network. The appropriate facility depends on projected use, interaction with motor vehicle traffic, available right-of-way, opportunities presented with public works projects, and other factors. The range of treatments in this plan are supported by the long-established precedent of bicycle facilities in Dane County as well as by nationally accepted best practice manuals like the *Urban Bikeway Design Guide* (National Association of City Transportation Officials, 2012), *Wisconsin Bicycle Facility Design Handbook* (WisDOT, 2004), *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2011), *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach* (ITE, 2010), and *Guide for the Development of Bicycle Facilities* (American Association of State Highway and Transportation Officials, 2012).

Bicycle facilities may be either constructed with a new roadway or land development project or retrofitted into existing facilities. Due to the complex nature of virtually every corridor, projects sponsors will need to examine corridors in detail to determine which bike facilities, if any, are appropriate. The role of this regional bike plan is to recommend general alignments for off-street facilities and identify needs for on-street facilities. For on-street facilities, the plan identifies street segments that may be deficient for bicyclists but does not recommend specific facility types such as bike lanes, protected bike lanes, or other treatments used on bicycle priority streets. Project-level analysis is required to determine the feasibility and appropriateness of a specific facility type given roadway characteristics and competing considerations such as pedestrian space, motor vehicle capacity, and parking. In some cases, the most appropriate bicycle facility is not practical given right-of-way constraints and costs.



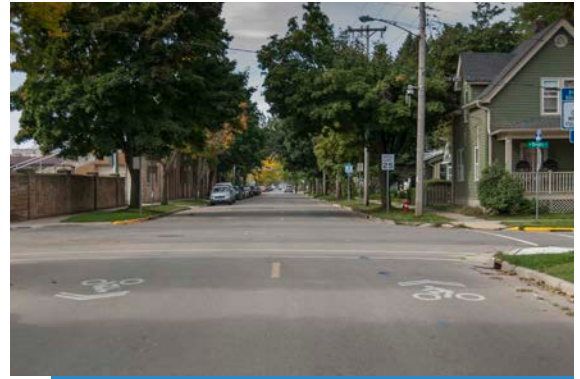
Photo: Arthur Ross, City of Madison Traffic Engineering

## C. On-Street Facilities

### Connected Low Volume Streets and Bicycle Priority Streets

**Description:** Low-speed (25 mph) and low-volume local and collector streets that most bicyclists find comfortable to bike on. These shared-space streets should contribute to an interconnected network with reasonably direct travel when combined with other facilities. Bicycle priority streets are distinguished from other local streets with the addition of bicycle wayfinding and other signage, traffic calming, sharrows, and other improvements for bicycling.

**Typical Use:** Secondary bikeways and primary bikeways where dedicated bike lanes or paths are not feasible or necessary.



Mifflin Street at Brearly Street, Madison

### Bike Lanes

**Description:** Signed and marked lanes dedicated for bicycle use. Bike lanes are one-way travel lanes for bicyclists generally located on the right side of the roadway. On one-way streets, bike lanes may be located on the left side of the roadway. Intersection treatments vary, but bike lanes should be carried through to the intersection as appropriate to create space and a travel path for bicyclists. The standard minimum width for bike lanes is four feet (not including the gutter pan) or five feet if adjacent to a parking lane or barrier (*Wisconsin Bicycle Facility Design Handbook*, WisDOT, 2004). Wider bike lanes may be warranted where traffic volumes and speeds are higher.

**Typical Use:** Moderate to high traffic streets.



University Avenue at Hilldale Way, Madison

### Buffered Bike Lanes

**Description:** Signed and marked lanes dedicated for bicycle use with marked space separating bicyclists and the general purpose travel lanes for motor vehicles. Buffered bike lanes provide a painted barrier while protected bike lanes, described below, provide a physical barrier.

**Typical Use:** Moderate to high traffic streets with high bicycle volumes.



Segoe Road at Oconto Court, Madison

### One-way Protected Bike Lanes

**Description:** Signed and marked lanes dedicated for bicycle use with a barrier separating bicyclists and the travel lanes. Protected bike lanes, sometimes called cycle tracks, provide a physical barrier such as curbs, parked cars, or delineators. Protected bike lanes may be at the elevation of the road, the elevation of the sidewalk, or somewhere in between. While protected bike lanes have a similar level of service as shared-use paths, they may create conflict points where turning traffic crosses them at intersections and driveways.

**Typical Use:** Streets with few turning conflicts and high bicycle volumes.



## Two-way Protected Bike Lanes

**Description:** Signed and marked lanes dedicated for bicycle use with a barrier separating bicyclists from the other travel lanes. Protected bike lanes provide a physical barrier such as curbs, parked cars, or delineators. Two-way protected bike lanes operate in both directions side by side. While protected bike lanes have a similar level of service as shared-use paths, they may create conflict points where turning traffic crosses them at intersections and driveways. These conflict points are most challenging for two-way protected bike lanes.



Dearborn Street and Adams Street, Chicago

**Typical Use:** One-way streets and streets with few turning conflicts and high bicycle volumes.

## Counter-flow Bike Lanes

**Description:** Signed and marked lanes dedicated for bicycle use on one-way streets that flow one way in the opposite direction of general purpose traffic. One-way streets with counter-flow bike lanes are effectively conventional two-way streets with one direction dedicated to bicycle use. Counter-flow bike lanes may be separated by pavement markings or raised medians.

**Typical Use:** One-way streets.



Charter Street at Dayton Street, Madison

## Bus, Bike, and Right Turn Lanes

**Description:** Signed and marked lanes dedicated to buses, turning traffic, and bicycle use. If bus and right-turn volumes are relatively low, these facilities may provide a high level of service for most bicyclists. However, conflicts with buses and right-turning traffic can pose a significant problem.

**Typical Use:** Arterials streets with high transit volumes, bus rapid transit corridors.



Fish Hatchery Road, Fitchburg

## Paved Shoulders

**Description:** Shoulders on rural highways that are wide enough for bicyclists to use. Paved shoulders differ from bike lanes in that they are built on rural sections without curbs, and they are not marked exclusively for bike use. Paved shoulders may be used intermittently for parking or vehicle breakdowns. Paved shoulders should generally be at least four feet wide, preferably five or more on high-volume corridors (*Wisconsin Bicycle Facility Design Handbook*, WisDOT, 2004). It is important that paved shoulders are maintained and kept free of debris.

**Typical Use:** Rural highways with moderate to high traffic speeds and volumes.



Portage Road, Madison

## D. Off-Street Facilities

### Shared-Use Paths

**Description:** Paths designed to accommodate bicycle traffic that are restricted to bicyclists, pedestrians, and other forms of non-motorized traffic.

**Typical Use:** Rail and utility corridors with available space, high-volume boulevards with limited driveway access, parks and other recreational areas.

### Wide Sidewalks

**Description:** Sidewalks that are eight feet wide or greater that can better accommodate bicycles. While wide sidewalks and shared-use paths along roadways are not an appropriate stand-alone bicycle treatment, they provide an off-street alternative for bicyclists who are not comfortable riding with traffic. They may be asphalt or concrete and need to accompany appropriate on-street bicycle facilities. When sidewalks are used by bicyclists, conflicts with turning traffic arise at intersections and driveways.

**Typical Use:** High volume boulevards with limited driveway access.

## E. Existing Bicycle Facilities

Dane County's network of bicycle facilities has grown substantially since the turn of the 21st century (see Chapter 1: Introduction). The urban on-street network is dominated by bike lanes on arterial and collector streets, but bicycle priority streets, counter-flow bike lanes, and buffered and protected bike lanes are also present. On rural roads, high-volume County and State trunk highways are likely to have three-to four-foot shoulders. A high-quality network of off-street shared-use paths permeates many urban areas and continues to serve long distance travel.

Existing urban and rural bicycle facilities are shown in **Figure 4-1** and **Figure 4-3**. These facilities do not operate separately, but form a cohesive network of routes. For instance, bike lanes in urban areas often transition to shoulders in rural areas. Shared-use paths connect bike facilities where the street network does not provide connectivity, and low-volume streets fill in stretches of long-distance shared-use path systems. Bicycle/pedestrian overpasses and underpasses provide grade-separated crossings of barriers such as freeways, rivers, and rail corridors. In new developing areas, a mix of urban and rural facilities is not uncommon as roadways are urbanized piece by piece.

The density of street intersections, shown in **Figure 4-2**, illustrates places where the urban street network is likely to provide connectivity for cyclists. A dense network of streets and shared-use paths minimize out-of direction travel and simplifies trip planning.



*Southwest Path at Allen Street, Madison*



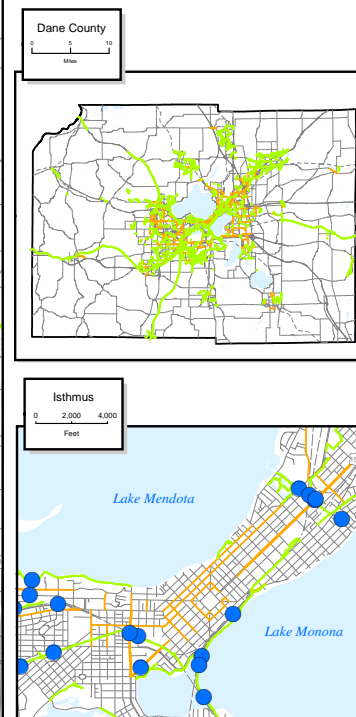
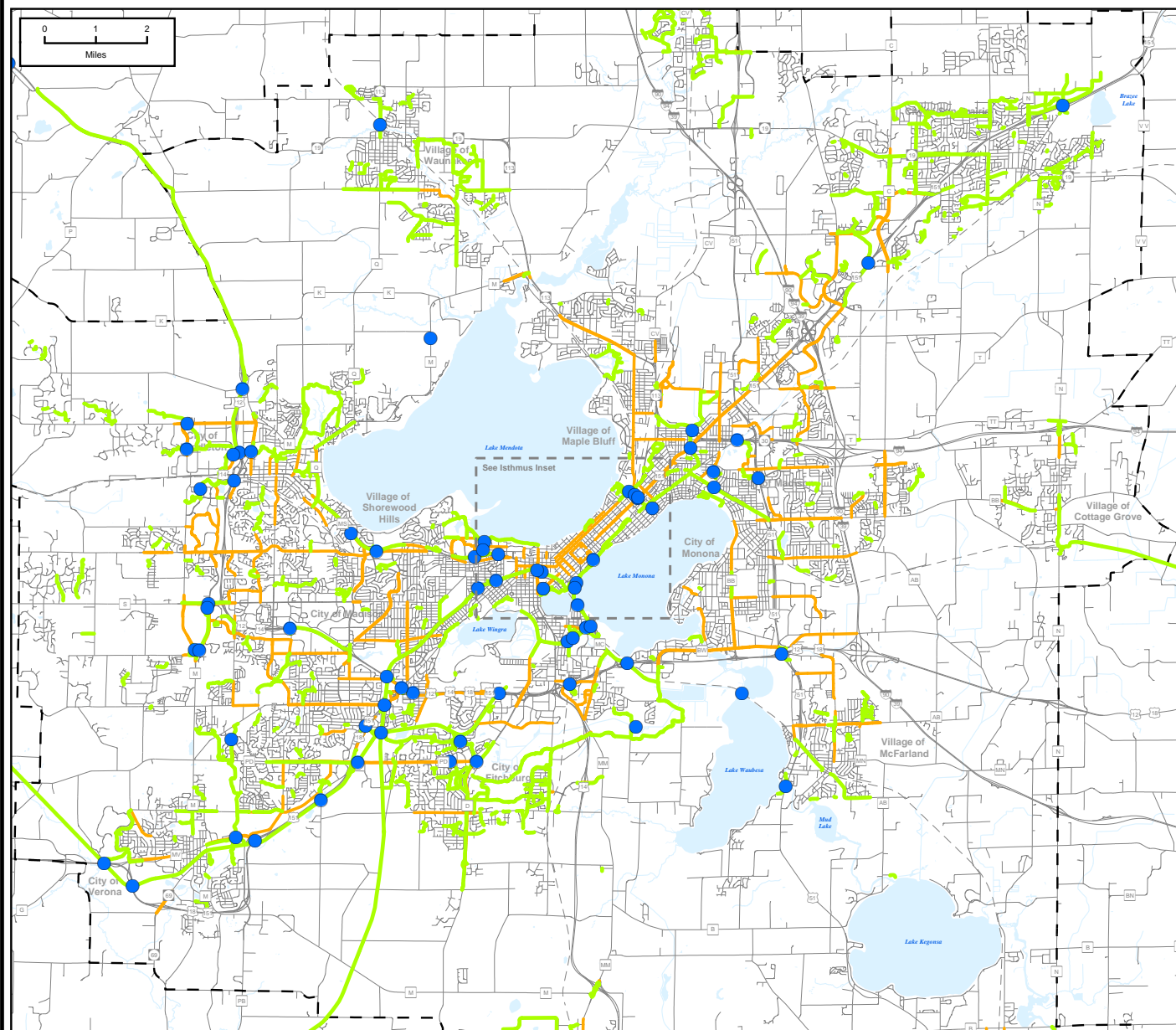
*Grand Ave at Ironwood Drive, Sun Prairie*

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Existing Bicycle Facilities

- Overpass or Underpass
- Shared-Use Path
- Bicycle Lane / Paved Shoulder
- - MPO Boundary



Prepared by staff to the:  
Madison Area  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source Data:  
Bicycle Routes and Routes: 2014 (MPO)  
Bicycle Routes: 2014 (MPO)  
Bicycle Routes: 2014 (MPO)  
Bicycle Routes: 2014 (MPO)

Author: 2014  
Date: 2014  
Date: 2014  
Date: 2014

Date Revised: 7/29/2015  
Lambert Conformal Conic Projection  
NAD 83, Zone 12N

Figure 4-1 Existing Urban Bicycle Facilities, Madison Area



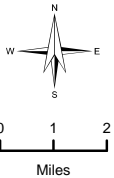
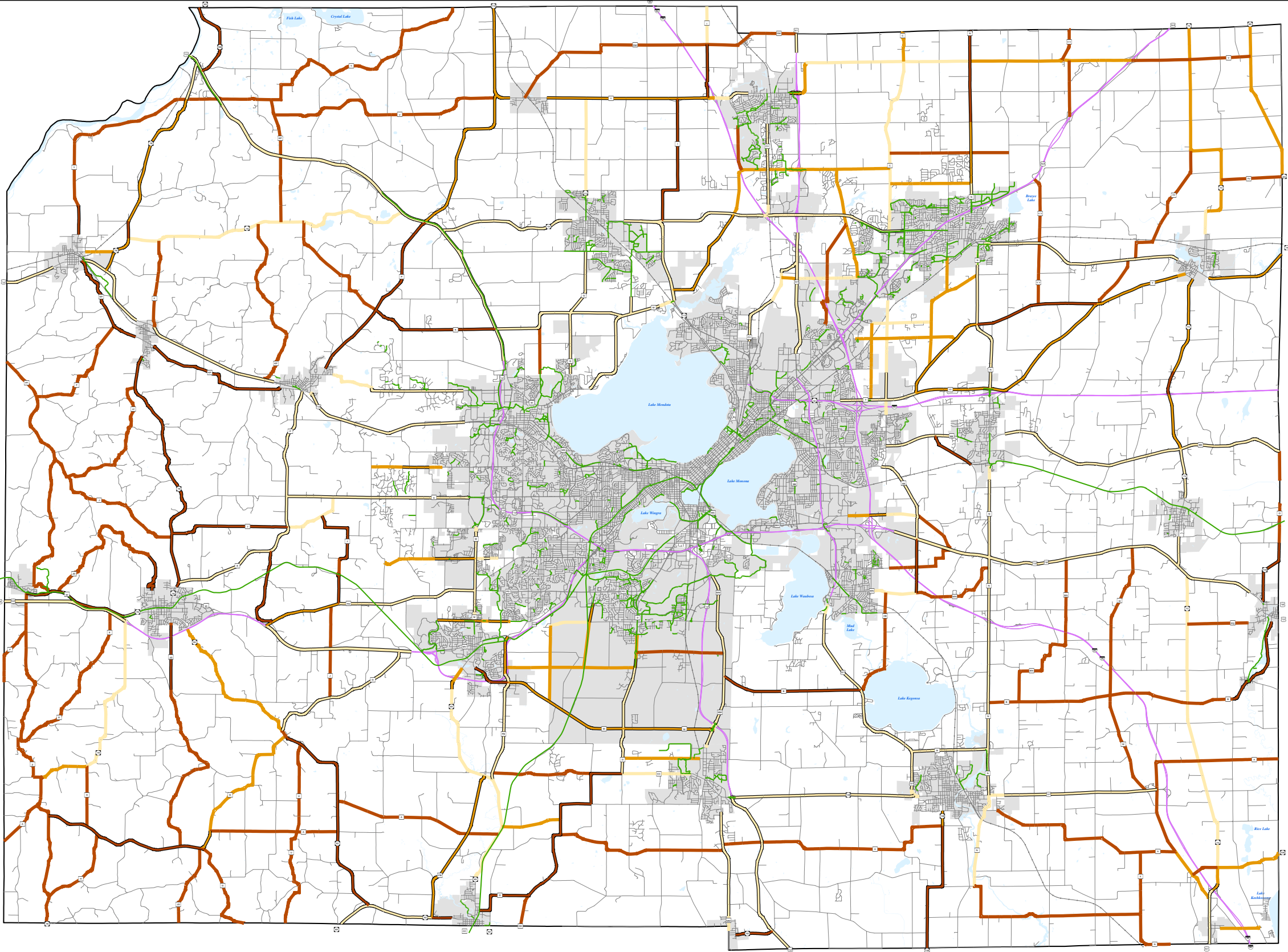
Figure 4-3 Existing Rural Bicycle Facilities, Dane County

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Existing Rural Bicycle Facilities

- Shared-Use Path
- Most Suitable Roads for Bicycling
- Roads May be Suitable for Bicycling
- Least Suitable Roads for Bicycling
- Bicycles Prohibited or Not Recommended
- Other Roads
- Paved Shoulders
- Incorporated Area



Prepared by staff to the:  
Madison Area  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source Info:  
Street Data: 2013 Orthophoto Derived (DCLAD)  
Hydrography: 1200, 1:24,000 (WDNR)  
City Election Limits: 2014, Annotation Records (DCLAD)  
Author: jlg  
Data Printed: 8/21/2015  
Data Set: 8/21/2015 11:28:03 AM  
File: W:\MPO\_2015\2015\Map\Map\_PlanReport\_Map04\_Fix\_RuralFacilities.mxd

Date Revised: 8/21/2015  
Lambert Conformal Conic Projection  
WGS84 - Dane, NAD 83(91)

## F. Bicycle Functional Classification System

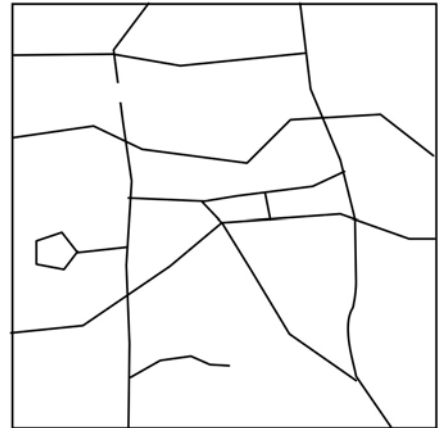
The bikeway network has major and minor components with varying functions, from long shared-use path systems like the Capital City Trail to local and collector streets that connect neighborhoods. The goal of the functional classification effort is to formalize this concept as a tool that can identify gaps and deficiencies in the overall bikeway network as well as help prioritize improvements. This process is shown graphically in **Figure 4-4**. In the past, maps and databases have focused on identifying facilities rather than routes. While this is useful for maintaining facilities, it does not identify continuous, high quality, well-used routes connected by different types of facilities.

The intended users for the bicycle functional classification system are planners and engineers who can identify gaps and barriers and who prioritize projects. The functional classification system does not inform individuals on where they should or should not be riding; all public streets are generally open to bicyclists except for limited-access highways that specifically prohibit bicycles. However, future uses of the functional classification system may include user-side applications that aid in trip planning, such as wayfinding signs and interactive maps, several applications of which are already available or are currently being developed.

Traditionally, roadways have been classified by their role in the transportation system for motor vehicles. In the traditional model, motorists travel from “local” low-volume residential streets to “collector” streets and “arterial” highways, and back down again. Local streets prioritize access while arterials prioritize speed and volume accommodation. This model does not translate directly to bicycling. Bicyclists tend to desire more direct paths and prioritize the comfort of paths or low volume streets versus higher speed, higher volume arterials since they travel at relatively constant speeds and are not as sensitive to capacity constraints. Further, the bicycle functional classification effort has no direct relation to grant funding eligibility or to design standards as there are no uniform national or state-wide adopted criteria. For these reasons, the bicycle functional classification system uses different terminology than the roadway functional classification system. The classification scheme for bikeways is shown below and summarized in **Table 4-1**.

**Primary bikeways** typically have high bicycle volumes or are comfortable, direct routes for the majority of bicyclists linking neighborhoods and destinations. Primary bikeways typically include routes on shared-use paths, buffered and protected bike lanes, bike lanes on moderate-volume streets, and low-volume streets or bike priority streets. They are typically spaced every half mile to mile. In rural areas, primary bikeways connect cities and villages. In suburban areas, they collect cyclists from large catchment areas and provide continuous pathways to other communities.

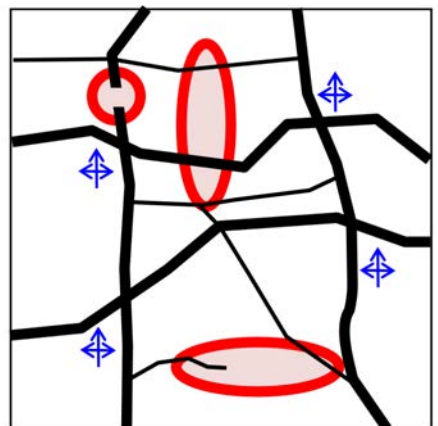
**Figure 4-4** Role of Bicycle Functional Classification in Bikeway Planning



1. Hypothetical bikeway network of on-street and off-street facilities



2. Routes on the network are given a functional classification based on connectivity, function, and use



3. Gaps in the network are identified and improvements are prioritized; wayfinding is added

**Secondary bikeways** fill in the gaps between primary bikeways and provide neighborhood access to the primary bikeway system. Secondary bikeways typically consist of routes on continuous low-volume streets, short segments of shared-use paths, or moderate-volume highways with shoulders. The combined primary and secondary network typically provides two to four routes per mile. In rural areas, secondary bikeways connect towns and villages. In suburban areas, they form a network of connected streets and paths that cyclists follow to navigate within their communities.

Some direct, high-volume arterial streets with bike lanes are classified as secondary bikeways. These routes are often the fastest, most direct way to travel, but are not used by some bicyclists because of high traffic volumes. Experienced riders may consider this class of secondary bikeways to be primary, but primary bikeways are defined as being comfortable for the majority of users.

**Table 4-1**  
**Description of Primary and Secondary Bikeways**

Attributes	Primary Bikeways	Secondary Bikeways
Facilities	Shared-use paths, protected bike lanes on high volume streets, bike lanes on moderate volume streets, and bicycle priority streets	Shared-use paths, bike lanes on moderate and high volume streets, connected low-volume streets
Connectivity	Connect regional employment and retail areas as well as central business areas and neighborhood centers	Connect residential areas and smaller retail and employment areas
Usage	Moderate to high use for transportation or moderate to high potential for use in developing areas	Lower to moderate usage
Typical Spacing	½ to 1 mile in urban areas As needed in rural areas	¼ to ½ mile in urban areas As needed in rural areas
Other attributes	Primary bikeways often cross barriers like highways and rivers, may feature facilities that attract tourism, and are likely to avoid steep hills	Secondary bikeways often connect users to primary bikeways, and may in some cases offer faster and more direct travel than the primary bikeway system, but at a lower comfort level

Besides these typical attributes, the existing bikeway functional classification system was assembled based on network connectivity. For instance, the primary route between the cities of Madison and Sun Prairie takes bicyclists along High Crossing Boulevard, a relatively high-volume roadway with bike lanes that would normally be classified as secondary. However, there are currently no viable alternatives to this route, so it is identified as the primary bikeway in the area.

**Figure 4-5** and **Figure 4-6** show the bicycle functional classification system as it exists today. **Figure 4-7** and **Figure 4-8** show the planned future bicycle functional classification system taking into account planned facilities and needed improvements. The future bikeway system shows a larger, more robust and connected network with a higher reliance on shared-use paths.

