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Transit Development Plan

for the Madison Urban Area

**2013-2017
Transit Development Plan
for the Madison Urban Area**

*Recommendations Approved by the
City of Madison Common Council
on March 19, 2013
and by the
Madison Area Transportation Planning Board
on April 3, 2013*



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2/21/2013	1	LONG RANGE TRANSPORTATION PLANNING COMMITTEE		
2/18/2013	1	BOARD OF ESTIMATES	Return to Lead with the Recommendation for Approval	Pass
2/5/2013	1	TRANSIT AND PARKING COMMISSION	Refer	
2/5/2013	1	TRANSIT AND PARKING COMMISSION	Refer	
2/5/2013	1	COMMON COUNCIL	Refer	Pass
2/1/2013	1	Department of Planning and Community and Economic Development	Referred for Introduction	

Fiscal Note

The Transit Development Plan contains recommendations which could have a long-term effect on the cost and revenues of the transit system. Implementation of the recommendations will be assessed as a normal part of future year annual capital and operating budget deliberations, subject to Common Council approval.

Title

Adopting the recommendations of the 2013-2017 Transit Development Plan for the Madison Urban Area as a framework to guide transit system development over the 2013-2017 period.

Body

WHEREAS, the Transit Development Plan for the Madison Urban Area is a strategic plan and transit improvement and budgeting guide to identify the near-term direction of the transit system, which is generally updated every five years by the Madison Area Transportation Planning Board - a Metropolitan Planning Organization (MPO) in cooperation with the City of Madison - Metro Transit, which is the operator of the majority of public transit in the Madison area; and

WHEREAS, the last Transit Development Plan was adopted in August 2004 for the 2004 to 2008 period, and many of its recommendations were implemented; and

WHEREAS, a 2013-2017 Transit Development Plan (TDP) for the Madison Urban Area has been developed by the Madison Area Transportation Planning Board (MPO) in cooperation with Metro Transit within the framework of the MPO's long-range regional transportation plan; and

WHEREAS, the many factors which have an impact on transit service design and usage, including residential and business development, socioeconomic characteristics of the population, changes in travel and living patterns, service trends and performance, and capital and operating costs and revenues, have been considered; and

WHEREAS, recent transit ridership levels in the Madison area have been growing faster than transit service levels, resulting in overcrowding concerns emerging as one of the top concerns for Metro Transit staff, in addition to requests for faster and more frequent and expansive service; and

WHEREAS, any significant expansion of Metro transit service is currently limited by the fleet size, Metro Transit's maintenance facility, and the current funding structure; and

WHEREAS, the TDP was nonetheless prepared based on a service and capital needs assessment and serves as a guide for prioritizing future service change and facility improvements if additional facility capacity and operating funds are made available over the next five years;

NOW, THEREFORE BE IT RESOLVED that the Common Council of the City of Madison adopts the recommendations of the 2013-2017 Transit Development Plan for the Madison Urban Area as a framework to guide transit system development of the 2013 to 2017 period, subject to the availability of adequate funding resources for capital equipment and annual operations and annual review of service productivity and ridership response.

Resolution TPB No. 74

**Adopting the Recommendations of the 2013-2017 Transit Development Plan
for the Madison Urban Area**

WHEREAS, the Transit Development Plan (TDP) for the Madison Urban Area is a strategic plan and transit improvement and budgeting guide to identify the near-term direction of the transit system, which is generally updated every five years by the Madison Area Transportation Planning Board – a Metropolitan Planning Organization (MPO) in cooperation with Metro Transit, the operator of the most of the public transit services in the Madison area; and

WHEREAS, the last TDP was adopted in August 2004 for the 2004 to 2008 period, and many of its recommendations have been implemented; and

WHEREAS, the 2008 Cooperative Agreement for Continuing Transportation Planning for the Madison, WI Metropolitan Area between the State (WisDOT), MPO, and City of Madison (for Metro Transit) calls for the MPO to be responsible for and considered the lead agency in coordination of the TDP as well as long-range transit planning; and

WHEREAS, a *2013-2017 Transit Development Plan (TDP) for the Madison Urban Area* has been developed by the MPO in cooperation with Metro Transit and other transit operators within the framework of the MPO's long-range regional transportation plan; and

WHEREAS, the many factors which have an impact on transit service design and usage, including residential and business development, socioeconomic characteristics of the population, changes in travel and living patterns, service trends and performance, and capital and operating costs and revenues, have been considered; and

WHEREAS, recent transit ridership levels in the Madison area have been growing faster than transit service levels, resulting in overcrowding concerns emerging as one of the top concerns for Metro Transit staff, in addition to requests for faster and more frequent and expansive service; and

WHEREAS, any significant expansion of Metro transit service is currently limited by the fleet size, capacity of Metro Transit's maintenance facility, and the current transit funding structure; and

WHEREAS, the TDP was nonetheless prepared based on a service and capital needs assessment and serves as a guide for prioritizing future service change and facility improvements if additional facility capacity and operating funds are made available over the next five years;

NOW, THEREFORE BE IT RESOLVED that the Madison Area Transportation Planning Board adopts the recommendations of the *2013-2017 Transit Development Plan for the Madison Urban Area* dated April 2013, which incorporates the changes to the Draft TDP recommendations in the Addition/Change sheet dated March 13, 2013, as a framework to guide transit system development of the 2013 to 2017 period, subject to the availability of adequate funding resources for capital equipment and annual operations and annual review of service productivity and ridership response; and

BE IT FURTHER RESOLVED that the suggested service modifications and improvements and the program of capital improvements be utilized as a planning and budgeting guide by staff and policy making bodies.

04/03/2013
Date Adopted

Al Matano
Al Matano, Chair,
Madison Area Transportation Planning Board

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2013-2017 Transit Development Plan for the Madison Urban Area Executive Summary

Introduction

The Transit Development Plan (TDP) is a short- to medium-range strategic plan intended to identify transit needs and proposed improvements for a five-year planning horizon. The Madison Area Transportation Planning Board (TPB) – A Metropolitan Planning Organization (MPO) is responsible for developing and maintaining the TDP. The MPO works in cooperation with the City of Madison – Metro Transit (Metro) and other transit providers, funding partners, and jurisdictions in the Madison area. The TDP is developed within the overall framework of the long-range regional transportation plan. The TDP recommendations are approved by the MPO and the City of Madison as the major transit operator.

The following goals were developed to guide preparation of the TDP and ongoing service planning:

1. Meet people's daily mobility needs.
2. Increase transit ridership to mitigate congestion in constrained travel corridors.
3. Increase transit's mode share to achieve sustainability goals and reduce climate change.
4. Maintain cost efficiency and effectiveness of transit service.
5. Maintain reliability of transit service that is convenient, comfortable, and affordable.
6. Provide for the safety and security of transit passengers, operators, and facilities.
7. Maximize connections to other transportation modes, including intercity rail and bus lines.
8. Provide transportation that is accessible.
9. Support land use and development that maximizes the safety and efficiency of the transportation system.
10. Provide service that increases access to jobs.

Metro Transit's ridership increased 30% between 2005 and 2011, while annual service hours increased only 5% from 364,500 to 383,100. This ridership increase is a positive



development; however, overloading and crowded buses have become a problem during peak periods and occasionally at other times. Metro's bus storage and maintenance facility on East Washington Avenue has reached its capacity and expanding the bus fleet to provide additional service is impossible without expanding storage space. Another continuing challenge is the need to provide new service or faster, more effective service to growing peripheral employment centers and neighborhoods and suburban communities. Funding is a major challenge, given the lack of a dedicated funding source for transit, reduced state operating assistance, reduced federal capital funding, local spending limits imposed by the state, and tight local budgets. Many of the service recommendations in this TDP will not be possible without a new funding source and/or the state covering the share of operating costs it did in the 1990s. The TDP makes recommendations intended to address these issues and other service and capital needs in order to continue to maintain, improve, and expand transit in the Madison region.

Key TDP study areas include:

► Fixed Route Service Improvements

A detailed analysis of Metro's operating characteristics and ridership patterns was completed. This information is useful to determine where and how riders are using the system as well as how it is performing. The results are new, updated Transit Service Planning/Design Guidelines and Performance Standards as well as a set of recommendations for potential service changes and expansions. These recommendations range from immediate service changes moving towards implementation to longer term concepts to address needs of the system.

► Bus Stop Spacing

Many of Madison's transit corridors (Johnson and Gorham Streets, Jenifer Street, Monroe Street) have bus stops every block – this condition has not substantially changed since these corridors were served by streetcars in the early twentieth century. While closely spaced bus stops are convenient for riders in these corridors, they result in delay for all riders along the line. A bus stop consolidation program is described and intended to reduce ride times while maintaining an acceptable level of convenience and meeting the needs of riders with mobility limitations, and maintaining stops near high ridership generating land uses.

Besides the TDP, there are several other ongoing studies related to public transportation. The TDP references these studies and to the extent possible incorporates their findings and recommendations. These include the Metro Maintenance Facility study, Bus Rapid Transit study, Metro Bus Size study, and an update to the Coordinated Public Transit – Human Services Transportation Plan for Dane County. Other related studies to be initiated in 2013 include planning for a new inter-city bus terminal and the City of Madison's Transportation Master Plan.

Summary of Current Transit Services

Metro Transit, which is owned by the City of Madison, is the major operator, providing fixed-route and paratransit service. Metro operates under the oversight of the Mayor of Madison, the Common Council, and the city's Transit and Parking Commission. Metro Transit contracts with other communities, UW-Madison, and the Madison Metropolitan School District to provide service. The Contracted Services Oversight Subcommittee (CSOS), made up of representatives of these entities, meets regularly to discuss policy matters related to contracted transit service and to improve communications between Metro staff and the contracting agencies. Some other communities, including Monona, Stoughton, and Sun Prairie, provide transit or shared-ride taxi service available to the general public.

Metro Transit Fixed-Route – In 2011, Metro operated 61 regular fixed-route bus routes – 17 full time, 9 weekday only, 18 peak only, 6 mid-day only, 6 weekend only, and 5 campus circulators. In addition, it provides supplemental school service targeted towards middle- and high-school students.

Metro's fixed-route transit service is grouped into four categories: core routes, peripheral routes, commuter routes, and circulator routes. Core routes, like Metro Routes 2, 4, and 6 operate at relatively high frequencies throughout the day and connect transfer points. Peripheral routes

like Routes 13 and 32 provide service coverage and connect neighborhoods. Commuter routes like Routes 38 and 75 provide weekday peak-period service from residential areas to education and employment centers – primarily UW-Madison and the Madison CBD. Circulator routes like Routes 10 and 80 operate shorter routes within the geographical confines of major activity centers, or between an activity center and a nearby residential area.

Metro has four major transfer points, which were opened in July 1998 to implement Metro's route restructuring that decentralized the system, which was previously centered on transfers at the Capitol Square. A minor transfer point was added in the City of Middleton in 2007 as part of the service restructuring in that community. The transfer point system substantially reduces travel times in outer Madison neighborhoods by providing cross-town service and eliminating many transfers at the Capitol Square. Most routes continue to be oriented to serve the Madison CBD and UW-Madison campus, where about 70% of weekday transit trips are oriented. Pulse scheduling is used to provide timed transfers generally at 0 and 30 minutes past the hour.

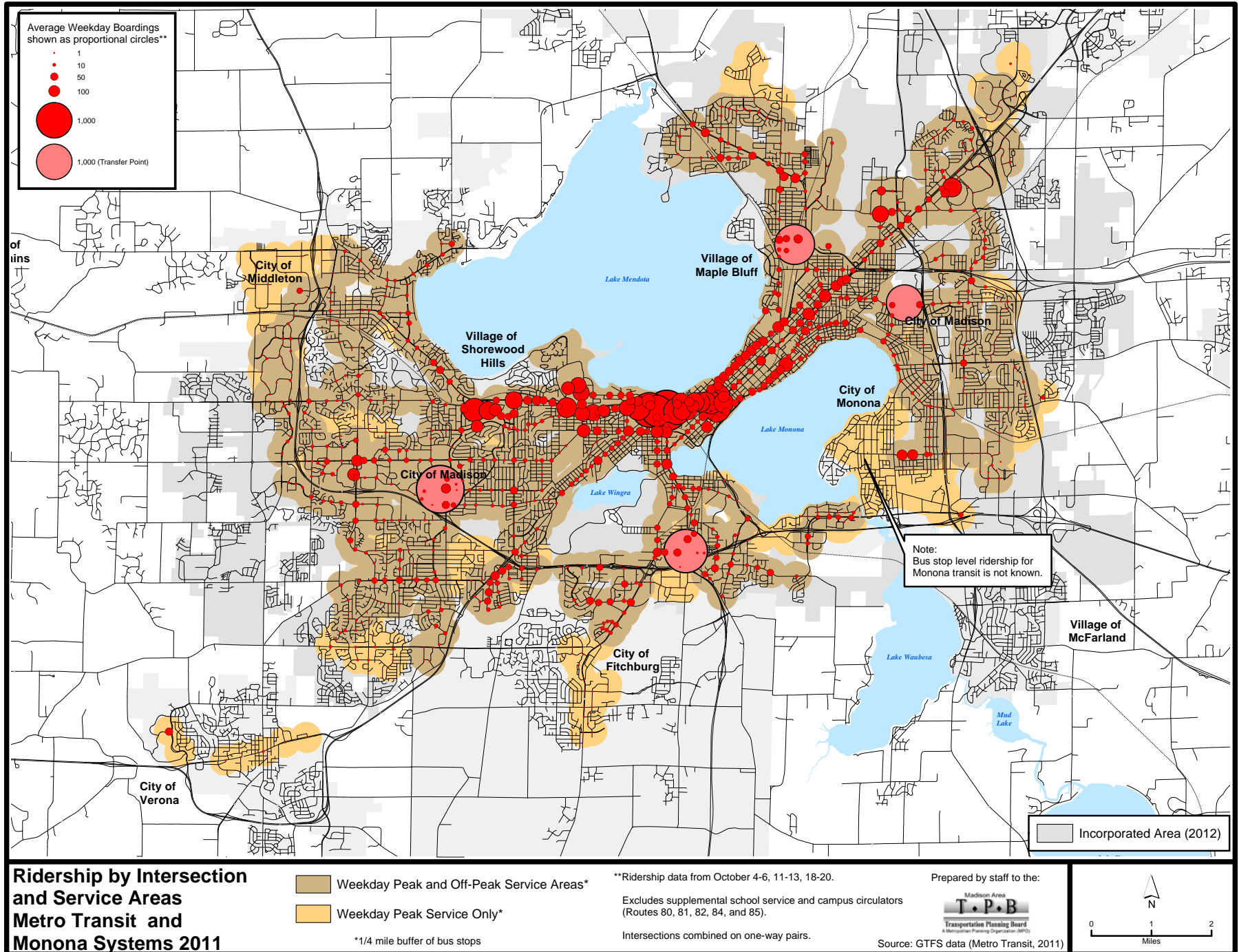
In 2011, Metro Transit provided 1,275 daily service hours on weekdays while school was in session. A total of 508 service hours were provided on Saturdays and 451 hours were provided on Sundays. Fixed-route bus service provided about 383,000 annual revenue hours of service and served 14.9 million one-way unlinked passenger trips with an operating expense of about \$42 million.

The City of Monona contracts with a private provider for weekday commuter service to central Madison and limited point deviation service. The weekday peak period service area for the Metro and Monona transit systems is 62 square miles. The 2010 population within the service area was approximately 235,100 persons. This includes 85% of the City of Madison's population, 70% of the Middleton population, and 51% of the Fitchburg population. Figure 1 shows the weekday service area and Metro Transit boardings by intersection.

Metro Transit Paratransit – Paratransit service is provided by Metro on a demand-responsive, advance reservation basis within $\frac{3}{4}$ mile of fixed-route all-day transit service (excluding peak-only commuter routes), as required by the Americans with Disabilities Act. The service, which is for persons unable to use the regular fixed routes, is available during the same span as the fixed-route service that it supplements. Service is provided with a combination of Metro's fleet of 20 cutaway vans and contracted service from several private operators.

Monona Transit – The City of Monona provides public transportation service within its city limits and to central Madison. The service consists of one peak period fixed route called Monona Express and one point deviation mid-day route called Monona Lift. Monona Express operates in a counter-clockwise loop around Lake Monona in the morning and a clockwise loop in the afternoon. Monona

Figure 1



Lift makes three similar clockwise trips as well as three trips that circulate within Monona during the weekday mid-day. Elderly and disabled riders may call and arrange to be picked up or dropped off within one-half mile.

Sun Prairie Shuttle and Shared-Ride Taxi – The City of Sun Prairie provides one shuttle route, open to the public between west Sun Prairie and East Towne Mall in Madison. The fare for the service is \$3.50, and three week-day round trips are provided with minibuses. Sun Prairie also provides a shared-ride taxi service within the city that is open to the general public with a standard adult fare of \$3.50. Discounts are available for youths, seniors and people with disabilities.