Figure 4-5 Existing Bikeway Functional Classification, Dane County

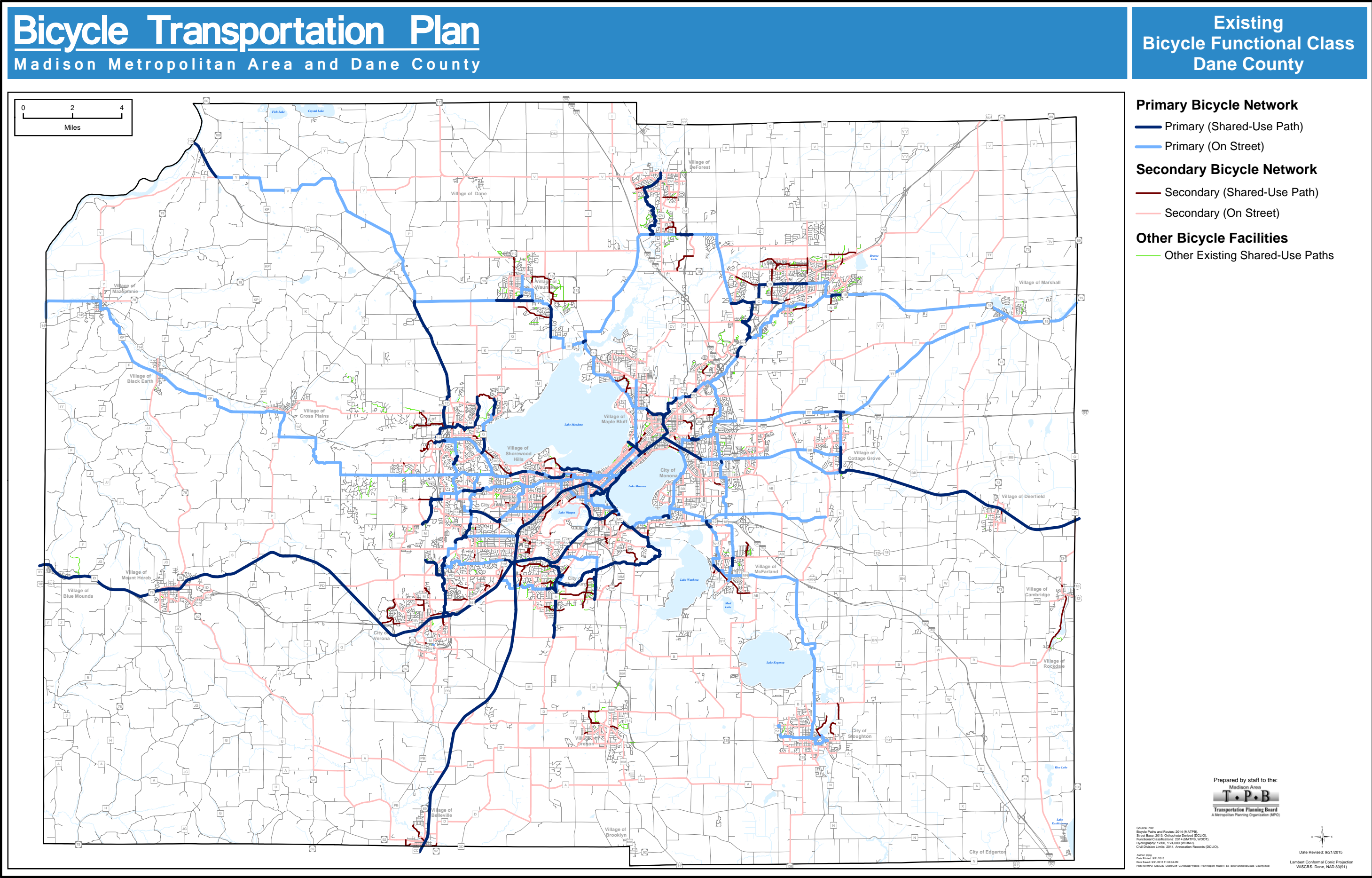


Figure 4-6 Existing Bikeway Functional Classification, Madison Area

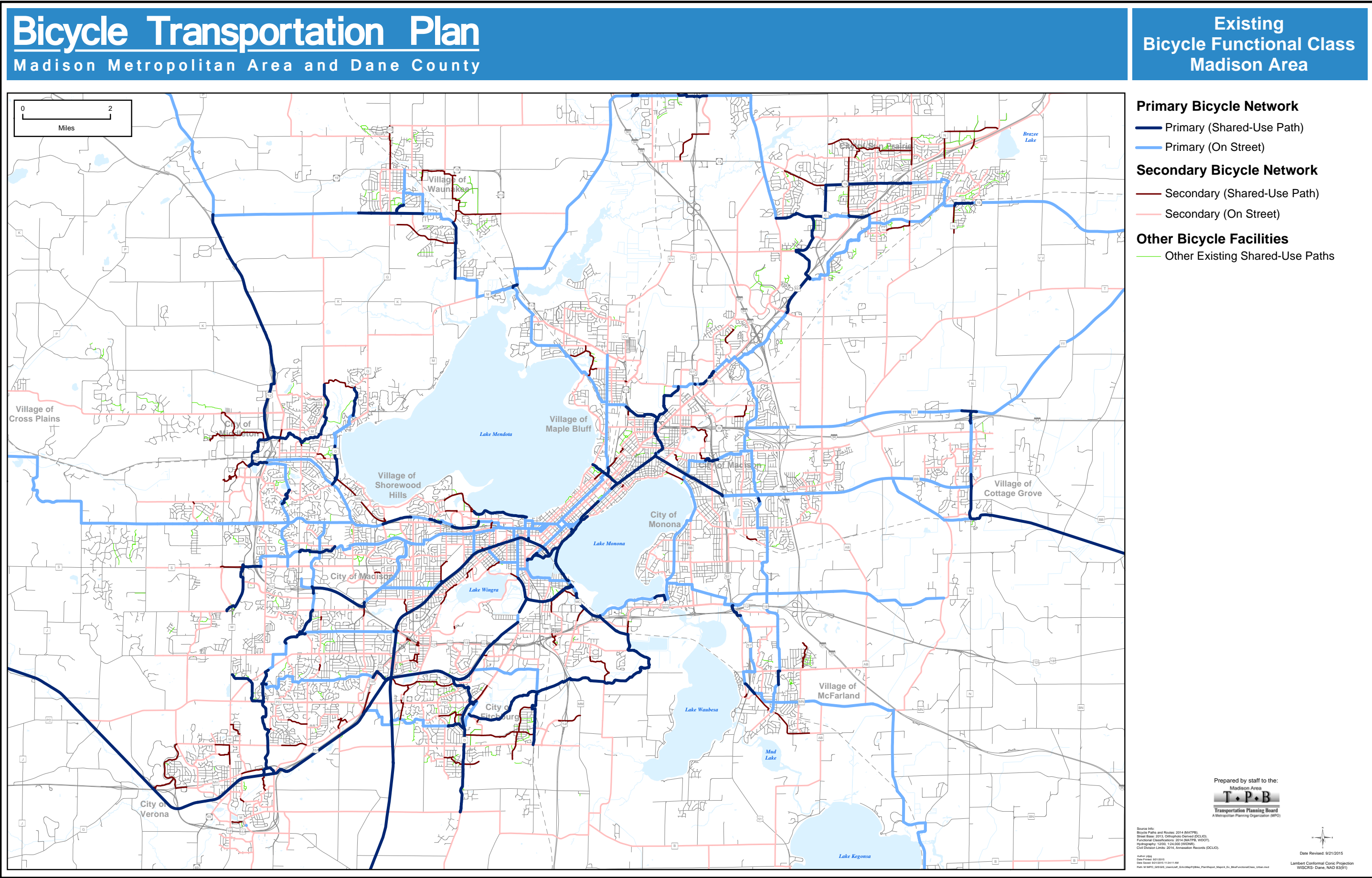
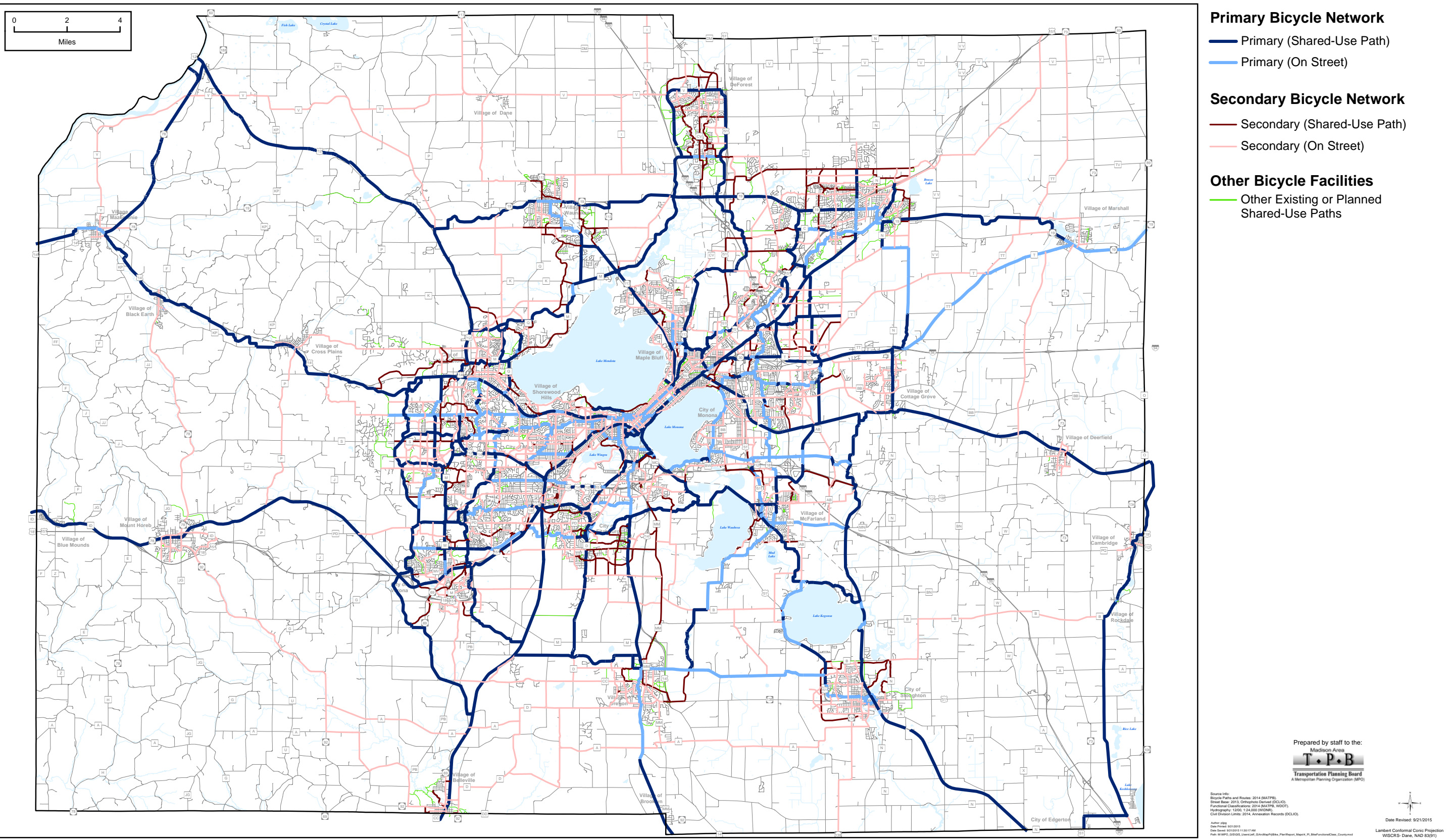


Figure 4-7 Future Bikeway Functional Classification, Dane County

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Future Bicycle Functional Class Dane County



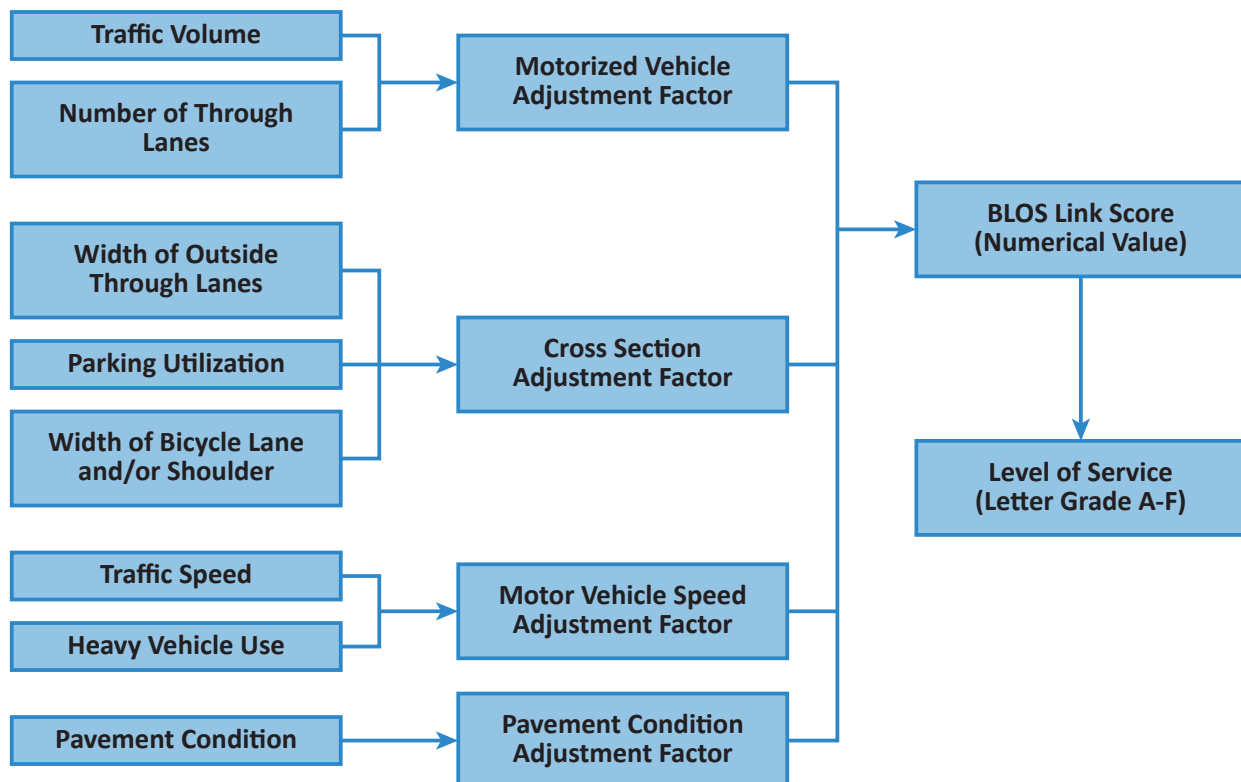


## G. Urban Bicycle Level of Service

Measuring the performance of the bikeway system today is important for identifying needs and improvements. The *Highway Capacity Manual* (Transportation Research Board, 2010) provides a methodology for determining the level of service (LOS) on bicycle facilities as well as other modes. Bicycle Level of Service (BLOS) estimates how bicyclists are likely to perceive their level of safety and comfort based on roadway geometry and traffic flow patterns. BLOS calculations are available for urban streets, rural roads, intersections, and shared-use paths. BLOS was only calculated for urban streets because the calculations are feasible with readily available information. Intersection BLOS is something that could be calculated and used to aid in a street reconstruction design project.

The BLOS methodology produces a level of service letter grade A through F, with A representing the “best” bicycling conditions and F representing “worst.” LOS can be calculated for “links” (sections of roadway between intersections), intersections, and “segments” (a combined score taking into account link score, intersection score, and other factors). However, the data needed for calculating intersection and segment score is beyond the capabilities of this regional plan. The basic inputs and structure to the BLOS calculation for roadway links are shown below in **Figure 4-9**.

**Figure 4-9 Highway Capacity Manual Methodology for Bicycle Level of Service, Urban Streets (Links)**



Some variables used in the BLOS analysis – traffic volume, number of through lanes, and traffic speed – were derived from data sources from WisDOT, City of Madison Traffic Engineering Division, and other sources. Traffic volumes used for the analysis approximate weekday peak hour conditions. Outside lane widths and bike lane widths were measured and approximated from aerial photographs. Parking use was estimated based on aerial photographs and supplemented with local knowledge. Roadway geometry and parking use generally represent midday conditions. Heavy vehicle (e.g., trucks and buses) use was assumed to be 2% for minor arterials and 3.5% for principle arterials. The pavement condition variable was omitted (every segment was given a “good” rating) for the BLOS calculation because many street segments with poor pavement quality will be resurfaced, perhaps several times, within the time horizon of this plan. These assumptions result in level of service scores that combine peak period and off-peak conditions, but are closer to peak conditions in most cases because of the use of peak hour traffic volumes.

BLOS scores in the Madison area are shown in **Figure 4-10**. In general the results of the analysis are reasonable, showing high scores (A and B) for lower-volume roads with bicycle lanes, and lower scores (E and F) for high-volume roads without bicycle lanes. However, some anomalies show the weakness of the analysis. The sensitivity to bicycle and shoulder lane width can be seen on Campus Drive (a high-volume roadway with limited access and shoulders), which scores a C because of its shoulders even though most cyclists avoid it in favor of parallel routes. The sensitivity to on-street parking and heavy vehicles is illustrated on East Gorham Street (a one-way, two-lane street with a combined parking and bicycle lane), which shows a BLOS score of E because of the parking and heavy vehicles despite having dedicated space for bicycling.

The conclusion from staff involved in the BLOS analysis project is that the methodology is generally sound but could benefit from continued refinement. For instance, several high-volume, high-speed roads that received C’s, D’s, and E’s would likely be considered F’s by many cyclists, experienced or not. The formulas may be too sensitive to several factors such as parking, shoulder width, and pavement condition, but that reaction is not based on formal testing of the model. Several of those factors are difficult if not impossible to estimate given resources typically allocated to bicycle suitability or level of service. Additionally, the methodology may be improved upon by accounting for treatments like colorized bike lanes, buffered or protected bike lanes, sharrows, intersection treatments, topography, and marked bicycle lanes compared to shoulders.

Alternative methods for assessing bicycle accommodations on urban streets are also available, such as the Level of Traffic Stress (Low-Stress Bicycling and Network Connectivity, Mineta Transportation Institute, 2012). However, the best assessment method may be a locally derived process that can be linked with project prioritization and design.

**Table 4-2**  
**Level of Service Score and Letter Grade Relationship**

BLOS Link Score	LOS Letter Grade
0.000 - 2.00	A
2.001 - 2.75	B
2.751 - 3.50	C
3.501 - 4.25	D
4.251 - 5.00	E
5.001 and up	F

**Figure 4-11 Level of Service Distribution by Mileage, Urban Streets in the Madison Area**

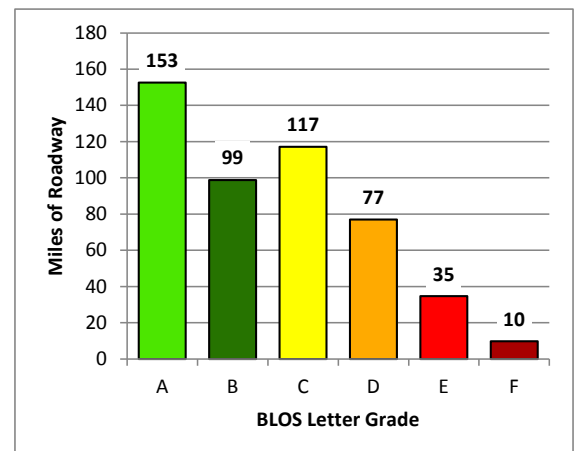
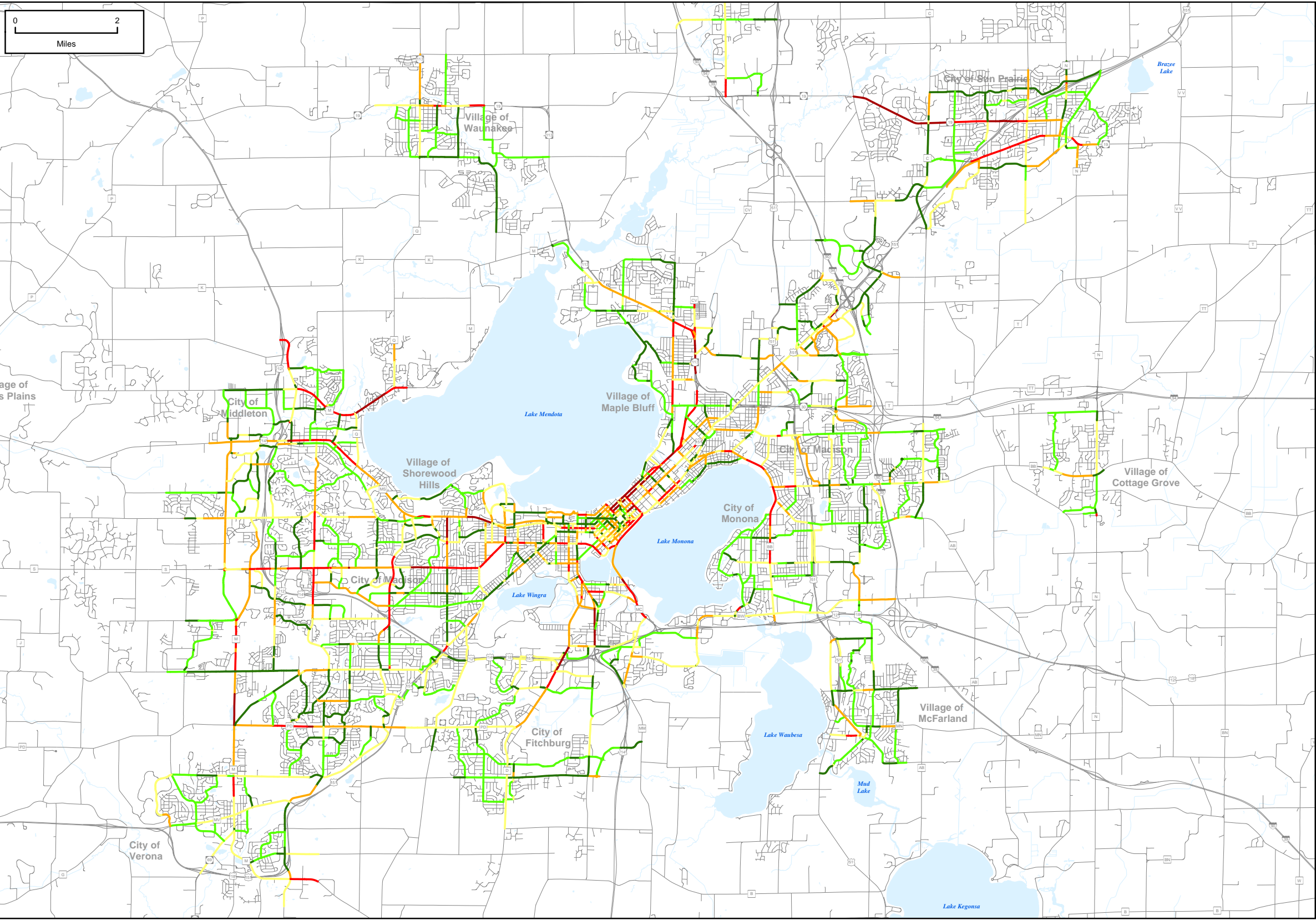


Figure 4-10 Bicycle Level of Service, Madison Area

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Bike Level of Service



- Bike Level of Service**
- > A, A
  - B
  - C
  - D
  - E
  - F

Prepared by staff to the:  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source Info:  
Street Data: 2013, OpenStreetMap (OSM),  
Functional Classifications: 2014 (MTPB, WDOT),  
Hydrography: 1:250,000 (USGS),  
Civil Division Limits: 2014, Annexation Records (DCLUG).

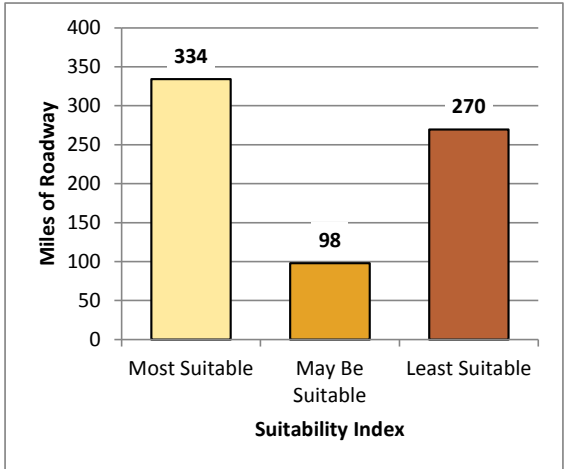
Date Revised: 7/14/2015  
Lambert Conformal Conic Projection  
WISCRS-Dane, NAD 83(91)

## H. Rural Bicycle Suitability

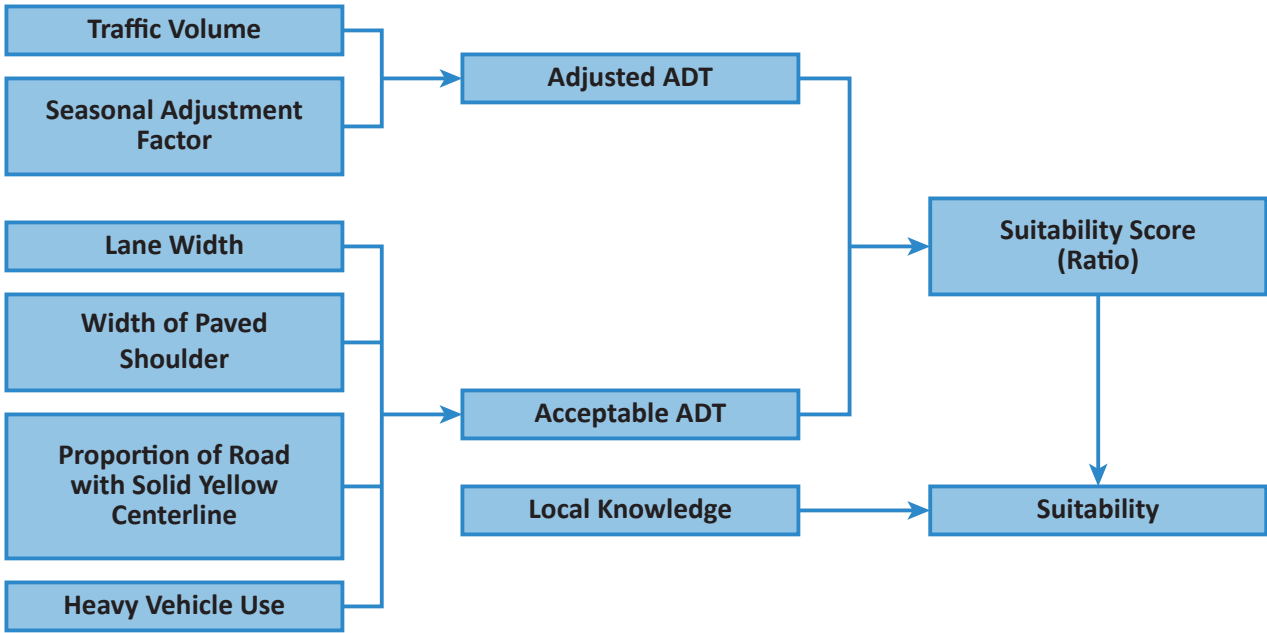
The Madison Area Transportation Planning Board (MPO) regularly partners with Dane County to publish the *Dane County Bicycle Map*. The *Dane County Bicycle Map* uses a modified method for determining bicycle suitability on rural roads described in a WisDOT report called *Planning for Rural Bicycle Routes* (Van Valkenberg, 1993). This methodology, shown in **Figure 4-12** below evaluates the ability of cars and trucks to safely pass bicyclists. Based on this analysis and local knowledge, rural highways are rated “most suitable,” “may be suitable,” and “least suitable.” The factors that go into this analysis are shown below.

All rural federal, state, and county trunk highways in Dane County with the exception of limited access freeways, as well as some local roads where traffic volume data is available, are evaluated according to this method and are shown in **Figure 4-3** on Page 33. The breakdown for state and county trunk highways is shown in **Figure 4-13**.

**Figure 4-13 Bicycle Suitability Distribution by Mileage, Rural State and County Trunk Highways in Dane County**



**Figure 4-12 Methodology for Bicycle Suitability Analysis, Rural Roads**



## I. Long Distance Bicycle Travel between Communities

**Figure 4-14** shows important regional inter-city cycling routes between Madison and its suburbs (drawn in green) as well as long distance routes that continue beyond Dane County borders (drawn in orange). These routes generally follow the primary bikeway network described in the Bicycle Functional Classification network. As such, they seek out lower-volume roads and shared-use paths where available, although some cyclists may prefer more direct routes via busier highways. Future routes are shown as dotted lines, incorporating planned future shared-use paths like the Good Neighbor Trail, Lower Yahara River Trail, and Goodman Path.

**Figure 4-15** shows the current cycling conditions on regional inter-city routes between Madison and selected other Dane County communities. Inter-city routes traverse both urban and rural roads as well as shared-use paths, so Figure 4-15 illustrates the simplified summary method described below. It includes an “out of direction factor,” defined as the ratio of the actual biking distance to the straight-line distance between the two points.

- **Shared-Use Path** – Paved or unpaved path that may require a state trail pass
- **On-Street Easy** – Low-speed and low-volume urban streets and rural roads
- **On-Street Moderate** – Urban streets and rural roads with moderate speeds and volumes or high speeds and volumes and appropriate bicycle facilities
- **On-Street Hard** – Urban streets and rural roads with moderate to high speeds and volumes and inadequate bicycle facilities

**Figure 4-15 Existing Regional Inter-City Cycling Conditions**

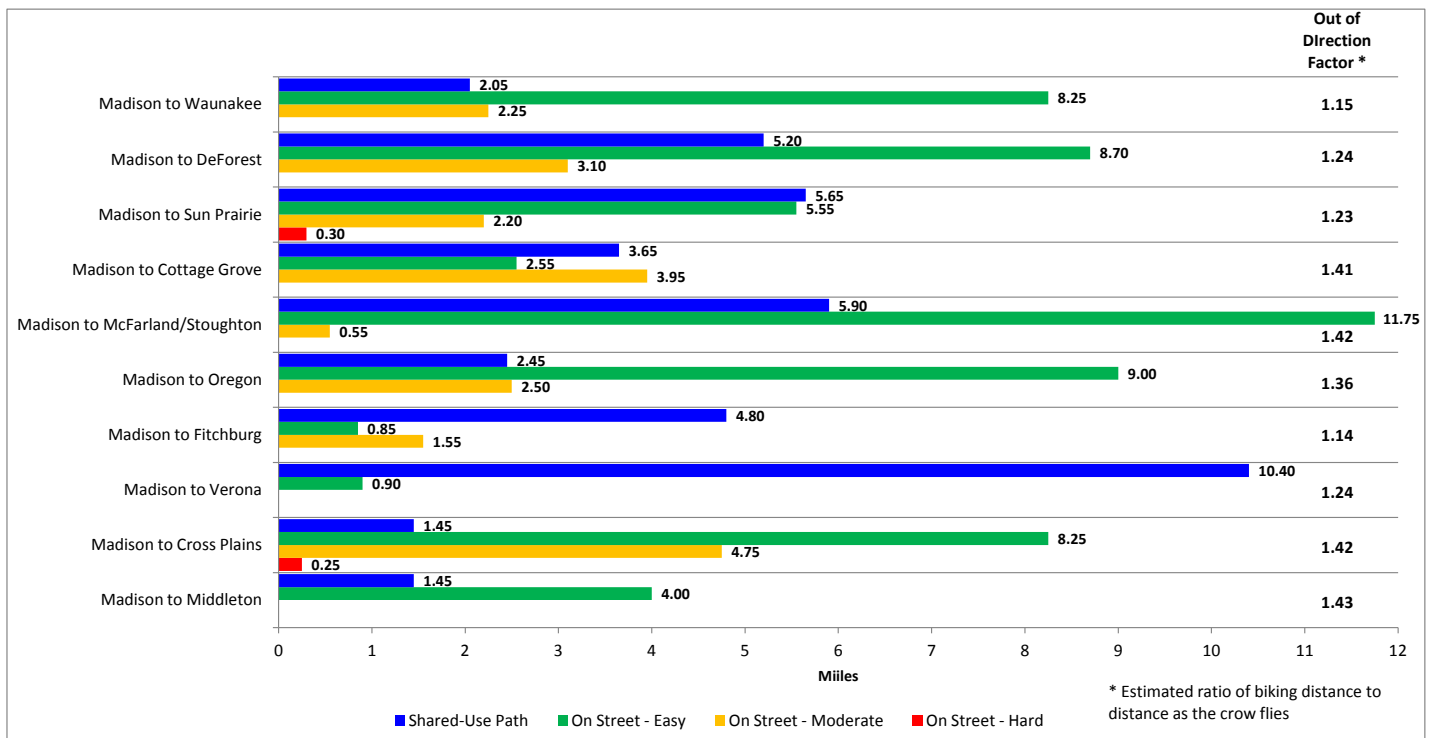
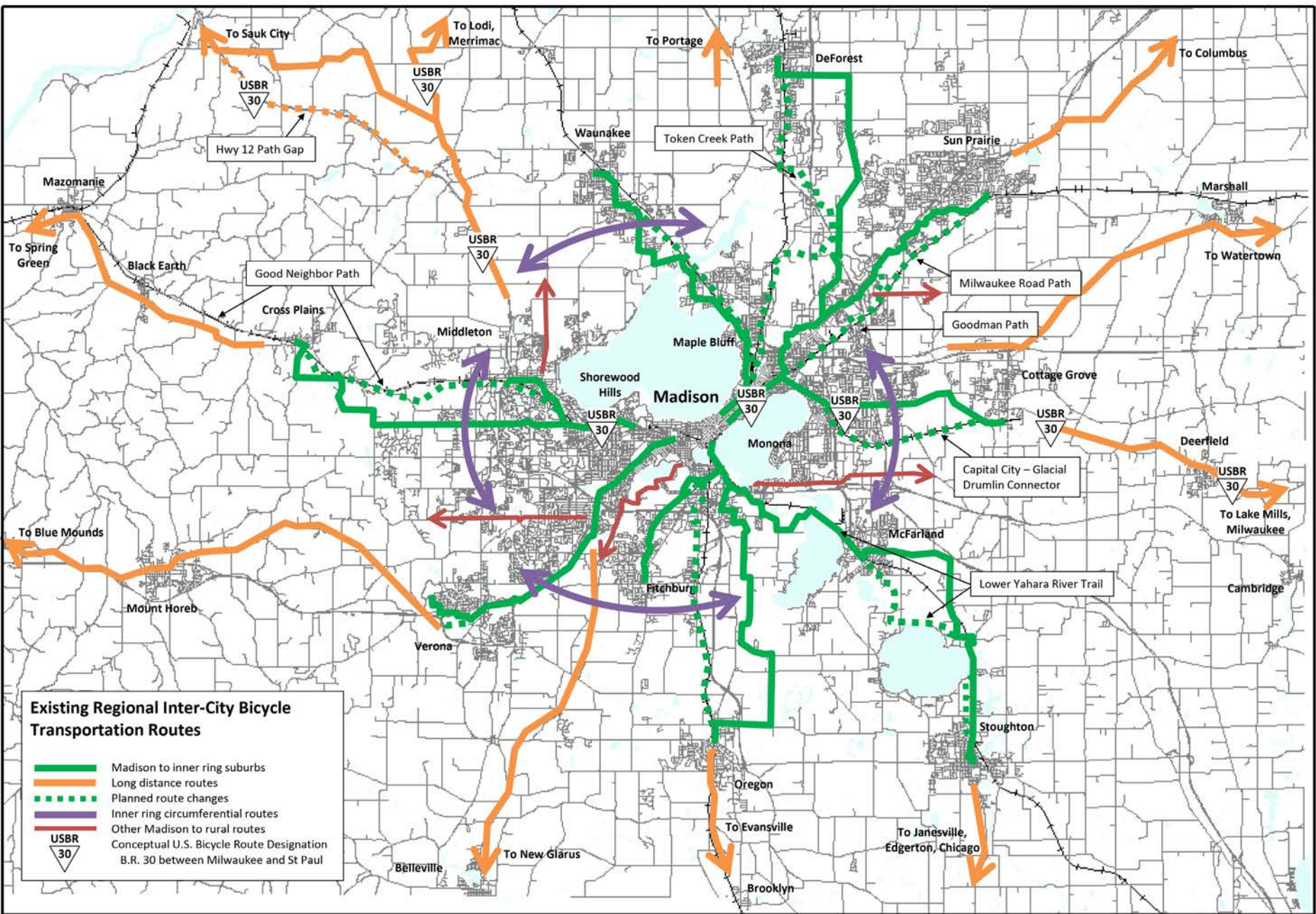


Figure 4-14 Regional Inter-City Bicycle Transportation Routes



## J. Bikeway Network Gap and Deficiency Analysis

The benefit of analyzing bicycling infrastructure is that planners are able to identify gaps and deficiencies in the bikeway network. Gaps and deficiencies have been identified primarily along the primary and secondary networks established by the bicycle functional classification effort. Data and input used for identifying these deficiencies included:

- Bicycle level of service and roadway suitability analysis
- Corridor planning efforts led by the City of Madison, WisDOT, and others
- Local knowledge obtained from planners, engineers, and bicycle users making up the advisory committees
- Public outreach efforts like the City of Madison's Ideascale program and interactive webpage used for input as part of this planning effort

Examples of network gaps and deficiencies are shown in **Table 4-3**.

**Table 4-3**  
**Examples of Bikeway Network Gaps and Deficiencies**

Example Gap or Deficiency	Possible Solutions
<b>Missing bike facilities</b> On streets with high speeds and volumes, bicycle facilities are needed. Most streets built or last improved prior to the 1990s did not include bike facilities and may need to be retrofitted.	Bike lanes (in urban areas) and shoulders (in rural areas) may be retrofitted into street cross sections. This is not practical in some corridors due to right-of-way issues and other constraints. See the Bicycle Facilities Toolbox.
<b>Substandard bike facilities</b> Some older bike lanes and shared-use paths are too narrow, have sharp curves, have deteriorated pavement, or are otherwise substandard	Substandard facilities can be improved and brought up to modern standards with reconstruction projects or as stand-alone fixes.
<b>Missing connections</b> Geography or bikeway network constraints may restrict travel between neighborhoods or disrupt the continuity of a bicycling corridor.	Short shared-use paths can bridge gaps. New street connections can be built crossing freeways and natural barriers. Development projects can rearrange street networks.
<b>Problem intersections</b> High-volume intersections, particularly intersections with high volumes of turning traffic such as at freeway interchanges, can be intimidating or unsafe.	Design improvements at intersections include improved channelization, green bike lanes, bike boxes, enhanced crosswalks, and grade separation for shared-use paths.

Identified gaps and deficiencies are shown in **Figure 4-16**. This is not an exhaustive list, and this database should be maintained and updated as new gaps and barriers are identified. Ideally, these problems should be systematically corrected and network gaps filled in. In many cases, planners and engineers have known about these issues for some time. Many past network gaps and deficiencies have been corrected while others remain due to political, funding, or technical hurdles.

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County



Chapter 5

# Bicycle Use and Trends



## A. Introduction

Transportation mode to work data from the American Community Survey (ACS) is by far the largest, most comprehensive source of information on bicycle use available. The ACS is similar to the Decennial Census in that it collects information about age, sex, race, where individuals work and how they get there, where they live, and many other topics. Survey forms are sent out monthly. Among the transportation questions are those referring to the respondent's commuting patterns "last week". Data is available for a single year or a range of years (e.g., 2009-2013) depending upon the size of the geography and the data set. Unfortunately, ACS data only covers commute trips and does not cover trips for leisure, shopping, education, and other purposes – an inherent limitation of the data.

Census data suggests that the typical individual bicycling to work in the Madison area lives in central Madison, is young, male, and has either a low or high (but not moderate) income. However, most bicycle commuters do not fit this description, as all age groups, genders, income ranges, and races report a range of bicycle commute levels. It is difficult to say whether or not the variance in bicycle commuting in these demographic categories is caused by cultural or social preferences, physical abilities, or if they are outcomes of other factors.

The University of Wisconsin-Madison Transportation Services conducts regular commuting surveys of its students, faculty, and staff. This survey is very in-depth and has historical data going back to 1979. One important and useful feature of the survey is that it asks for commuting patterns during "good" weather and "bad" weather. Although weather is subjective this measure does give some information regarding seasonal riding trends.

Bike counts have been produced by the City of Madison Traffic Engineering Division. These counts are obtained from detection systems, typically on shared-use paths near traffic signals, at about 12 locations. While the locations are limited, the data is available 24 hours per day and 365 days per year. In 2014 and 2015 respectively, the City of Madison installed new bike counters along the Southwest Path near Regent Street and along the Capital City Path near John Nolen Drive which provide useful data on bicycle volumes and have visible displays that show the current daily totals for path users and others to see.

In 2013, the Wisconsin Bike Fed (WBF) began leading an effort to count bicyclists and pedestrians at selected locations around Madison using the National Bicycle and Pedestrian Documentation Project model. These counts are conducted by volunteers between 4:00 pm and 6:00 pm on a weekday. So far, counts have only been conducted in the summer. While these manual counts are limited to a few counts per year and only count the afternoon peak period, they have the advantage of using human counters who can differentiate between road users, can count bicyclists riding on sidewalks, and do not miss riders who steer around loop detectors.

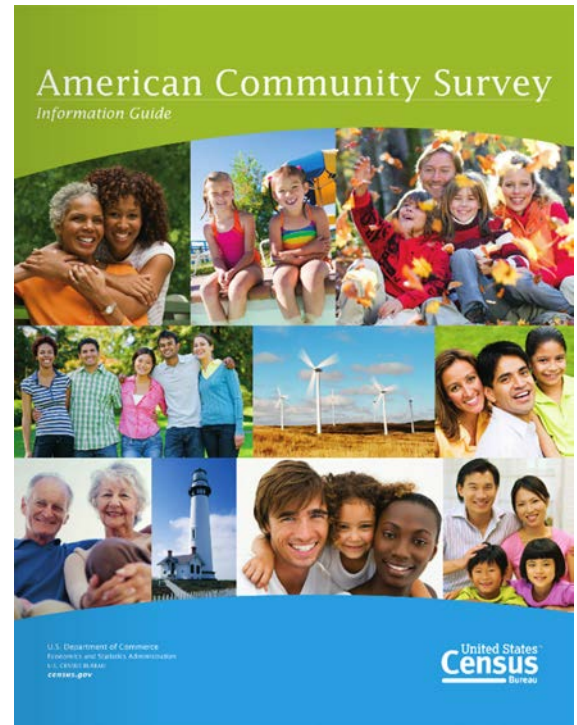


Photo: Arthur Ross, City of Madison Traffic Engineering

Bicycle safety information was obtained from the University of Wisconsin Traffic Operations and Safety (TOPS) lab and the City of Madison. This data is a compilation of police reports that can be screened for crashes involving cyclists.

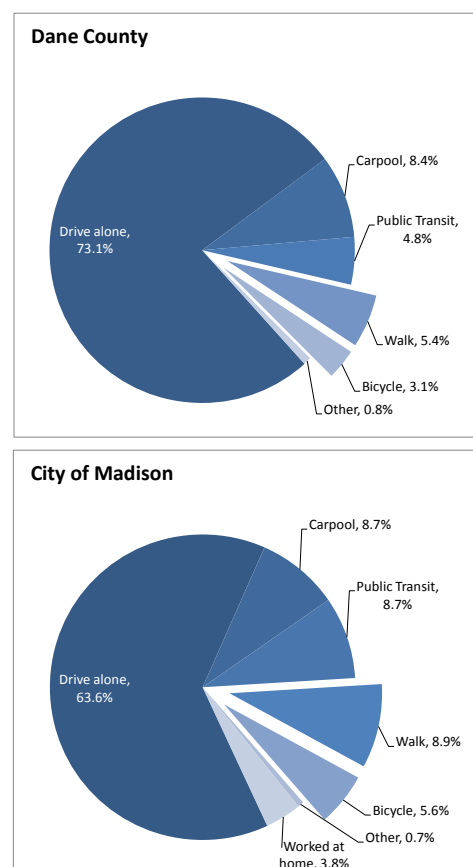
## B. Bicycle Commuting in Dane County

Although the overall proportion of commuters bicycling and walking to work in Madison and Dane County is relatively small compared to the entire work force, high volumes of bicyclists and pedestrians are present in central Madison. Given the high levels of traffic congestion in central Madison corridors, bicycle and walk trips play a significant role in mitigating congestion and improving the livability of these neighborhoods. As modes of transportation, bicycling and walking are critical in the development of a safe, convenient, efficient, and interconnected transportation network.

Since walking trips are similar to bicycle trips – generally short, unscheduled, and non-motorized – many commuters may alternate between modes and some analysis of walking trends is included in this section. According to the latest American Community Survey (ACS) data, Dane County has a bike commute mode share of about 3%. The City of Madison, which is considerably more urban than the county in general, has a bike commute mode share of about 5.6% (see **Figure 5-1**). These numbers are high compared to other U.S. cities and metro areas nationally. The national average bike commute mode share in large U.S. cities is 1.0% (*Bicycling and Walking in the United States 2014* Benchmarking Report, Alliance for Biking and Walking). The City of Madison's bike commute mode share trails only a few other mid-size cities with college campuses such as Davis, CA; Boulder, CO; and Eugene, OR.

An analysis of bicycle mode share to work by census tract provides a geospatial understanding of bike commuter concentrations in the Madison area (see **Figure 5-2**). Bicycling as a means of transportation to work is concentrated in the central Madison isthmus area; bike commute rates of well over 10% are not uncommon for some Census tracts. Residents living in peripheral Madison have bicycle commute rates of 2% to 5%, while smaller communities and rural areas in Dane County typically have rates below 2% (**Table 5-1**).

**Figure 5-1 Means of Transportation to Work in Dane County and City of Madison, 2010-2012**



Source: 2012 ACS Table B08006 Sex of Workers by Means of Transportation to Work.

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

Bicycling to Work  
Percent of Total  
Workers by Census Tract

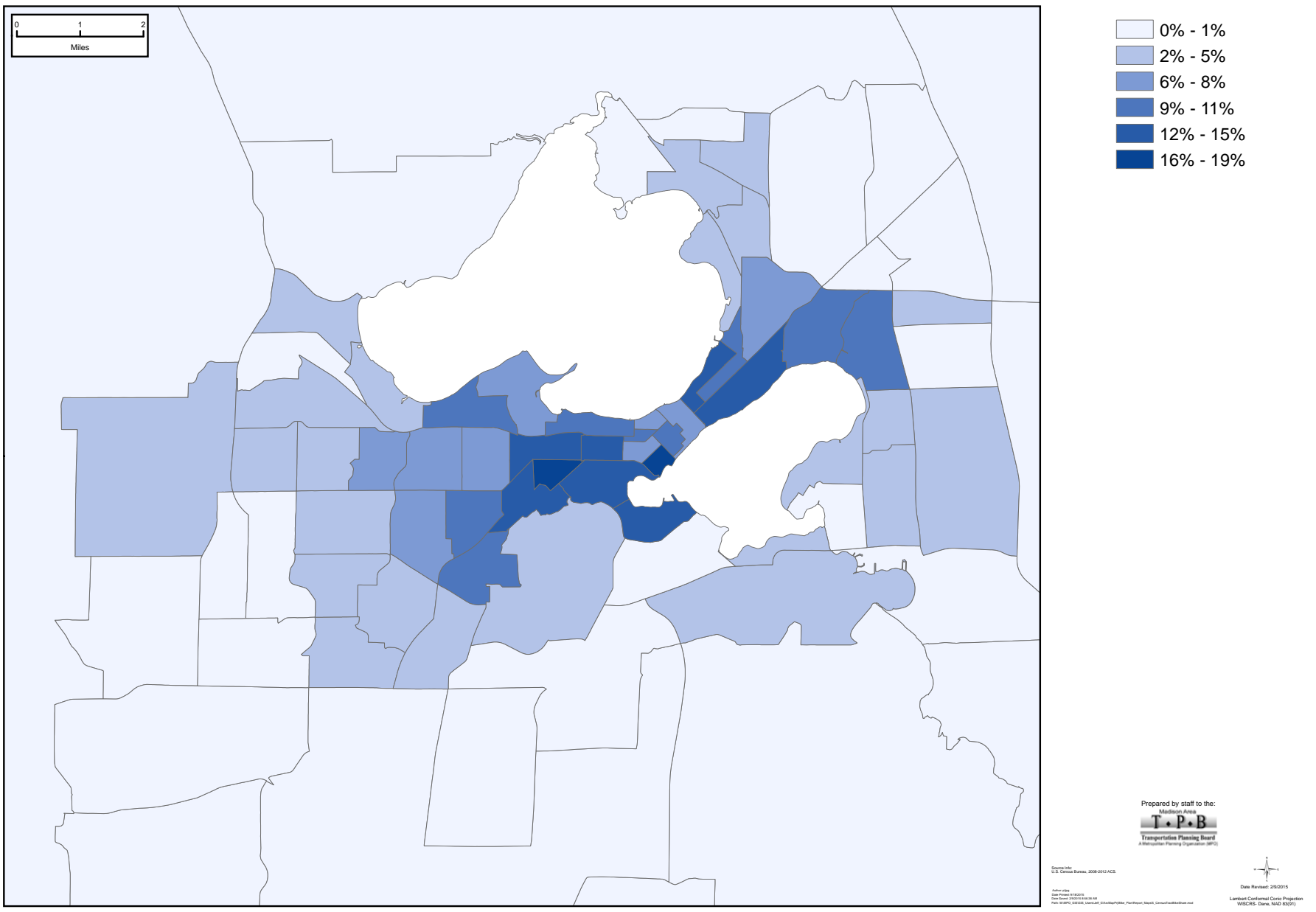


Figure 5-2 Bicycle Mode Share to Work by Census Tract in the Madison Area

Source: 2012 ACS Table B08006 Sex of Workers by Means of Transportation to Work

Among the likely reasons for this concentration of bicycle work trips in central Madison are:

- The residential areas are dense and located close to the high concentration of jobs near the Capitol Square and UW campus.
- Parking in the Madison central business district (CBD) and UW campus is limited and expensive.
- A convenient and enjoyable bicycle transportation network with an interconnected backbone of off-street paths, continuous low-volume residential streets, and on-street bike lanes serves the area.
- The jobs in the CBD and UW are professional and educational in nature, which often do not require the use of a personal car for work.

**Table 5-1** shows bicycle and walk mode shares for communities with a population of more than 2,000, including historical data from the 2000 Census. The communities that are larger and closer to central Madison have higher levels of bicycle commuting than communities farther away. For instance, Shorewood Hills (not shown in **Table 5-1**) borders the UW campus and has a very high level of bicycling (albeit with a population of less than 1,000), while Cottage Grove and Edgerton show negligible levels of cycling. Most communities showed positive trends in bicycle commuting between 2000 and 2009-2013. The largest increase in the bicycle mode shares was in the City of Monona where bicycle commuting increased from 0.7% to 2.8%.

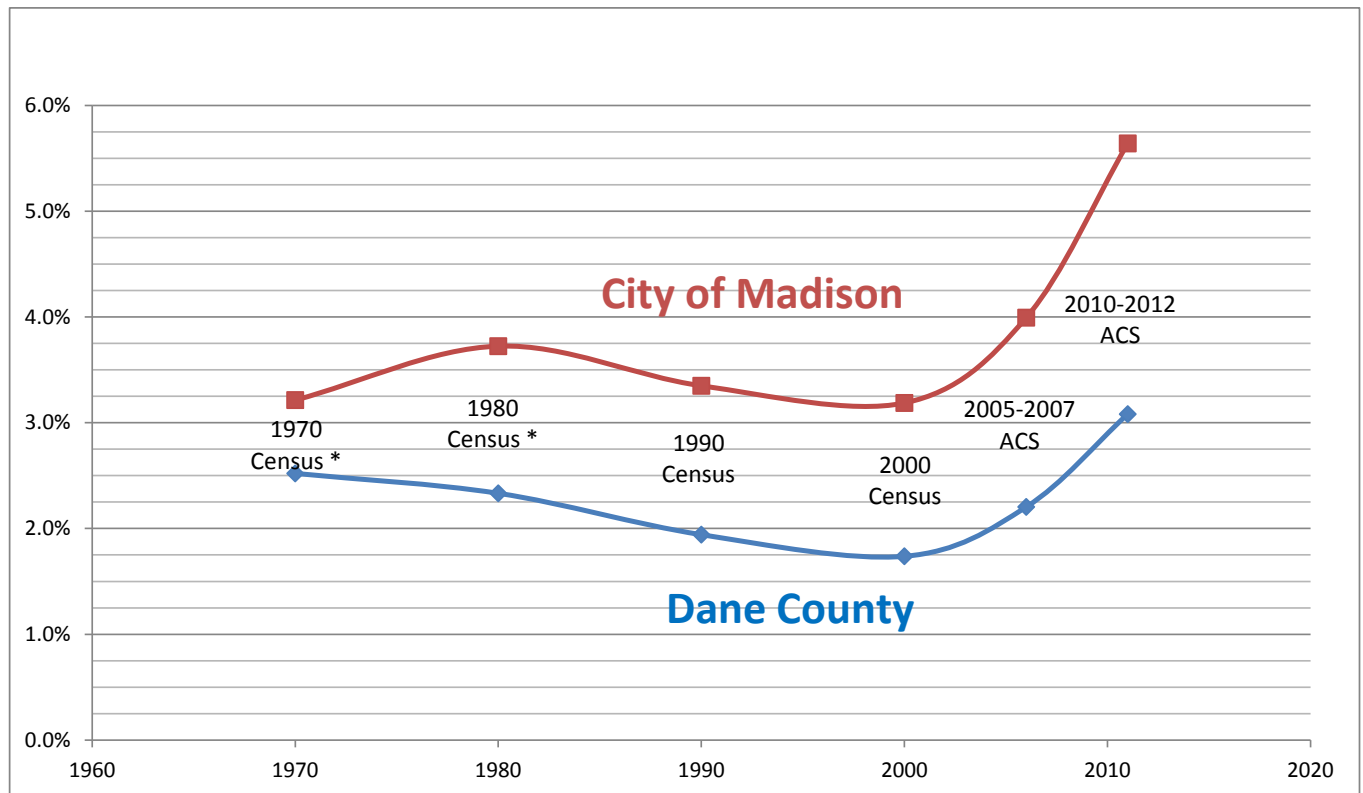
**Table 5-1**

**Bicycle and Walk Mode Share to Work for Selected Cities & Villages in Dane County**

	2000			2009-2013			Bike Mode Change
	Bike Share	Walk Share	Total Workers	Bike	Walk	Total	
Madison, City	3.2%	10.7%	119,705	5.3%	9.6%	133,977	+ 2.1%
Sun Prairie, City	0.1%	1.4%	11,070	0.2%	1.4%	16,363	+ 0.1%
Fitchburg, City	0.5%	0.8%	11,690	1.2%	1.8%	13,531	+ 0.7%
Middleton, City	0.7%	1.7%	9,305	1.1%	0.4%	9,985	+ 0.4%
Stoughton, City	0.2%	3.5%	6,440	1.7%	4.3%	6,770	+ 1.5%
Waunakee, Village	0.0%	3.4%	4,875	0.4%	0.9%	6,475	+ 0.4%
Verona, City	0.3%	2.7%	3,650	0.6%	1.6%	5,924	+ 0.3%
Oregon, Village	0.0%	1.5%	4,075	0.5%	1.9%	5,126	+ 0.5%
DeForest, Village	0.1%	0.6%	4,140	0.0%	2.5%	4,985	- 0.1%
McFarland, Village	0.0%	1.7%	3,715	0.3%	1.3%	4,671	+ 0.3%
Monona, City	0.7%	1.6%	4,375	2.8%	1.8%	4,076	+ 2.2%
Mount Horeb, Village	0.3%	3.8%	3,280	0.3%	4.3%	3,729	0.0%
Cottage Grove, Village	0.0%	1.1%	2,200	0.0%	0.8%	3,488	0.0%
Edgerton, City	0.0%	4.8%	2,600	0.0%	2.3%	2,762	0.0%
Windsor, CDP	0.0%	0.0%	1,555	0.0%	0.0%	2,154	0.0%
Cross Plains, Village	0.5%	3.8%	1,820	0.8%	3.2%	2,018	+ 0.2%
Dane County	1.7%	6.2%	42,540	3.0%	5.6%	274,086	+ 1.3%

Sources: 2000 CTPP Table P1-002 Sex by Means of Transportation to Work, 2013 ACS Table B08006 Sex of Workers by Means of Transportation to Work.

**Figure 5-3 Bicycle Mode Share Trends 1970 – 2012, Dane County and City of Madison**



\* In 1970 and 1980, the bike mode was combined with the “other” category that includes motorcycle and taxicab. Bike mode share for these years was estimated at 80% of the “other” category for Dane County and 90% for City of Madison. These proportions roughly equal today’s split between bike, motorcycle, and taxi.  
Sources: See chart.

Bicycling to work in Madison and Dane County has steadily increased since 2000 (**Figure 5-3**) after a period of slightly declining rates from 1980 to 2000. Between the 2000 Census and 2010-2012 ACS, bicycle mode shares increased from 1.7% to 3.1% in Dane County and from 3.2% to 5.6% in the City of Madison.

### C. Means of Transportation to Work by Selected Social and Economic Characteristics

ACS data tables can show the breakdown of bicycle commuting by age, gender, race and ethnicity, household income, and other metrics. One limitation of these tables is that bicycling is usually combined with taxicab, motorcycle, and other modes. However, analysis of the totals indicates that about 80-90% of this “other” category is bicyclists.

## Age

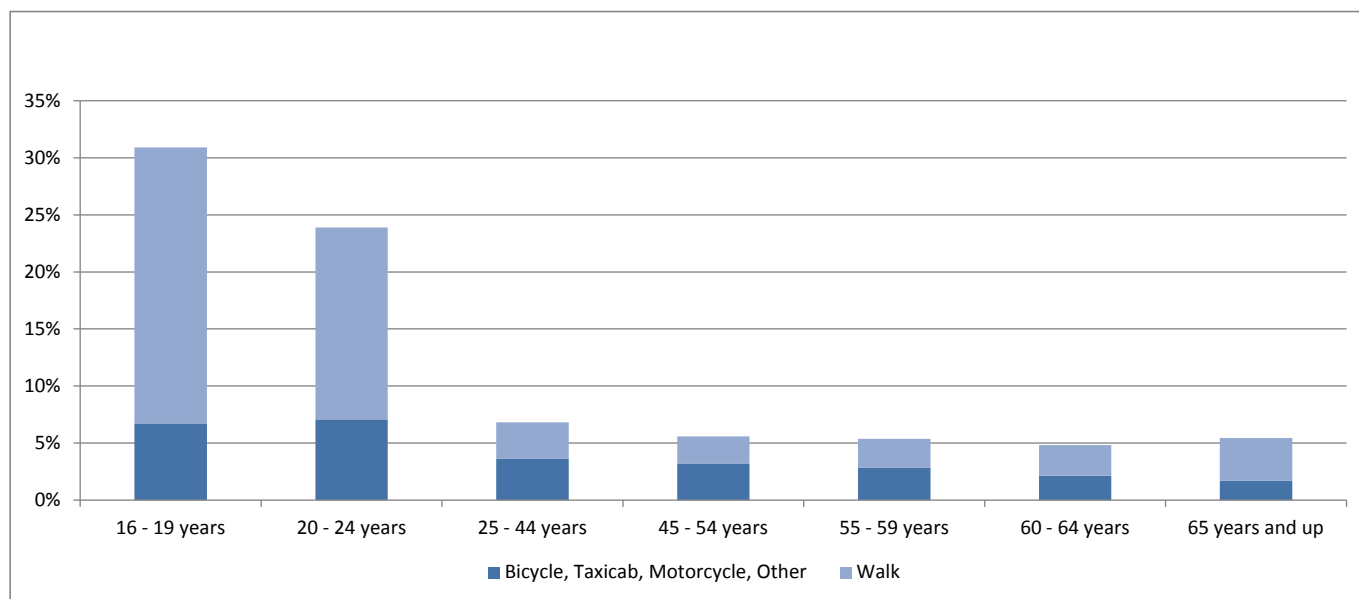
Younger commuters are more likely to bike to work (**Table 5-2, Figure 5-4**). Individuals aged 16-24 represent only 16% of total workers in Dane County but comprise 29% of the trips to work by bicycle. These trends may be due to the attractive low cost of cycling for college and university students as well as the physical demands of bicycling compared to driving, public transit, and walking. Individuals less than 25 years old are much more likely to walk compared to individuals over age 25.

**Table 5-2**  
**Bicycle and Walk Mode Share to Work for Age Groups in Dane County**

Age	Bicycle, Taxicab, Motorcycle & Other	Walking
16 to 19 years	6.7%	24.2%
20 to 24 years	7.1%	16.8%
25 to 44 years	3.6%	3.2%
45 to 54 years	3.2%	2.4%
55 to 59 years	2.9%	2.5%
60 to 64 years	2.1%	2.7%
65 years +	1.7%	3.7%

Source: American Community Survey, 2010-2012

**Figure 5-4 Bicycle and Walk Commuting by Age Group in Dane County**



Source: American Community Survey, 2010-2012

## Gender

Male respondents to the American Community Survey are about twice as likely to commute to work by bicycle with a commute mode share of 4.1% in Dane County and 7.7% in the City of Madison (**Table 5-3**). However, males and females are nearly equal in terms of walk mode share to work, with both at 5.4% in Dane County and about 9% in the City of Madison. Gender is the only category where the ACS reports bicycle commute mode shares without including motorcycle, taxicab, and other.

**Table 5-3**  
**Bicycle and Walk Mode Share to Work for Gender in Dane County**

Gender	Bicycle	Walking
Male	4.1%	5.4%
Female	2.0%	5.4%

Source: American Community Survey, 2010-2012

The gender distribution of total workers in the City of Madison is nearly equal, with males totaling 51% of the workforce. However, males greatly exceed females in trips to work by bicycle, with 69% of the workers biking to work responding as being male (**Figure 5-5**).

## Race and Ethnicity

For individual races in Dane County, white commuters reported somewhat higher levels of bicycle commuting (3.9%) than Black (3.3%) or Asian (3.1%) commuters (**Table 5-4**). **Figure 5-6** shows that white individuals appear to bike at approximately equal rates as non-white individuals; however, individuals identifying as “two or more races” report an unusually high bike commute mode share of 8.0%.

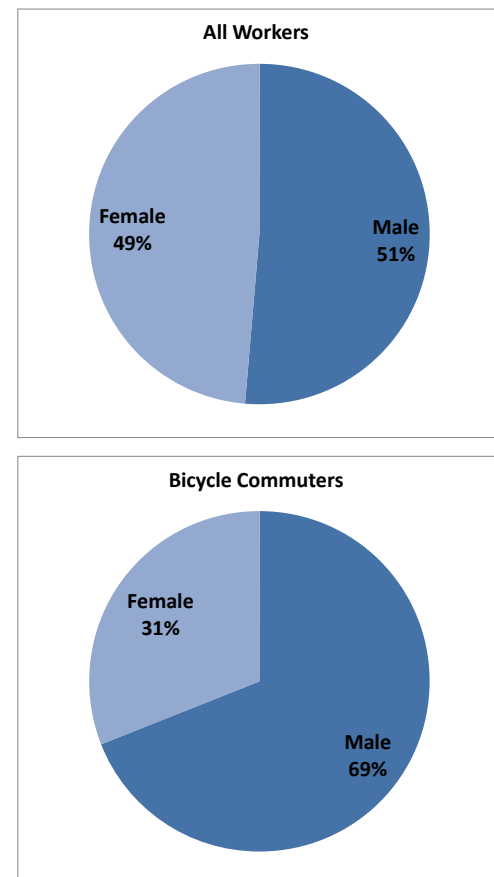
**Table 5-4**  
**Bicycle and Walk Mode Share to Work for Race and Ethnicity in Dane County**

Race	Bicycle, Taxicab, Motorcycle & Other	Walking
White	3.9%	5.2%
Black or African American	3.3%	9.5%
Asian	3.1%	4.9%
Two or more races	8.0%	8.2%
Other race	2.4%	8.6%

Ethnicity	Bicycle, Taxicab, Motorcycle & Other	Walking
Hispanic/Latino	2.2%	4.6%
Not Hispanic/Latino	4.0%	5.2%

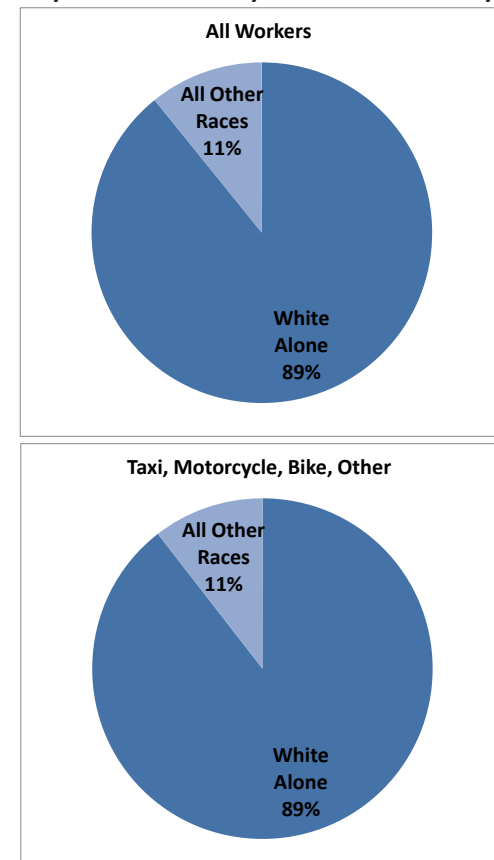
Source: American Community Survey, 2010-2012

**Figure 5-5** Proportions of All Workers and Bicycle Commuters by Gender in Dane County



Source: American Community Survey, 2010-2012

**Figure 5-6** Proportions of All Workers and Bicycle Commuters by Race in Dane County



Source: American Community Survey, 2010-2012

## Household Income

In Dane County, commuting to work by bicycle, taxicab, motorcycle, or other generally declines as household incomes increase until household incomes reach about \$60,000, at which point they begin to increase (**Table 5-5, Figure 5-7**). Individuals with household incomes below \$15,000 per year have very high rates of walking to work. These trends likely reflect low-income college and university students that walk and bicycle to work as well as other low-income families that use bicycling and walking because of its low cost. The slight increase in bicycling and walking above \$60,000 may reflect the higher concentration of high-wage office jobs in the downtown core compared to the periphery, as well as the increased freedom of higher income individuals to live and work in locations of their choosing.