Stoughton Shared-Ride Taxi - Shared-ride taxi service is provided within the city of Stoughton. The service is available weekdays, Saturdays, and Sunday mornings, but no evening service is provided. General fares are a flat rate of \$3.00 for adults within the city. Some trips are available outside the city limits, but special charges are assessed. Discounts are available for seniors and people with disabilities.

Specialized Transportation Services – Several programs are available throughout the Madison area and Dane County that provide specialized transit service to meet the needs of people that are low-income, elderly, and/or have a disability. Most of this service is administered by the Adult Community Services Division of the Dane County Depart-

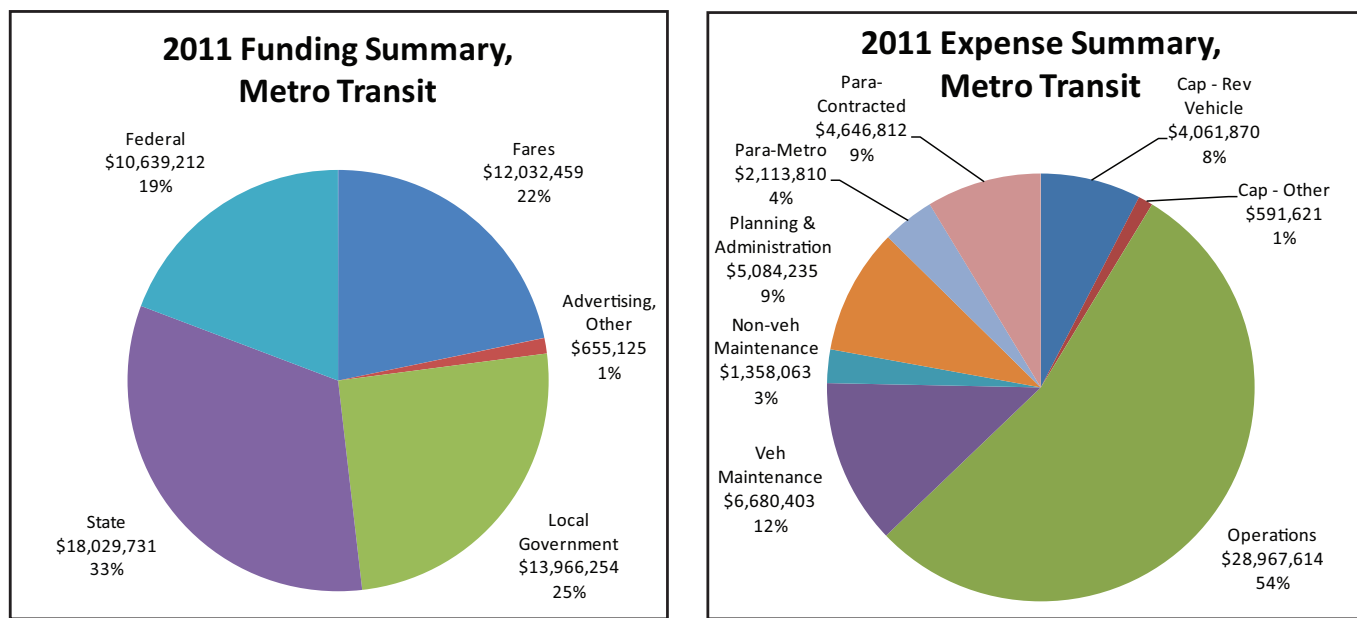
ment of Human Services (DCDHS) and is accessible, routed group ride or demand-response service with specific requirements for eligibility and trip purposes. The YWCA provides a JobRide service, which operates 24 hours per day and provides rides for low-income people to and from work where other transit options are not available.

Metro Transit Costs and Revenues

Metro Transit collected \$11.7 million in fares in 2011, covering 28% of its operating budget. Local funding sources include the City of Madison, partnering entities that contract with Metro for service in their jurisdiction, and Dane County, which provides mostly pass-through federal and state funding for paratransit service. State operating assistance funding constitutes the largest share of Metro's overall budget although the percentage has been declining since the mid-1990s. Federal capital grants from the Federal Transit Administration make up most of the remainder of Metro's funding other than a small amount of non-passenger revenue, mostly from advertising on the buses.

More than half of Metro's budget is spent on fixed-route transit operations, including transit operator wages, supervision, fuel, vehicle maintenance, and other expenses. On average, Metro paid about \$93 per revenue hour for fixed-route bus service, including operations and vehicle maintenance, and \$110 per revenue hour, including administration and non-vehicle maintenance.

Figure 2



Metro Transit System Characteristics and Performance

Metro Transit's fixed-route ridership has improved substantially since the late 1990's, growing from 10 million rides per year to 15 million. Substantial increases in service levels accompanied the transfer point restructure in 1998; however, service levels dropped in the early 2000's and have since increased slightly. Since 2005, ridership has been increasing at about 4.5% per year while service levels have been increasing at about 0.8% per year. These trends can be seen in Figure 3.

Metro's service consists of routes with mostly 30- to 60-minute headways that overlap on many shared corridors, resulting in some areas with regular 15-minute service or better. Buses are generally scheduled to arrive at offset times to avoid duplication and the bunching of buses. The average weekday productivity for the data set analyzed (October, 2011) was about 48 boardings per scheduled weekday revenue service hour for Routes 1-85; almost 60,000 daily boardings. Saturday and Sunday productivity was about 37 and 26 boardings per revenue service hour, respectively. Throughout the year, ridership peaks in the winter months when school is in session. July ridership dipped to a low of about 830,000 boardings to a high of 1,510,000 in October. Annually, 75% of Metro's 14.9 million fixed-route boardings occurred on main line routes, 18% occurred on UW campus circulators, and 7% occurred on supplemental school service.

Figure 3

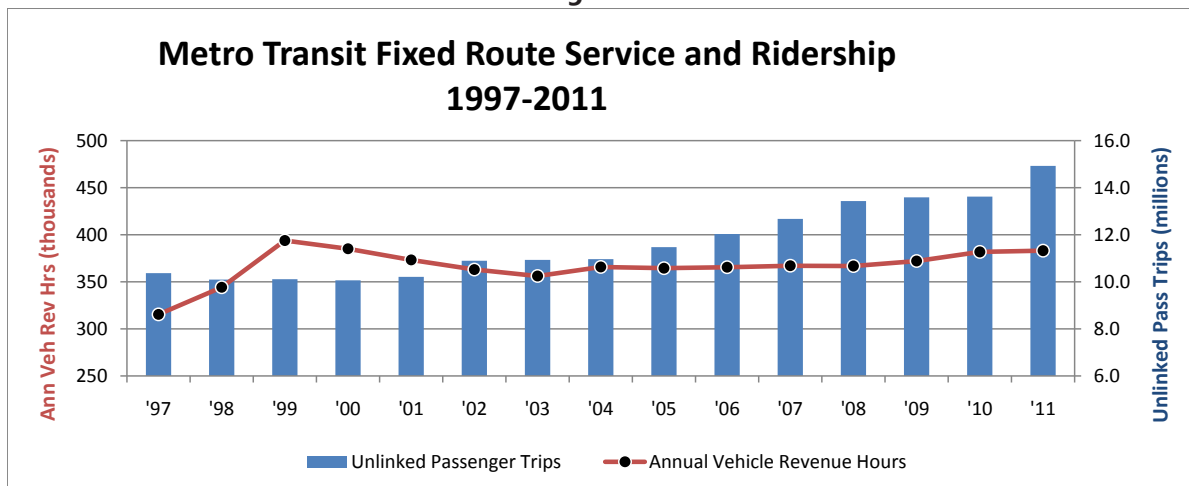
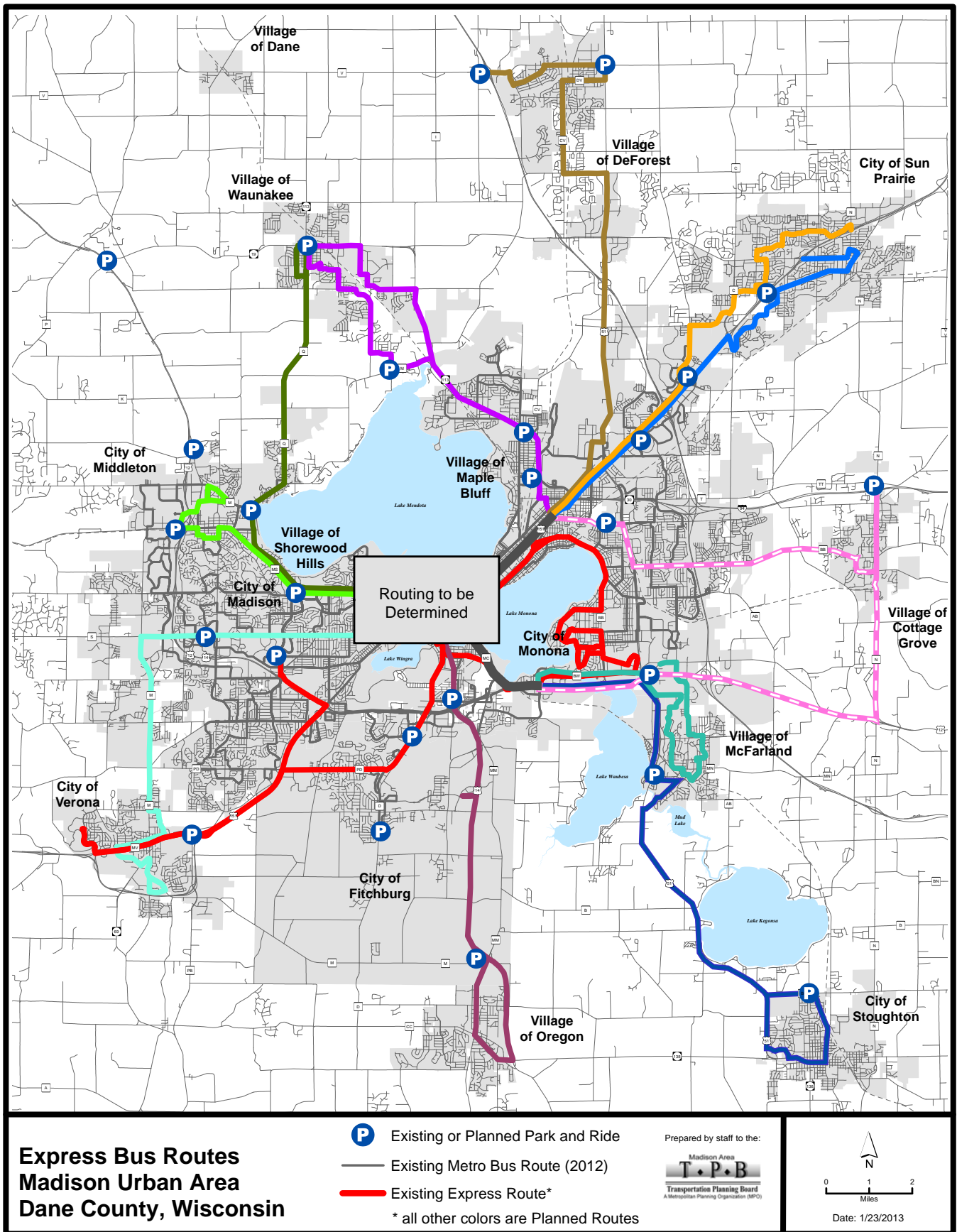


Table 1

System Characteristics	2006	2007	2008	2009	2010	2011
Transit Service Levels and Utilization						
Total Revenue Vehicle Hours	365,547	367,083	366,774	372,134	381,768	383,107
Total Revenue Vehicle Miles	4,703,901	4,717,515	4,707,127	4,709,101	5,566,675	4,818,879
Total Passenger Trips	12,034,468	12,672,265	13,433,221	13,588,426	13,623,461	14,923,970
Operating Expenses						
Total Expenses	\$35,143,898	\$36,199,459	\$39,237,204	\$40,547,797	\$40,434,049	\$42,090,315
Cost per Revenue Vehicle Hour	\$96.14	\$98.61	\$106.98	\$108.96	\$105.91	\$109.87
Cost per Revenue Vehicle Mile	\$7.47	\$7.67	\$8.34	\$8.61	\$7.26	\$8.73
Cost per Passenger	\$2.92	\$2.86	\$2.92	\$2.98	\$2.97	\$2.82
Revenue						
Total Fare Revenue *	\$7,912,169	\$8,721,876	\$9,083,451	\$9,992,237	\$10,737,634	\$11,712,963
Revenue per Passenger	\$0.66	\$0.69	\$0.68	\$0.74	\$0.79	\$0.78

* Total fare revenue includes revenue from unlimited ride passes.

Figure 4



Key Recommendations

The TDP recommends service and facility improvements and planning activities to take place between 2013 and 2017. Some actions – particularly long range items like expanding the Metro Transit maintenance facility and implementing bus rapid transit – will likely extend beyond the traditional limits of the TDP planning horizon; however, specific activities are necessary within the next five years to eventually achieve those outcomes.

The majority of the recommendations are targeted towards Metro Transit's fixed-route system, which constitutes the bulk of public transportation in the region. A total of 33 recommendations are included related to service planning, facilities, and other aspects of the transit service in the Madison area. In addition, new, updated Transit Planning Guidelines and Performance Standards were developed to guide annual service changes.

The following are some of the key recommendations:

- **Improve the utility of existing transit service by improving the directness and frequency of routes where appropriate.**

The TDP presents potential future service change concepts that have been identified by Metro staff, MPO staff, and others to improve service and reduce overcrowding. They range from small adjustments and extensions to more systematic changes that involve restructuring several different routes. Potential service changes are presented in three categories – Priority 1 (short term, 1-3 years), Priority 2 (medium term, 3-5 years), and Priority 3 (long term, new service as development and funding allow). These recommendations, shown in Section IV – Transit Development Plan, include new service, route extensions, frequency improvements, express service, and route changes. A new funding source would likely be necessary to implement all or most of these improvements.

- **Extend service to areas that are currently unserved by transit, including new commuter express service.**

Planning work for a network of regional express bus service primarily serving Dane County communities that are currently unserved by transit was refined. This service would be designed to serve home-based work trips during the conventional weekday commuting hours. The routes are primarily designed to serve trips to the Madison CBD and UW Campus areas, but would also serve reverse commutes to employment areas in suburban communities. With the current funding system, building this network is dependent on funding by the municipalities served.



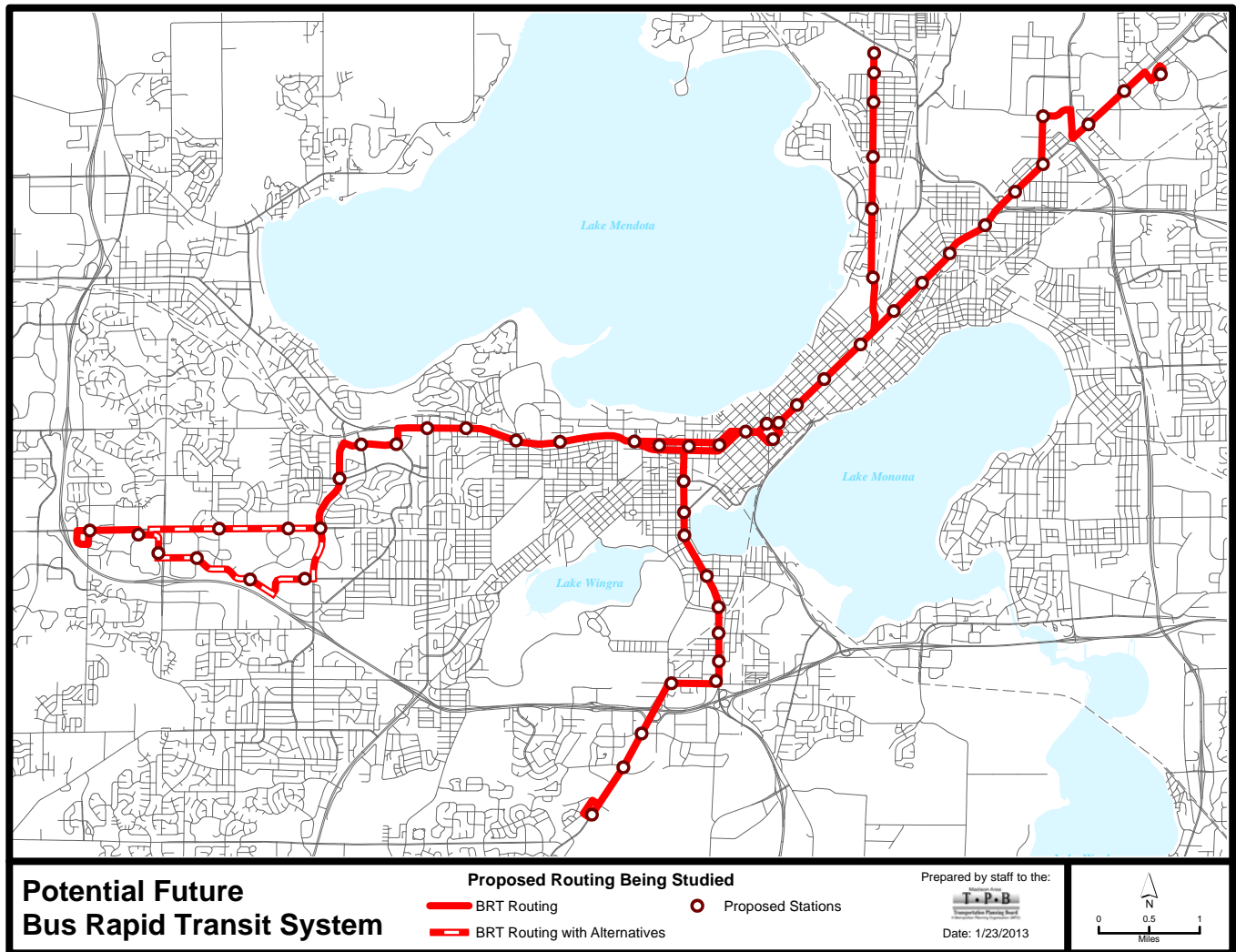
- **Adopt a bus stop consolidation program to remove or relocate excessive bus stops in central Madison, particularly on the Jenifer Street, Johnson Street, Gorham Street, and Monroe Street corridors.**

A bus stop consolidation program is recommended based on the analysis of bus stop spacing along central Madison transit corridors. This project will include a detailed stop-by-stop analysis and engage the public as well as staff and policy makers in order to minimize the impacts to transit users with limited mobility. The results of the analysis in the TDP show that a significant number of bus stops in central Madison could be removed in these and other corridors without reducing service area coverage. This would have several major benefits for Metro, transit users, and the environment, including faster service; improved reliability; and reduced fuel use, emissions, and maintenance costs.