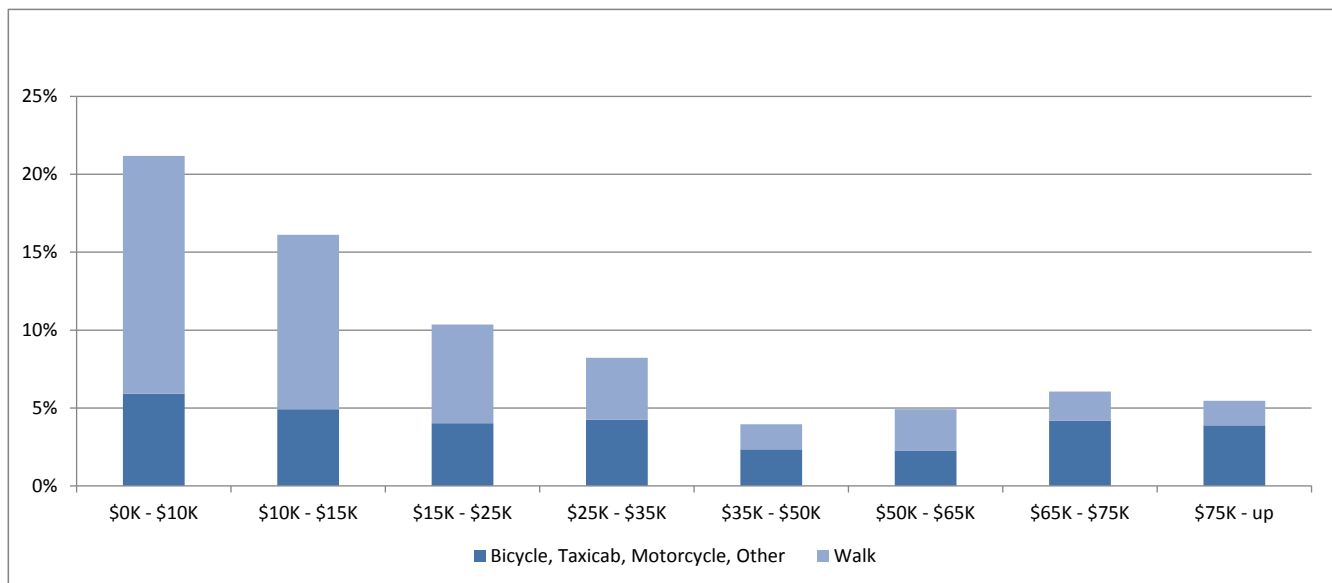
**Table 5-5**

**Bicycle and Walk Mode Share to Work by Household Income in Dane County**

Income	Bicycle, Taxicab, Motorcycle & Other	Walking
\$9,999 or less	5.9%	15.3%
\$10,000 to \$14,999	4.9%	11.2%
\$15,000 to \$24,999	4.0%	6.3%
\$25,000 to \$34,999	4.2%	4.0%
\$35,000 to \$49,999	2.3%	1.6%
\$50,000 to \$64,999	2.2%	2.7%
\$65,000 to \$74,999	4.2%	1.9%
\$75,000 or more	3.9%	1.6%

Source: American Community Survey, 2010-2012

**Figure 5-7 Bicycle and Walk Commuting by Household Income in Dane County**



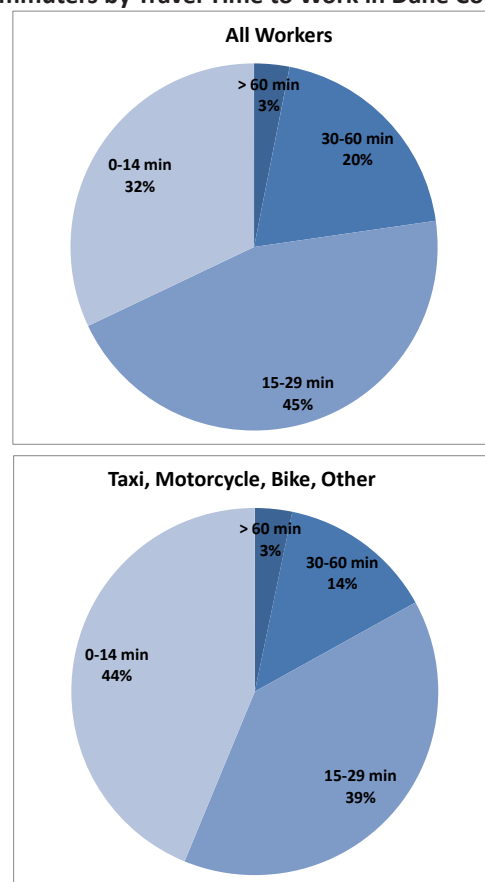
Source: American Community Survey, 2010-2012

## E. Length of Trips to Work

ACS data includes the reported travel time to work for responding individuals, but does not include the travel distance to work. Workers in Dane County reported an average commute time to work of 22 minutes across all modes (**Table 5-6**). Individuals who take public transit spend on average the most time commuting (32.1 minutes per trip) while individuals walking and biking to work spend the least (14.5 and 19.7 minutes, respectively) (**Figure 5-8**).

Since bicyclists are not only spending less time commuting but also traveling slower than auto traffic, they are making shorter commutes. Estimating the length of these commutes is somewhat inexact. However, if an average travel speed of 10 miles per hour is assumed for bicyclists, including traffic signals and stop signs, the average trip length would be 3.3 miles.

**Figure 5-8 Proportions of All Workers and Bicycle Commuters by Travel Time to Work in Dane County**



Source: American Community Survey, 2010-2012

**Table 5-6**  
**Dane County Means of Transportation to Work by Travel Time to Work**

Travel Time to Work	Total	Drive Alone	Carpool	Public Transit	Bike, Other	Walk
Less than 10 minutes	38,430	28,474	2,529	403	2,031	4,993
10 to 14 minutes	45,115	34,776	3,319	1,116	2,343	3,561
15 to 19 minutes	48,640	37,198	4,698	1,915	1,895	2,934
20 to 24 minutes	48,414	37,864	5,039	2,732	1,401	1,378
25 to 29 minutes	20,752	16,777	1,977	909	635	454
30 to 34 minutes	30,946	23,103	3,662	2,511	695	975
35 to 44 minutes	11,554	8,549	1,375	1,063	441	126
45 to 59 minutes	8,607	5,932	1,034	1,251	229	161
60 or more minutes	8,117	5,544	873	1,281	328	91
Weighted Average TT to Work (min)	22.0	21.8	24.2	32.1	19.7	14.5
Assumed Average Speed (mph)		30	30	10	10	3
Estimated Average Trip Length (mi)		10.9	12.1	5.3	3.3	0.7

Source: American Community Survey, 2010-2012

## F. Commuting to the University of Wisconsin

The University of Wisconsin – Madison has a student enrollment of 42,820, with a staff of 21,700. Students, faculty, staff, and UW Hospital employees included, the UW is associated with roughly 70,000 commuters, or about 14% of the total Dane County population.

The University of Wisconsin has a long history of tracking the transportation choices of students, faculty, and UW Hospital employees. The *2014 Biennial Transportation Survey* report (UW Transportation Services) provides basic transportation and commuting characteristics of current UW students and employees in both good and bad weather. The 2014 data, derived from about 1,800 survey responses, reveal that student bicycling rates are relatively high.

In good weather, 22% of students biked to campus (**Table 5-7**). However, most of these students switched to transit in bad weather, with bicycle rates dropping to only 3% and the transit rate rising from 17% to 53%. Students bike to campus in slightly greater numbers than faculty and staff during good weather, but at approximately the same rate during bad weather.



**Table 5-7**

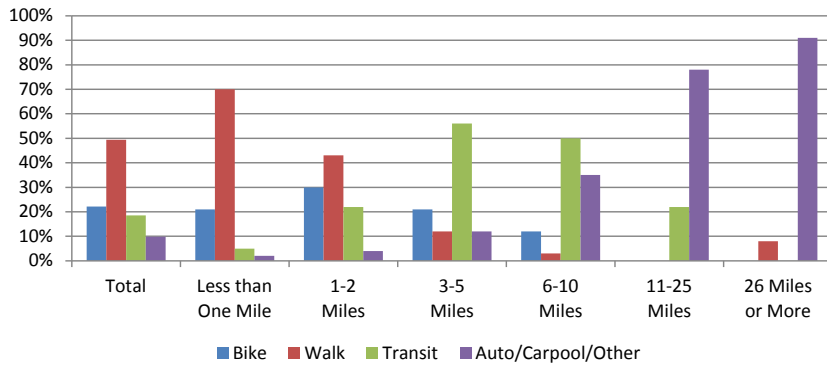
**Mode Split Summary for the University of Wisconsin - Madison**

Group: Weather:	Students		Faculty/Staff		UW Hospital	
	Good	Bad	Good	Bad	Good	Bad
Bike	22.1%	3.4%	17.4%	3.7%	5.2%	0.6%
Walk	49.4%	32.0%	4.2%	2.4%	1.8%	1.7%
Transit	18.6%	53.1%	14.7%	25.0%	12.5%	12.7%
Auto/Carpool/Other	9.9%	11.5%	63.7%	68.9%	80.5%	84.9%

Source: 2014 Biennial Transportation Survey, UW Transportation Services

Students living between one and two miles from campus are most likely to bike with a 30% mode share (**Table 5-8**). Very few biked farther than 10 miles and within a mile, walking is the dominant mode. The data indicates that the vast majority of students surveyed – almost 90% – live within five miles of campus. UW faculty and staff commute longer distances, with about 60% of respondents reporting a one-way commute of over 5 miles.

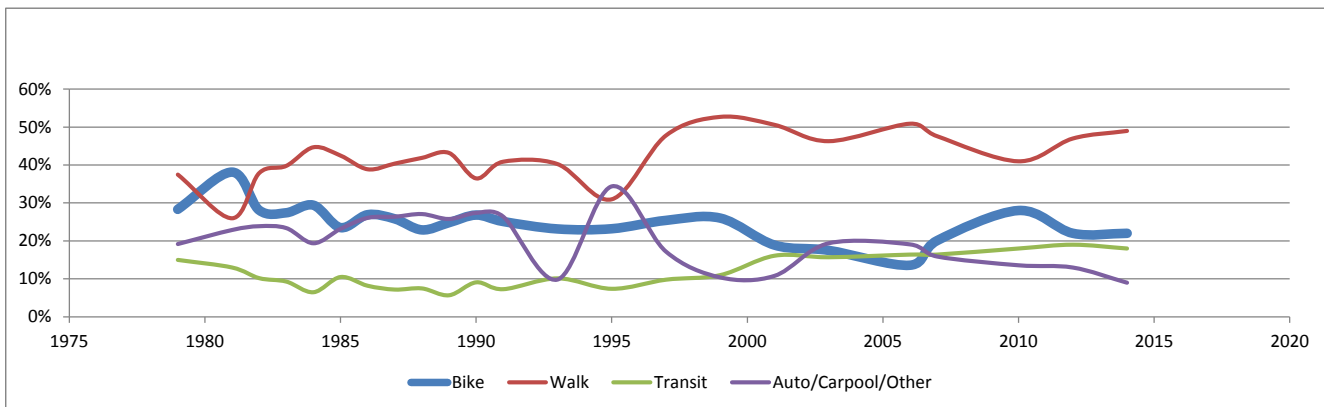
**Table 5-8**  
**UW Campus Commute Mode Share by Distance**



Source: 2014 Biennial Transportation Survey, UW Transportation Services

The UW has been conducting transportation surveys of its students and faculty for over 30 years. Throughout that time, the UW has seen many changes. However, the bike commute mode share for students has remained relatively constant at about 25% (**Figure 5-9**) while walking and transit have increased steadily and auto/carpool has decreased.

**Figure 5-9 Historical UW Campus Student Commute Mode Share Summary, Good Weather**



Source: 2014 Biennial Transportation Survey, UW Transportation Services

## G. Bicycle Counts

Accurately counting bicyclists on bikeways is fundamental to gauging the performance or usefulness of facilities. Unfortunately, bikes are difficult to count automatically and few institutionalized counting programs exist. At least three agencies are currently performing bicycle counts:

- **The City of Madison Traffic Engineering Division** regularly collects usage statistics with automated equipment, normally with inductive loop detection near traffic signals. While this method provides continuous data, it is limited in that counts are only provided at intersections and may be missing bikes that pass through the area without activating the detection. The City of Madison has also installed 2 stand-alone bike count stations that visibly displays real-time daily bike counts.
- **The Wisconsin Bike Fed** began performing regular manual bike counts at selected locations in 2013 utilizing volunteers. While the manual method is arguably more accurate than automated methods and can collect more detailed information, the counts are limited to a span between 4:00 p.m. and 6:00 p.m. a few days per year.
- **The Wisconsin Department of Transportation (WisDOT)** has done several location-specific bike counts related to major corridor studies along the Beltline Highway and Stoughton Road. These counts provide accurate counts throughout the day but will not be performed regularly.

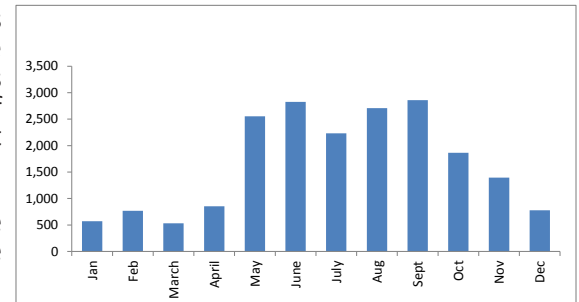
The areas with the highest recorded bike counts include University Avenue through the UW campus, the Capital City Trail at North Shore Drive, the Capital City Trail through the Isthmus, and the Southwest Path. The City of Madison reports daily counts of 2,000 or more in summer months. Wisconsin Bike Fed counts show higher counts in the 4:00 p.m. to 6:00 p.m. span in these areas than the City of Madison counts do – some of which may be cross traffic, or cyclists that were not picked up by the loop detectors. Bike counts are typically unavailable outside the Madison area.

Predictably, bike volumes are higher in warm weather months. They are highest in late spring and early fall when the UW and other educational institutions are in session. Counts throughout the year at selected locations from the City of Madison are shown in **Figure 5-10**.

Bike volumes follow similar patterns as auto and transit usage throughout the day. Hourly counts throughout the weekday at selected locations from the City of Madison are shown in **Figure 5-11**. The afternoon peak period is the heaviest time; about 10% of daily bike traffic is counted during the peak hour. However, ridership appears to be about equal among weekdays, Saturdays, and Sundays, as shown in **Figure 5-12**.

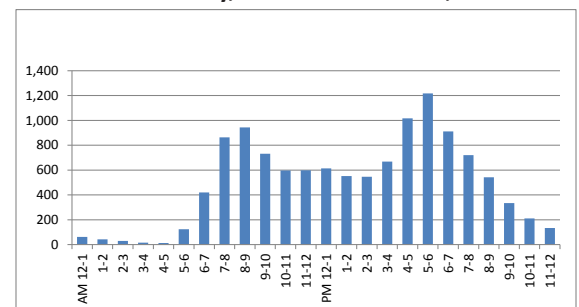
A comprehensive view of afternoon counts from 4:00 p.m. to 6:00 p.m. is shown in **Figure 5-13**, showing bike count information from the City of Madison, Wisconsin Bike Fed, and WisDOT.

**Figure 5-10 Seasonal Variation in Bicycling – City of Madison Bike Counts, Average Weekday Counts, Selected Locations, 2012**



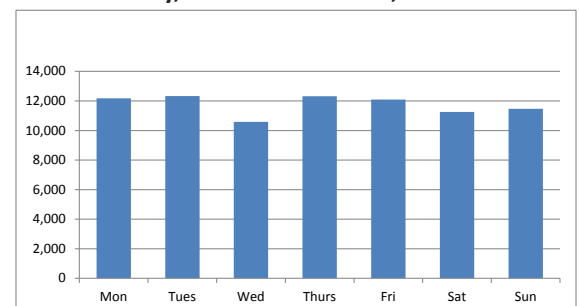
Source: City of Madison Traffic Engineering Division, 2012, counters 5001 to 5011

**Figure 5-11 Hourly Variation in Bicycling – City of Madison Bike Counts, Average Weekday Hourly Counts in July, Selected Locations, 2012**



Source: City of Madison Traffic Engineering Division, 2012, counters 5001 to 5011

**Figure 5-12 Weekday Variation in Bicycling – City of Madison Bike Counts, Average Daily Counts in July, Selected Locations, 2012**



Source: City of Madison Traffic Engineering Division, 2012, counters 5001 to 5011

**Bicycle Traffic Counts  
Weekday 4-6 pm (2012-2015)  
for Madison Area**



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## H. Bicycle Safety

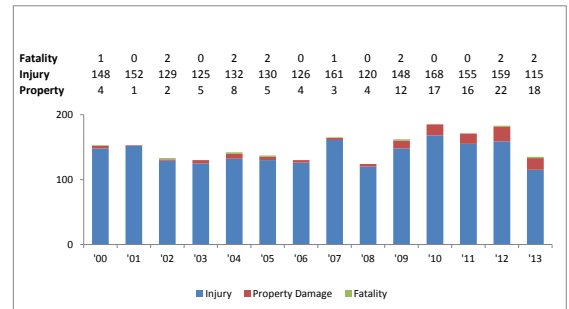
The U.S. National Highway Traffic Safety Administration (NHTSA) reports that nationwide, there were 726 cyclist fatalities in 2012, including 11 in Wisconsin (*Traffic Safety Facts*, NHTSA, 2012 Data, April 2014). These 726 fatalities accounted for about 2% of the 33,561 traffic deaths during that year. The NHTSA reports that the majority of cyclist fatalities occur between the hours of 4:00 pm and 8:00 pm. This is most likely due to a combination of factors, including high bicycle and general traffic volumes during the afternoon peak period, the onset of dusk, and the presence of intoxicated vehicle operators. Approximately 69% of crashes resulting in a fatality had an operator of a vehicle with a blood alcohol content of 0.08 or more. The NHTSA shows a steady decline in overall traffic fatalities since the early 2000s, but the number of cyclist fatalities has remained about the same at about 700 per year.

In Dane County, traffic safety statistics are compiled by the University of Wisconsin Traffic Operations and Safety (TOPS) laboratory. These records are further analyzed by the City of Madison to create a more robust database within city limits. One significant limitation of bike safety statistics is that only crashes with an injury, a fatality, or property damage of \$1,000 or more result in a police report. Countless minor crashes occur without being reported because they fall below this threshold.

139 crashes involving bicyclists were reported in Madison in 2011 (*2011 Crash Report*, City of Madison Traffic Engineering). According to the 2011 Crash Report, about half of all crashes were caused by auto drivers failing to yield, 14% were caused by a bicyclist failing to yield, and the remainder had other causes. 74% of crashes occurred at an intersection; in more than half of the crashes, an auto was turning and the bike was going straight.

Bicycle crash locations throughout Dane County were mapped using UW TOPS lab data as well as data from the City of Madison, as shown in **Figure 5-15**. Most crashes outside the Madison area are diffuse; as a result **Figure 5-15** focuses on the Madison area to show more detail. Bicycle crashes are concentrated in central Madison where bicycle use is highest and also at high volume intersections of arterial streets.

**Figure 5-14 Historical Reported Crashes in Dane County Involving a Bicyclist**



Source: UW Traffic Operations and Safety Laboratory

**Madison Metropolitan Area and Dane County**

 Bicycle Path



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## Chapter 6

# Current Education, Encouragement and Enforcement Activities



Education, encouragement, and enforcement programs help people of all ages, backgrounds, and abilities make use of the bicycling infrastructure that Dane County offers. These programs help people learn to use the roads and paths safely, as well as assist those who are new to bicycling to start riding. Programs also help ensure that motorists understand their responsibilities in keeping bicyclists safe. Dane County has many programs and policies that make the area one of the nation's top bicycling locations. The goal of this plan is to build upon these efforts, thereby allowing more people to discover the joy and benefits of bicycling and to help them ride safely.

## **A. Dedicated Government Staff Positions**

A number of staff positions are dedicated to working on bicycle projects and programs in Dane County. The City of Madison Pedestrian/Bicycle Coordinator focuses on planning and engineering activities related to bicycle and pedestrian facilities in the city. This position is tasked with conducting safety studies, attending neighborhood safety meetings, and ensuring that project designs meet the needs of bicyclists and pedestrians. In addition to being involved with education and outreach events, the Pedestrian/Bicycle Coordinator updates the city's bike map, brochures, website, and other bicycle-related information.

Another City of Madison position, the Madison Bicycle Registration Coordinator, oversees the Madison Bicycle Registration program. City of Madison General Ordinance 12.78(1) requires all bicycles used by Madison residents to be registered. It also requires bicycles purchased from a bicycle dealer within the City of Madison by a City of Madison resident to be registered by that dealer at the time of sale. Bicycles with a current registration from another municipality meet the City of Madison bicycle registration requirement. The four-year bicycle registration costs \$10 and is a preemptive measure to help residents if their bicycles are lost or stolen. The Bicycle Registration Coordinator is also the key contact for bicycle shops for the distribution of maps, brochures, and other information. As time allows, the Bicycle Registration Coordinator also assists with encouragement and education activities.

The City of Madison also employs a full-time Pedestrian/Bicycle Safety Educator who works with schools in the Madison Metropolitan School District (MMSD) as well as neighborhood and youth organizations. The safety educator's activities focus on skills development through implementation of a basic bicycle skills curriculum.

The University of Wisconsin-Madison's Transportation Services division employs a full-time Bicycle/Pedestrian Coordinator. This position plans, sites, and orders all bicycle parking facilities on the UW campus. It also manages paid bike parking, promotes city bike registration, oversees the University Bicycle Resource Center's operations and student employees, manages the collection of illegally parked or abandoned bikes, and supervises all bicycle/pedestrian educational programs.

In addition, the City of Madison has many other staff who spend time working on bicycle issues in a variety of departments. Other communities also have staff that work on improving bicycling opportunities as an important part of their positions.

## **B. Youth Education and Encouragement**

Many Dane County communities have active Safe Routes to School (SRTS) programs. The programs are intended to promote walking and bicycling to school and work, and to make conditions safer for walking and bicycling.

From 2011 to 2014, the MMSD received funding through a SRTS grant to expand their efforts to promote walking and biking to school. This grant allowed them to develop policies that support walking and biking, implement new encouragement campaigns, continue work on traffic safety planning, purchase new bike racks for 30 schools, and increase education efforts.

To promote bicycle education, MMSD received donations of bicycle fleets for elementary and middle school teachers to use for hands-on training. MMSD offers training to physical education teachers to prepare them to teach safe bicycling. The bicycle fleets can also be used for school field trips as well as for Madison School Community Recreation (MSCR) summer programming and afterschool recreational programming. MSCR also offers a Learn to Ride course for youth and adults who have not yet learned to ride a bicycle.

The City of Sun Prairie also has an active SRTS program at all of its elementary and middle schools. A number of schools have regular walking school buses (adults chaperoning groups of children to school), encouragement activities, and up-to-date school traffic safety plans. In addition, schools in McFarland, Oregon, and Waunakee have recently updated their traffic safety plans and made improvements to help create a safe environment for children to walk and bike.

An outgrowth of the SRTS program is the annual Dane County “Walk or Wheel Challenge.” Held in October, this one-week walking and biking competition encourages students to walk or bicycle to school. Dane County schools earn points based on encouragement and awareness-raising activities, and top schools receive cash prizes.

Dane County schools also take part in the national Fire Up Your Feet program. In cooperation with the Wisconsin Bike Fed and the Safe Routes to School National Partnership, this program encourages Dane County families, students, and schools to work together to create active lifestyles. Students use an online activity tracker to record behavior that incentivizes physical activity and healthy living. Students of Dane County schools compete with other schools on a national scale to walk, bike, and engage in other physical activity.



*Photo: Peter Gray*

A variety of other youth programming also occurs throughout Dane County. Many schools partner with the non-profit organization Tri 4 Schools to host youth athletic events. Many municipalities host bicycle rodeos in partnership with non-profit organizations and schools. Activities at bike rodeos typically consist of riding skills stations, helmet fittings, safety instruction and bike maintenance stations. Several Dane County schools also partner with the non-profit National Interscholastic Cycling Association to host Youth Mountain Bike League teams. In addition, some schools offer bike clubs and unicycle clubs, and some local cycling clubs also have programs aimed at youth.

To facilitate teaching bicycle skills to youth, the WisDOT Bureau of Transportation Safety hosts “Teaching Safe Bicycling,” a one-day training course for people who teach bicycling to children. Topics include child traffic skills, common crash types, and crash avoidance skills. This free course is offered in Dane County every year.

To ensure opportunities exist for all children to own a bicycle, the non-profit Wheels for Winners provides an “earn-a-bike” program. Children participate in community service projects and safety training coordinated by local neighborhood centers to receive the bicycles free of charge. The program distributes approximately 200 bikes annually.

### **C. Education and Encouragement Programs and Events**

Madison’s signature bicycling event is Ride the Drive. This one-day, “carefree, car free” special event closes select streets to motor vehicle traffic and opens the streets to cyclists, walkers, rollerbladers, and anyone else who wishes to participate in the festive atmosphere. These popular events typically see a turnout of about 20,000 participants. Participants enjoy live music, food, and other activities along the route. Currently two such events are held each year in Madison.

The Wisconsin Bike Fed, a statewide bicycle advocacy organization, organizes Bike Week. This celebration of bicycling includes an entire week of activities including daily bicycle commuter stations, a family ride, a bike-in movie, and other activities to encourage more people to ride both for transportation and for fun.

The Bike Fed also operates a program called Share and Be Aware that educates motorists, bicyclists, and pedestrians on how to safely share the road. The program includes information on Wisconsin traffic laws and tips for motorists and bicyclists.

As a component of the Share and Be Aware program, the Bike Fed hosts a monthly roundtable called Savvy City Cycling. This is a series of informational presentations with the goal of increasing the skills of bicyclists of all skill levels. The presentations provide a welcoming atmosphere where less-experienced bicyclists can join regular riders and learn from specialists about in-depth bicycling topics. Educational topics include commuting skills, preparing for winter riding, and making oneself more visible while bicycling.



*Photo: City of Madison Parks Department*

In an effort to encourage bicycling by women, the Bike Fed has launched a Women & Bicycles Ambassador Program. The program features “bike ambassadors” who plan and hold events for women. This includes workshops, social hours, bike rides, and other events that promote women bicycling.

Dane County also hosts a wide range of bicycle-related events that are important parts of the local bicycle culture. The events include neighborhood-based activities, small organized rides, and large international events like Ironman Wisconsin.

In Madison, several low-income neighborhoods have monthly bicycle repair events during the summer. In addition, the FreeWheel Cycle Shop, a community bicycle shop located in south Madison, offers help fixing or building a bike out of donated parts.

To facilitate opportunities for people who may not normally be able to use bikes, the Madison chapter of the United Spinal Associates, Inc. hosts bicycling events for people who are disabled or visually impaired. These events supply disabled individuals with adaptive bicycles to ride and offer tandem riding opportunities for the visually impaired.

A number of other events encourage people to try making trips by bicycle. A bike-in movie series is held at Gunflint Trail Park in Fitchburg during the summer months. The park is located near a shared-use path and attendees are encouraged to ride their bicycles. Bicyclists are even invited to ride to the popular Memorial Day weekend Brat Fest, and people who bike to Friday morning’s Take Your Brat to Work Day promotional event receive a free bratwurst. Monona has declared 2015 the Year of the Bike, so city staff and officials are planning numerous educational and fun events throughout the year to celebrate.

Many large competitive events are also held throughout Dane County. Since 2002, triathletes from around the world come to Madison every September to participate in the annual Ironman Wisconsin event. Typically held in early September, the grueling bicycle course takes riders 16 miles out of urban Madison before beginning two 40-mile loops in rural Dane County. Dane County has also hosted both road and cyclocross national championship events, and Madison recently hosted the North American Unicycling Competition. Most weekends, smaller events including races, tours, and charity events are also held around the region.

Bicycle events continue year-round in Dane County. Bike Winter events and workshops are held annually regardless of the weather, including Winter Bike to Work Day. In addition, fat bike events and weekly rides happen throughout the winter season.



Photo: John Maniaci, Madison Area Sports Commission



Photo: USA Cycling

## D. Education and Encouragement Services

The Madison Area Transportation Planning Board encourages bicycle commuting through its Rideshare Etc. program. Rideshare Etc. is a matching service that assists commuters in finding transportation options for carpooling, bicycling with a partner, vanpooling, and using park-and-ride lots. A feature of the online software allows people to search for a “bike buddy,” pairing new bicycle commuters with experienced cyclists. Staff also provide assistance at commuter fairs and other outreach activities and assist employers interested in making their businesses more bicycle-friendly.



In addition, the University of Wisconsin-Madison Transportation Services department includes a Transportation Options program which provides support for bicycling, carpooling, transit, and other commuting options. The UW Bicycle/Pedestrian Coordinator works within this department and oversees campus bicycle infrastructure and programming. This includes the UW Bicycle Resource Center, which provides students with the free use of tools, air pumps, grease, and other supplies. The center also offers a range of bicycling assistance such as bicycle repair manuals, maps, and monthly events including group rides, classes, and movies.

Other colleges in Madison are also promoting bicycling. For example, Edgewood College faculty and staff who bike to campus can enroll in the college’s incentive program. Users are issued a swipe card that allows them to track their trips making them eligible for gift cards, movie passes, and other benefits based on how much they ride. Madison College is also working to improve bicycle access to their Truax campus by working to bring bikesharing to campus, increasing the amount of secure bike parking, and improving the design of paths and intersections to increase bicycle safety.

The provision of bicycle parking at events is growing in Dane County. Bicycle valet services are provided at large events such as Concerts on the Square and Badger football games. Some larger Sun Prairie events also offer valet bicycle parking. A number of neighborhood festivals offer large bike parking corrals to encourage attendees to bike to the event.

The City of Madison continues to partner with Trek Bicycles to grow bicycle-sharing through BCycle. Currently BCycle operates 39 stations throughout the city with more than 350 bikes, and their network keeps expanding. Users are able to check out a BCycle bike at any station, ride to where they need to go, and park the bicycle at the closest station to their destination. People use BCycle to run errands, grab lunch, travel from the bus stop to their office, or just explore the city. The goal is to make it easier for people to make short trips by bicycle.

Another unique non-profit in Madison is Dream Bikes, which helps young people acquire skills by working in a bicycle retail shop. Dream Bikes employs Madison-area teens, providing them with hands-on, paid job training while offering low-cost bicycles for sale to the community. Teen mechanics refurbish donated bikes which are then sold at discounted prices. Dream Bikes offers microloans to make it possible for anyone to purchase a bicycle. Dream Bikes also hosts group bike tours and holds free bicycle repair events.

Both printed and online bicycle maps are available for Dane County and for various municipalities. The Madison Area Transportation Planning Board, in coordination with Dane County, publishes the Dane County Bicycle Map. The map contains general bicycling information and depicts the relative suitability of rural roads in the county for bicycling. The map also shows trails, parks, and other destinations.

The City of Madison Traffic Engineering Division publishes the Madison Bicycling Resource Guide & Route Map. The map depicts the Madison area bicycle route system, on-street bike facilities, and off-street paths. In addition to the map, it also includes illustrated bicycle riding safety tips, helpful information for parents about making bicycling safer for children, bicycle maintenance and commuting tips, and information on area bicycling organizations and contacts.

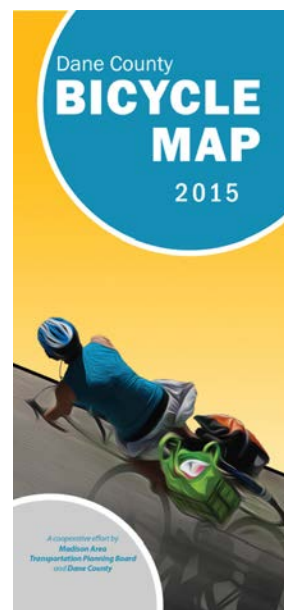
Other communities, including Fitchburg, Middleton, DeForest, Marshall, and Sun Prairie, also provide local bicycle maps.

## E. Enforcement

In 2015 police officers from Madison, Fitchburg, Monona, Sun Prairie, Verona, Middleton, and the UW participated in an Enforcement for Pedestrian and Bicycle Safety course. The course provides pedestrian and bicycle safety education for police officers with an emphasis on laws, common crash types, and improving crash avoidance through enforcement activities.

The Madison Police Department Traffic Enforcement Safety Team frequently conducts education and enforcement activities focused on pedestrian and bicycle safety. People who are ticketed for violations are able to attend ticket diversion classes. There are classes directed at both bicyclists who receive tickets and motorists who receive failure-to-yield tickets. The UW and the Village of Shorewood Hills also participate in Madison's ticket diversion program.

The University of Wisconsin Police Department regularly holds the "Be Bright" campaign in which bicyclists riding at night without proper lighting are stopped. While police officers talk to offenders, a volunteer installs free front and rear bike lights.



Many Dane County municipalities have uniformed police officers on bicycles, including Madison, Monona, Fitchburg, Middleton, and Sun Prairie. These officers carry out routine patrol duties and provide education about and enforcement of laws affecting bicyclists. The police bicycle program provides greater contact with citizens and allows for patrol of areas only accessible by bicycle (e.g., shared-use paths, congested areas with crowds at special events).

The Madison Fire Department and Fitch-Rona (serving Fitchburg and Verona) EMS also have medical response bicycle units. These units frequently work special events where it is easier to respond to needs by bicycle.



Chapter 7

# Current Engineering, Envisioning, End – of – Trip, and Evaluation Activities



## A. Engineering

Ongoing engineering or infrastructure construction projects are active throughout Dane County. Bike lanes and paved shoulders are routinely incorporated into street and highway reconstruction projects when they are necessary and practical. Many of these activities are covered in more detail in the Bicycle Network Plan in Chapter 9. For a review of bicycle facilities that were added since 2000, see Chapter 1.

Several major new shared-use path projects are in various stages of planning, design, and construction throughout Madison and Dane County. Selected upcoming projects, including new on-street bike facilities, in the 5-year *Transportation Improvement Program* (Madison Area Transportation Planning Board, 2015) are summarized below. These projects are shown as programmed facilities in **Figures 9-1, 9-2, and 9-4** in Chapter 9.

- **Highway M/Pleasant View Road Corridor Path** – The City of Madison is partnering with other entities to reconstruct the Highway M/Pleasant View Road corridor through several phases. By 2016, a new urban roadway will be in place with bike lanes and a parallel shared-use path from Mineral Point Road to south of McKee Road with grade separation at major intersections.
- **West Beltline Path Extension** – Planning is underway to extend the West Beltline path from its current terminus at Grand Canyon Drive west to Junction Road.
- **Cannonball Path Extension** – The Cannonball path was opened to Fish Hatchery Road in 2015 and planning is underway for an extension to the Wingra Path.
- **Lower Yahara River Trail** – A new path connecting McDaniel Park in McFarland to the Capital City Trail is expected to be open in 2017. This challenging project will include a boardwalk crossing of Lake Waubesa.
- **Capital City Path/Glacial Drumlin Trail Connection** – Planning is underway to connect these two regional paths, filling a gap between east Madison and Cottage Grove. This connection will complete a nearly exclusive off-street route between Madison and Milwaukee.
- **Highway C/Highway 19 Path** – The shared-use path network in west Sun Prairie will be expanded along the north side of Highway 19 and east side of Highway C in conjunction with a reconstruction project.
- **McKee Road Reconstruction** – McKee Road will be reconstructed with bike lanes between Maple Grove Road and Nine Mound Road in 2017 and 2018.
- **Lacy Road Reconstruction** – Lacy Road will be reconstructed with bike lanes between Research Park Drive and Syene Road in 2017.
- **Buckeye Road Reconstruction** – Buckeye Road will be reconstructed with bike lanes between Monona Drive and Stoughton Road in 2018.
- **Main Street Reconstruction (Cottage Grove)** – Main Street will be reconstructed with bike lanes between Oak Street and School Road in 2018.

Dane County, the Madison Area Transportation Planning Board, and affected communities are collaborating to implement standardized wayfinding and destination signage intended to eliminate confusion and allow bicyclists to navigate the region with greater ease. This project will eliminate existing “Bike Route” signage and provide more usable and consistent information that is consistent among municipalities. The first phase of this project will develop guidelines as well as implementation plans for a few select corridors.

## B. Envisioning (Planning)

Several planning efforts are underway and many bicycle-related planning processes have been completed and are in effect. The City of Madison is developing a transportation master plan, *Madison in Motion*, concurrently with the *Bicycle Transportation Plan*. *Madison in Motion* will identify what Madison needs to do to become a more pedestrian-, bicycle-, and transit-oriented city. Because they are being developed at the same time, both planning efforts for these documents and their final recommendations will be consistent with one another. While this *Bicycle Transportation Plan* takes a regional view of Dane County and the Madison area, *Madison in Motion* focuses more specifically on potential projects in Madison.

WisDOT, with partnering entities, is actively engaged in bicycle planning. The *Beltline Highway Planning and Environmental Linkages* study will provide significant detail on needs and potential improvements along and crossing the Beltline Highway that will be incorporated into future environmental documentation. Similar studies are in progress for Stoughton Road (Highway 51) through Madison and along the I-39/90 corridor. Staff from various agencies as well as consultants are working together to ensure that findings and recommendations among all these projects are consistent.

The City of Madison, along with Toole Design Group, are currently conducting a study to examine bicycle and moped parking in downtown Madison. This study has collected a substantial amount of information from bicyclists who visit the downtown area and has created a comprehensive database of existing bike parking assets. It will provide recommendations for improving bike parking downtown.

Several Dane County municipalities have bicycle plans. In addition, many comprehensive plans address bicycling as well as land use and street network planning, which affects bicyclists. A selected list of available planning documents is shown in **Table 7-1**.



**Table 7-1**  
**Selected list of bicycle planning documents**

Municipality	Year	Summary
City of Madison	Ongoing	The <i>Madison in Motion</i> comprehensive transportation plan will make infrastructure recommendations, including a bike network map.
City of Sun Prairie	2009	The comprehensive plan addresses goals for bicycling and includes a bicycle facilities and routes plan.
City of Middleton	2009	The <i>Bicycle and Pedestrian Plan</i> provides a list of recommended actions, including detailed corridor planning.
City of Fitchburg	2008	The <i>Bicycle and Pedestrian Plan</i> provides a list of recommendations, including detailed facilities guidelines and a map with planned improvements.
City of Stoughton	2012	The comprehensive plan includes a land use and transportation plan.
City of Verona	2014	The <i>Downtown Mobility &amp; Development Plan</i> includes a Mobility Plan section with recommendations to better accommodate bicyclists.
Villages of Waunakee and Westport	2005	The <i>Waunakee-Westport Bicycle and Pedestrian Plan</i> includes facilities guidelines and plans as well as other recommendations.
Dane County	2012	The <i>2012-2017 Parks and Open Space Plan</i> includes a network map of planned regional trails.

The University of Wisconsin is in the process of updating its campus master plan. This plan will address campus facilities planning, including transportation infrastructure like bicycle facilities and bicycle parking.

### C. End-of-Trip Facilities and Multi-Modal Connections

The City of Madison includes bicycle parking requirements in its zoning ordinance, which requires property developers to take bicyclists' needs into account when submitting development plans to the city. Bicycle parking ordinances address the number of bicycle parking spaces, types of racks, and locations that are appropriate in different types of areas such as business districts, schools, and near residential buildings. Other Dane County municipalities generally do not have specific bicycle parking requirements in their ordinances but work with developers to ensure that adequate bicycle parking is included in projects.

The City of Madison has established an on-street bicycle parking corral on King Street during warm weather months where one metered on-street automobile parking space is removed to accommodate parking for up to ten bicycles. Bicycle parking is routinely accommodated at city-provided bike racks, and parking for two bicycles is incorporated into the space number signs for the city's multi-space parking meters. Business owners can also request to have bicycle parking facilities installed in street terraces at no cost to the business.

The City of Madison has also established bicycle “rest areas” with benches, bike parking, and a repair station with an air pump and tools in two locations: one on the east side of the city at the intersection of the Capital City Path and the Yahara River Path, and one on the west side along the Southwest Path. The City of Fitchburg recently opened the Dawley Bike Hub, a bicycle rest area adjacent to the Capital City Trail and Cannonball Path that includes restrooms, a water bottle filling station, and a bike repair station with an air pump and tools. In addition, several local businesses have added bicycle repair stations on their property that are available to the public.



Metro Transit buses are all equipped with front bicycle racks that accommodate up to two bicycles. Bicycle capacity is occasionally exceeded on buses. When a bicyclist does not have room on the front rack for their bicycle, they are generally passed up. Metro continues to explore the use of bike racks that would allow up to three bicycles to be carried at the same time, but has encountered operational challenges when the larger racks are deployed.

The UW currently has 13,350 bicycle parking spaces and has recently replaced 600 older bike racks with newer racks that can accommodate more bicycles, resulting in fewer bikes being chained to trees and signs. They also have 14 bicycle locker locations with 111 spaces and three bicycle cages (fenced bicycle parking areas) with 49 spaces. The UW has a goal of providing 14,500 bicycle spaces by 2017.

The City of Madison, along with Toole Design Group, are currently conducting a study to examine bicycle and moped parking in downtown Madison. This study has collected a substantial amount of information from bicyclists who visit the downtown area and has created a comprehensive database of existing bike parking assets. It will provide recommendations for improving bike parking downtown.

## **D. Evaluation**

The City of Madison has a number of loop detectors and other automatic bicycle counters that detect and count bicyclists year round. An Eco-Totem, which counts bicyclists and displays real-time bike counts, was recently installed along the Southwest Path. The Wisconsin Bike Fed also organizes manual bicycle counts annually at strategic locations. In addition, national commuting statistics for municipalities, counties, and other geographical areas are available from the American Community Survey. This data is publicly available and can be used in comparisons between communities. Bicycle crash and safety information is collected by the City of Madison and others. The UW conducts a transportation survey about every two years, collecting commute information from students, faculty, and other employees.

More information on these ongoing evaluation activities and further analysis can be found in Chapter 5.

Chapter 8

# Education, Encouragement, and Enforcement Recommendations



Education, enforcement, and encouragement programs help foster an active bicycling culture. They attract new riders, motivate current riders, and improve the relationship between bicyclists and other road and path users. Drivers who fail to abide by traffic laws, putting bicyclists at risk, are among the top complaints of regular bicyclists, and similarly bicyclists who do not follow applicable traffic laws are frequently subjects of others' complaints.

The recommendations in this plan continue and build on the activities that are already taking place (See Chapter 6). These activities, led by a varied group of government agencies, advocacy groups, and others, are critical to achieving the bike plan vision of fostering bicycling as an integral part of daily life. The recommendations carry a theme of promoting support, education, and safety.

## A. Education Recommendations

Recommendation	Actions
Support the development of education programs that promote safe bicycling and increase public awareness of bicycling facilities and resources	<p>Develop partnerships with community organizations to implement education and encouragement programs for populations that are historically underrepresented in bicycling, including older adults, women, people with disabilities, economically disadvantaged, and people of color.</p> <ul style="list-style-type: none"> <li>• Offer culturally-appropriate classes and rides to help novice bicyclists from varied backgrounds become comfortable and familiar with bicycling. Expand ambassador or mentor programs to encourage bicycling.</li> <li>• Work with City of Madison Neighborhood Resource Teams on transportation issues. The Neighborhood Resource Teams were started to encourage and enhance communication, coordination, and relationship-building among City staff, City departments, residents, and other stakeholders to promote equity and to improve the quality of life for all residents of Madison's neighborhoods.</li> </ul>
	<p>Increase opportunities to learn varied bicycle skills such as:</p> <ul style="list-style-type: none"> <li>• Bicycle mechanic skills</li> <li>• Winter bicycling tips and skills</li> <li>• Family bicycling tips</li> <li>• How to shop by bicycle</li> </ul>
	<p>Hold ribbon-cutting and other events to publicize the opening of new facilities to raise public awareness of bicycle facilities.</p>
	<p>Develop information campaigns that help both bicyclists and motorists understand how to use or operate near new facilities.</p>

Recommendation	Actions
Provide and promote safety education programs taught by qualified instructors and that target both youth and adult bicyclists.	Offer bicycle-training programs such as the League of American Bicyclists Ride Smart education programs. The Ride Smart program is designed to work with bicyclists of all experience levels, ranging from brand new bicyclists up to experienced bicyclists who want to refine their skills and teach others.
	Expand opportunities for children and adults to learn the basics of how to ride a bicycle through programs such as the Learn to Ride courses currently sponsored by Madison School Community Recreation and City of Madison Traffic Engineering. Learn to Ride teaches children and adults to learn the basics of riding including balancing on a bike, pedaling, stopping and steering control.
	Expand summer bicycle camps and after-school bicycle clubs for youths.
	Expand recreational opportunities for youth such as the Tri 4 Kids program, unicycle classes, and the youth mountain bike league.
	Continue holding local bicycle rodeos to help children learn basic safety skills and to educate parents on safe bicycling for their children.
	Develop a “safety town” space for parents and children to practice bicycle and pedestrian skills. A “safety town” is a miniature neighborhood with buildings, roads, traffic signs, and more that allows parents and children to practice the skills they learn at rodeos or bicycle safety trainings before venturing out on rides on city paths and streets.
	Continue to offer and promote bicycle education programming to college students. Currently UW-Madison offers a variety of courses at the University Bicycle Resource Center, and they provide a location for making bicycle repairs. Other colleges should consider adopting a similar model of education for their students.

Recommendation	Actions
Enhance and expand Safe Routes to School programming	Continue to increase the number of schools that are actively participating in Safe Routes to School throughout Dane County and that have comprehensive programs with education, encouragement, enforcement, and evaluation activities.
	Increase the number of schools that have an up-to-date traffic safety plan that addresses the safety of bicyclists, pedestrians, bus riders, and children being dropped off by motor vehicles.
	Expand the delivery of bicycle safety education in Dane County schools. <ul style="list-style-type: none"> <li>Continue to expand use of the Madison Metropolitan School District elementary and middle school bike fleets both for safety education training in physical education and for school field trips.</li> <li>Additional Dane County school districts should look for opportunities to offer more comprehensive bicycling safety training in physical education. School districts could look at ways to share resources such as shared bike fleets and working cooperatively on teacher training.</li> <li>Offer opportunities for older youth to learn bicycle mechanic skills as a part of tech education programming. These students can serve as mentors for Safe Routes to School efforts and assist in keeping school bicycle fleets in good operating condition.</li> </ul>

Recommendation	Actions
Support the development of communication campaigns to improve the attitude and behavior of both motorists and bicyclists.	Develop and implement a countywide multimedia bicycle safety and education campaign to increase knowledge of traffic rules and improve interaction between motorized and non-motorized modes. For example, Travel With Care is a public service campaign from the national advocacy group People for Bikes that works to foster a positive image about bicyclists.

Recommendation	Actions
Develop materials and instruction to educate motorists and bicyclists about traffic laws.	Continue and expand the Share and Be Aware campaign or equivalent. <ul style="list-style-type: none"> <li>Share and Be Aware is a statewide campaign to raise awareness among all road users (drivers, pedestrians, and bicyclists) that everyone would be safer if they all obeyed traffic laws. A team of Share and Be Aware ambassadors works across the state to spread these important road education messages. The ambassadors teach classes, attend community events, and participate in public meetings.</li> </ul>
	Provide education on sharing the road with bicyclists and pedestrians to municipal staff with driving responsibilities such as bus drivers, snow plow operators, waste and recycling drivers, and others who regularly drive as a part of their job.

Recommendation	Actions
Educate municipal leaders about bicycle issues and encourage them to bicycle or visit facilities.	Offer and encourage attendance at bicycle-related trainings for municipal leaders and staff such as attendance at WisDOT bicycle training courses, appropriate webinars, the Wisconsin Bike Fed Bike Summit, the national Pro Walk Pro Bike conference, and the National Safe Routes to School Conference.
	Invite local leaders and staff to participate in on-bicycle tours to see facilities or as part of grand openings, and to participate in Bike to Work Week or other events.
	Establish a resource group for planners, engineers, and other staff representing multiple municipalities and departments to share knowledge and ideas and to prioritize and coordinate regional projects.

## B. Encouragement Recommendations

Recommendation	Actions
Encourage bicycle commuting as well as bicycling for other trips.	<p>Work with public and private employers to promote bicycle commuting. Besides offering secure bike parking, showers and other support facilities, employers can create a culture that makes bicycling commuting acceptable and positive. Potential employer initiatives include:</p> <ul style="list-style-type: none"> <li>• Promoting Bike to Work Week, participating in the National Bike Challenge, Love to Ride Program, or other corporate-sponsored bike challenge.</li> <li>• Hosting bike workshops for employees.</li> <li>• Offering a commuter tax benefit for cyclists, employee discounts on bicycles and accessories, or other incentive programs.</li> <li>• Providing a company fleet of bicycles for short trips or access to BCycle.</li> <li>• Distributing information to assist employees with bicycle route-finding, how to get started commuting, and other appropriate topics. Include information on bicycling to work in new employee information materials.</li> </ul>
	Partner with BCycle to continue expansion to bicycle-friendly neighborhood business districts and identify more opportunities to support bike share in more neighborhoods, business districts, college areas, and communities throughout Dane County.
	Increase the number of bicycle fix-it stations with tire pumps and basic tools located throughout the urban area.
	Expand the promotion of Bicycle Benefits or other bicycle usage-related discounts to encourage more bicycle trips for shopping, dining, and other non-work trips.
	<p>Offer personalized transportation options information and encouragement, such as through a Smart Trips program.</p> <p>Smart Trips is a comprehensive program designed to reduce drive-alone trips and to increase biking, walking, transit, and ridesharing in targeted geographic areas of the city. It incorporates an innovative and highly effective individual marketing methodology which hand-delivers packets of information to residents who wish to learn more about all their transportation options including transit, walking, bicycling, carpooling, car sharing, or simply combining trips. The program features neighborhood-specific maps and information as well as organized activities which aim to get people out in their neighborhoods or places of employment to shop, work and discover how many trips they can easily, conveniently, and safely make without using a car.</p>
	<p>Continue to cooperatively develop, distribute, and update bicycle maps for both local communities and Dane County.</p> <ul style="list-style-type: none"> <li>• Currently, the Dane County Bicycle Map is updated every one or two years and provides the relative suitability of rural roadways in the county for bicycling as well as suggested through routes and paths. Conditions for roadways in urban areas are not shown on the map due to level of detail limitations.</li> <li>• Local communities should offer maps of their urban areas showing routes to school, parks, and other destinations, as well as the suitability of the routes to encourage bicycling in their communities. The City of Madison Bike Map and Guide is published each year, which includes bicycle facility information and points of interest along with bicycle safety and resource information. In addition, a number of other communities offer some type of bicycling map including Middleton, Fitchburg, Sun Prairie, Marshall, and DeForest.</li> <li>• Expand efforts to create materials in languages other than English.</li> <li>• Efforts should continue to ensure that maps are widely distributed to locations such as bicycle shops, libraries, visitors' centers, hotels, employment sites, realtors' offices, and other locations.</li> </ul>
	<p>Continue collaborative efforts among Dane County, the Madison Area Transportation Board, and local municipalities to address bicycle wayfinding in a comprehensive, coordinated manner.</p> <p>Way finding and destination signage are intended to eliminate confusion and to allow bicyclists to navigate the region with greater ease. Signage includes information such as short, medium, and long distance locations served by a route as well as mileage and other route information. Currently, a project has been initiated to develop both standards and an implementation plan for bicycle wayfinding throughout the county.</p>

Recommendation	Actions
Encourage bicycling promotion events such as bike to work/school week, commuter challenges, bike rodeos, bike valets, and open streets events.	Continue to grow Bike to Work Week in Madison and expand activities in other Dane County communities.
	Look for opportunities to expand to Bike Month or a new Bike Week to include promotion of bicycling in general and not just for the trip to work.
	Continue Madison's Ride the Drive and expand open streets events to other Dane County communities. People can be intimidated about getting their bicycles out to ride. Learning just how easy it can be to get around their community on two wheels can inspire them to continue riding.
	Continue to promote the National Bike Challenge, the Love to Ride program, and other programs that encourage people to ride more.
	Continue to work with employers through the Madison Area Transportation Planning Board's Rideshare, Etc website to run their own corporate commuter challenges. Employers can set up their own company challenge any time of the year to focus on bicycling or other multi-modal options through the Rideshare, Etc program.
	Continue expansion of encouragement activities aimed at children and families. Current activities include: <ul style="list-style-type: none"> <li>• Dane County Walk or Wheel Challenge, a one-week challenge each October promoting walking and biking at Dane County schools.</li> <li>• National Bike to School Day each May.</li> <li>• Fire Up Your Feet, an online activity tracker aimed at increasing physical activity before, during and after school for students, parents, school staff, and teachers.</li> </ul>
	Continue to grow Bike Winter activities and promotion of Winter Bike to Work Day to help keep people bicycling year round. Bike Winter offers inspiration and education activities such as talks, rides, and special events throughout the winter months.
	Continue to expand the number of special events and activities that encourage people to bike. <ul style="list-style-type: none"> <li>• Current events such as bike-in movies, bicycle pub crawls, bicycle nights at sporting events, and farm tours by bicycle showcase bicycling as a way to incorporate bicycling into everyday life.</li> <li>• Continue to support events that grow bicycle tourism in Dane County. Events such as Ironman and the recent national cycling championships grow awareness of bicycling and provide economic benefits to the region</li> </ul>
	Continue to expand monitored bicycle parking at events throughout Dane County. Explore bicycle parking requirements for events in urban areas requiring a street closure and with an anticipated number of participants greater than 2,000.

Recommendation	Actions
Support bicycle freight and cargo transportation.	Work with local businesses currently using cargo bikes, non-profit organizations, and the bicycle industry to identify barriers for the use of bicycles for commercial applications.
	Develop opportunities for businesses to test different cargo bikes to see how they could fit into their business model and which type would be most useful.
	Increase the use of bicycles on the job by local government agencies and departments.

Recommendation	Actions
Provide and promote encouragement programs targeted at people who may be interested in bicycling.	Continue to support bicycle-training programs such as Savvy City Cycling. Savvy City Cycling is the Wisconsin Bike Fed's monthly round table and presentation aimed at increasing skills of all levels of bicyclists. The presentations are intended to provide a welcoming place where the bike curious can join regular riders and learn from specialists about in-depth bicycling topics.
	Increase bicycling opportunities for people with disabilities through programs such as Project Mobility, which provides people with adaptive cycling equipment.
	Continue to provide earn-a-bike programs such as Wheels for Winners to ensure low-income children have access to bicycles.
	Expand opportunities for low-income residents to purchase and maintain bicycles. This could include expanding programs such as: <ul style="list-style-type: none"> <li>• Neighborhood bike maintenance events</li> <li>• Dream Bikes</li> <li>• Free Wheel Community Bicycle Shop</li> </ul>
	Create and/or improve key signature routes such as the Lake Monona Loop to create more awareness of bicycle-friendly recreational routes.

Recommendation	Actions
Support businesses and campuses in their transportation demand management activities.	Continue to provide support for companies starting or expanding commute options programs. Rideshare, Etc provides assistance with conducting employee surveys, analyzing a company's location and facilities, and facilitating discussions to determine what benefits it might make sense to offer or what options might work for employees.
	Continue to offer the Guaranteed Ride Home program to bicycle commuters and expand publicity of the program as an option for bicyclists. Guaranteed Ride Home provides free rides home from work in emergency situations to individuals who regularly carpool, vanpool, take mass transit, or commute by bicycle.
	Continue to promote bicycle commuting as part of the Rideshare, Etc program through outreach efforts to businesses and employees, and through the distribution of informational materials.
	Promote the availability of Bike Buddy matching through the Rideshare Etc program website ( <a href="http://www.rideshareetc.org">www.rideshareetc.org</a> ). The Bike Buddy matching tool makes it easy for cyclists to find others to ride with to and from work. People can sign up to be matched with experienced or novice cyclists, so novice cyclists can look for someone more experienced to help introduce them to bicycle commuting.

Recommendation	Actions
Support businesses, universities, and communities in applying for Bicycle Friendly status through the League of American Bicyclists program.	Continue to form partnerships between non-profits, health promotion coalitions, and government agencies to provide support.

Recommendation	Actions
Embrace new technology such as electronic mapping to help users find an appropriate route.	Continue to expand online mapping efforts to make it easier to find information on bicycle routes that include information such as the location of steep hills, busy crossings, or other information related to the actual or perceived difficulty of the route. Cooperate with companies that provide online trip planning tools to improve map data.

Recommendation	Actions
Leverage promotional opportunities such as Ride the Drive.	Use events to provide additional information on safe riding, sharing the road, and other opportunities to the public to increase their riding after bicycle-specific events.
	Use events to get elected officials and staff out on bicycles to build support for bicycle project and programs.

Recommendation	Actions
Consider alternatives to trail fees for bicyclists on shared-use paths that are used for transportation purposes.	Use alternative revenue streams to support trail maintenance in Dane County while phasing out trail fees on shared-use paths that are used for transportation purposes.
	Improve publicity for exemptions to trail pass requirements for people using shared-use paths to commute to work and expand the exemption to include low-income people using trails for other purposes.

## C. Enforcement Recommendations

Recommendation	Actions
Educate law enforcement personnel on enforcement methods for bicyclist safety.	Increase the number of officers who have attended the Enforcement for Bicycle Safety course. This course teaches law enforcement officers all aspects of bicycle safety, as well as which laws to emphasize with bicyclists and motorists to help reduce crashes.
	Expand the Bicycle-Mounted Police Program. Cyclists can connect with bicycle officers on different levels than motor vehicle patrol officers. They may be more receptive to education or enforcement efforts related to cycling. Additionally, having police officers on bicycles raises awareness of motorists that bicyclists are on the road.

Recommendation	Actions
Support enforcement of traffic laws relating to motor vehicles that increase bicyclist safety, such as failure to yield in crosswalks (W.S.S. 346.24), blocking bike lanes (W.S.S. 346.53), and failure to leave at least three feet of clearance when passing (W.S.S. 346.075) – including targeted activities at problem locations.	Promote targeted enforcement of violations that focus on primary collision factors such as failure to yield the right of way and turning right on red without watching for bicyclists.
	Work with local police departments and county sheriff's department to promote all users' responsibilities for safe streets.

Recommendation	Actions
Work with enforcement agencies to prioritize enforcement of bicycle-related traffic violations such as wrong-way riding and riding at night without a light.	Promote targeted enforcement of violations that focus on primary collision factors such as riding the wrong way on a one-way street, riding without lights at night, and riding on the wrong side of the road.
	Expand the Be Bright bicycle light safety campaign. This campaign by the UW-Madison Police Department stops bicyclists for not having appropriate lighting on their bike. While the violator is educated by a UWPD officer, a volunteer installs the lights on the bike at no charge.
	Continue to offer bicycle safety class attendance in lieu of traffic fines. Currently in the City of Madison, UW-Madison, and Shorewood Hills, bicyclists may have their fines waived by attending a bicycle safety course.

Recommendation	Actions
Work with Planners and design engineers to identify areas where traffic violations may be addressed through changes to infrastructure.	Review traffic violation and crash data on an ongoing basis to identify problem areas which require attention.
	Develop a simple-to-use, well-publicized reporting system to report all bicycle crashes resulting in injury or any property damage. Currently only those crashes that involve a moving vehicle and result in serious injury or property damage in excess of \$1,000 (more than the value of many bicycles) is reported.

Chapter 9

# Engineering, Envisioning, End- of-Trip Facilities, and Evaluation Recommendations



The engineering, envisioning, and end-of-trip facilities recommendations support and build upon successful programs already in place at the City of Madison, in Dane County, and in other cities and villages in the planning area. In addition to policy recommendations, the bicycle network plan lays out the priorities for improving on-street and off-street bicycling conditions.

## **A. Bicycle Network Plan**

The bicycle network plan recommends a combination of on-street and off-street improvements to the bicycle network. These improvements aim to fulfill the goals of providing a safe, connected system of routes represented by the bicycle functional classification maps. They address bikeway network gaps and deficiencies and are informed by the urban bicycle level-of-service analysis and rural bicycle suitability analysis. For more information on these analyses, see Chapter 4. The recommendations extend and enhance existing facilities and reinforce planning that is already taking place in many communities; they also propose new facilities, some of which are long-term projects to be completed in conjunction with future development. Many planned facilities were drawn from existing comprehensive plans, neighborhood plans, and other planning processes.

The facilities presented in the bicycle network plan are intended to be comprehensive. However, it is likely that new opportunities will present themselves in the future that could not be foreseen in 2015. Also, local communities may identify additional facilities as part of local bicycle/pedestrian or neighborhood development plans.

On-street and off-street facilities are planned in tandem and are shown together in **Figure 9-1** for all of Dane County and in **Figure 9-2** for the Madison area. The bicycle network plan generally addresses the need for new facilities and the need for substantial improvement of existing facilities. The network plan does not address design or maintenance issues. An engineering policy recommendation (see tables below) states that agencies should “modernize substandard facilities to meet current state and national design standards.” Substantial facility improvements may include path widening or straightening or conversion of a paved shoulder to an urban bike lane, for example.

Urban on-street facilities in the bicycle network plan are identified based on needs for facilities or improvements of existing facilities. These street segments generally have moderate to high traffic volumes and speeds, and they typically do not have bicycle facilities incorporated into the roadway cross section. The bicycle network plan does not specify an on-street treatment for these roadway segments. The recommendation is for agencies with jurisdiction over these facilities to perform more detailed corridor planning when opportunities arise to incorporate facilities described in the bicycle facilities toolbox (Chapter 4).

Opportunities for incorporating bike facilities generally come with street reconstruction and resurfacing projects. However, in some cases reallocation of the existing street space may allow for the addition of bike lanes through restriping. Many of the identified roadway corridors do not have bicycle facilities for several reasons:

- They were built or last reconstructed before incorporating bicycle facilities was common.
  - The appropriate time to incorporate bicycle facilities often comes when these roadways are reconstructed.
- They have limited space.
  - In these corridors, it is sometimes not practical to retrofit bicycle facilities by displacing sidewalk space, parking, or travel lanes.
- They are urbanizing.
  - Rural roads were often acceptable to bike on when they were built, but urbanization causes increases in traffic volumes. These roads are often improved with bicycle facilities as development occurs.