- **Develop concepts for bus rapid transit (BRT) and plan for its implementation in the next five to ten years pending the outcome of the Transit Corridor Study (BRT Study).**

The Transit Corridor Study, led by the MPO, and funded through the Capital Region Sustainable Communities grant, will be completed in 2013. It will likely recommend four corridors for bus rapid transit development: University Avenue to West Towne, Park Street to Fitchburg, East Washington Avenue to East Towne, and Sherman Avenue to north Madison. A map showing the full system included in the study is shown in Figure 5. Staff and policy makers will continue to collaborate to move this project towards fruition.

Figure 5



For more information contact:



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SECTION 1 - Background ▶▶▶▶▶▶▶▶

Introduction

The Transit Development Program (TDP) is a short- to medium-range plan intended to identify transit needs and proposed improvements for a five-year planning horizon. This TDP updates and replaces the last TDP, adopted in 2004 for the years 2004 to 2008. The Madison Area Transportation Planning Board (TPB) – A Metropolitan Planning Organization (MPO) is responsible for developing and maintaining the TDP. The MPO works in cooperation with the City of Madison – Metro Transit (Metro) and other transit providers, funding partners, and jurisdictions in the Madison area.

An update to the TDP was underway in 2009. The effort shifted to assisting the newly formed Dane County Regional Transit Authority (RTA) in developing a plan for improved transit services to support a local referendum for a transit supportive sales tax. The RTA-enabling legislation was subsequently repealed. The TDP update was further delayed due to the MPO being short staffed and the need to focus its efforts on completing a Congestion Management Process (CMP) and Regional Transportation Plan update (RTP 2035). The TDP is developed within the overall framework of the RTP.

Madison Metro Transit's ridership increased 30% (from 11,476,000 trips to 14,924,000 trips) between 2005 and 2011, while annual service hours increased only 5% from 364,500 to 383,100. This ridership increase is a positive development; however, overloading and crowded buses have become a substantial problem during peak periods

and occasionally at other times. This is related to one of Metro's major shortcomings: there are currently no routes outside the UW-Madison campus that provide direct, high-frequency service on high-ridership corridors throughout the day. Some express, direct trips are available during peak periods but this service mainly consists of many overlapping low- to medium-frequency routes that are difficult for new and occasional users to understand. The TDP recommends transit service improvements to reduce travel times, maximize the ease of use of the system, and match transit service levels with ridership demand to the extent possible given the constraints on the system.

The largest capital need, by far, is an expansion of Metro's maintenance facility and/or a new satellite facility. The current maintenance facility on East Washington Avenue at Ingersoll Street has reached and exceeded its capacity. The facility was constructed in 1981 for a fleet of 160 buses, and now accommodates a fleet of 209 full-size transit buses, 20 paratransit vans, and other vehicles. Metro Transit is actively working to plan for a new, expanded, and/or additional facility.

Many of Madison's strong transit corridors in the central Madison area (Johnson and Gorham Streets, Jenifer Street, Monroe Street, and University Avenue) have bus stops every block – eight or more per mile. This condition has not substantially changed since Mills Street, University Avenue, State Street, Jenifer Street, and Johnson Street were served by streetcars in the early twentieth century operating in traffic conditions that were substantially different than today. While closely spaced bus stops are conve-



nient for riders in these corridors, they result in delays for all riders using the service. The TDP evaluated bus stop spacing in central Madison, and one of the recommendations is to implement a bus stop consolidation program in these corridors.

Two other transit studies related to medium- and long-term transit improvements are being conducted concurrently with the TDP update process and are informing it. These are the Transit Corridor (Bus Rapid Transit) Study and the Bus Size Study to look at whether it makes sense for Metro to diversify its bus fleet with larger and/or smaller buses. Some of the Metro service recommendations represent incremental steps towards implementation of bus rapid transit (BRT). The BRT study is identifying service changes that would be needed to integrate the local routes with a BRT system. Some TDP service change recommendations and BRT service change concepts overlap, but they represent two slightly different scenarios. The TDP service change recommendations highlight significant potential changes within the next five years or as funding is available, assuming bus rapid transit is not implemented. The BRT service change concepts represent conceptual changes to the existing transit network to accommodate and complement the BRT system.

TDP Purpose, Scope, and Process

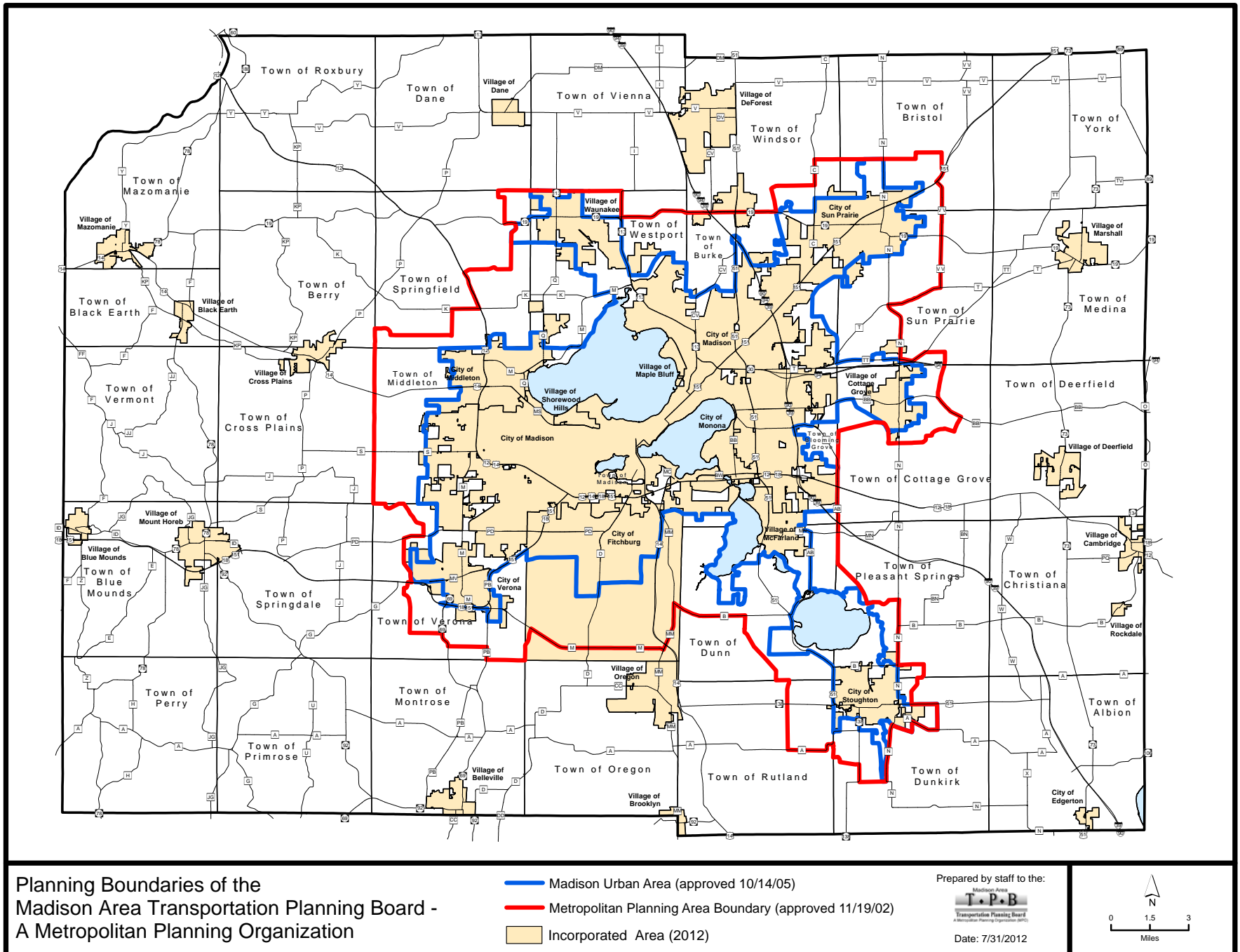
The Transit Development Program (TDP) is a five-year strategic plan designed to identify the near-term future direction of the transit system. It is intended to guide the planning activities, service and facility improvements, and budgets of Metro Transit and other transit providers. Issues covered include vehicle acquisition, service improvements and extensions, facility improvements, marketing and customer information programs, and the coordination of transit and land use planning. MPO staff prepares the TDP with assistance from Metro Transit staff.

The TDP is developed within the overall framework of the regional long-range transportation plan. The current long-range plan is the Regional Transportation Plan Update (2012) and has a planning horizon of 2035. The long-range plan is further refined and detailed through area or corridor studies, such as the Transit Corridors (Bus Rapid Transit) Study, as well as through short-range planning, such as the TDP. These mid-range and short-range planning efforts identify specific improvements to be included in the region's five-year Transportation Improvement Program (TIP), which is updated annually by the MPO.



The planning area for the TDP is the MPO's metropolitan planning area. The current planning area (Figure 1) was approved in 2002 and includes the cities of Madison, Fitchburg, Middleton, Verona, Sun Prairie, Stoughton, and Monona; the villages of McFarland, Cottage Grove, and Waunakee; and the Town of Madison. The MPO is in the process of adopting a new planning area following the 2010 U.S. Census, which added the villages of DeForest and Cross Plains as well as the urban part of the Town of Windsor to the 2010 Madison Urbanized Area. These communities were included in the planning area for the TDP.

Figure 1



The TDP was prepared under the guidance of the TDP Review Group, which met about once per month between June 2012 and the completion of the TDP. During the process, MPO staff also made presentations to and received input from the City of Madison's Transit and Parking Commission (TPC), Contracted Services Oversight Subcommittee (CSOS), Long-Range Transportation Planning Committee, and the MPO's technical and citizen advisory committees. Public input was sought through a number

of avenues, including meetings with the Madison Area Bus Advocates and by posting materials and the draft TDP document on the MPO's Web site.

The TDP is adopted by the MPO and the City of Madison, which is the major transit operator.

TDP Review Group	
Name	Organization
Chuck Kamp	Metro Transit
Drew Beck	Metro Transit
Gary Poulson	City of Madison (Transit & Parking Commission)
David Trowbridge	City of Madison (Planning)
Mark Opitz	City of Middleton & Madison Contracted Services Oversight Subcommittee
Dar Ward	UW-Madison (Transportation Services)
Norah Cashin	Dane County (Department of Human Services)
Joseph Kapper / Ian Ritz	Wisconsin DOT (Bureau of Transit)
Ahnaray Bizjak	City of Fitchburg & Madison Contracted Services Oversight Subcommittee
Ken Golden	MPO Policy Board
Bruce Wilson	Public (Madison Area Bus Advocates)



The Madison Area

Geography

Madison, with a 2010 population of 233,200, is Wisconsin's second largest city behind Milwaukee. The population of the 2010 Madison Urbanized Area, which includes the cities of Madison, Middleton, Fitchburg, Verona, Monona, and Sun Prairie, the villages of Cottage Grove, Cross Plains, DeForest, McFarland, and Waunakee and other smaller villages and towns, was 401,800. The Madison central business district (CBD) lies geographically in the center of Dane County and the Madison Urbanized Area, with the Capitol Square situated between lakes Mendota and Monona. The University of Wisconsin-Madison campus, with an enrollment of 42,000, is situated about one mile west of the Capitol Square. The city was built out with several overlapping grid systems to a distance of about two miles to the west, south and northeast. Beyond this distance, the city followed traditional suburban development patterns. This central Madison area, defined loosely as the area east of Farley Avenue, north of Olin Avenue, and southwest of First Street, is heavily constrained geographically by lakes Mendota, Monona, and Wingra.

The large government employment base and student population are two reasons for the high per capita transit ridership in Madison compared to other U.S. communities. According to the National Transit Database, Metro Transit was ranked 65th nationally among transit operators in unlinked passenger trips on scheduled service, with a total of about 15 million trips taken in 2011. In population, Metro Transit's service area was 273rd, with about 250,000 people. This places Metro Transit 24th nationally, at 59 annual trips per person within its service area in 2011.



Central Madison looking to the northeast. The UW-Madison campus is in the foreground left; Capitol Square, center; and isthmus background left.

Population and Demographics

From 2000 to 2010, the population of the Madison metropolitan area increased from about 350,200 to 401,800. Table 1 on the following page shows the population distribution of selected Madison area communities from 1990 to 2010 along with the population change in the last decade. This trend in population growth is expected to continue in the future.



Table 1
Population Distribution in Selected Madison Metropolitan Communities

Community	1990 Census	% of Total	2000 Census	% of Total	2010 Census	% of Total
Cottage Grove, Village	1,131	0.4	4,059	1.2	6,192	1.6
Fitchburg, City	15,648	5.3	20,501	6.0	25,260	6.4
Madison, City	190,776	64.7	208,054	61.0	233,209	59.2
Madison, Town	6,442	2.2	7,005	2.1	6,279	1.6
Maple Bluff, Village	1,352	0.5	1,358	0.4	1,313	0.3
McFarland, Village	5,232	1.8	6,416	1.9	7,808	2.0
Middleton, City	13,785	4.7	15,770	4.6	17,442	4.4
Monona, City	8,637	2.9	8,018	2.4	7,533	1.9
Shorewood Hills, Village	1,680	0.6	1,732	0.5	1,565	0.4
Stoughton, City	8,786	3.0	12,354	3.6	12,611	3.2
Sun Prairie, City	15,352	5.2	20,369	6.0	29,364	7.5
Verona, City	5,374	1.8	7,052	2.1	10,619	2.7
Waunakee, Village	5,897	2.0	8,995	2.6	12,097	3.1
Westport, Town	2,732	0.9	3,586	1.1	3,950	1.0
Cross Plains, Village	2,362	0.8	3,084	0.9	3,538	0.9
DeForest, Village	4,882	1.7	7,368	2.2	8,936	2.3
Windsor, Town	4,620	1.6	5,286	1.6	6,345	1.6
Total	294,688		341,007		394,061	

Note: Cross Plains, DeForest, and Windsor are not within the MPO planning boundary, but are anticipated to be included following the 2010 census.

Figure 2 illustrates the 2010 population density by Census Block within Dane County. The map shows the dense core of population in the Madison central business district and the relatively high densities in central Madison, including the Isthmus, near west, and near south sides. Other population concentrations can be seen in and around the Madison area. Many of these concentrations feature multi-family apartment and condominium buildings that are suitable for transit service.

Table 2 and Figure 3 on page 8 show the population distribution in selected Madison metropolitan communities stratified by age. Significant increases can be seen in the "baby boom" population – ages 45 to 64 – as well as in the population of young people.



Figure 2

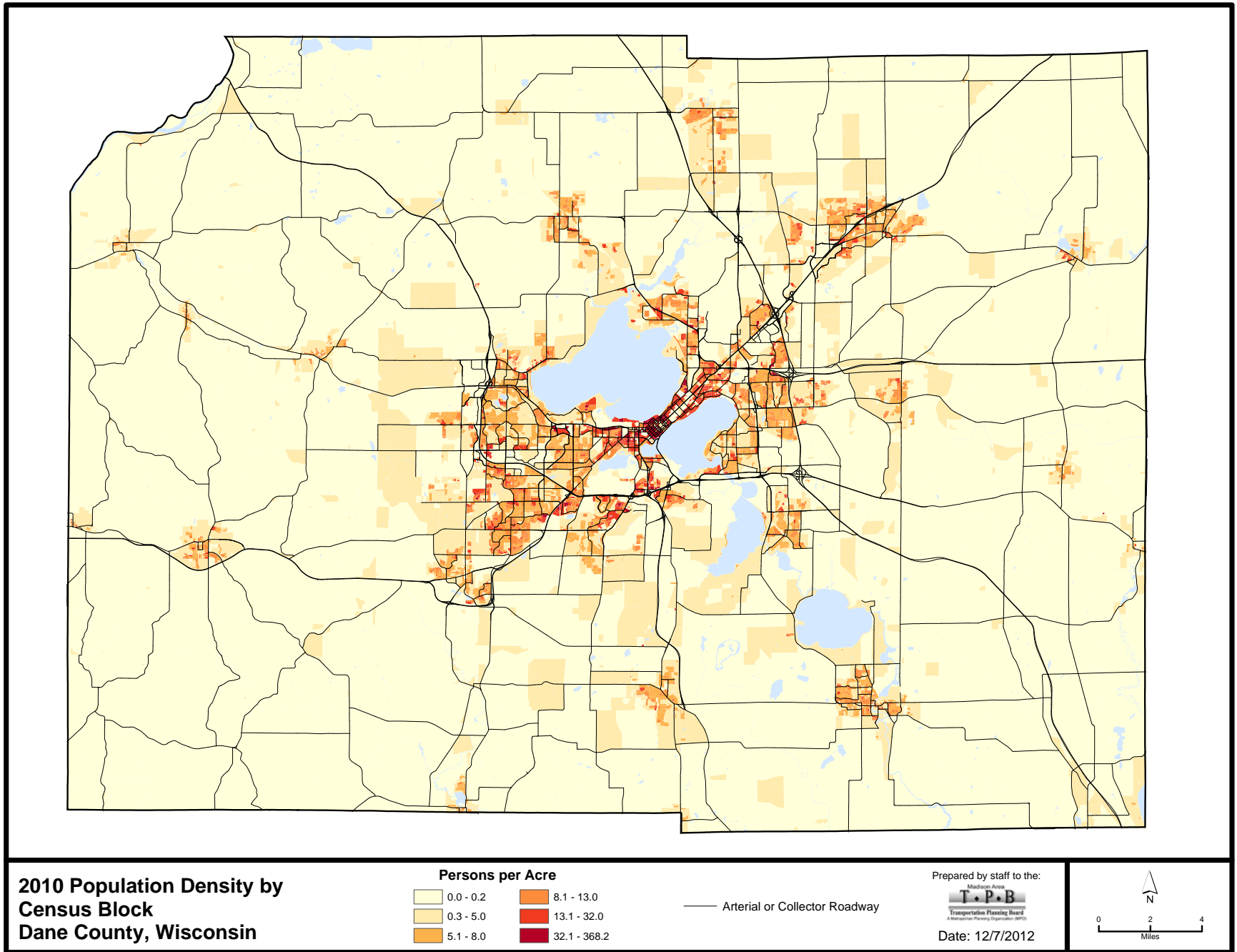
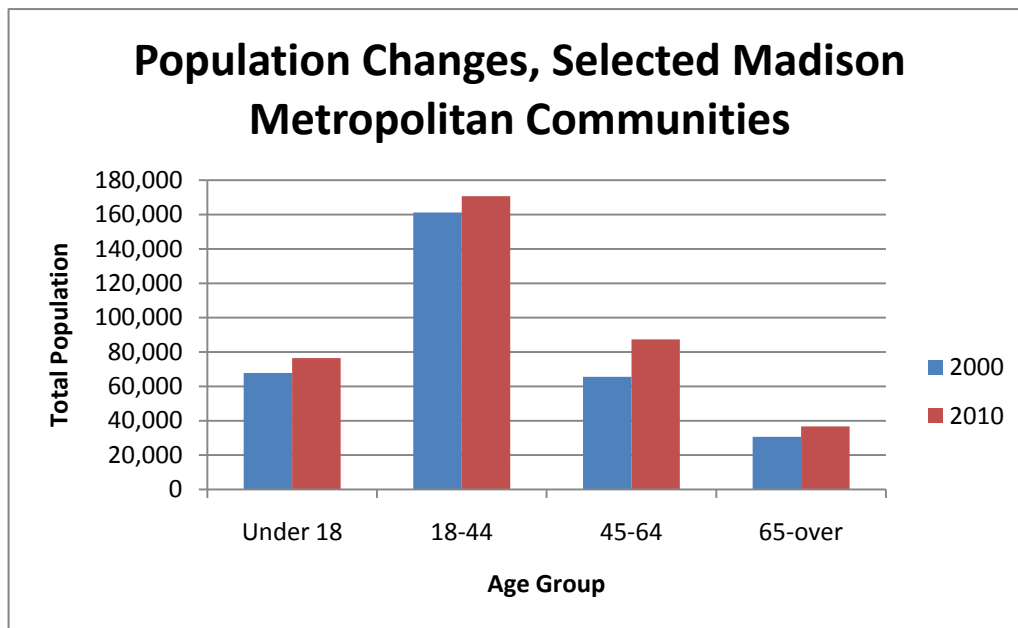


Table 2
2010 Population Distribution by Age Group, Selected Madison Area Communities

Community	Age Group				Total
	Under 18	18-44	45-64	65-over	
Cottage Grove, Village	2,012	2,366	1,340	474	6,192
Fitchburg, City	6,186	10,756	6,388	1,930	25,260
McFarland, Village	2,102	2,466	2,438	802	7,808
Madison, City	40,738	118,912	51,176	22,383	233,209
Madison, Town	1,458	3,364	1,181	276	6,279
Maple Bluff, Village	293	295	510	215	1,313
Middleton, City	3,809	6,386	5,099	2,148	17,442
Monona, City	1,275	2,376	2,411	1,471	7,533
Shorewood Hills, Village	394	306	554	311	1,565
Stoughton, City	3,160	4,308	3,308	1,835	12,611
Sun Prairie, City	8,178	11,836	6,742	2,608	29,364
Verona, City	3,076	3,604	2,896	1,043	10,619
Waunakee, Village	3,824	3,748	3,325	1,200	12,097
Westport, Town	719	967	1,318	946	3,950
Cross Plains, Village	969	1,271	971	327	3,538
DeForest, Village	2,595	3,326	2,242	773	8,936
Windsor, Town	1,573	2,094	1,918	760	6,345
Total	82,361	178,381	93,817	39,502	394,061

Figure 3
Age Distribution of Population: 2000-2010, Selected Madison Metropolitan Communities



Note: Excludes Cross Plains, DeForest, and Windsor, which were not in the MPO planning area in 2000.

Employment and Education

As the state's capitol and the seat of Dane County, Madison has a substantial government employment base centered in the office buildings on the southeast side of the Capitol Square. The city also houses the University of Wisconsin-Madison, located about one mile west of the Capitol Square. UW-Madison is one of the nation's largest universities with an enrollment of over 42,000, along with about 20,000 employees and faculty. This has shaped a commute pattern that remains focused in large part on the central Madison area, particularly for transit trips.

Almost all of the employment growth over the last 25 years has been in peripheral employment centers such as the American Center, UW Research Park, Old Sauk Trails, Middleton business parks, and the Epic campus in Verona. These areas also draw large numbers of commuters, but relatively few transit trips due to their locations, sprawling campus designs, and plentiful, generally free parking.

Figure 4 shows the employment density within the Madison metro/Dane County area. Besides the Madison CBD

and the UW campus, notable employment centers are located in the West Towne area in southwest Madison, west Madison and Middleton, Epic Systems in Verona, south Madison near the Beltline Highway, east Madison along the USH 51 corridor, and the East Towne and American Center areas in northeast Madison. There were a total of about 306,000 jobs in Dane County in 2010 with the vast majority of those located in the Madison metropolitan area, as shown in Figure 4.

Besides the University of Wisconsin, post-secondary education is provided by Madison College with three main campuses: West near Gammon Road and Mineral Point Road, Downtown near the Capitol Square, and Truax in north Madison. There are also several other locations throughout south-central Wisconsin. Madison College has an enrollment of over 26,000 students at its Madison-area campuses. Edgewood College, located in central Madison on Monroe Street, has an enrollment of 2,700 students.

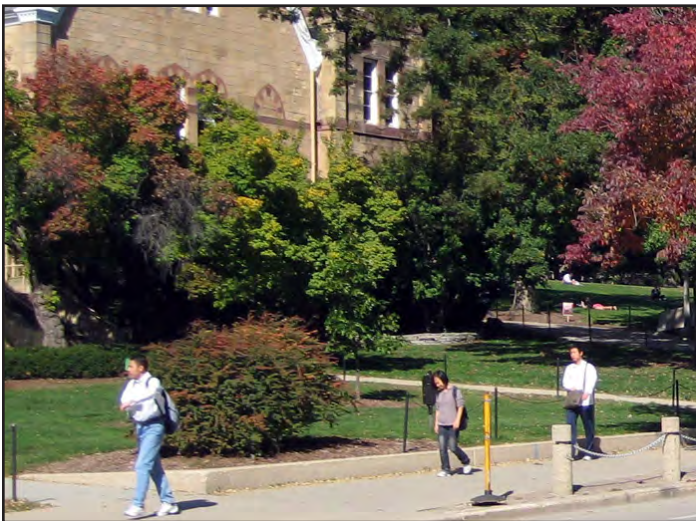
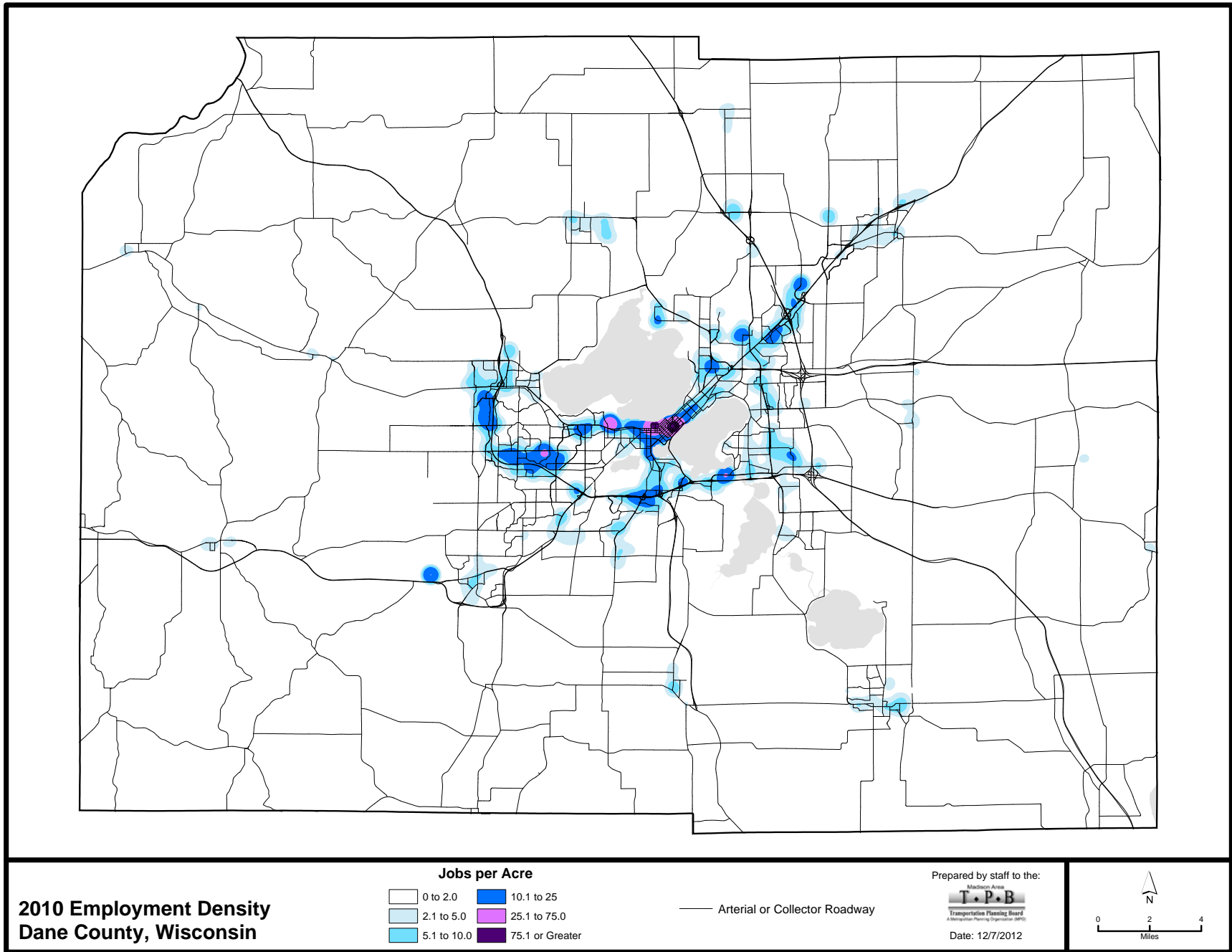


Figure 4



Source: Info USA (2010) and Madison Area TPB

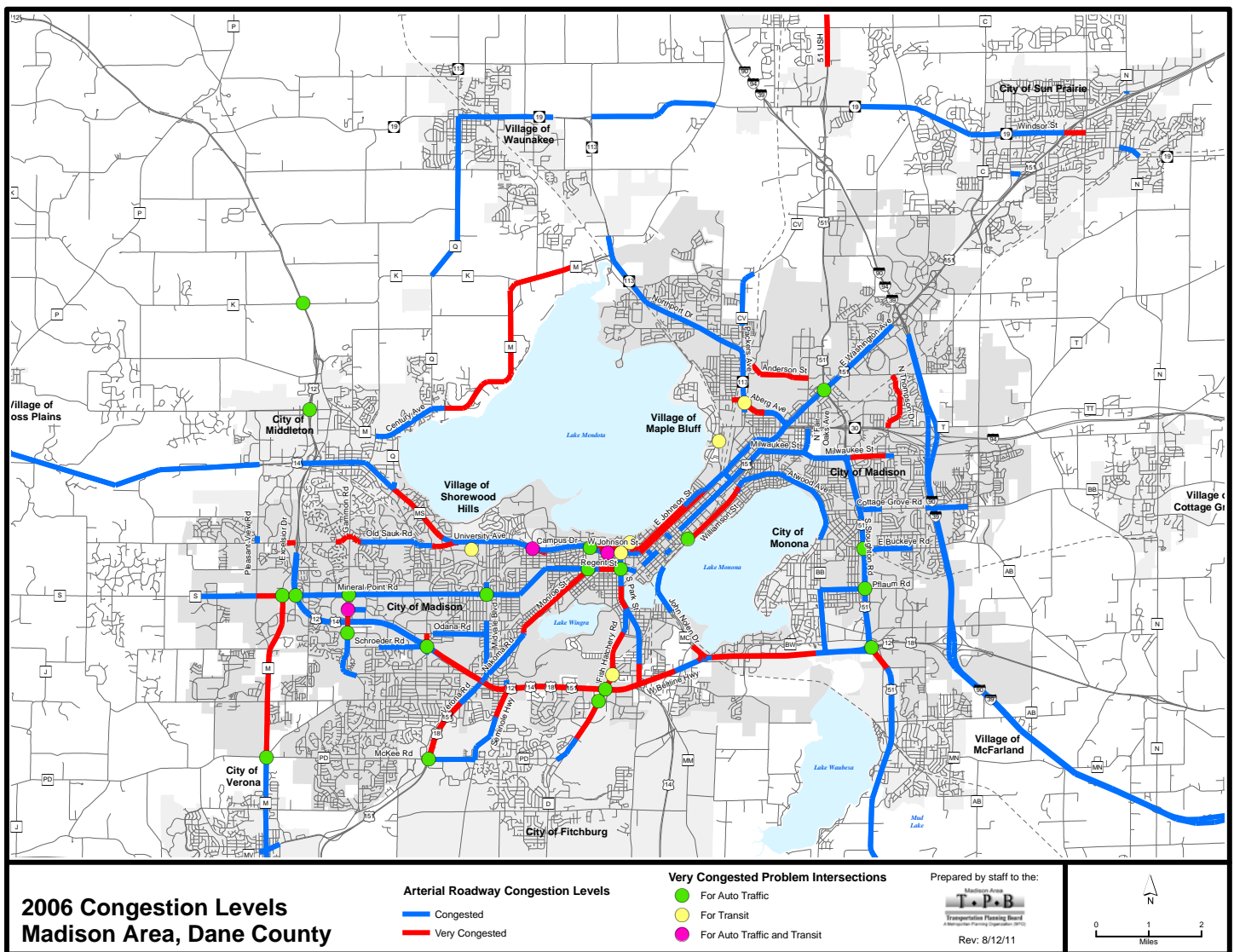
Non-Transit Transportation

Interstate Highways 39, 90, and 94 serve Madison on the east side, while limited access highways USH 12, 14, and 151, serve Madison's west, southwest, and south sides. The Beltline Highway (USH 12, 14, 18, and 151) connects these regional roadways to the south; however, no limited access highways penetrate central Madison. The urbanized Madison area is primarily served by a network of arterial streets. Many of these roadways are congested or very congested during the weekday peak period as shown in Figure 5. Parking in the Madison CBD is generally metered at \$1.75 per hour. Surface and structured lots range from \$0.75 to \$1.75 per hour, and monthly passes are available for \$105 to \$220.