Rural on-street facility needs were similarly identified based on traffic volumes, the availability of a paved shoulder, and their function in the bicycle network. Unlike urban street corridors, rural highway treatments generally involve one facility type: paved shoulders. The bicycle network plan recommends that agencies with jurisdiction over these facilities perform detailed corridor planning when opportunities arise to incorporate paved shoulders. These opportunities generally come with highway reconstruction projects. Many of these corridors do not have paved shoulders or have paved shoulders that are less than four feet wide for several reasons:

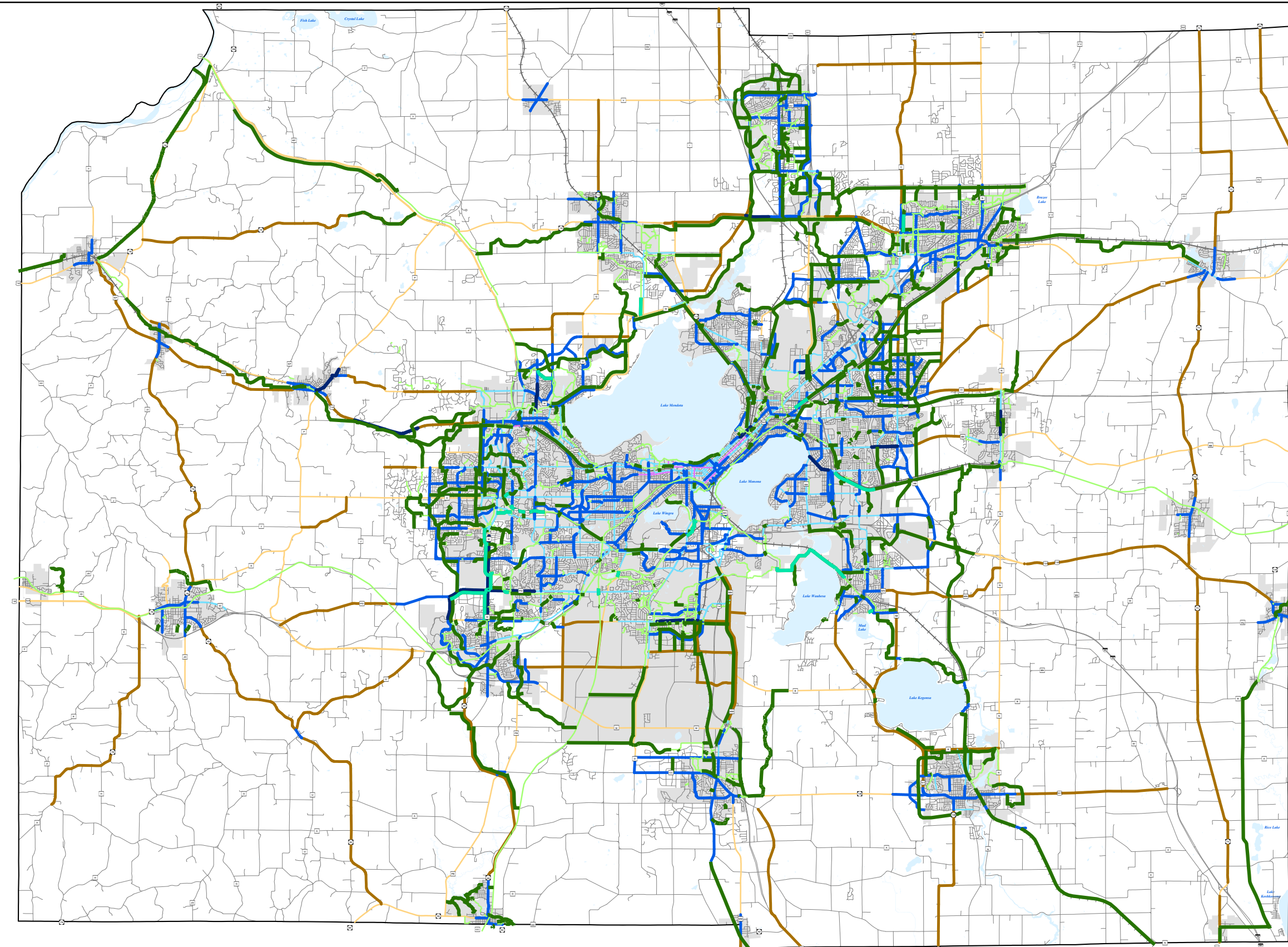
- They were built or last reconstructed before incorporating paved shoulders was common.
  - The appropriate time to incorporate paved shoulders is when these roadways are reconstructed. Surface treatments, like seal-coating, do not provide the roadway structure necessary to support a widened roadway.
- There is limited available space for expanding the roadway cross-section.
  - Some rural highways have limited rights-of-way available, or road widening is limited by the presence of utilities, bridges, natural features, and other structures.
- The cost to include paved shoulders is prohibitive.
  - Including paved shoulders on rural roads that are constructed on significant cut or fill sections or have other obstacles may add considerably to the cost of a project. Agencies responsible for these highways, such as the Dane County Department of Public Works, Highway & Transportation, often do not have sufficient funds available for this type of improvement.

Figure 9-1 Bicycle Network Plan, Dane County

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Bicycle Network Plan Dane County



### Urban On Street Facilities

- Existing Bike Priority Streets
- Existing Bike Lanes\*
- Programmed On Street Facilities
- Need for New or Improved On Street Facilities\*\*

### Rural On Road Facilities

- Existing Shoulders 4 Feet or
- Need for New or Improved Paved Shoulders\*\*

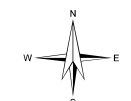
### Off Street Facilities

- Existing Shared-Use Path
- Programmed Shared-Use Path
- Planned Shared-Use Path

Incorporated Area

\* Includes Bus/Bike/Turn Lanes

\*\* The need for new or improved on street facilities has been identified based on traffic volumes and speeds, roadway cross sections, and other characteristics. Bikeway improvements may not be feasible or practical due to competing needs for sidewalks, terraces, parking, and other right of way constraints.



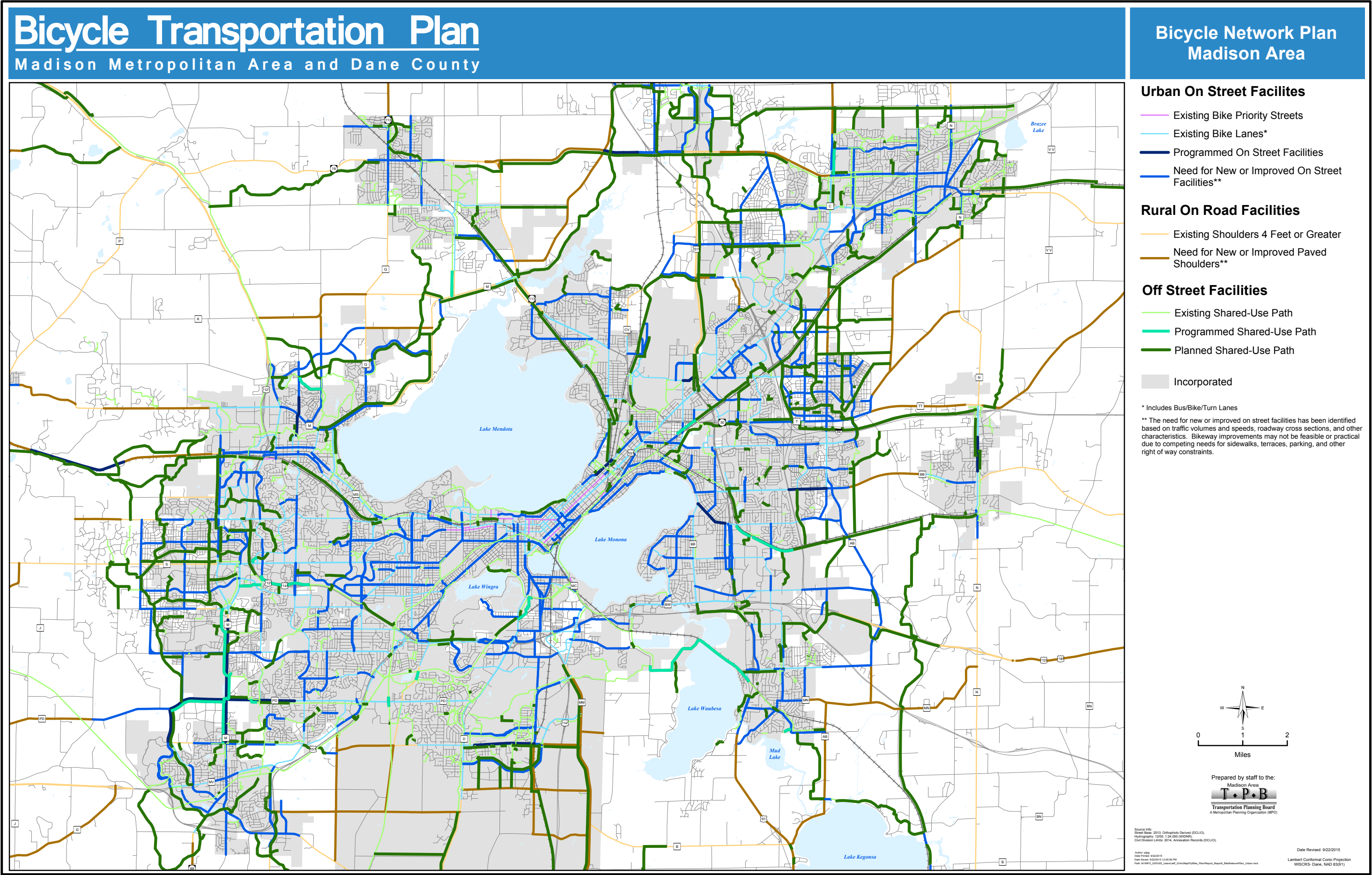
Prepared by staff to the:  
Madison Area  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source Info:  
Street Data: 2013, Orthophoto Derived (DCLD)  
Hydrography: 1200, 1:24,000 (WGNR)  
City Election Limits: 2014, Annotation Records (DCLD)

Author: jpb  
Date Printed: 9/22/2015  
Date Saved: 9/22/2015 11:51:50 PM  
Path: W:\BAP\20150515\_Madison\_Area\_Transportation\_Plan\_Report\_Signage\_SchedulePlan\_Countymap

Date Revised: 9/22/2015  
Lambert Conformal Conic Projection  
WGS84 - Dane, NAD 83(91)

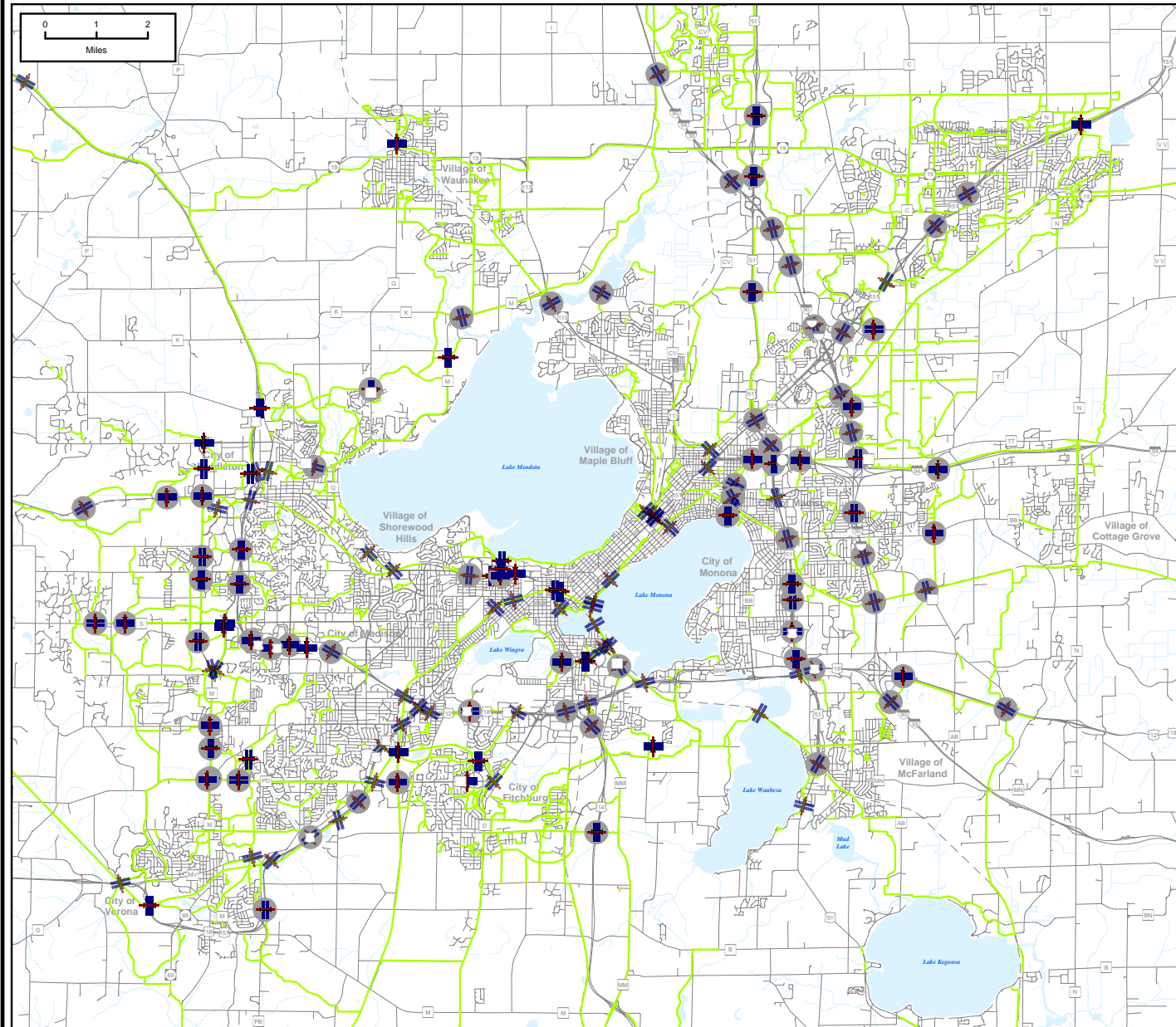
Figure 9-2 Bicycle Network Plan, Madison Area






# Bicycle Transportation Plan

## Madison Metropolitan Area and Dane County

### Existing and Planned Grade-Separated Path Crossings



-  Existing Grade-Separated Crossing
-  Planned Grade-Separated Crossing
-  Existing or Planned Shared-Use Path

Prepared by staff to the:  
**Madison Area**  
**T.P.B.**  
 Transportation Planning Board  
 (A Metropolitan Planning Organization (MPO))

Source: USGS  
 Street Data and Points: 2014-2015  
 Street Data: 2014, Geomatics International (GIC)  
 Regional Data: 2014, Geomatics International (GIC)  
 Regional Data: 2014, Geomatics International (GIC)  
 Regional Data: 2014, Geomatics International (GIC)  
 Regional Data: 2014, Geomatics International (GIC)

Author: JPB  
 Date: 7/14/2015  
 Date: 7/14/2015  
 Date: 7/14/2015  
 Date: 7/14/2015  
 Date: 7/14/2015

Date Revised: 7/14/2015  
 Lambert Conformal Conic Projection  
 NAD83 Zone 14N  
 NAD83 Zone 14N

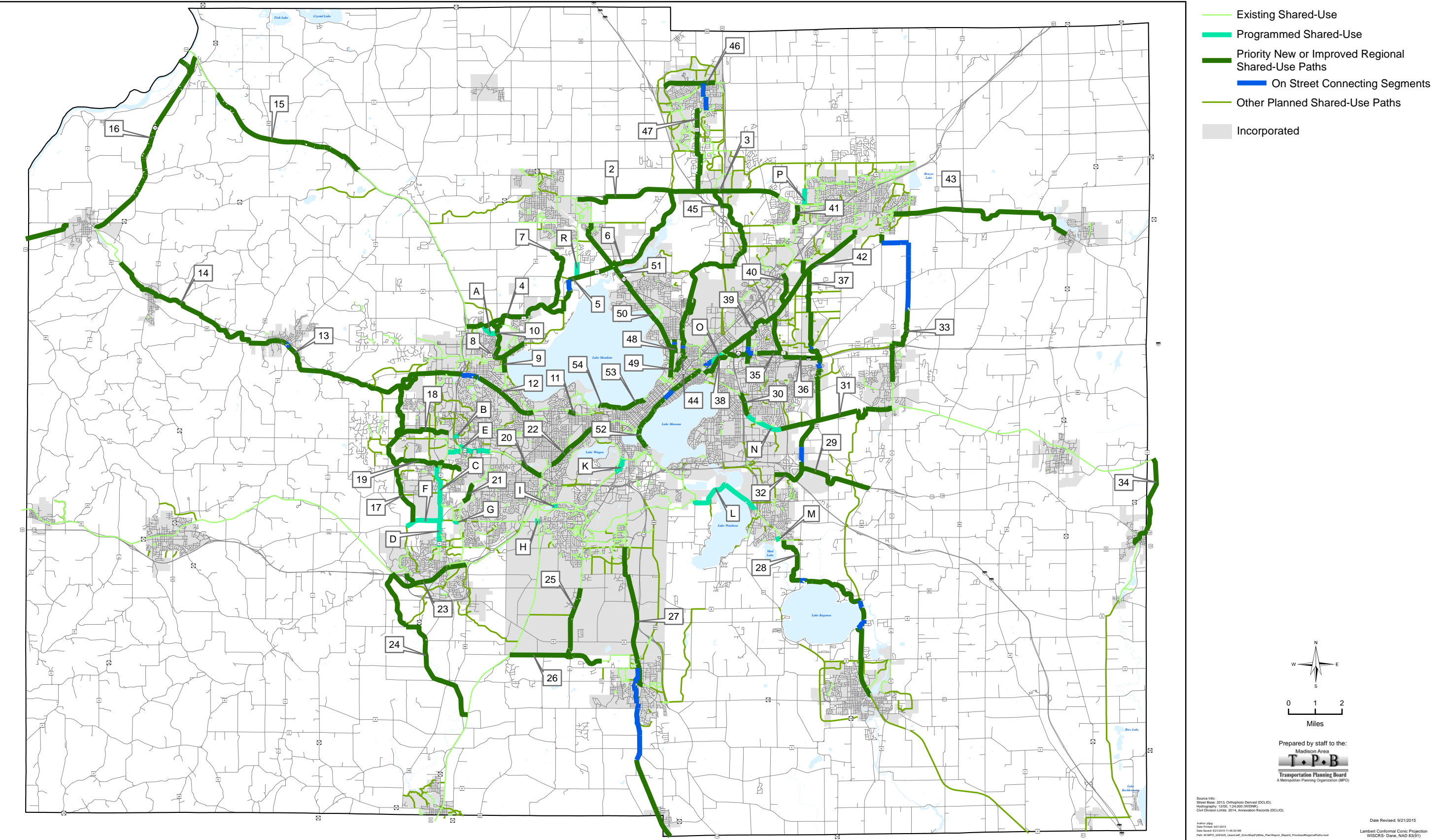
Figure 9-3 Existing and Planned Grade-Separated Path Crossings, Madison Metropolitan Area

Figure 9-4 Prioritized Regional Shared-Use Paths

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Priority Regional Shared-Use Paths



Off-street facilities in the bicycle network plan are comprised of shared-use paths open to bicyclists as well as pedestrians and other users. Existing plans were used as the starting point for developing these facility recommendations. The bicycle network plan then takes a regional view connecting locally planned facilities between communities, adding planned paths where they are needed, and prioritizing paths based on their need and regional significance.

Crossings of major highways and other features are an important component of the bicycle network plan. Since limited-access freeways cannot be crossed at grade, and because grade-separated crossings are expensive compared to other bicycle facilities, these crossings – or lack of crossings – often represent crucial missing links in the bicycle network. Crossing highways at interchanges is intimidating and potentially dangerous for many bicyclists because of the high traffic speeds, traffic congestion, high volumes of turning traffic, and traffic signal delay.

The Beltline Highway (U.S. Highways 12/14/18/151) was constructed on the south and west sides of Madison between the 1950s and the 1980s. It features densely spaced interchange crossings but few non-interchange crossings that are compatible with bike routes. WisDOT is currently engaged in a Planning and Environmental Linkages study and is working with stakeholders to identify improvements along and across the length of the Beltline Highway. Other concurrent studies are underway examining Stoughton Road/USH 51 between Stoughton and DeForest, and I-39/90 through Dane County.

Existing and planned or potential grade-separated shared-use path crossings in the Madison metropolitan area are shown in **Figure 9-3**. In addition to these grade-separated path crossings, many on-street bikeway crossings exist. Several moderate-volume non-interchange roadway crossings also exist, such as the new Marsh Road, which was constructed between Madison and McFarland in 2004. Planned grade-separated crossings shown in **Figure 9-3** are illustrative and demonstrate a need for a crossing in that area. In some cases, grade-separated crossings may be difficult or infeasible, but nevertheless the need for crossings to connect these neighborhoods exists.

The bicycle network plan further identifies planned shared-use paths that have important regional roles in the bicycle transportation system. Many planned shared-use paths are part of neighborhood development plans and perform an important role within the neighborhood, but are not expected to play large roles in the regional bicycle network. On the other hand, some planned paths span several jurisdictions and will form key links in the network of planned primary and secondary bikeways. These projects are more likely to use public funding sources, particularly county, state, and federal grants.



Prioritized regional shared-use paths are shown below in **Figure 9-4** and listed in **Table 9-1** and **Table 9-2**. Prioritized regional paths were selected that best meet the following bicycle transportation plan goals:

- **Safety:** The path provides a safer, higher quality, alternative to the existing route.
- **Usage:** The path connects population centers to destinations and attractions, and so is likely to attract many users.
- **Connectivity:** The path fills in a gap in the bikeway network, and is likely to be a primary bike route.
- **Equity:** The path serves low-income, diverse, or under-served neighborhoods.
- **Livability:** The path promotes sustainable development or tourism and creates an enjoyable biking experience.
- **Longevity:** The path is feasible to construct, is cost-effective, and can be maintained.

## **B. Environmental Analysis of Planned Regional Priority Paths**

New shared-use paths will require an environmental review to minimize impacts to wetlands, water quality, and environmentally sensitive areas. The alignments in the regional priority path system were laid out to avoid infringement on these assets. In some cases, the planned paths skirt wetlands and water features, creating a continuous bike route while minimizing the number of street crossings. Paths that have unavoidable alignments through wetlands may minimize their impacts to the wetlands by using the following methods:

- Utilize existing structures and pathways.
- Utilize natural land contours or retaining walls to avoid excessive filling.
- Use pervious pavement.
- Skirt sensitive wetland areas instead of bisecting them.
- Plant and preserve natural buffers within and around wetlands.
- Avoid the habitats of sensitive species and critical wetland areas.
- Use elevated boardwalks and bridges to help minimize disturbance to wetland vegetation.
- Minimize total path width in the vicinity of wetlands.
- Place appropriately sized bridges and culverts at intermittent and perennial streams.

Conserving and restoring regionally important natural resources contributes to a healthy natural environment and makes the region a desirable place to live and work. Connecting these regional and local features within environmental corridors helps protect water quality, sustain wildlife and plant habitat, and provides valuable opportunities for recreation and education. According to Capital Area Regional Planning Commission staff, new bicycle facilities and retrofits may impact water quality and natural resources throughout the region, but adding shared-use paths and bike lanes wherever possible is a good choice for providing more sustainable transportation alternatives.

## C. Recommendations

The following engineering, envisioning (planning), and evaluation recommendations are intended to provide general policy guidance for local communities, Dane County, WisDOT, and the MPO in planning, prioritizing, programming, and designing new or improved bicycle facilities.

### Engineering Recommendations

Recommendation	Actions
Expand the network of bicycle ways with new multi-use paths and on-street facilities to serve all communities and neighborhoods.	Construct new off-street shared-use paths in developing areas as street and utility infrastructure is built.
	Retrofit existing transportation corridors with shared-use paths. Examples of transportation corridors include freeways, arterial streets with few driveways and cross streets, utility corridors, drainage ways, and railroads.
	Construct dedicated on-street bicycle infrastructure such as bike lanes and premium facilities like buffered bike lanes, one-way protected bike lanes, and two-way protected bike lanes where appropriate in existing and developing areas.
	Retrofit local streets to construct high-quality bike priority streets where potential bike use is moderate to high and parallel routes are not acceptable to many bicyclists.
	Construct new paved multi-use paths between major urban areas.
	Retrofit rural roads, particularly county highways, to include paved shoulders with a usable surface that is preferably five feet wide and at least four feet wide, where appropriate and economically feasible given right-of-way and topographical constraints. Special consideration should be given to areas with high bicycle volumes and limited visibility.
	Design all bicycle facilities to meet or exceed current state and national geometric standards as reflected in guidelines published by WisDOT, AASHTO, and NACTO. Multi-use facilities should meet Americans with Disability Act (ADA) standards.

Recommendation	Actions
Eliminate bicycling barriers and hazards through the accommodation of bicyclists' needs in the design of bridges and grade-separated highway crossings, street intersections, railroad crossings, and traffic control devices.	Include bike lanes on all new bridges and highway crossings. Where appropriate, also include wide sidewalks or shared-use paths.
	Complete the street and bicycle way network where highways, railroads, and other barriers limit bike travel options. Construct new freeway crossings using collector streets with bicycle facilities that do not have interchange ramps. Add new pedestrian/bicycle crossings where appropriate.
	Improve high-volume street intersections that present barriers to bicyclists. Tools for improving bicycle safety include continuous bike lanes, colorized bike lanes, bike boxes, separated bicycle crossings, and grade-separated crossings.
	Upgrade traffic signal and detection systems on streets and shared-use paths to accommodate bicyclists.
	Improve intersection design and visibility where side paths cross intersections.
	Upgrade at-grade railroad crossings to provide a smooth surface with as little intersection skew as possible to prevent bicycle wheels from getting caught.

Recommendation	Actions
Include bicycle facility improvements in conjunction with roadway projects as a routine part of the project.	Adopt and implement complete streets goals, laws, and policies.
	Include bicycle infrastructure throughout project development for road construction projects, from conceptual planning and cost estimating to preliminary and final design.
	Include bicycle facilities on all arterial streets and collector streets with moderate to high traffic volumes where feasible.
	Reduce conflicts between bicycles and buses with improved infrastructure on streets with high bike and bus volumes.
	Provide high-quality bicycle access to destinations along corridors with commercial and employment land uses. Where many bicyclists use routes that are parallel to high-traffic-volume commercial arterial streets, provide connections.

Recommendation	Actions
Maintain bicycle facilities to a level that accommodates safe usage year-round.	Clear snow, ice, and debris from bike lanes and shared-use paths in a timely and reliable manner. Utilize maintenance methods to clear space necessary to maintain adequate width for bicycles.
	Train snow removal personnel so that they are up to date on current policies and best practices in snow removal.
	Improve snow clearance at intersections and curb ramps where plow passes may create snow piles from perpendicular routes.
	Maintain snow removal equipment that is appropriate for the bicycle facilities maintained by the agency. Investigate the use of tools that improve maintenance while reducing hand labor.
	Provide adequate snow clearance at bicycle parking facilities.

Recommendation	Actions
Implement pavement management programs to maintain bicycle facilities.	Implement plans and policies to fill potholes and resurface/reconstruct pavements as needed to maintain a smooth, rideable surface.
	Prioritize pavement maintenance activities on facilities with high bicycle use and high potential conflicts with motor vehicles.
	Refresh pavement markings, including colorized surfaces, as they wear out.
	Encourage reporting of unsafe road or path conditions from the public and employees and respond in a timely manner.

Recommendation	Actions
Increase bicycle wayfinding throughout the bicycle network.	Implement a consistent county-wide bicycle wayfinding system. Include maps and signs that are easy to use and recognize for all users. Incorporate the bicycle functional classification planning work identifying the primary bicycle network into the wayfinding system. Eliminate outdated bicycle wayfinding infrastructure that is not being maintained.

Recommendation	Actions
Design facilities that are self-enforcing and that require little maintenance.	Identify segments of the bicycle-way system that are frequently blocked by parked cars, delivery trucks, and other obstructions and address the problems. Tools include colorized bike lanes, raised barriers, and improved signage and pavement markings.
	Include operational planning and life cycle costs into bicycle-way design. Incorporate design elements that reduce reliance on specialized equipment for ongoing maintenance.

Recommendation	Actions
Modernize substandard facilities to meet current state and national design standards published by WisDOT, AASHTO, and NACTO.	Modernize bike lanes that are too narrow or improperly marked. Bike lanes should be designed so that they are wide enough for safe bicycle travel based on the traffic speeds and volumes. At a minimum, they need to be at least five feet wide, or four feet if adjacent to a gutter or other soft boundary. They need to be properly signed and marked as bike lanes.
	Modernize shared-use paths that are too narrow or otherwise substandard. Shared-use paths should generally have a minimum of ten feet of paved usable width, should have horizontal and vertical curves that are appropriate for the anticipated speeds, and should be properly signed and marked.
	Pave unpaved shared-use paths that are used for transportation as well as recreation.
	Narrow shoulders on rural roads should be widened to a width of five feet preferred, four feet minimum of usable width where appropriate and economically feasible given right-of-way and topographic constraints.
	Substandard shared-use path crossings and street intersections should be modernized to incorporate current design standards.
	Design all bicycle facilities to meet current state and national geometric standards published by WisDOT, AASHTO, and NACTO. All multi-use facilities should meet Americans with Disability Act (ADA) standards.

Recommendation	Actions
Minimize the impact on bicyclists during road construction projects.	When bicycle facilities are closed, post signed, reasonably direct and comfortable detours on parallel routes for bicyclists who are not comfortable riding in traffic.
	Avoid unnecessary bikeway closures, especially during peak use times. When needed, officially close bicycle facilities with appropriate signage in advance of the closure so that bicyclists are aware and can adjust their route.
	Avoid placing traffic control devices such as construction barrels and detour signs in bike facilities. Inspect work sites to ensure ongoing compliance with standards.
	Provide notification to bicyclists of upcoming detours through e-mail distribution lists, online information, and other resources.

Recommendation	Actions
Provide appropriate lighting along bicycle facilities.	Add lighting that is appropriate for bicyclists and pedestrians to existing and planned bicycle facilities where bicycle volumes and background lighting justify it.
	Evaluate lighting at conflict points such as crosswalks and intersections.

Recommendation	Actions
Evaluate intersections and other choke points that have high crash rates.	Perform detailed engineering and operational studies on intersections with documented moderate to high rates of bicycle crashes, near misses, or conflicts.