The Madison area is also well served by a continuous network of sidewalks, crosswalks, and bicycle lanes and paths. The Capital City Trail extends from the Nine Springs Greenway south of Madison to the Capitol Square, the isthmus, and east Madison. The Southwest Commuter Path begins at a connection with the Capital City Trail just south of the Capitol Square and extends southwest along an abandoned rail corridor formerly operated by the Illinois Central Gulf Railroad. A public bicycle sharing system is available with 32 stations and 300 bicycles located throughout central Madison.

Figure 5 shows areas of congestion affecting auto traffic and transit.

Figure 5



Completed Recent Transit Planning Studies

The 2004 to 2008 TDP presented a plan for maintaining and expanding the transit system. In addition, several other transit-planning efforts have been undertaken since the 2004 to 2008 TDP. These include the Transport 2020

East-West Transit Corridor Alternatives Analysis Study, the Madison Streetcar Study, the Regional Transit Authority Plan for Transit, and the Long Range Metro Transit Planning Ad Hoc Committee.

The 2004 to 2008 TDP provided recommendations for many aspects of Metro's functions, some of which have been implemented. A summary of the major recommendations from the 2004 to 2008 TDP and their implementation status is shown below.

Table 3
Recommendations From the 2004 to 2008 TDP

Recommendation	Progress
Identify short-term and long-term solutions for increasing bus travel speeds.	Improvements in route directness were made. For example, Route 8 was streamlined and converted to Route 15.
Conduct a pilot study to test a transit signal priority system.	Transit signal priority has not been implemented, but it is now being evaluated as part of the BRT study.
Evaluate the best corridors for a start-up high capacity transit service, including consideration of non-rail corridors (West Towne, East Towne, and Park Street).	The Transport 2020 project concluded its Alternative Analysis phase and was put on indefinite hold. BRT is being studied along Sherman Avenue, East Washington Avenue, Park Street, and University Avenue/West Towne.
Evaluate the feasibility of adding additional transfer points.	The Middleton Transfer Point opened in 2007. Informal transfers at East Towne, the Capitol Square, and other locations continue to be used.
Evaluate the feasibility of implementing alternative types of service in lower-density areas.	A bus size study is being conducted beginning in 2013; there are no immediate plans for point deviation service, etc.
Improve service and extend routes into developing areas on the west side.	Routes 55 and 75 were added in 2005 and 2012 serving Epic Systems and Verona. The west end of Route 6 was simplified. Middleton service was restructured.
Evaluate improvements to and restructure south side service.	Routes 31, 41, 42, and 43 were consolidated into Routes 11 and 16. Route 13 was added on John Nolen Dr, and Routes 44 and 48 were improved.
Improve service, including limited-stop routes, to the University of Wisconsin campus, Fitchburg, the American Center, and other areas.	Commuter service to Fitchburg was expanded to Nobel Drive. Mid day service was added to The American Center (Route 26).
Use intelligent transportation systems (ITS) to improve on-time performance.	Not implemented.
Develop park-and-ride lots at the transfer points and other locations.	A park-and-ride lot was constructed at the North Transfer Point and it is planned to be expanded.
Reduce emissions from buses by using cleaner fuels and alternative fuels.	Metro's fleet now includes 19 diesel-hybrid 40-foot buses, and low-sulfur diesel fuel is in use.
Continue marketing efforts and expand the unlimited ride pass program.	The Commute Card program was started and unlimited ride passes were expanded.
Evaluate private sponsorship and advertising revenues to fund capital projects.	A pilot program to wrap buses with a full-length advertisement was implemented and continues today. The program was moved in-house in 2012.
Reach regional agreement on a new financing and governance structure for area-wide transit service.	Regional Transit Authority legislation was enacted and an RTA created, but the enabling legislation was later repealed.
Increase the convenience of Metro's maps and schedules.	Schedule information was added to selected bus stops throughout the system.

Transport 2020

The Transport 2020 project concluded its Alternative Analysis study and completed a draft application to the Federal Transit Administration (FTA) to begin preliminary engineering in 2008. In 2009, it was withdrawn because of the lack of both a Regional Transit Authority (RTA) and local financial commitment for capital and operating costs. The project is currently on hold pending RTA legislation and consideration of other alternatives such as BRT.

The Locally Preferred Alternative (LPA) consisted of an alignment exclusively on railroad right-of-way from Middleton, just west of USH 12 (West Beltline Highway) to the Town of Burke, near the intersection of Reiner Road and Nelson Road. Service on the LPA consisted of two overlapping routes – Middleton to Fair Oaks Avenue and the Town of Burke to Whitney Way – each with two-way service with 20-minute peak headways and 40-minute off-peak headways timed to result in 10- to 20-minute headways on the central corridor from Whitney Way to Fair Oaks Avenue. The study examined several alternatives, including on-street alignments along Mineral Point Road and a Doty Street/Wilson Street couplet, a railroad alignment to the Dane County Regional Airport, and a bus rapid transit alternative. The LPA had 17 stations along a 16-mile alignment and was anticipated to cost \$252 million and to serve about 11,000 daily riders by 2030.

Madison Streetcar Study

The Madison Streetcar Study examined corridors just west, south, and east of the State Capitol for a new streetcar circulator system. An initial downtown loop alignment emerged as a one-way loop between Park Street and the Capitol Square via Johnson Street and State Street eastbound, and Wilson Street, Broom Street, and State Street westbound. From there, the study recommended extensions to the northeast along Main Street, Mifflin Street, and East Washington Avenue, and to the south along Park Street. The project cost was estimated at about \$61 million for the central loop segment between Park Street and the Capitol Square.

In August 2007, Madison Mayor Cieslewicz announced that the City of Madison would no longer pursue construction of a streetcar system. The Madison Streetcar Preliminary Feasibility Study was released in October 2007 and the Streetcar Study Committee was disbanded.

Regional Transit Authority (RTA)

In June 2009, the Wisconsin State Legislature enacted Assembly Bill 75 (Act 28) authorizing the creation of the Dane County Regional Transit Authority (DCRTA). The DCRTA was formed but did not have funding for staff.

With assistance from the MPO, Metro Transit, and City of Madison staff, the DCRTA developed a draft short-term plan for improved transit service that would be funded by a potential new ¼-percent sales tax. The draft Plan for Transit included the following conceptual improvements:

- ▶ New regional express service to Sun Prairie, Cottage Grove, Waunakee, Westport, Verona, McFarland, Stoughton, and the Dane County Regional Airport;
- ▶ Expanded bus service between Madison and the cities of Monona, Middleton, and Fitchburg;
- ▶ Improved bus service within Madison;
- ▶ A network of park-and-ride lots;
- ▶ Expanded paratransit and other demand-response service;
- ▶ Improved specialized transportation services for the elderly and persons with disabilities;
- ▶ A modernization of the transit system, including smart fare cards, on-board Wi-Fi, and new hybrid buses;
- ▶ Planning for a new intermodal transit center; and
- ▶ Improved bus stop amenities such as sidewalks, boarding platforms, benches, shelters, and trash containers.

The DCRTA decided not to move forward with a referendum on the new sales tax in the spring of 2011. Assembly Bill 40 (Act 32) was passed later in 2011, eliminating the RTA authorizing legislation and thereby dissolving the DCRTA.

Long Range Metro Transit Planning Ad Hoc Committee

An ad hoc committee was formed in 2007 to explore ways to improve Metro service and to secure adequate funding. The study topics included funding, cost management, system improvements, increasing ridership, and marketing. A final report was completed in June 2008, which included a variety of short, medium, and long-term recommendations. Among the recommendations were improved transit service (lower headways and more direct routing), improved fare cards, a regional transit authority for sustainable funding, bus stop amenities, marketing improvements to attract new riders, express commuter service, and bus rapid transit. Metro Transit has implemented several of the recommendations in the report.

Wisconsin Department of Transportation (WisDOT) Management Performance Audit

In March 2009, WisDOT released the Transit System Management Performance Audit of the Madison Metro Transit System, a study that is required at least every five years for Metro to remain eligible for state funding aid. Key findings from the audit included favorable statistics for Metro in terms of service provided and system efficiency. Key recommendations were listed for Planning and Scheduling, Maintenance, Transit Operations, Finance, Personnel and Labor Relations, Marketing and Customer Service, Information Technology, Parts, Building and Grounds, Safety Management and Security, and Paratransit Services. The key themes involved more intense use of data and software, the use of service evaluation and performance measures, continued and improved maintenance, expanded long-range planning efforts, expanded marketing efforts, and construction of a new maintenance facility.

Ongoing Transit Planning Studies

Several planning studies are taking place concurrently with the TDP. Many of these studies overlap and interact with each other. Besides these specific studies and planning efforts, other peripherally related transportation planning and coordination efforts related to land use, parking, and other subjects are also taking place but are not shown in the list below.

Intercity Bus Terminal

Since the closing of the Badger Bus depot on Bedford Street in 2009, Badger Bus, Van Galder, Megabus, and other intercity bus lines have been using the Langdon Street bus stop near the UW Memorial Union as their primary Madison stop. Greyhound uses a stop on Huxley Street near the North Transfer Point. Planning for a new intercity bus station – and potentially, a future rail station – will investigate several potential sites near downtown Madison and the UW campus.

BRT Study (Transit Corridors)

The MPO, in cooperation with the Capital Area Regional Planning Commission (CARPC) and SRF Consulting, is using part of a federal Sustainable Communities grant to study the viability of bus rapid transit in the Madison area. The study is examining four primary corridors: north along Sherman Avenue, east along East Washington Avenue, south along Park Street and Fish Hatchery Road, and west along University Avenue to West Towne Mall.

City of Madison Transportation Master Plan

The City of Madison will begin a master planning process to build upon existing transportation plans and other adopted plans to form a connected plan involving all major travel modes. Its goals include creating a walkable, bikeable, livable city; strengthening new and existing neighborhoods; and emphasizing transportation choices and mode connectivity. The 18-month planning process is expected to begin in 2013.

Metro Maintenance Facility Study

Due to an over-capacity situation at Metro's storage and maintenance facility at 1101 East Washington Avenue, an effort is underway to plan for a new, expanded, and/or additional facility. The facility was designed in 1981 to accommodate 160 buses and now stores over 200 buses and 20 paratransit vans.

Bus Size Study

The 2008 Long-Range Metro Transit Planning Ad Hoc Committee report identified the need for "an outside group to review...whether smaller, larger, or a mix of buses should be used to serve the Metro area." Metro Transit, in cooperation with the MPO and a consultant team, will analyze the applicability of diversifying the fleet with smaller and larger buses. Smaller buses may a) improve Metro's image by matching smaller, more neighborhood-scale vehicles with low-ridership peripheral routes, b) reduce Metro's operating costs by reducing fuel consumption, and c) reduce Metro's need for parking space at its maintenance facility. Larger buses may alleviate some of the passenger overloading problems and reduce Metro's operating cost by reducing the number of Extra Buses used during peak commute times.

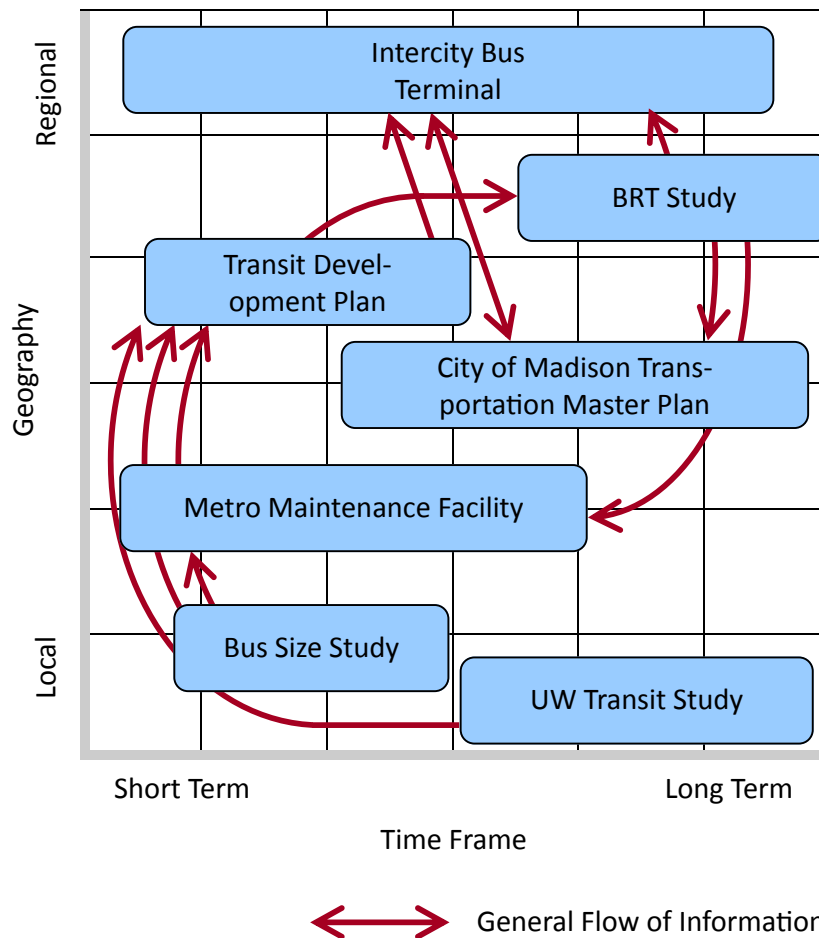
UW Madison Campus Transit Study

The Campus Bus and Accessible Transportation Study, led by the University of Wisconsin, in cooperation with Nelson\Nygaard, will determine mobility and accessibility issues and concerns related to transit service on campus. It will evaluate the campus services provided and make recommendations to help guide the growth of the system.

Figure 6 is a schematic representation of ongoing transit-related studies showing generally how these efforts fit into the regional planning framework and how they relate to one another.

Figure 6

Ongoing Transit and Transit-Related Transportation Studies



SECTION 2 - Summary of Current Transit Services



Overview of Metro Transit Fixed Route Transit Service

In 2011, Metro operated 61 total bus routes: 17 full time, 9 weekday only, 18 peak only, 6 mid-day only, 6 weekend only, and 5 campus circulators (of which 1 was full time, 1 was weekday only, 1 was peak only, and 2 were evening only). In 2011, 1,275 daily service hours were provided on weekdays while the UW and Madison Metropolitan School District were in session. A total of 508 service hours were provided on Saturdays and 451 hours were provided on Sundays. In 2011, Metro fixed-route bus service provided about 383,000 revenue hours of service and 14.9 million one-way unlinked passenger trips with an operating expense of about \$42 million.

Metro's route structure historically operated in a radial pattern, with nearly all routes connecting at the Capitol Square in downtown Madison. In July 1998, Metro underwent a major network restructuring and converted to a transfer point system using timed transfers at four transfer points in outer Madison; at the same time, routes were renamed from the lettering system used at the time to the numbered system used today. A new minor transfer point was added in Middleton as part of a restructuring of service in that community in 2007. The transfer point system operates on a 30- to 60- minute pulse that requires relatively uniform route lengths and cycle times for most routes.

The transfer point system is designed to better serve employment and shopping centers and residential neighborhoods in the outer Madison area. The transfer point system substantially reduces travel times by providing cross-town service and eliminating many arduous transfers at the Capitol Square. Most routes continue to be routed to serve the Madison CBD and UW-Madison campus, where about 70% of weekday transit trips are oriented, according to the October 2011 transit system performance analysis (see Section 3 - Metro Transit System Characteristics and Performance). Pulse scheduling is used to provide timed transfers at each transfer point, where several routes arrive, wait for a few minutes, and then leave at about the same time regularly throughout the day. An operational benefit of the transfer point system is that it accommodates most of Metro's layovers, reducing the need for on-street space for buses to wait between outbound and inbound trips.