## Envisioning (Planning) Recommendations

Recommendation	Actions
Fully integrate bicyclists' needs into local and state agencies' planning, design, and operation of transportation projects and programs.	Seek input of bicyclists during the design phase of major projects to identify potential bicycle improvements.
	Ensure design staff has training and experience to incorporate the needs of bicyclists into roadway projects.
Recommendation	Actions
Encourage citizen participation and stakeholder input.	Develop and maintain interactive online tools for users to comment on plans and projects and to interact with staff.
	Broaden public outreach for corridor improvements to include feedback from users in the field.
	Engage citizens from diverse, economically disadvantaged neighborhoods.
Recommendation	Actions
Adopt compact and mixed land use development principles, ordinances, and street design standards which integrate planning for bicycle infrastructure.	Support and strengthen local land use policies for compact, mixed-use development in appropriate areas, and for designing and constructing bicycle facilities in new development projects.
	Encourage school districts to participate in providing safe and continuous bicycle and pedestrian connections from surrounding neighborhoods when siting, constructing, or improving school facilities.
Recommendation	Actions
Develop an interconnected bikeway network to provide alternatives to high volume, high-speed arterial streets.	Develop neighborhoods that incorporate an interconnected street system that includes local and collector through streets navigable by bicyclists without significant out-of-direction travel, including non-interchange highway crossings and bridges.
	Build bicycle priority streets with traffic calming and signage in new neighborhoods.
	Supplement the street system with shared-use paths where necessary to maximize connectivity of the network for bicyclists and pedestrians.
Recommendation	Actions
Develop and maintain functional hierarchy of primary and secondary bicycle facilities to identify network gaps and communicate the need for fixes.	Maintain and update the bicycle functional classification system developed in the Bicycle Transportation Plan.
	Utilize the bicycle functional classification system to identify network gaps, prioritize improvements, and implement an effective wayfinding system.
Recommendation	Actions
Locate future off-street paths where they are most useful for transportation and cost effective (i.e., where they supplement rather than duplicate the local street system).	Utilize opportunities for multi-use paths such as open space areas, railroad corridors, utility corridors, drainage ways, and highway right-of-ways.
	Plan off-street paths that are reasonably direct and avoid out-of-direction travel between common origins and destinations.
	Reserve public space for future bicycle projects through land development projects and along transportation corridors when immediate construction is not viable.

Recommendation	Actions
Maximize the effectiveness of federal, state, and local funding.	Seek varied sources of funding, including but not limited to federal, state, and local funds, partnerships with local non-profits and other agencies, or even developer impact fees or property assessments.
	Cultivate consistent communication among agencies and staff to ensure collaboration happens early and often in the planning, design, development, and funding processes.

Recommendation	Actions
Actively pursue creative, cost-effective solutions to connecting isolated neighborhoods.	Invest political and financial capital in key “choke point” projects that work to overcome barriers like highways and waterways.
	Analyze the feasibility of modern on-street bicycle facility treatments like protected bike lanes in areas that are not well served by an off-street path network.

Recommendation	Actions
Incorporate equity analysis and objectives into bicycle and other transportation planning and investment decisions.	Include accessibility-based equity analysis in bicycle and other transportation planning and involve the public in that analysis to reflect community concerns and priorities.
	Develop plans to address any identified equity impacts of the current bikeway network and bicycle programs that disproportionately affect transportation-disadvantaged people.

Recommendation	Actions
Develop goals for each performance measure using new baseline data and trend information	Develop informed short- and long-term goals for the Madison metropolitan area for the bicycle performance measures outlined in Chapter 11.
	Encourage local communities to develop informed short- and long-term goals for the bicycle performance measures for their individual communities

## Evaluation Recommendations

Recommendation	Actions
Improve and increase bicycle counting strategies	Furnish passive bicycle count equipment at strategic high-use locations.
	Conduct manual bicycle counts at strategic locations.
	Coordinate with private organizations, volunteers, and other agencies to maximize data collection efforts.
	Consider the use of technology such as smart phone apps and Bluetooth detectors to improve bicycle counts and trip information.

Recommendation	Actions
Include bicycle users in evaluation efforts.	Develop and maintain interactive online tools for users to report bicycle facility problems, interact with staff, and monitor remedies.
	Conduct user and non-user surveys to monitor the effectiveness of the bikeway system.

Recommendation	Actions
Improve evaluation methods to project future use of new facilities and to help prioritize projects.	Integrate bicycling and other multimodal options into travel demand forecasting methods to predict the use of planned facilities.
	Develop scenario planning tools to predict the effects of land use and transportation decisions.

Recommendation	Actions
Monitor performance measures in the Bicycle Transportation Plan at both the regional and local level, including progress towards meeting goals when adopted.	Update measurable regional and local data such as bicycle use, safety, bikeway network mileage, and bicycle level of service.
	Identify opportunities to improve the performance measures in the Bicycle Transportation Plan.
	Apply for the highest practical ranking from the League of American Bicyclists' Bicycle Friendly America program at the local municipal level as well as at the regional level.

Recommendation	Actions
Identify and evaluate equity analysis measures	Identify neighborhoods that are underserved by the current bikeway system.
	Evaluate the access of transportation-disadvantaged populations to bicycle education and outreach resources.

## End-of-Trip Facilities and Multi-Modal Connections

Recommendation	Actions
Enact policies and laws to ensure appropriate levels of bicycle parking are provided by private property owners.	Incorporate bicycle-parking requirements into local zoning ordinances, and ensure enforcement of the requirements by zoning inspectors.
	<p>The following provisions should be considered for inclusion into a bicycle-parking ordinance:</p> <ul style="list-style-type: none"> <li>• Require a certain percentage of spaces to be covered.</li> <li>• Require distribution of spaces at various public entrances.</li> <li>• Require a certain percentage of spaces be able to accommodate a bicycle trailer or longer cargo bike. (For example, at a shopping destination).</li> <li>• Require signage indicating the location of bicycle parking if it is not visible from the street.</li> <li>• Allow conversion of some auto spaces to bicycle spaces (either year round or seasonally).</li> <li>• Require full compliance with bicycle parking requirements in non-compliant older buildings when they are rehabilitated or undergo a change in use.</li> <li>• Allow a reduction of auto parking spaces to provide a combination of short- and long-term bicycle parking.</li> </ul>

Recommendation	Actions
Provide ample, secure, well designed, well lit, attractive, and conveniently located bicycle parking facilities.	Budget for and install parking in the public right-of-way, with priority given to downtown and neighborhood business districts and other areas with demonstrated need.
	Provide an appropriate mix of parking, including covered parking, secure bike cages, and bike lockers.
	Maintain an appropriate supply of bicycle parking throughout the year by clearing snow in the winter.
	Implement the recommendations of the Downtown Madison Bicycle and Moped Parking Study that relate to bicycle parking.

Recommendation	Actions
Work with businesses and campuses to locate on-site bicycle parking.	Assist businesses and campuses to ensure that there are enough appropriately designed bicycle parking facilities to meet demand.

Recommendation	Actions
Support the provision of facilities such as showers and bicycle maintenance stations.	Ensure that all appropriate public buildings include showers and locker facilities in new building projects and in buildings being rehabilitated.
	Encourage and provide incentives for private developers, building owners, and employers to provide showers and locker room facilities for employees.
	Work with fitness clubs in or near employment centers to create arrangements whereby, for a small fee, bicyclists could use their shower facilities.
	Increase the number of bicycle fix-it stations with tire pumps and basic tools located throughout the urban area. In areas where appropriate, build facilities modeled on the Fitchburg Bike Hub with bathrooms, tools, parking, and direct trail access.
	Develop a downtown Madison bicycle station.

Recommendation	Actions
Expand and improve bicycle sharing.	Continue expansion of bike sharing to bicycle-friendly neighborhood business districts, and identify more opportunities to support bike sharing in more neighborhoods, business districts, college areas, and communities throughout Dane County.
	Explore innovative ways to expand bike sharing to diverse and economically disadvantaged neighborhoods.
	Continue to support bike sharing in public rights-of-way.
	Require provision of space for bike-sharing stations in private developments, where appropriate.

Recommendation	Actions
Build, enhance, and promote multi-modal connections between bicycling and driving.	Provide additional park-and-pedal lots located on shared-use paths that have direct access to employment centers.

Recommendation	Actions
Enhance multi-modal connections between bicycling and transit.	Explore options to increase the bicycle carrying capacity on buses without interfering with transit operations. This may include front exterior racks that hold three bikes, or on-board bicycle space.
	Provide adequate short-term bicycle parking and long-term bicycle storage for transportation centers like transit transfer points and park-and-ride lots. This may include secure and weather-protected parking.

# Chapter 10

## Equity and Environmental Justice



## A. Introduction

Title VI of the 1964 Civil Rights Act (42 U.S.C. 2000d-1) stipulates that equity and environmental justice (EJ) be incorporated into projects that receive federal funding. To further strengthen Title VI, President Clinton issued Executive Order 12898 in 1994, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This order aims to make achieving environmental justice part of each federal agency's mission by identifying and addressing disproportionately high and adverse human health or environmental effects of government programs, policies, and investments, such as transportation facilities, on minority and low-income populations. Because many bicycle projects in Dane County have a federal funding component, incorporation of equity and environmental justice are not just best practices – they are required by law.

The vision for the *Bicycle Transportation Plan* also states that “people living in the Madison metropolitan area and Dane County will be connected by a safe, convenient, and enjoyable bicycle network that is accessible and comfortable for individuals of all ages, races, backgrounds, and abilities.” For this to happen, it is necessary to address disparities in bicycle-related investments, representation, and resources. To best address these disparities, a good understanding of the current situation is important.

The issue of bicycle transportation equity cannot be considered separately from the larger issues of equity being discussed throughout Dane County. Since 2000, the Dane County population has become more racially and ethnically diverse. Minorities now make up almost 20% of the county's population, with the largest increase occurring in the Hispanic population (*The Health of Dane County 2013 Health Status Overview Report*, Madison and Dane County Public Health, 2013).

Providing opportunities for physical activity remains an important issue for Dane County. Over 59% of Dane County adults are either overweight or obese, and 23% of Dane County 7th through 12th grade children are overweight or obese (*The Health of Dane County 2013 Health Status Overview Report*, Madison and Dane County Public Health, 2013).

*Race to Equity, A Baseline Report on the State of Racial Disparities in Dane County* (Wisconsin Council on Children and Families, 2013), reveals high levels of disparity in health, education, income, criminal justice, and child welfare. The report also states that about half of the area's low-income black households live in approximately 15 small, compact residential concentrations scattered throughout the City of Madison and around its perimeter. These areas are often disconnected from important services, and in some cases they also suffer from insufficient public transit service due to their locations on the urban periphery. Offering high-quality bicycle facilities in these areas will help connect these neighborhoods with necessary services and also provide opportunities for physical activity.

## **B. Bicycle Usage by Minorities and People with Low Incomes**

Unfortunately, there is not currently enough data about bicycle usage to thoroughly examine who does and does not use a bicycle in Dane County. Chapter 5 highlighted data from the American Commuter Survey which breaks down bicycle commuting by age, gender, race and ethnicity, and household income. A major limitation of that information is that it does not capture non-work trips like school trips and short trips to the store or for other errands. The *U.S. Bicycling Participation Benchmarking Study Report* (People For Bikes, 2015) showed that traveling to and from social events and running errands are the most common types of transportation bicycle trips.

Another limitation of the ACS survey is that bicycling is usually combined with taxicab, motorcycle, and other modes. However, commuting trends stratified by gender are available for bicycling alone. According to these more detailed “Sex of Workers by Means of Transportation to Work” tables, about 80% of commuters in this “other” category are bicyclists, so the ACS data is still useful for equity analysis. For individual races in Dane County, white commuters reported somewhat higher levels of bicycle commuting (3.9%) than Black (3.3%) or Asian (3.1%) commuters. Individuals identifying as “two or more races” report a much higher bike commute mode share of 8.0%, but this may be attributable to statistical error due to the low sample size.

In Dane County, the rate of individuals who commute to work by bicycle, taxicab, motorcycle, or some other mode is relatively high among individuals with household incomes below \$35,000, and the rate generally declines as household incomes increase until household incomes reach about \$60,000, at which point the rate of bicycle commuting increases.

## **C. Plan Recommendations Concerning Equity**




Equity is one of the six adopted goals of the Bicycle Transportation Plan (the others are safety, usage, connectivity, livability, and longevity). The strategies (seven E’s) and recommendations contain specific actions intended to increase participation in bicycling and facilities planning by low-income individuals, minorities, and people who live in neighborhoods that may have been excluded in the past.

Education and encouragement programs should understand the specific needs of historically underrepresented populations like low-income people and people of color. These families may experience different barriers to bicycling than others. Examples of these barriers include not being able to afford a quality bike, not having the skills, tools, or funds to repair a bike, cultural stigmas around biking as well as transit use, lack of cooperation from landlords, and not having easy access to maps and other materials. Anecdotal accounts suggest that participation in events like Ride the Drive and Bike Week are lower among people of color – event organizers may be able to increase participant diversity by addressing those barriers.

## Madison Metropolitan Area and Dane County

— Existing Bicycle Facilities  
— Proposed Bicycle Facilities

### Concentrations of Low Income and Zero-Car Households\*

 Medium  
 Medium-High  
 High

\* Combined Low Income / Zero-Car Rating

Medium – Score of medium for Low Income or Zero-Car but not high in either

Medium High – Score of high for Low Income or Zero-Car but not high in both

High – Score of high in both Low Income and Zero-Car

### Low Income Households

1.5-2 times MMPA\*\* Average were given a low income rating of medium

2+ times MMPA\*\* Average were given a low income rating of high

### Zero-Car Households

2-3 times MMPA\*\* Average were given a zero-car rating of medium

3+ times MMPA\*\* Average were given a zero-car rating of high

\*\* Madison Metropolitan Planning Area

Prepared by staff to the:



Source Info:  
Bicycle Paths and Routes: 2014 (MATPS).  
Street Base: 2013, Orthophoto Derived (DCLIC).  
Functional Classifications: 2014 (MATPS, WDOT).  
Hydrography: 1200, 1:24,000 (WIDNR).  
Civil Division Lines: 2014, Annotation Barriers (DCLIC).

Author: pjjg  
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Date Saved: 6/18/2015 3:28:09 PM  
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Date Revised: 3/2/2015


Lambert Conformal Conic Projection  
 GCS: NAD 83 (91)

## Madison Metropolitan Area and Dane County

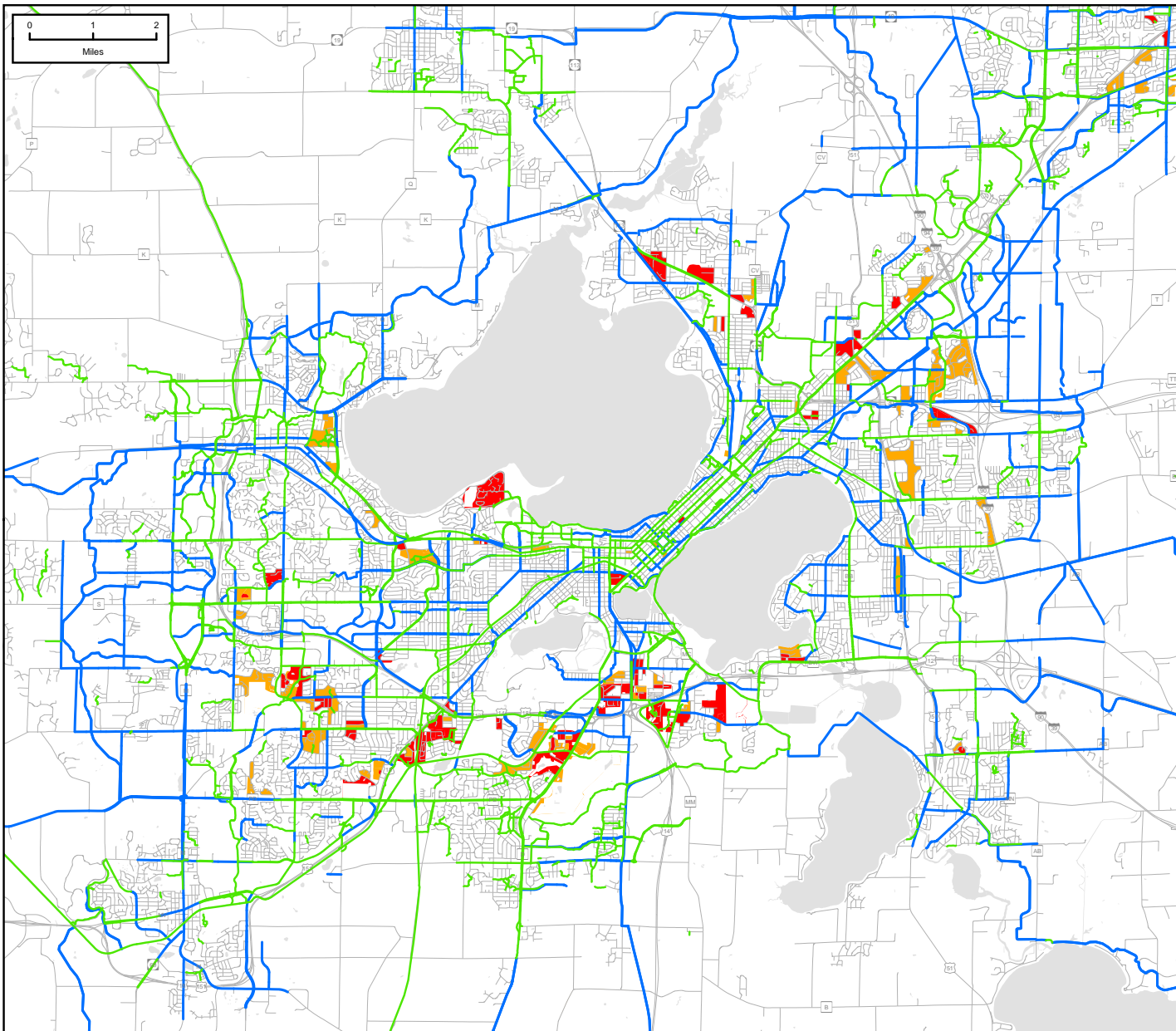
— Existing Bicycle Facilities  
— Planned Bicycle Facilities

**Percent Minority**

 2 to 3 Times MMPA\* Average:  
39.2% - 58.8% (min 100 persons)

 3+ Times MMPA\* Average:  
58.9% - 96.0% (min 100 persons)

\*MMPA (Madison Metropolitan Planning Area) average = 19.6%



Prepared by staff to the:



Source Info:  
Bicycle Paths and Routes: 2014 (MATPS).  
Street Base: 2012, Orthophoto Derived (OCLIO).  
Functional Classifications: 2014 (MATPS, WDOT).  
Hydrography: 12/00, 1:24,000 (WDNR).  
Civil Division Limits: 2014, Annexation Records (OCLIO).

Author: piping  
Date Printed: 6/18/2016  
Date Saved: 6/18/2016 9:58:22 AM  
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Date Revised: 6/19/2015

**Figure 10-2 Existing and Planned Bicycle Facilities and Areas with Concentrations of Minority Populations**

**Madison Metropolitan Area and Dane County**

**Madison Metropolitan Area and Dane County**



**Figure 10-3 Existing and Planned Bicycle Facilities and Areas with Health Disparities, Dane County**

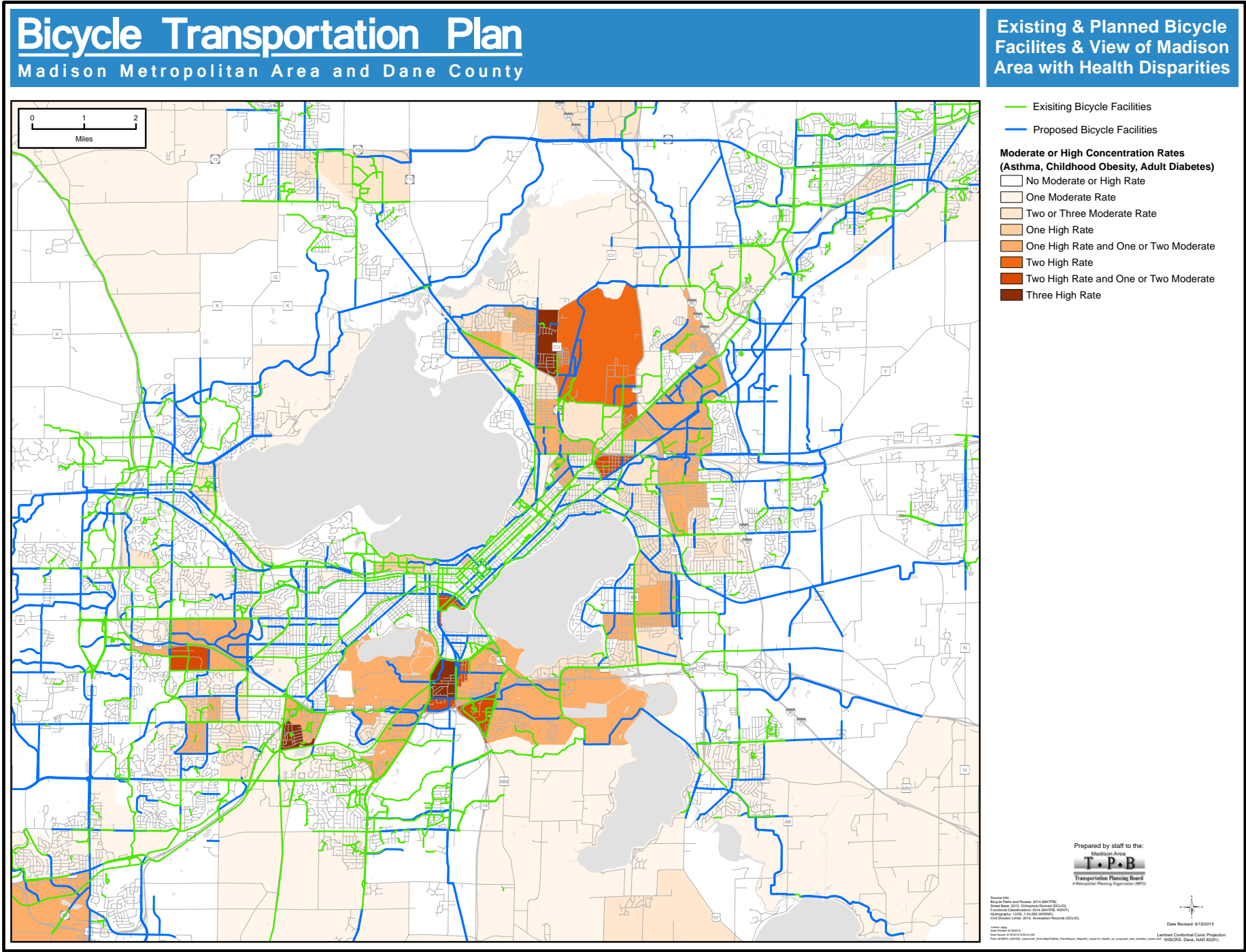


Figure 10-4 Existing and Planned Bicycle Facilities Health Disparities, Madison Area

Corridor planning for new and improved bicycle facilities should continue to seek input from the public. Several of the areas of equity concern identified later in this chapter are affected by regional highways like Verona Road, the Beltline Highway, and others. New facilities should bridge these barriers to improve mobility for isolated neighborhoods.

Continued and improved equity analysis should be undertaken to ensure that low-income and minority neighborhoods have equitable access to grant funds. This includes grants administered by the Madison Area Transportation Planning Board, such as the Transportation Alternatives Program (TAP) and STP-Urban grants.

## **D. Existing and Planned Bicycle Facility System**

Data from the Madison Area Transportation Planning Board's bicycle facilities geodatabase and other sources is available to analyze how well areas of Dane County are currently served by the bikeway network. For purposes of equity and environmental justice analysis, the following indicators are used to identify areas of concern:

- Areas with concentrations of low-income and with zero-car households
- Areas with concentrations of minority populations
- Areas with concentrations of asthma, childhood obesity, and adult diabetes

The facility recommendations in this plan are intended to serve all areas of Dane County and provide increased access for all types of cyclists.

**Figure 10-1** through **Figure 10-4** show the areas of concern listed above and both the existing and planned on-street and off-street bicycle facilities.

## **E. Distribution of Premium Bicycle Facilities**

The distribution of high-quality "premium" bicycle facilities is key to understanding how the bikeway system serves neighborhood areas and communities. Premium bicycle facilities for this analysis are considered to be shared-use paths, bicycle boulevards, and other facilities like protected bike lanes and counter-flow bike lanes that are identified as primary or secondary on the bicycle functional classification network. These facilities are more attractive to new, less confident bicyclists, especially children.

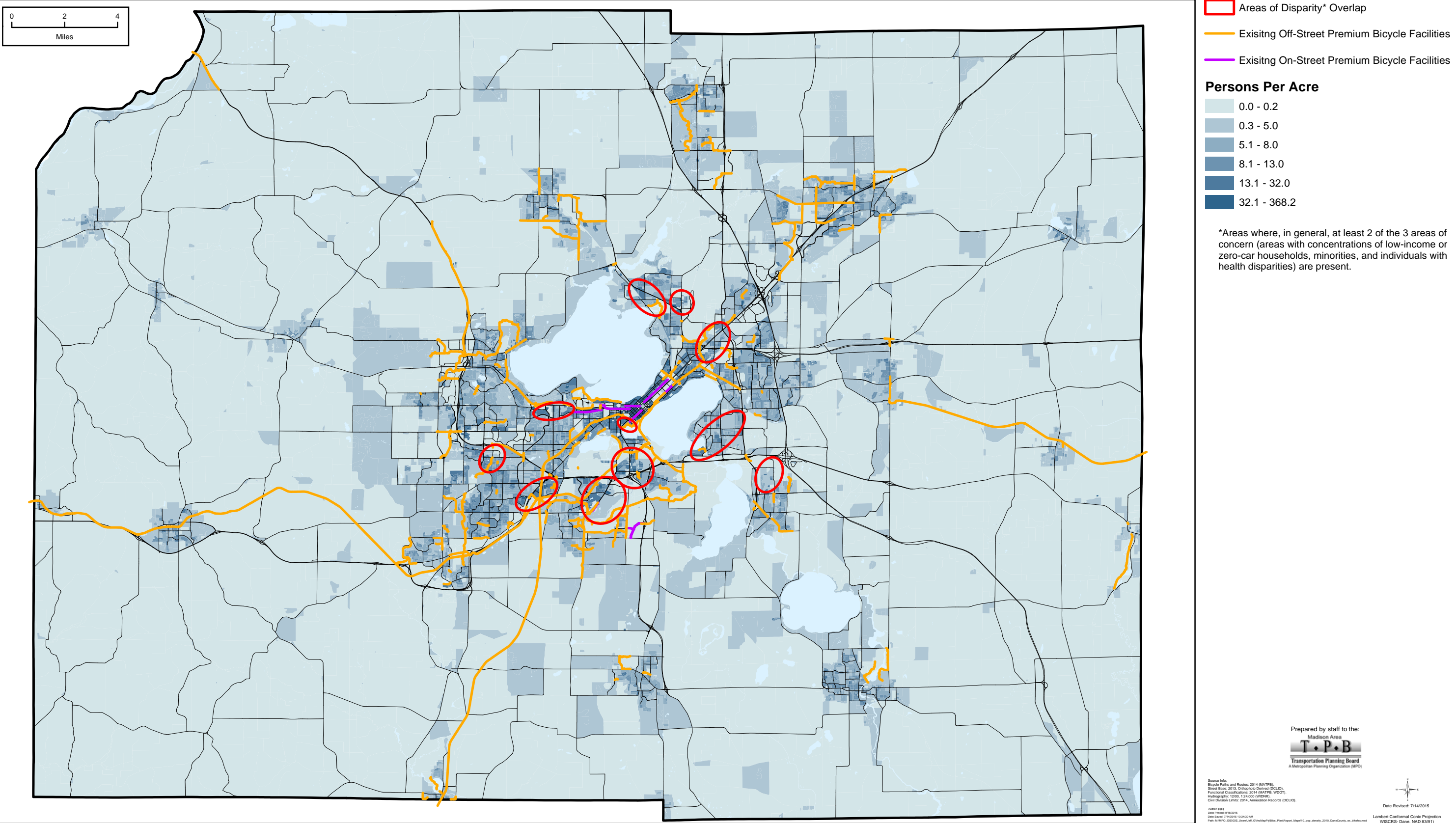
**Figure 10-5** shows the density of premium bicycle facilities in relation to areas of concern from an equity perspective. It is estimated that 47% of Dane County residents are within one-quarter mile of a premium bicycle facility using 2010 population data. The density of premium bicycle facilities was calculated by summing the mileage of facilities per square mile within each Dane County census tract, which is shown in **Figure 10-6**. The red ovals highlight parts of the county where, in general, at least 2 of the 3 areas of concern (areas with concentrations of low-income or zero-car households, minorities, or individuals with health disparities) are present.