Most routes that serve central Madison use a shared corridor along the University Avenue and Johnson Street couplet, State Street, and the Capitol Square connecting the

UW-Madison and Capitol Square. This overlapping service provides a high-frequency corridor that is commonly used for short circulation, particularly by students. Although many transfers that took place at the Capitol Square prior to the implementation of the transfer point system now take place at the transfer points, many transfers still occur there, particularly between core routes and peripheral routes that terminate at the Capitol Square. During special events on the Capitol Square, such as the Dane County Farmer's Market, buses often use the Capitol Loop detour.



Many bus routes take advantage of the direct pathway through the UW campus via University Avenue. A separate bicycle lane and a bus and right-turn only lane provide relief from most traffic congestion.

The transfer points generally have timed transfers at 0 and 30 minutes past each hour. The East Transfer Point is the exception with timed transfers occurring at 15 and 45 minutes past the hour. This offset pulse allows for staggered bus arrival times through the Isthmus, effectively increasing the frequency of service. The Middleton Transfer Point has no official pulse, but routes 70 and 73 are often interlined through it (Route 70 continues as Route 73, and vice versa), resulting in seamless transfers between the two routes. There is no pulse at the Capitol Square; however, many routes leave the transfer points at the same time and arrive at the Capitol Square at about the same time.



Route 6 leaves the West Transfer Point.

Metro's fixed routes are designated with route numbers 1 through 84. Although no official pattern is used, most low-numbered routes are core routes that operate throughout the day. Routes in the 20s are likely to serve the north side of Madison, 30s the east side, 40s the south side, 50s the west side, 70s Middleton, and 80s UW-Madison. Several routes contain splits, where alternating trips take different paths. These routings are communicated to passengers on the bus's destination sign, for example, "VIA TOKAY," and are often referred to as "vias." Bus trips are extensively interlined, or "through-routed" from one route to another, to maximize scheduling efficiency, guarantee transfers, minimize deadheading (buses moving from one terminal to another out of service), and create blocks and runs that are more equitable for operators.

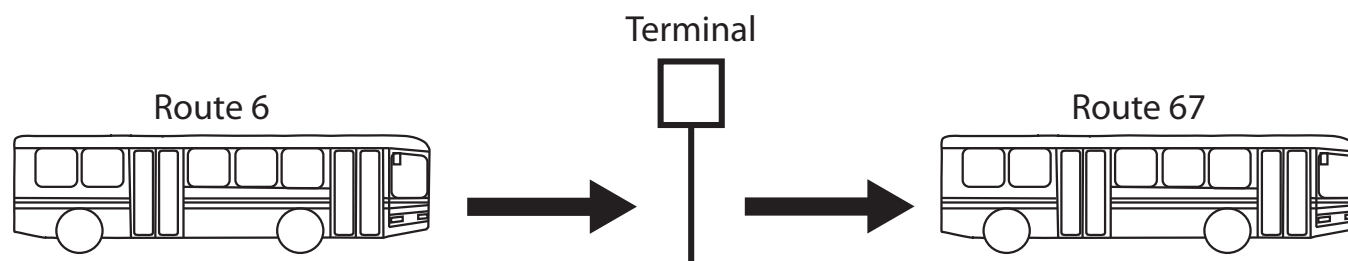
Fixed Route Categories and Service Levels

Metro's fixed routes are loosely categorized internally according to their function within the overall transit system. This family of services are referred to as "core" routes that form the backbone of the transit system, "peripheral" routes that provide coverage through the service area, peak-period-only "commuter" routes that improve frequency and provide faster, more direct service, and "circulator" routes that serve short trips around the UW-Madison campus and central Madison. Some routes serve a combination of functions and don't fit neatly into a particular category.

Core Routes are medium-frequency routes that operate in high-volume travel corridors through the central part of the urban area. They form the backbone of the transit system and primarily operate from transfer point to transfer point along diametrical lines, via the Madison CBD. The core routes are routes 2, 3 (7 on weekends), 4, 5, 6, and 67. A subset of core routes, called connector routes, are circumferential lines that connect the transfer points without serving the CBD: routes 16, 17, and 18.

Core routes, with the exception of Route 16, operate with 30-minute headways during both peak and mid-day periods. Headways on routes 4, 5, and 16 increase to 60 minutes in the evenings, but routes 2, 3, 6, 17, 18, and 67 maintain 30-minute headways throughout the weekday. Route 6 is the only route to have a terminus at a location other than a transfer point (East Towne Mall). Route 67 would normally fit into the peripheral route category. However, almost all Route 6 trips continue as Route 67 to West Towne; therefore, this pair is commonly considered to be the same route. On weekends, Route 3 is replaced by Route 7. Route 7 has a slightly different routing with

Figure 7
Bus Route Interline





A core route, Route 4, competes with other street users on State Street.

a 90-minute cycle time rather than Route 3's 120-minute cycle time. Route 17 has no weekend service, but its connecting service between the North and East Transfer Points is provided by routes 20 and 30 on Saturday and Sunday.

Peripheral Routes are secondary routes that generally connect outlying residential neighborhoods or activity centers with the transfer points. In some cases, they are radial lines serving the Madison CBD, but are shorter, have lower ridership, do not serve a transfer point, and/or have less regional importance than the core routes. The pe-

ripheral routes are routes 13, 14 (west of the Madison CBD, which becomes Route 8 on weekends), 15 (west of the Madison CBD and Route 68 on weekends), 19, 20, 21, 22, 26, 30, 32, 34, 36, 39, 40, 50, 51, 52 (59 on weekends), 70 (78 on Saturdays), and 73 (63 on weekends). A subset of peripheral routes called "flexible routes" have a demand-response component to maximize coverage in low density areas. Metro does not operate any flexible routes, but Monona Transit operates the Monona Lift route, which is a flexible peripheral route.

Peripheral routes have 30-minute service during weekday peak periods, 30-60 minute service during the mid-day on weekdays, and 60-minute service on weekends. In some cases, no service exists on weekends. Routes 14 and 15 west of the Capitol Square are served by routes 8 and 63, respectively on Saturday and Sunday. Service in Middleton is provided by Route 78 on Saturdays only with service to the West Transfer Point. Route 32 is not operated during weekday peak periods; it is instead covered by a combination of routes 14 and 15 which continue past the East Transfer Point to central Madison and the west side. Similarly, Route 70 service is discontinued and provided by routes 71, 72, and 74 during peak periods.

Many peripheral routes (routes 21, 22, 32, 36, 39, 40, 50, 51, and 78) operate as one-way loop routes that begin and end at a transfer point. This design maximizes service coverage and frequency at the expense of increasing out-of-direction travel. Routes that terminate in central Madison or have a cycle length longer than 30 minutes generally operate as linear routes with a layover at each end.



A peripheral route, Route 15, adds frequency to the University Avenue corridor during peak periods and relatively low-frequency off-peak service to west Madison neighborhoods.

Commuter Routes provide weekday peak-period service from residential areas to education and employment centers – primarily UW-Madison and the Madison CBD – but also to peripheral employers and other locations. Commuter routes may provide the only service to outlying neighborhoods, supplement core or peripheral routes, or replace peripheral routes. Commuter routes may be one-way routes (traveling from residential neighborhoods to employment/education centers in the morning and the reverse in the afternoon only) or two-way routes (traveling both ways during the morning and afternoon peak periods). The commuter routes are Metro routes 11, 12, 14 and 15 (east of the Capitol Square), 25, 27, 28, 29, 37, 38, 44, 47, 48, 55, 56, 57, 58, 71, 72, 74, 75, and 84. In addition to Metro's service, Monona Transit operates the commuter route Monona Express, and Portage Public Transit offers commuter service to the North Transfer Point. Route 75 was added in March 2012. A subset of commuter routes, express routes, have limited or no stops in some part of their routes to make the service more competitive with driving (Metro routes 25, 29, 48, 55, 56, 57, 74, 75, Monona Express, and Portage Public Transit).

Circulator Routes operate within the geographical confines of major activity centers, or between an activity center and a nearby residential area. Metro routes 1, 9, 10, 33, 80, 81, 82, and 85 are circulator routes. Route 80 has very frequent 6- to 12-minute service throughout the weekday peak periods and mid-day, and it serves the UW-Madison campus, UW Hospital, and Eagle Heights residential area. In 2011, Route 80 served over 2 million boardings, roughly



Route 80, a circulator route within the UW campus, is by far the most heavily used bus route with over 2 million boardings in 2011 and 6-minute mid-day headways.



13.5 percent of total system ridership. An express version of Route 80, Route 84 (a commuter route) only operates in the afternoon peak. Route 85, the second campus circulator with mid-day service, began serving the southern area of the UW-Madison Campus in 2006, but was absorbed into Route 80 in 2012. Routes 81 and 82 are supplemental evening service that begin at about 6:30 p.m. and extend until about 2:00 a.m. (3:00 a.m. Friday and Saturday evenings). No fare is charged for the campus circulator routes. Campus circulator service is reduced substantially on weekends and during UW-Madison's recess when classes are not in session.

Routes 9 and 10 are weekday-only routes with 30-minute service that provide lower travel times and higher frequency between the Isthmus and UW-Madison campus compared to core routes 2, 3, and 4, particularly during the mid-day. Route 1 serves the Capitol Square, the Bassett neighborhood, UW-Madison, and Old University Avenue during the mid-day only with 60-minute headways. Although it provides little utility, Route 1 is interlined with Route 19 and utilizes service hours that otherwise would be wasted because of Route 19's uneven 75-minute cycle time. Similarly, Route 33 provides little utility but is interlined with Route 9 and makes use of service hours that otherwise would be wasted.

In the past, Metro Transit had operated a downtown shuttle service called the "Nickelodeon." It was discontinued and replaced with a fare free zone, which was a more cost-effective way to provide increased mobility and circulation in central Madison. The fare free zone operated from 1991 until the transfer point restructure in 1998. Route 1 then provided circulator service between the Capitol Square and UW campus, but was discontinued in 2000 due to low ridership.

2005-2011 Changes

Metro's service has changed substantially since the last TDP. These changes - summarized in Table 4 on the following page - were put in place to address route performance, funding changes, changes in ridership patterns, and other issues.

2012 Service Changes

A service change was implemented on August 26, 2012 during the production of this TDP. These changes are generally reflected in the maps produced, but are not reflected in the data analysis. The most significant changes that took place were related to UW campus circulator service. A reduction in the amount of funding available from the UW necessitated a significant reduction in the amount of transit service hours. A summary of the service changes are as follows:

Route 11: Prior to August 2012, Route 11 made a deviation to serve the Wisconsin Physicians Service (WPS) Insurance Corporation campus via Engel Street on westbound p.m. trips only. This deviation was removed due to low patronage and to keep the bus on schedule.

Route 25: Prior to August 2012, Route 25 made a deviation to serve the Alliant Energy building via Bitmore Lane. This deviation was removed due to low patronage and to keep the bus on schedule.

Route 70: Route 70 was rerouted from Northbrook Drive to Parmenter Street.

Route 75: A new route was added in March 2012 between the Capitol Square and Epic campus in Verona via Fish Hatchery Road, McKee Road, and USH 151. The service consists of two morning round trips and two evening round trips during peak periods on weekdays only, which significantly reduces the travel time from the Madison CBD to the Epic campus.

Route 80: Prior to August 2012, the east end of Route 80 made a counter-clockwise loop via Charter Street, Johnson Street, Park Street, and Observatory Drive. This loop was revised to Charter Street, University Avenue, Randall Avenue, Dayton Street, Lake Street, Langdon Street, and Observatory Drive. This change allows Route 80 to serve some of the area that was previously served by Route 85, which was deleted.

Route 81: Headways on Route 81 were increased from 15 minutes to 30 minutes, reducing the number of buses in service from two to one. Temporary routing changes were made to accommodate the long-term detour due to construction associated with Langdon Street and the Memorial Union.

Route 82: Temporary routing changes were made to accommodate the long-term detour due to construction associated with Langdon Street and the Memorial Union.

Route 85: Route 85 was deleted and absorbed into Route 80.

Table 4
Summary of Metro Service Changes Between 2005-2011

Description	2005 Service	2011 Service
Middleton	Route 60 travelled from Madison to north Middleton and Middleton, and then continued to the West Transfer Point via Gammon Road. Routes 61 and 62 provided service west of Middleton and more direct service to Madison during peaks.	Routes 60, 61, and 62 were deleted. New Route 70 provides similar service to Route 60 but does not extend to the West Transfer Point. New Routes 71 and 74 provide similar service to former Route 61. New Route 73 provides all-day service from Middleton to Deming Way, Junction Road, Watts Road, Odana Road, and the West Transfer Point, replacing Route 62 and other service (see Route 6 west).
Bluff Street and Old Sauk Road	Route 8 traveled from Deming Way to Old Sauk Road, Capital Avenue, Bluff Street, and central Madison. Route 15 provided direct peak service east of Old Sauk Road via Campus Drive.	Route 8 was deleted except on weekends. Route 14 provides all-day service on Bluff Street and Route 15 provides all day service on Old Sauk Road with direct service to central Madison via Campus Drive.
Routes 65	Route 65 provided peak only service from West Towne to Westfield Road, Old Sauk Road, Gammon Road, Colony Drive, Segoe Road, Midvale Boulevard, Mineral Point Road, Speedway Road, and Old University Avenue.	Route 65 was deleted. Service on Westfield Road and Colony Drive was replaced with a peak variant of Route 14. Service on Segoe Road was replaced with the new Route 11 (west) (see Route 53).
Route 53	Route 53 provided peak service from the West Transfer Point to University Research Park, Mineral Point Road, the UW hospital, and Observatory Drive.	Route 53 was deleted. New Route 11 (west) provides peak service from the West Transfer Point to University Research Park, Segoe Road, Midvale Boulevard, University Avenue, the UW hospital, and Observatory Drive. New Route 12 (west) provides complimentary reverse peak service from central Madison to the West Transfer Point.
Route 6 (west)	Route 6 continued west of the West Transfer Point with several branches, serving Odana Road, Mineral Point Road, West Towne Mall, and Junction Road.	Route 6 ends at the West Transfer Point. Service to the west is provided by Route 67 (Mineral Point Road to West Towne), Route 73 (Odana Road to Junction Road and Middleton), and all-day service on Route 15.
Verona	No service to Verona existed.	New Route 55 was added in 2005 providing direct peak service from the West Transfer Point to the new Epic campus in Verona.
Route 19	Route 19 served Old University Avenue, Monroe Street, and Allied Drive with peak service extended to King James Way.	Peak service to King James Way was eliminated and new Route 52 provides all-day service from the West Transfer Point to McKee Road just west of Verona Road.
Routes 44, 48	Route 48 provided peak service from the South Transfer Point to Fish Hatchery Road and McKee Road.	Routes 44 and 48 provide two-way peak service from the UW campus to Fish Hatchery Road and Nobel Drive.
Route 5 (south)	Route 5 operated from the Capitol Square to UW campus and the South Transfer Point via Park Street or John Nolen Drive	Route 5 was rerouted to bypass the UW campus via West Washington Avenue (replacing Route 8). The via John Nolen Drive Routing was deleted and replaced with new Route 13 with service from the South Transfer Point to UW campus.
Southeast Madison	The area southeast of Park Street and the Beltline Highway was served by Routes 41 and 42, loop routes to and from the South Transfer Point. Evening and weekend service was provided by Route 43, a combination of Routes 41 and 42.	Routes 41, 42, and 43 were deleted and replaced with Route 16 with service from the South Transfer Point to Moorland Road, Broadway, and the East Transfer Point, operating without stops through Monona (see Route 31). New Route 11 (east) provides peak only service on Nob Hill Road.

Table 4 (continued)
Summary of Metro Service Changes Between 2005-2011

Route 31	Route 31 was a loop route with all day service from the East Transfer Point south along Dempsey Road and Turner Avenue, then north along Monona Drive.	Route 31 was deleted and replaced with new Route 16 with two-way service from the East Transfer Point south along Monona Drive, Buckeye Road, Turner Avenue, Pflaum Road, and the South Transfer Point, operating without stops through Monona (Southeast Madison). Route 39 was revised slightly to provide mid-day service on Dempsey Road, and service on Monona Drive between Pflaum Road and Buckeye Road was eliminated.
American Center	Route 25 provided peak service only to American Center.	Route 36 was added, providing hourly mid day service to American Center.
Dane County Regional Airport	Route 24 was a loop route with weekday service (30 minutes peak, 60 minutes off peak) from the North Transfer Point to Packers Avenue, Tennyson Lane, and the airport.	Route 24 was deleted. Route 20 was revised to include a deviation to the airport on some trips. Service was improved to every 30 minutes off peak and weekend service was added.
Route 27	Route 27 provided peak service complimenting Route 5 (south) on Park Street and traveled to the North Transfer Point via Johnson and Gorham Streets. It continued north to provide direct service to Delaware Boulevard, serving the area served by Route 21 off peak.	Route 27 was deleted south of the UW campus and replaced with new Route 44 (See Routes 44, 48). The routing north of the North Transfer Point was deleted and Route 21's span was extended to include peak times. Some Route 21 trips are still interlined with Route 27.
Route 10	Route 10 had operated a two-way loop mid days only from the UW campus to Broom and Bassett Streets, Jenifer Street, First Street, Johnson and Gorham Streets, and returning to the UW campus. It was deleted prior to 2005 when the schedules for Routes 3, 4, 2, and 5 were revised to provide staggered service through the isthmus about every 15 minutes.	Route 10 was reinstated in 2009.
Routes 37 and 38	Routes 37 and 38 provided peak service from the UW hospital to Pflaum Road.	Some trips on Routes 37 and 38 were extended west from the UW hospital to Whitney Way in order to provide additional peak service to the Hill Farms area.
UW Campus	Route 80 provided frequent service throughout the day, Routes 81 and 82 provided evening service.	Route 85 was added, a frequent, all-day circular route primarily serving south UW campus. It was deleted in 2012.

Paratransit service is provided by Metro on a demand-responsive basis within $\frac{3}{4}$ mile of fixed-route all-day transit service (excluding peak-only commuter routes), as required by the Americans with Disabilities Act (ADA). The service is available during the same span as the fixed-route service that it supplements. However, service is limited to the area within the boundaries of the communities that contract with Metro for fixed-route service. The Village of Shorewood Hills is an exception to this, where Metro has a contract to provide paratransit service only. Figure 8 shows the Metro paratransit service area.



Metro operated paratransit van.

Figure 8
Weekday Metro Paratransit Service Area

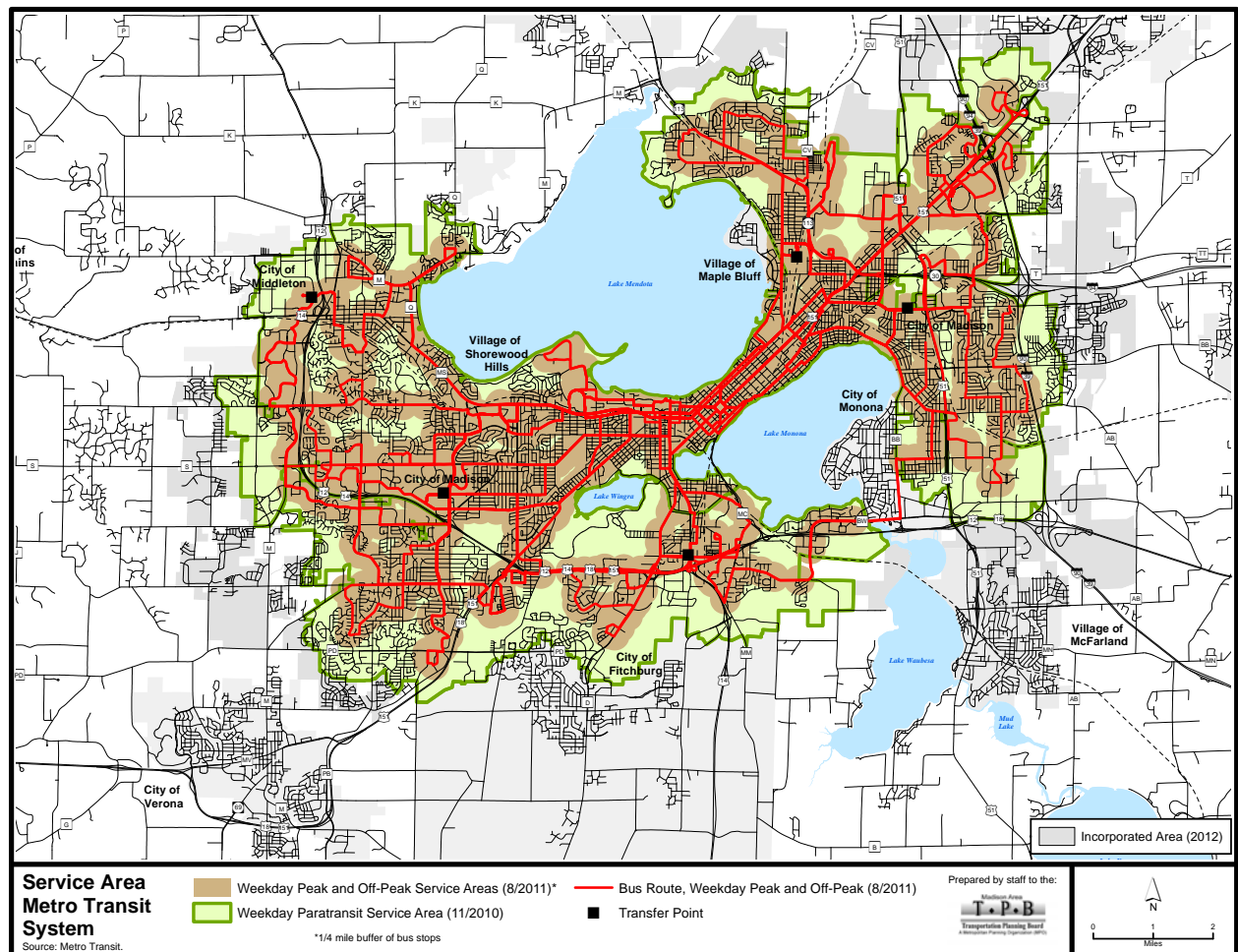


Table 5
Metro Paratransit Service Statistics: 2011

	Unlinked Passenger Trips	Passenger Miles	Operating Expenses
Directly Operated	54,137	259,161	\$ 2,131,810
Purchased Transit	214,805	1,255,290	\$ 4,646,812
Total	268,942	1,514,451	\$ 6,778,622

Riders must periodically apply to Metro and be certified as eligible to use paratransit in accordance with ADA guidelines and its implementing regulations. The definition of persons eligible to use paratransit includes three categories of riders: (1) those unable to ride without assistance; (2) those able to ride fixed-route with the assistance of a wheelchair lift; and (3) those unable to access fixed-route stops. Because Metro's buses are all accessible, category 2 riders must use the fixed-route system except when wintry weather prevents them from accessing the system. For more information on rider eligibility and other paratransit standards and policies (e.g., ride cancellations, travel times), see Metro Transit's website.

Paratransit trips must be scheduled at least one day in advance; however, subscription service is available for riders who make regularly scheduled trips. The majority of trips are these subscription trips. In the past, paratransit riders had been charged a higher fare for peak-period trips. Beginning in 2013, fares for all trips are \$3.25, regardless of the time of day.

Paratransit service is provided with a combination of Metro's fleet of 20 cutaway vans and contracted service from Abby Vans, Badger Bus Lines, and Transit Solutions. In 2011, Metro Paratransit provided about 269,000 one-way trips at an operating expense of \$6.8 million, which included both directly operated transit and purchased

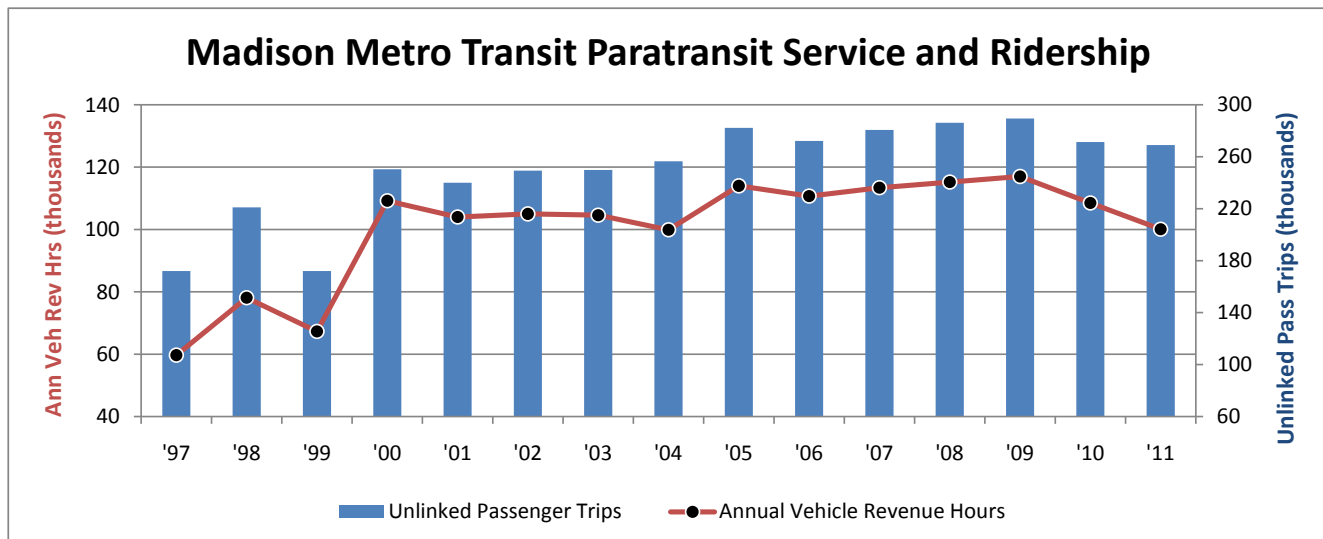
transit. About 20% of paratransit trips are directly operated by Metro Transit; contractors provide the remainder. The breakdown between directly operated and purchased transit is shown in Table 5.

Metro's paratransit ridership saw major increases in the 1990s, but has stabilized and has been increasing gradually since 2000. Since most demand-response trips are serving one passenger at a time, annual revenue service hours have kept pace with ridership. Figure 9 shows Metro paratransit service hours and ridership from 1997-2011.

Metro Transit Supplemental School Service

Metro provides supplemental school-day service on special routes called Supplemental School Service designed primarily to serve middle and high school students living within the Madison Metropolitan School District (MMSD) and scheduled to coincide with school start and end times. The Supplemental School Service is especially useful where other Metro service is not available or where overloading of buses on regular routes would otherwise occur. MMSD contracts with Metro to provide most of the transportation for its students because it is more cost effective than contracting with a private bus company to provide conventional school bus service.

Figure 9



While the Supplemental School Service is open to the general public for use, middle-and high school students fill most of the seats. The supplemental school routes are grouped into four geographies: W routes (near West High School), E routes (near East High School), M routes (near Memorial High School), and L routes (near LaFollette High School). The routes are adjusted each year in response to new development and changing school enrollments.

Metro provided 72 morning and 72 afternoon scheduled Supplemental School Service trips to 14 middle and high schools during the 2011-2012 school year. Generally, the service is provided with the older vehicles in Metro's fleet. Some Supplemental School Service are combined with other regular service to maximize the utility of each bus in operation and to reduce deadhead and other non-productive time. However, since Supplemental School Service is operated by part-time operators and, due to contract terms, most fixed-route service is operated by full-time operators, limited interlining occurs between them.

Metro Transit Special Event Service and Extra Buses

In the past, Metro provided shuttle service to a number of special events. These included UW-Madison football games at Camp Randall Stadium; UW-Madison basketball and hockey games, WIAA basketball and wrestling tournaments, and concerts at the Kohl Center; the Madison Blues Fest at Olin Park; and the Rhythm & Booms celebration at Warner Park around the 4th of July. In 2008, however, a new federal regulation (CFR 49 Part 604) restricted public

transit agencies from providing charter bus service, with some exceptions. As a result, this service is no longer provided by Metro.

Metro schedules about 88 "Extra Bus" trips throughout the day to accommodate passenger loads on busy routes, particularly during the morning and afternoon peak periods. These trips are not published in the Ride Guide and are generally scheduled a few minutes before the published trip that they supplement and usually only cover a portion of the route. 51 of the 88 extra trips serve the near west side of Madison between Hill Farms and the Capitol Square (routes 2, 14, and 15). Extra Buses account for about 36 weekday service hours (17 of which serve the near west side of Madison). The majority of extra bus trips occur in the afternoon peak period, but Extra Buses also run in the morning peak periods and the mid-days and early evenings as well. Extra Buses are highly dynamic and change frequently to meet the changing demands on the system.

Current Metro Transit Bus Fleet Inventory

As of December 2011, Metro Transit had an active fixed-route fleet of 209 transit coaches and 20 paratransit vans. 19 of the 209 buses are hybrid diesel-electric, and the remaining 190 are diesel powered. The majority of the active fleet are coaches manufactured by Gillig; all have a standard length of 40 feet. The oldest coaches in the active fleet are from model year 1994; the average age of the

Table 6
Summary of Metro's Current Fixed-Route Bus Fleet

Year	Manufacturer	Model	Fuel	Length	Number of Vehicles
1994	Other	5.501	Diesel	40'	5
1995	Gillig	PHANTOM	Diesel	40'	4
1996	Gillig	PHANTOM	Diesel	40'	8
1997	Gillig	PHANTOM	Diesel	40'	5
2000	New Flyer	DLF40	Diesel	40'	30
2001	New Flyer	DLF40	Diesel	40'	16
2002	New Flyer	DLF40	Diesel	40'	14
2003	New Flyer	DLF40	Diesel	40'	15
2004	Gillig	LOWFLOOR	Diesel	40'	15
2005	Gillig	LOWFLOOR	Diesel	40'	15
2006	Gillig	LOWFLOOR	Diesel	40'	16
2007	Gillig	LFHYBRID	Hybrid	40'	5
2009	Gillig	LOWFLOOR	Diesel	40'	33
2010	Gillig	LFHYBRID	Hybrid	40'	14
2011	Gillig	LOWFLOOR	Diesel	40'	14
Total					209

fleet is just under seven years old. A total of 175 vehicles are required to furnish fixed-route transit service with a spare ratio of just under 20%. The limited capacity of Metro's single bus storage and maintenance facility on East Washington Avenue does not allow for an expansion of the fleet at this time. Table 6 provides a summary of Metro's fixed-route bus fleet.

Metro Transit Facilities

Bus Stops

Metro has 2,036 bus stops in the system, most of which are in the City of Madison. There are 931 far-side bus stops (the bus stops after crossing an intersection), 808 near-side stops (buses stop before crossing an intersection), and 297 stops with other configurations (mid-block, within an intersection, or transfer points). Fixed route buses only stop to serve passengers at bus stops; however, supplemental school routes serve some stops that are unsigned.

Transit riders identify bus stops by their recognizable blue signs with the Metro logo and route numbers. The current design is a one-sided sign that is mounted at a 45-degree angle to the curb. This design is necessary because of the no-parking emblem on the sign. Some signs have been retrofitted with decals on the back of the sign that read "BUS STOP" so that riders can identify them more easily. Signs at near-side bus stops have traditionally been located 60-80 feet before the actual bus stop location with a separate sign that reads "BOARD BUS AT CORNER." This practice was also used because of the no-parking emblem on the sign. Some near-side bus stops have been changed to a new design, with the bus stop sign located at the bus stop and a separate no-parking sign located 60-80 feet from the bus stop. Bus stop signs are installed and maintained by the City of Madison Traffic Engineering Department. Supplemental school routes are not listed on bus stop signs.

Currently, Metro maintains a limited database with the features associated with each bus stop, including location, presence of a shelter, and stop times. Some additional features such as the presence of a bench or boarding platform are not included.



A single sign near-side bus stop with "BOARD BUS AT CORNER."



A bus stop sign with a "Bus Stop" decal on the back side.

Boarding Platforms

Many Metro bus stops are equipped with a concrete boarding platform or other hard, flat surface and are wheelchair-accessible. Some stops throughout the system have turf or other materials and are not wheelchair accessible.



Bus stops with and without boarding platforms.

Shelters and Benches

Of Metro's 2,036 bus stops, 193 have shelters (not including the four major transfer points). About six different shelter designs can be found at bus stops. The number of shelters in service in 2012 and their descriptions are as follows:

- 94 – The standard Metro design that was installed in the late 1970s and early 1980s was a standard black bus shelter with a domed roof. General wear and tear is visible on many of these shelters. Metro



A bus shelter on the UW-Madison campus.

received a \$200,000 federal 2011 State of Good Repair grant to improve bus shelters, which it plans to use in conjunction with local funding to rehabilitate many of these shelters and add lighting.