Figure 10-5 Existing Premium Bicycle Facilities and Population Density

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

## Existing Premium Bicycle Facilities and Population Density



## Madison Metropolitan Area and Dane County

Miles of Bicycle Facilities per Square Mile



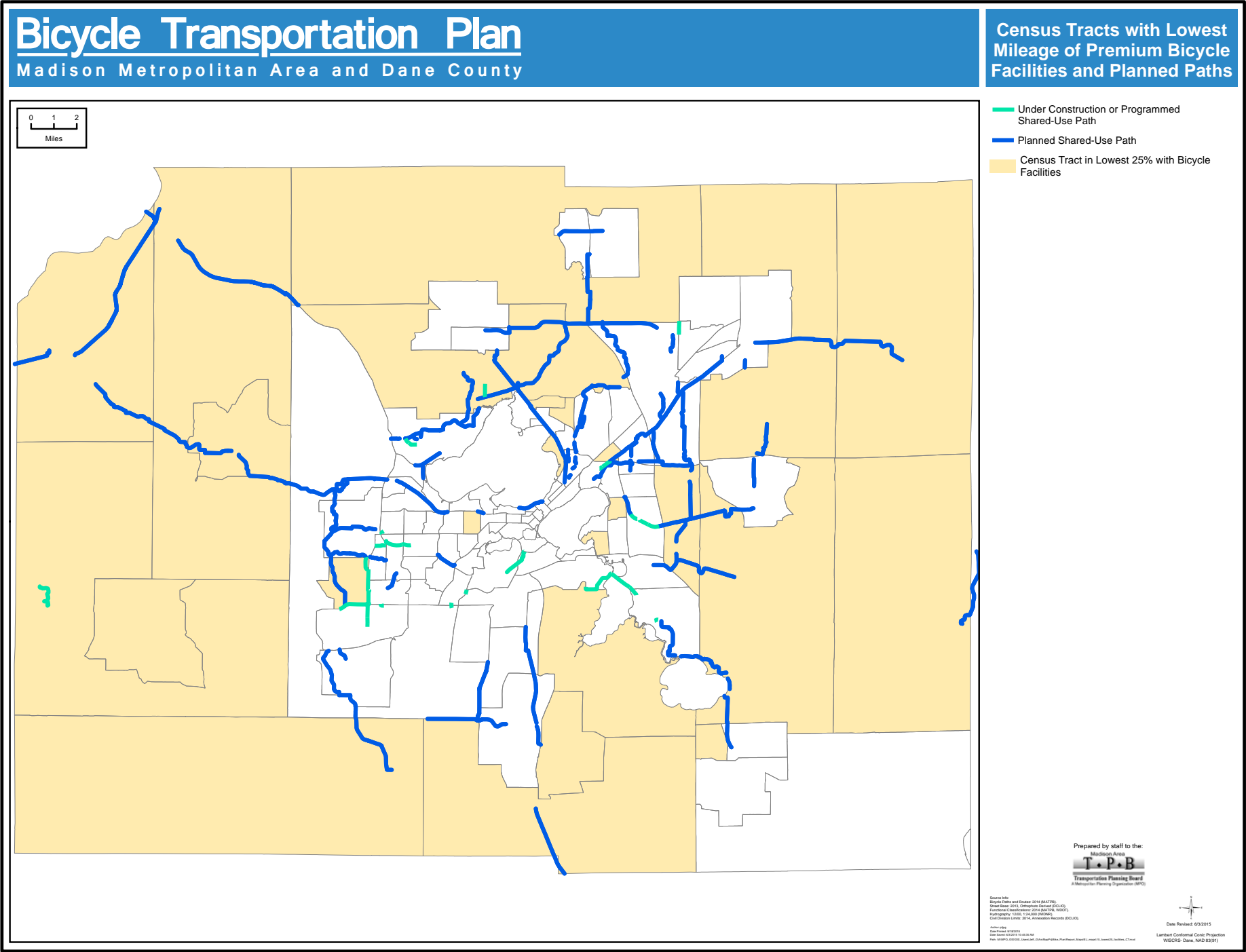


Figure 10-7 Census Tracts with Low Mileage of Premium Bicycle Facilities and Planned Shared-Use Paths

**Figure 10-7** shows the census tracts in the bottom 25% for provision of premium bicycle facilities along with the programmed and recommended regional priority shared-use paths in the Bicycle Network Plan. Many of the census tracts with the lowest premium bicycle facility mileage per square mile are in rural areas, as might be expected. However, some urban census tracts also rate in the bottom 25%, including areas in north Madison, southwest Madison, and Monona.

A number of planned projects will expand bicycle service to underserved areas. Major shared-use path projects that are expected to improve bike access for people in areas of equity concern are listed below.

- The Cannonball Path was recently constructed from west Fitchburg to Fish Hatchery Road with a new bridge over the Beltline Highway, and planning work is underway for an extension to the Wingra Creek Path.
- The Lower Yahara River Trail will be constructed from the Capital City Trail near Lake Farm Park to McFarland, and it will include a new bridge and boardwalk over Lake Waubesa. This project will substantially reduce bike travel times and remove barriers for people in McFarland and southeast Madison.
- The planned Sherman Flyer Path and Hartmeyer Path will connect the north side of Madison with the Yahara River Path and Capital City Trail. This project will serve an area with low-income and minority concentrations.
- The Packers Avenue Path will also expand the bicycling network into north Madison, providing an off-street alternative to Packers Avenue.
- The Goodman Path in northeast Madison will improve bicycle access to low-income neighborhoods near USH 30, East Washington Avenue, and East Towne.
- The expansion of the West Beltline Path planned near West Towne will represent a significant improvement for low-income and minority families in southwest Madison and a population with health disparities.
- The reconstruction of Buckeye Road in east Madison will include new bike lanes in low-income areas.

A number of barriers remain to people living in areas of equity concern. System-wide gaps in the bikeway network are discussed in Chapter 4, and facility needs are addressed in Chapter 9.

- Near west Madison neighborhoods have limited options for travel into central Madison. The majority of University Avenue now has on-street bike lanes, but a gap remains between Shorewood Boulevard and Farley Avenue. The shared-use path and connecting local streets parallel to University Avenue are mostly complete but some gaps remain.
- Southwest Madison and northwest Fitchburg neighborhoods face barriers presented by the West Beltline Highway and Verona Road.
- South Madison and north Fitchburg residents face challenging bicycling conditions on Fish Hatchery Road and Park Street. Crossing the West Beltline Highway is also a challenge, with no direct access to the employment center south of the West Beltline Highway and east of Fish Hatchery Road.
- In east and southeast Madison, Stoughton Road represents the most significant obstacle, which may improve with new planned crossings. The lack of a safe, comfortable route between southeast Madison and central Madison will be satisfied with the new Lower Yahara River Trail.
- Northeast Madison struggles with connections across several major roadways, including East Washington Avenue, Stoughton Road, USH 30, and I-39/90/94. Bicycle routes through East Towne are also limited by a lack of street connections and bicycle facilities. Shared-use paths and marked bike lanes are planned to help these problems.
- North Madison neighborhoods have seen improved bicycle connections with the addition of bike lanes on Northport Drive and Sherman Avenue, but a high quality route into central Madison remains elusive.

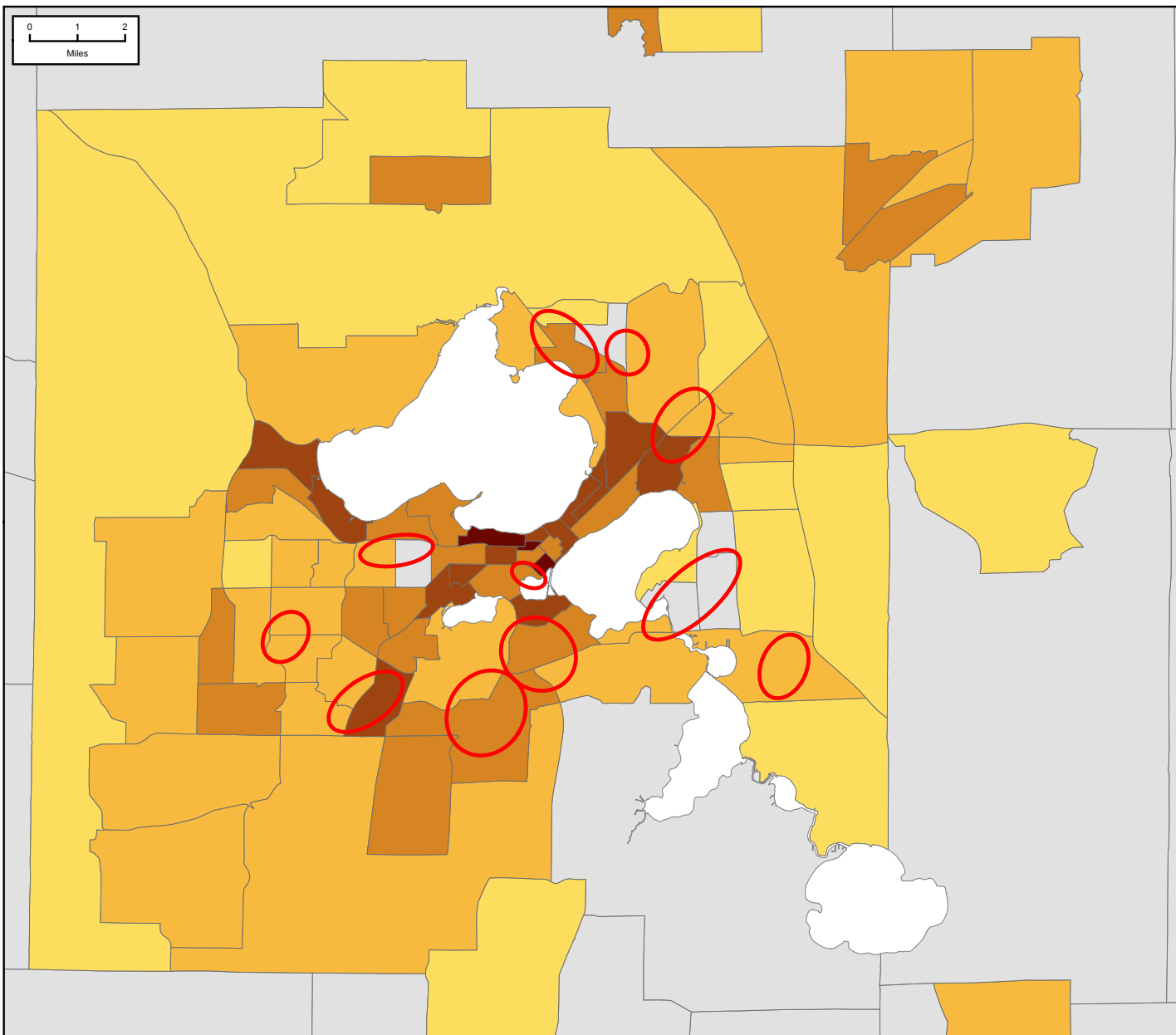
**Figure 10-8** shows the density of existing premium bicycle facilities with the addition of the programmed shared-use paths and prioritized regional shared-use paths recommended in Chapter 9. In north Madison, neighborhoods that have historically had fewer bicycle facilities and have more low-income and minority families and individuals with health concerns show an increase in premium bicycle facilities. Some rural census tracts in areas with health disparities also show a significant increase in the miles of premium bicycle facilities.

Additional analysis is needed to truly understand how these neighborhoods are served by the bikeway network. This analysis should not just look at the mileage of bicycle facilities, but it should also examine the ease of bicycle travel from neighborhoods to important destinations such as employment centers, grocery stores, schools, and medical facilities. This more involved bicycle accessibility analysis is currently being developed and will be included in the MPO's Regional Transportation Plan update, which is underway and will be adopted in late 2016 or early 2017.

# Bicycle Transportation Plan

Madison Metropolitan Area and Dane County

Miles of Existing & Planned Premium Bicycle Facilities by Square Mile by Census Tract



Miles of Existing and Planned Bicycle Facilities per Square Mile

- 0.00 - 0.50
- 0.51 - 1.00
- 1.01 - 2.00
- 2.01 - 4.00
- 4.01 - 8.00
- 8.01 - 12.00

  Areas of Disparity\* Overlap

\*Areas where, in general, at least 2 of the 3 areas of concern (areas with concentrations of low-income or zero-car households, minorities, and individuals with health disparities) are present.

Prepared by staff to the:  
Madison Area  
**T.P.B.**  
Transportation Planning Board  
A Metropolitan Planning Organization (MPO)

Source: MPO  
Bicycle Data and Routes: 2014 (MTPB)  
Roadway Data: 2013, Oregonian Journal (OJ)  
Functional Classification: 2014 (MTPB, MDCIT)  
Map Date: 2015, 2/24/15 (MTPB)  
Data Collection: 2014, Assessment Records (SCLIS)

Author: MPO  
Date: 6/15/2015  
File: Bicycles\_2015\_0615.mxd  
Print: 6/15/2015, 2:00 PM, 100% (11x17)

Date Revised: 6/15/2015  
Lambert Conformal Conic Projection  
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UTM Zone: 12N, Datum: NAD 83, Spheroid: GRS80, Datum: NAD 83, Unit: Meters, Contour Interval: 1000

Figure 10-8 Miles of Existing and Planned Premium Bicycle Facilities by Square Mile by Census Tract, Madison Area

## E. Overcoming Barriers to Bicycling

Expanded facilities are a crucial component to improving access for all, but other barriers also exist that keep people from riding a bike. Programming to encourage and educate cyclists along with opportunities for people of all income levels to have a bike are also critical elements in expanding the number and diversity of Dane County bicyclists.

The 2014 U.S. Bicycling Participation Benchmarking Study Report (*People For Bikes*, 2014) conducted for the organization People for Bikes found a number of issues that can help policy makers better understand what else besides safe facilities keeps people from bicycling. Some key findings of their survey include:

- Availability of an operational bicycle is a key barrier for many people, particularly low-income adults, African-Americans, women, and older adults.
- 12% of adults who reported not riding in the last year have never ridden a bicycle.

Continuing to expand upon current education programs and opportunities for low-cost bicycle purchase and repair are key components of the recommendations in Chapter 8. Partnerships will be integral to ensuring that education and encouragement recommendations continue to be expanded and reach targeted groups. Cooperation will be needed between social service agencies, health advocates, and government agencies to fully address barriers and implement the recommendations.

## Chapter 11

# Implementation



## A. Introduction

The *Bicycle Transportation Plan* provides a long-term vision for the development of a metro area and countywide bicycle facility network. It also includes detailed recommendations for enhancement and expansion of current programs and activities to support and encourage bicycling. Implementation of the plan will take place incrementally over many years by multiple entities. Implementing agencies (local communities, Dane County, WisDOT, and the MPO) and organizations will need to communicate and work together to effectively implement the plan recommendations.

The Madison Area Transportation Planning Board (MPO) can assist by helping to coordinate the efforts of the primary implementing agencies and to support local community and county bicycle planning and encouragement program efforts. This includes providing information and conducting analyses of the benefits of bicycling facility infrastructure investments through tools such as the MPO's new Active Living Places Index and a tool to measure bicycle accessibility to key destinations and jobs. The Active Living Places Index measures how supportive an area is of healthy, active living based on walkability and accessibility to the bikeway and transit systems. Walkability is measured by intersection density and density of important destinations. Bikeway system accessibility measures density of premium bike facilities and bicycle level of service of streets in an area. Transit accessibility/level of service factors bus service frequency of nearby stops and the percentage of jobs that can be reached within 45 minutes. Information from these tools will assist in both planning and decision making on new bicycle facility investments.

The MPO will monitor and regularly report on the status of implementation of the bicycle facility network and other plan recommendations and the performance measures laid out in the plan. **Table 11-1** lists these measures and the current trends in performance, if known. Some of these performance measures have not been officially tracked at a regional level in the past. This will require maintaining an up-to-date bicycle facility geodatabase, and will involve coordination with and cooperation from implementing entities to obtain data.



**Table 11-1**  
**Bicycle Performance Measures and Current Trends**

Plan Goal	Performance Measures	Current Trend
Safety	Crashes Fatalities Crashes/Fatalities per 10,000 daily commuters	Little change Little change Down
Usage	Bicycle counts Commute mode share	Up Up
Connectivity	Documented network gaps User satisfaction Bicycle Level of Service (proportion of urban collector and arterial streets that are B or better)	N/A Unknown Unknown
Equity	Population within ¼ mile of premium bikeway Relative commute mode share of women and minorities	Unknown Unknown
Livability	Bicycle Friendly Community status Communities with dedicated funding for cyclists	Improving Unknown
Longevity	Proportion of facilities that are plowed in winter Path pavement quality	Little change Unknown

The MPO's primary role in developing the regional bicycle facility network is providing funding for regional priority path projects and on-street facilities with the MPO's allocation of federal Transportation Alternatives Program and Surface Transportation Program (STP) – Urban funding. The MPO uses project scoring criteria consistent with the regional transportation plan and bicycle plan goals to select projects for funding from applications submitted by local units of government and Dane County. These two programs and other funding programs are discussed below.

The *Bicycle Transportation Plan* will be revisited regularly to report on the status of implementation and to review and amend the bicycle network plan as necessary. Major reviews and updates will occur in conjunction with updates of the *Regional Transportation Plan*, which occur every five years. The next *Regional Transportation Plan* update is already underway and is expected to be completed by November 2016. The regional priority shared-use path projects will also be reviewed and revised as necessary based on changed conditions as part of these major updates.

Municipalities are strongly encouraged to incorporate the *Bicycle Transportation Plan* recommendations into their local comprehensive plans and to preferably prepare their own local bicycle and pedestrian facility plans that tie into the regional bikeway network. In-depth local planning is important for making decisions in corridors and for laying out specific plans in both developed and undeveloped areas. Bicycle facility planning must be incorporated into detailed land use and street planning at the neighborhood level. Shared-use paths, for instance, are most effective when used to supplement, not replace, the local street system. MPO staff are available to assist in these efforts.

Dane County regularly holds coordination meetings to discuss bicycle projects. Similar local coordination meetings among neighboring communities or between departments in larger municipalities would help quality bicycle projects move forward in a timely and coordinated manner. MPO staff can also assist with these efforts, perhaps through creation of a regional bicycle workgroup or committee that meets once or twice a year to share information on project planning and design issues.

Bicycle facilities development needs to continue to actively engage the public and bicycle users. Bikeway network users represent a large source of information identifying maintenance problems and other hazardous conditions. Meaningful public engagement should also be used during the planning and design for bicycle facilities so that they can best serve the future users of the system.

## **B. Existing Funding Sources**

Larger bicycle projects often rely on a combination of funding sources including federal, state, county, and local funding. Municipalities need funds to support building new infrastructure as well as for operations, maintenance, and for education, encouragement, and enforcement programming. Funding for maintenance of bicycle facilities is a significant issue as the number of miles of paths continues to grow. Generally, federal grant funding is only available for new construction.

A few of the most important funding sources for bicycle projects are discussed in more detail below.

### **Transportation Alternatives Program (TAP)**

The MAP-21 federal transportation legislation merged three already existing funding programs (Safe Routes to School, Transportation Enhancements, and Recreational Trails programs) into the Transportation Alternatives Program (TAP). The funds from TAP, which are administered by the Wisconsin Department of Transportation (WisDOT), are used primarily for off-road bicycle and pedestrian projects. They are also used for Safe Routes to School infrastructure like crosswalks, as well as for non-infrastructure projects like education activities. Under MAP-21 the Madison Area Transportation Planning Board now receives an allocation of TAP funding to award to projects in the MPO's planning area. Municipalities may also compete for the statewide pool of funding.

Although the Recreational Trails Program (RTP) was merged into the Transportation Alternatives Program, a portion of TAP funds are set aside for the development of trail and trail facilities for both motorized and non-motorized vehicles. RTP funds in Wisconsin are overseen by the Department of Natural Resources (DNR). The program benefits hikers, bicyclists, in-line skaters, equestrian users, cross-country skiers, snowmobilers, off-road motorcyclists, all-terrain vehicle riders, four-wheel drivers, and others.



## The Surface Transportation Program (STP)

The Surface Transportation Program (STP) provides federal funding for projects to preserve and improve the conditions and performance on any federal-aid highway or bridge on any public road, for pedestrian and bicycle projects and for transit capital projects. The Madison Area Transportation Planning Board receives an allocation of STP – Urban funding to award to projects in the Madison Metropolitan Area. Eligible types of bicycle/pedestrian projects include:

- On-road bicycle lanes and paved shoulders
- Shared-use paths
- Bridges and underpasses for bicycles and pedestrians

The recently adopted selection process for STP-Urban projects indicates that all projects funded through the STP-Urban program must be consistent with the MPO's regional transportation plan, federal Title VI/ environmental justice requirements, and state complete streets laws effective May 2015. The last requirement holds most urban roadway projects accountable to, at a minimum, provide basic bicycle and pedestrian accommodation.



## Other funding sources and grant programs

A number of other WisDOT programs are also used to make improvements that benefit bicyclists. The **Local Road Improvement Program (LRIP)** assists local governments in improving county highways, town roads, and city and village streets. The improvements can include bike lanes, paved shoulders, and other bicycle facilities. The **Highway Safety Improvement Program (HSIP)** funds highway safety projects at sites that have a history of high crash rates. Emphasis is on low-cost options that can be implemented quickly. Bicycle and pedestrian projects are eligible for this program.

The Wisconsin DNR manages the **Knowles-Nelson Stewardship Local Assistance Program** which funds projects that create or support nature-based outdoor recreational opportunities. Funds from this program are frequently used to acquire land for bicycle trails.

Dane County has a number of budget initiatives that support bicycle programming. Dane County Parks introduces new bicycle trail initiatives into each annual capital budget. Dane County also funds a relatively new grant program for local municipalities called the **PARC & Ride Program**, which was built upon the former Partners for Recreation and Conservation (PARC) grant program. The PARC & Ride Program provides assistance for expanding trail connectivity, providing destination-oriented bicycle trails, and improving bicycling safety.

Dane County Parks also requires users of the Capital City Trail to have a state trail pass. Dane County receives 70% of the sales revenue generated from the passes sold along the Capital City Trail and uses those funds to help offset maintenance costs. Annual county revenues from state trail passes for the Capital City Trail typically are about \$45,000.

Pedestrian and bicycle accommodations are also routinely included as part of local street projects and some local municipalities include specific funding in their budgets for bicycle facilities and programs. For example, the City of Madison has specific line items for bicycle improvements in its annual budget as well as project-specific funding in the capital budget for new infrastructure. The City of Madison budget includes the following funding program categories:

- **Bikeways and Miscellaneous Improvements** – Funding for various types of bicycle-related improvements throughout the city including the resurfacing of shared-use paths.
- **Pedestrian/Bicycle Infrastructure Enhancement**– Funding to construct bike boulevards (bicycle priority streets) and other pedestrian and bicycle enhancements.
- **Safe Routes to School** – Funding for signs, lighting, curb ramps, short sidewalk segments, median islands, pavement retreatments, and traffic calming installations. In addition, funds may be used to improve access to city parks.
- **Traffic Safety Infrastructure** – Funding for projects that improve safety and accessibility for pedestrians, bicyclists, motorists, and transit users.
- **Project-Specific Funding** – Projects are detailed in each capital budget, which also includes estimates of future projects expected to be undertaken in the next five years.



Funding for projects and programs also comes from a variety of other sources. Infrastructure is sometimes constructed as part of new developments. This practice, or at a minimum the reservation of right-of-way, is encouraged. Both national and local non-profits such as People for Bikes and the Dane County Bicycle Association provide small funding grants to help get non-infrastructure projects started. Health organizations such as the Centers for Disease Control have also taken an interest in promoting active living, and funds are often available for bicycle initiatives.

## C. Financial Analysis of the Bicycle Plan

A financial capacity analysis was conducted of the priority regional path recommendations. Based on that analysis, implementation of the priority regional shared-use path projects described in Chapter 9 is expected to be financially feasible within the plan's time frame given current trends in funding for bicycle projects in Dane County.

A planning-level cost estimate was completed for each segment of the regional priority paths (shown in **Table 11-3**). Although this high-level cost estimation method is general and could not be used for individual project budgeting or preliminary engineering, it provides some confidence that the level of investment in bicycle infrastructure represented in the plan is realistic. Path segment cost estimates are based on the following assumptions:

- Paved shared-use paths retrofitted into urban environments are estimated at \$100 per foot, not including lighting, retaining walls, and other structures.
- Paved shared-use paths constructed in suburban and rural environments are estimated at \$60 per foot, not including lighting, retaining walls, and other structures.
- Urban shared-use paths that are widened or paved are estimated at \$60 per foot, not including lighting, retaining walls, and other structures.
- Major structures (bridges and tunnels) are estimated at \$1.5 million each (individual structures can vary in cost widely).
- All cost estimates are in constant 2015 dollars.
- Costs are rounded to the nearest \$50,000.



Shared-use paths totaling roughly \$25 million are programmed and funded in the five-year *2015-2019 Transportation Improvement Program* (Madison Area Transportation Planning Board, 2015), as shown in **Table 11-2**. Prioritized regional shared-use paths have been broken up into two groups: shorter term projects expected to be completed in the earlier stages of this plan's time frame (2020 to 2035) and longer term projects expected to be completed near the end of the plan's time frame (2036 to 2050). This division in the timing of the projects takes into account current local priorities and preliminary planning work, anticipated timing of development, and other factors. It also illustrates the phased roll-out of the bike network plan.

**Table 11-2**  
**Programmed Priority Regional Shared-Use Paths**

Index	Programmed Projects	Limits	Year	Est Cost (thousands)
A	Graber Pond Connector Trail	Graber Pond to Pheasant Branch Conservancy	2015	\$290
B	Ice Age Junction Path	Beltline Hwy to Tree Lane	2015	\$420
C	Pleasant View Road / Ice Age Junction Path	Flagstone Drive to Valley View Road	2016	\$2,870
D	Pleasant View Road Corridor Path	Flagstone Drive to Cross Country Road	2016	\$2,500
E	West Beltline Path Extension	Grand Canyon Drive to Junction Road	2016-2018	\$4,380
F	Hwy PD Corridor Path	Pleasant View Road to Nine Mound Road / Northern Lights Boulevard	2018	\$370
G	Ice Age Junction Path / McKee Road Overpass	Just west of High Point Road	2017	\$613
H	Badger State Trail / McKee Road Underpass	Part of McKee Road reconstruction	2019	\$1,538
I	Seminole Hwy Path	Dawley Park Bike Hub to Cannonball Path	2017	\$250
J	Cannonball Path Extension	Beltline Hwy to Fish Hatchery Road	2015	\$625
K	Cannonball Path Extension	Fish Hatchery Road to Wingra Creek Path	2016	\$550
L	Lower Yahara River Trail Lakespan Boardwalk *	Lake Waubesa crossing	2015	\$1,663*
M	Grandview Marsh Path	Pheasant Run to Creamery Road, McFarland	2015	\$85
N	Capital City Trail Extension	Buckeye Road to I-90	2016-2018	\$1,674
O	Goodman Path	Milwaukee Street to Hwy 30	2015-2016	\$2,450
P	Hwy C Path	Hwy 19 to St Albert Drive and Hwy 19 to the east, Sun Prairie	2016	\$387
Q	Military Ridge to Brigham Park Trail	Military Ridge to Brigham Park	2015	\$299
R	Woodland Drive Path, Westport	Mary Lake Road to Hwy M	2016	
	City of Madison Bikeways and Miscellaneous Improvements	General fund for resurfacing and other ped/bike improvements	Ongoing	\$2,868
	Unallocated Transportation Alternatives Program Funds		2019	\$680

\* Cost only includes funding added in 2015. The entire project cost from Lussier Family Heritage Center to McDaniel Park is estimated at \$6,770.

**Table 11-3**  
**Future Planned Priority Regional Shared-Use Paths**

Index	Priority Regional Shared-Use Paths	Limits	Estimated Cost (thousands) and Time Frame	
			2020-2035	2036-2050
2	Hwy 19 Path	Waunakee to DeForest		\$3,050
3	Hwy 19 Path	DeForest to Heatherstone Dr, Sun Prairie		\$950
4	North Mendota Path	Hwy 12 to Hwy Q	\$2,300	
5	North Mendota Path	Hwy Q to Hwy 113	\$1,500	
6	Upper Yahara River Path	Hwy 113 to Hwy 19		\$2,750
7	Bishops Bay - Waunakee Path	Bishops Bay to Waunakee	\$850	
8	Century Avenue Path	Pheasant Branch Trail to Hwy Q	\$2,150	
9	Allen Boulevard Path	Mendota Avenue to Century Avenue	\$300	
10	Pheasant Branch West Path Paving	Century Avenue to 1.2 miles north	\$400	
11	Good Neighbor Trail	Farley Avenue to Ridge Street	\$1,650	
12	Good Neighbor Trail	Eau Claire Ave to Middleton	\$4,450	
13	Good Neighbor Trail	Middleton to Cross Plains		\$2,500
14	Good Neighbor Trail	Cross Plains to Wisconsin Heights HS, Mazomanie		\$6,950

15	Hwy 12 Path	Rauls Road to Dunlap Hollow Road	\$2,000	
16	Hwy 78 Path	Mazomanie to Sauk City		\$2,650
17	Lower Badger Mill Creek Path	McKee Rd to Hwy 14 / Good Neighbor Path		\$3,650
18	Elderberry-Junction Path	Junction Road to Lower Badger Mill Creek Path		\$650
19	1,000 Oaks Path	High Point to LBMC Path		\$800
20	West Beltline Path	Whitney Way to Southwest Path	\$2,000	
21	Elver Connector	Raymond Road to Elver Park	\$400	
22	Southwest Path Widening	Randall Avenue to Midvale Boulevard	\$850	
23	Military Ridge Path Paving	Old PB to Epic	\$1,150	
24	Paoli to Verona Path	Badger State Trail at Hwy A to Military Ridge Trail	\$2,250	
25	Fish Hatchery Road Path Extension	Whalen Road to Hwy M	\$850	
26	Oregon to Badger State Path	3,000 feet west of Alpine Pkwy to Badger State Path	\$1,150	
27	Fitchburg to Oregon Path	Lacy Road to Oregon via Syene Road and RR corridor		\$5,650
28	Lower Yahara River Trail	McFarland to Stoughton	\$3,950	
29	Hwy 12 Path	Millpond Rd to Vilas Rd		\$5,450
30	Capital City Path Gap Connection	Cottage Grove Road to Buckeye Road	\$450	
31	Glacial Drumlin Trail Extension	Cottage Grove to Vondron Road	\$3,000	
32	Blooming Grove Drumlin Path	Owl Creek to I-94		\$7,550
33	Cottage Grove to Sun Prairie Path and Route	Path from Hwy BB to Town Hall Rd, on-street along Town Hall Rd, and path along Hwy N from Bailey Rd to Sun Prairie HS	\$1,000	
34	Cambridge to Glacial Drumlin Path	Cambridge to Glacial Drumlin Path	\$2,650	
35	Commercial Path	Thompson to I-39	\$450	
36	Interstate Path	SP rail corridor to Milwaukee Street underpass		\$2,450
37	Pipeline Path	Commercial to O'Keeffe		\$1,250
38	Hiestand Path	Olbrich to East Towne	\$6,250	
39	Goodman Path	Hwy 30 to East Towne	\$3,850	
40	Goodman Path	East Towne to Hwy 151 Path / West Sun Prairie	\$3,900	
41	West Sun Prairie Path	Hazelnut Trail to Hwy 19	\$250	
42	Milwaukee Road Path	Burke Road / Good Neighbor Path to Sun Prairie		\$1,250
43	Milwaukee Road Path	Sun Prairie to Marshall		\$5,350
44	Packers Path	Yahara River to Dane County Airport	\$1,100	
45	Token Creek Path	Dane County Airport to Hwy 19	\$8,100	
46	North Street Corridor Path, DeForest	Main Street to Hwy 51	\$1,050	
47	Lake Road Corridor Path, DeForest	Hwy 19 to Vinburn Rd		\$1,750
48	Hartmeyer Path	Aberg Avenue to Commercial Avenue	\$200	
49	Sherman Flyer Path	Johnson to Aberg (Sheridan / Steensland)	\$850	
50	Sherman Flyer Path	Aberg Ave to Troy Drive		\$2,400
51	Sherman Flyer Path	Troy Drive to Waunakee		\$1,250
52	Capital City Path Widening	Lakeside Street to Starkweather Path	\$5,650	
53	James Madison Path	Lake Street to James Madison Park		\$8,100
54	Howard Temin Lakeshore Path Paving	Elm Drive to Memorial Union		\$250
<b>Total</b>			<b>\$66,950</b>	<b>\$66,650</b>