- 23 – Modern Metro shelters were installed on East Washington Avenue and in other locations throughout the City of Madison.
- 24 – Older silver shelters were installed by the UW primarily in the campus area with a similar design to the black Metro standard design from the 1970s.
- 21 – The UW has replaced many of the older silver bus shelters on campus with new black shelters with a unique design. This design features the UW-Madison insignia, and the UW plans to replace the remaining older silver shelters as funding allows.
- 14 – When the State Street Mall was constructed in the 1970s, it included the construction of brick bus shelters on State Street and the Capitol Square. These structures were replaced with modern, unique glass and steel shelters during the rehabilitation of State Street in the mid-2000s.
- 17 – The Metro system includes various other types of shelters, which were installed during land development projects. The design of these shelters varies.

Most shelters contain built-in benches, transit system maps, and printed bus arrival times. Three shelters on the Capitol Square (Main and Carroll, Mifflin and Pinckney, and Pinckney and Main) have electronic message boards that display real-time bus arrival times. Metro does not have an official policy for determining the placement of shelters

and considers multiple factors when doing so, but Metro generally installs them at high-ridership stops or stops that function as informal transfer points where riders may have a longer wait.

Park-and-Ride Lots

Metro currently provides service to three officially designated park-and-ride lots. Two are located on the north side: one at the North Transfer Point and one within the Northside Town Center parking lot. The third, a state-owned facility called the Dutch Mill Park-and-Ride, is located in southeast Madison near the intersection of USH 51 (Stoughton Road) and USH 12/18 (the Beltline Highway). The Dutch Mill Park-and-Ride is also used by intercity bus service and was expanded in 2012 due to capacity problems.

The number of park-and-ride facilities dwindled during the 1980s and 1990s. A former lot at the Nakoma Plaza Shopping Center on Madison's southwest side was eliminated in 1998 due to difficulties accessing the lot and a low level of use. A former park-and-ride lot at St. Bernard's Church in Middleton was eliminated in 1994 when the bus route was moved from Franklin Avenue to University Avenue. Unofficial commuter parking and transit use is known to occur, increasing the strain on parking resources in some Madison neighborhoods. Metro continues to explore additional park-and-ride lot locations.

Besides Metro buses, park-and-ride lots serve other programs that encourage higher-occupancy vehicles, most notably by providing convenient transfer points for carpools and vanpools. The Dutch Mill Park-and-Ride, in particular, is heavily used by car/vanpool users and by Van Galder and other intercity bus riders. Van Galder Bus Co. pays Metro for part of the maintenance costs for the lot. There is also a state-owned park-and-ride lot within the American Center on Madison's Northeast side near USH 151. However, it is currently only served by reverse-peak (AM outbound and PM inbound) service. Another state-owned park & ride lot exists near the intersection of Verona Avenue and Old CTH PB in Verona, but it lacks acceptable access to nearby bus stops for routes 55 and 75. Planned facility improvements will make transit service available to the lot.

According to Metro's 2008 On-Board Survey, 3% of Metro passengers used a park-and-ride lot to access the bus while another 3% reported parking on the street to access the bus. The addition of more facilities and express-type service could significantly increase the number of park-and-ride passengers.

Transfer Points

Metro has four major transfer points which were opened in July 1998 to help implement Metro's route restructuring that decentralized the system. A fifth minor transfer point was added in the City of Middleton in 2007 as part of the service restructuring in that community. Almost all routes that serve transfer points terminate and lay over there.

The transfer points were located on the east, north, south, and west sides of Madison and are named based on their locations (e.g., East Transfer Point). The four original transfer points were located in sites intended to achieve uniform route lengths and cycle times between them necessary for the timed-transfer system, to minimize the travel time to central Madison without introducing excessive new circuitous routing, to minimize bus volumes and impacts on residential streets, and to provide high levels of transit service to activity centers such as shopping malls. Amenities at each transfer point include a covered canopy, wind screens, benches, real-time electronic bus schedule information, lighting, CCTV cameras, and other security measures.



Real-time information boards are located at various bus stops at the Capitol Square and at the transfer points.

All four major transfer points are designed with a clockwise loop roadway surrounding a central platform with designated inbound and outbound sides. Riders changing buses at transfer points do not need to cross streets, enter the loop roadway, or leave the platform at all. General traffic (other than transit and emergency vehicles) is prohibited from the loop roadway. The South Transfer Point has a capacity of six buses (three on each side); the North, West, and East Transfer Points each can accommodate up to eight buses (four on each side). Capacity has become a constraint to the system to some degree. For instance, during peak periods, there are times when nine buses are at the West Transfer Point simultaneously; some peripheral routes stage on the inbound side of the East Transfer Point because the outbound bays are full. Because of the timed transfer system, buses pull in as they arrive and leave nearly simultaneously; no pullouts are provided and routes do not serve specific bays other than "Inbound" and "Outbound."

The Middleton Transfer Point, however, is similar to a standard bus stop. The two major routes that serve it – routes 70 and 73 – are often interlined, and through trips are accommodated without changing buses. The Capitol Square does not have a timed transfer associated with it, although many core routes that serve it arrive and depart at about the same time. Additionally, the East Towne stop serves as an informal transfer point for routes 6, 20, 26, 30, and 36.

In 2010, a second exit was added to the South Transfer Point along with other improvements to the Badger Road/Park Street intersection to improve the on-time performance of Route 18. No major changes or renovations to other transfer points have been completed since the facilities were opened in 1998.



The West Transfer Point located near Whitney Way and Tokay Boulevard.

Metro Transit Administration, Operations, Bus Storage, and Maintenance Facilities

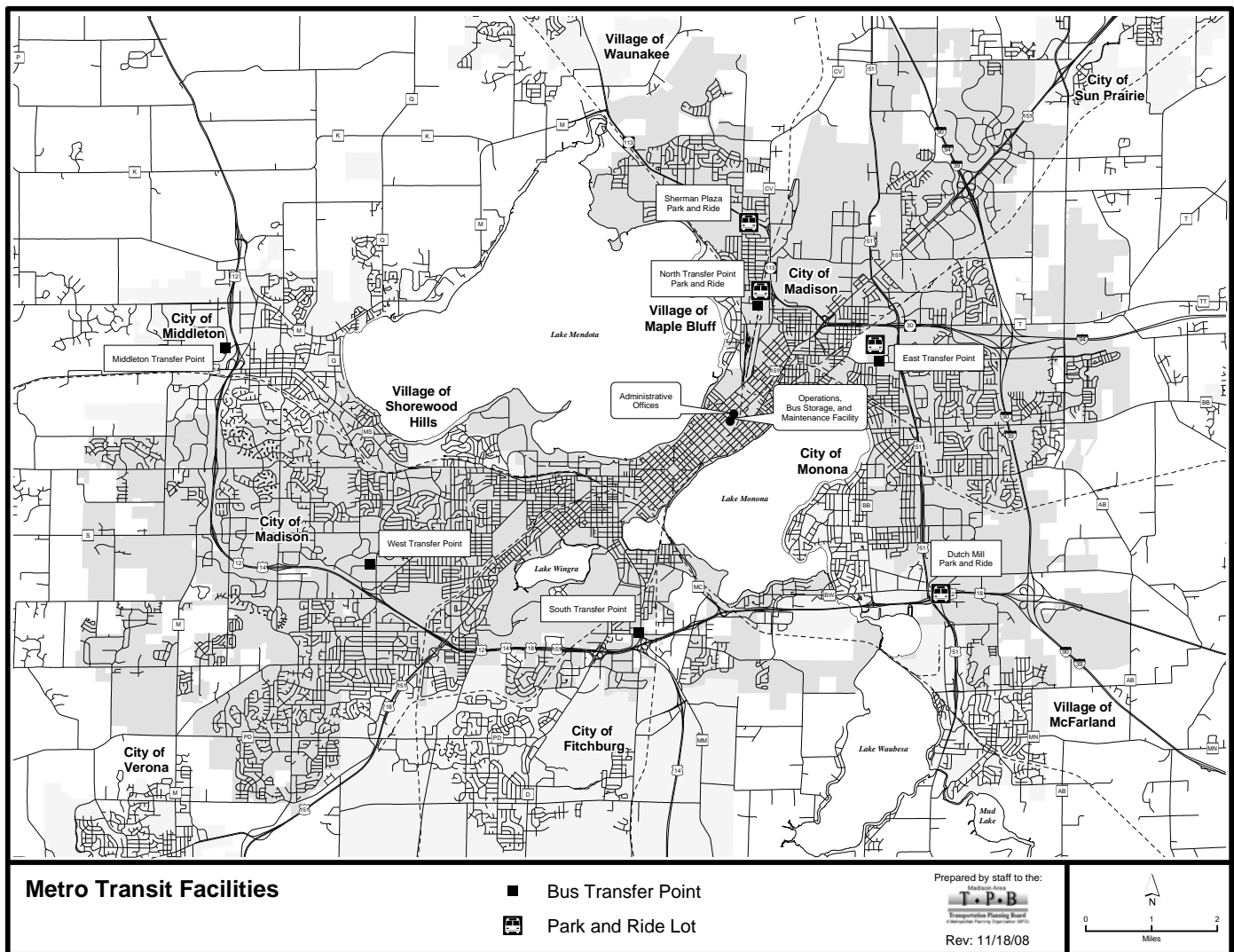
Metro Transit's operations, bus storage, and maintenance facility is centrally located on a 10.4-acre site in the 1100 block of East Washington Avenue. The facility includes a bus rehabilitation and maintenance area, storage space for buses, and space for maintenance equipment and spare parts inventory. Buses access the facility from Ingersoll Street. The facility was completed in two phases in the early 1980s and has had numerous interior and exterior modifications since then to address facility inadequacies. It was originally designed to accommodate 160 standard buses; it now holds 209 full-size buses and 20 paratransit vans and is beyond capacity.

Metro's administrative offices are located in a building on the same block as the bus storage and maintenance facility at 1245 East Washington Avenue, just west of Baldwin Street. This building houses the offices of the Administrative Unit, Finance Unit, Planning & Scheduling Unit, and Marketing and Customer Services Unit, including the Customer Services Center. The Customer Services Center handles all paratransit ride confirmations, provides transit information, sells passes and 10-Ride Cards, and handles other administrative tasks.

Besides the customer service office, 10-Ride Cards, passes, maps, and schedules can be purchased and downloaded online or purchased at over 40 other locations throughout Madison, Middleton, and Fitchburg.

Metro's operations, bus storage, and maintenance facility is in need of remodeling and expansion to improve the safety, performance, efficiency, and appearance of the facility. Expansion of service is currently limited by the inability of the facility to safely accommodate more than the current fleet of 209 buses. A space needs study for Metro was completed in November 2005 that included a site concept plan for the redevelopment and expansion of Metro's facilities, a phasing plan, and an implementation plan and funding strategy. A further study is currently underway to determine the next steps to expand or replace the facility, either in its existing location or in a new location, possibly including multiple sites.

Figure 10
Metro Transit Transfer Points and Park-and-Ride Lots



Metro Transit Organization

The City of Madison acquired the transit system from the privately owned Madison Bus Company in 1970, and Metro operators and other staff are city employees. The transit system operates under the oversight of the Mayor of Madison, the Common Council, and the city's Transit and Parking Commission (TPC). The TPC, whose membership consists of three Common Council members and six citizens, makes recommendations to the Mayor and Common Council regarding policies on all transit matters, and it also functions as a transit utility for the operation of the system. In addition to its responsibilities as a transit utility, the TPC provides overall management, operation, and control of transit system assets. The Mayor makes appointments to the TPC with the approval of the Common Council.

Local funding is generally provided through the City of Madison budgeting process. For service that extends beyond the City of Madison's boundaries, Metro contracts with municipalities or other entities. These funding partners include the cities of Middleton, Fitchburg, and Verona, the Town of Madison, and the Village of Shorewood Hills. The University of Wisconsin, Madison College, and the Madison Metropolitan School District also contract with Metro Transit to fund service. Since 2003, the TPC has had a Contracted Services Oversight Subcommittee (CSOS) to consider and provide recommendations on policy matters pertaining to the operation of contracted transit service. The CSOS has also helped to improve communications between Metro staff and the staff and officials of contracting municipalities and agencies.

The TPC also has an ADA Transit Subcommittee that monitors Metro Transit compliance with providing complementary paratransit service in accordance with the federal Americans with Disabilities Act (ADA) and its implementation guidelines. The ADA Transit Subcommittee also makes recommendations to the TPC on policy matters related to the provision of fixed route and paratransit service to persons with disabilities.

Metro Transit has six different units—Administration, Finance, Marketing and Customer Services, Planning & Scheduling, Maintenance, and Operations. The Transit General Manager (currently Chuck Kamp) is responsible for general management and oversight of the agency and serves as liaison to the TPC, the Mayor’s office, and other City of Madison department heads. Metro has two inter-unit staff teams which generally meet on a weekly basis. The Service Development Team plans service improvements using customer service data, surveys, and data from other sources. The Senior Management Team works to develop and improve administrative and operational systems, such as Metro’s computerized Customer Feedback Program.

Metro Transit Costs and Revenue

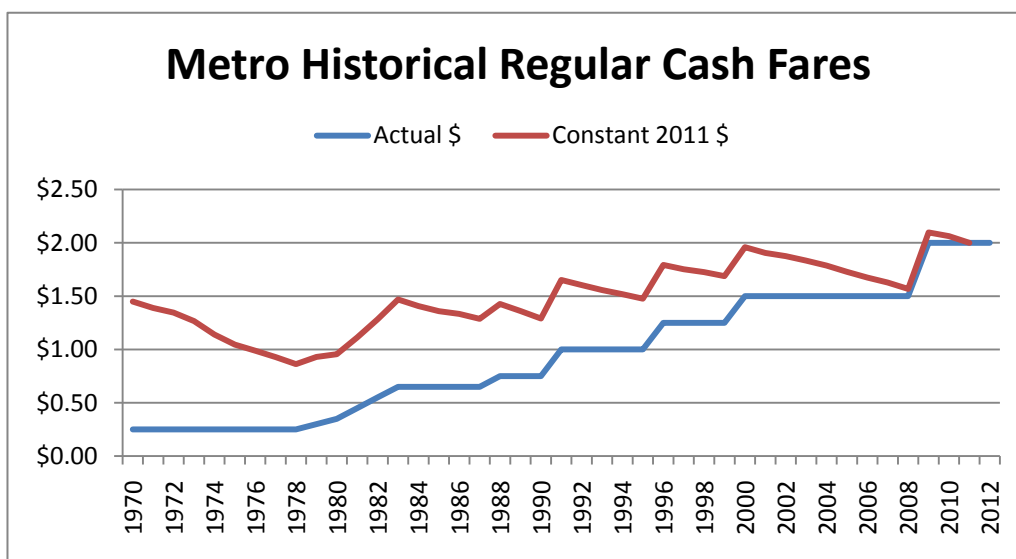
In 2011, Metro collected \$11.8 million in fares, or 21% of its total budget of \$55.4 million. Metro charges a flat fare for fixed route trips, regardless of distance or time of day. Standard fare options include a standard cash fare of \$2.00, a day pass for \$4.50, the 10-Ride Card for \$15.00, and the 31-Day Pass for \$55.00. Discounts are available to youths

(ages 5-17 or enrolled in high school), people with disabilities, people with low incomes, and seniors. Children under five years of age ride free. A “2-4-6 pass” is available on weekends and holidays that allows up to two adults and four children to ride for \$6.00. Transfers are given upon request and are valid for two hours. No fares are collected on campus routes 80, 81, 82, and 84; or on Route 85 before it was discontinued. An EZ Rider Youth pass is available for \$150.00 per semester.

Many schools and employers offer unlimited ride bus passes to their students or employees in the form of a magnetic strip card. These schools and employers are generally billed \$1.15 for each swipe. This fare is intended to take transfers into account, since transit riders using the cards are not issued conventional transfers. Instead, users swipe their card twice (or more) if they use two (or more) routes on their trip. Groups currently using the unlimited ride cards include:

- ▶ City of Madison employees
- ▶ UW-Madison students and employees
- ▶ Edgewood College students
- ▶ Madison College students
- ▶ Meriter Hospital employees
- ▶ St. Mary’s Hospital employees
- ▶ UW Hospital employees

Figure 11



Note: The consumer price index is from the Bureau of Labor Statistics, CPI for All Urban Consumers, 1982-84=100 (unadjusted).

In addition, Metro offers the Commute Card. This program is an annual unlimited ride pass similar to what is currently in place with the larger Madison-area entities discussed above, but it is available to most businesses, non-profit organizations, schools, colleges, and technical campuses.

Metro receives about 22% of its \$55 million budget from fares. State and federal contributions, including Federal Transit Administration (FTA) Capital Program and Urban Area Formula funds, made up over half of Metro's funds in 2011. \$50.7 million, or 91% of these funds were spent on operating expenses, with the remaining 9% spent on capital expenses (primarily buying new buses).

Figure 12
Metro Transit 2011 Boardings by Farebox Transactions

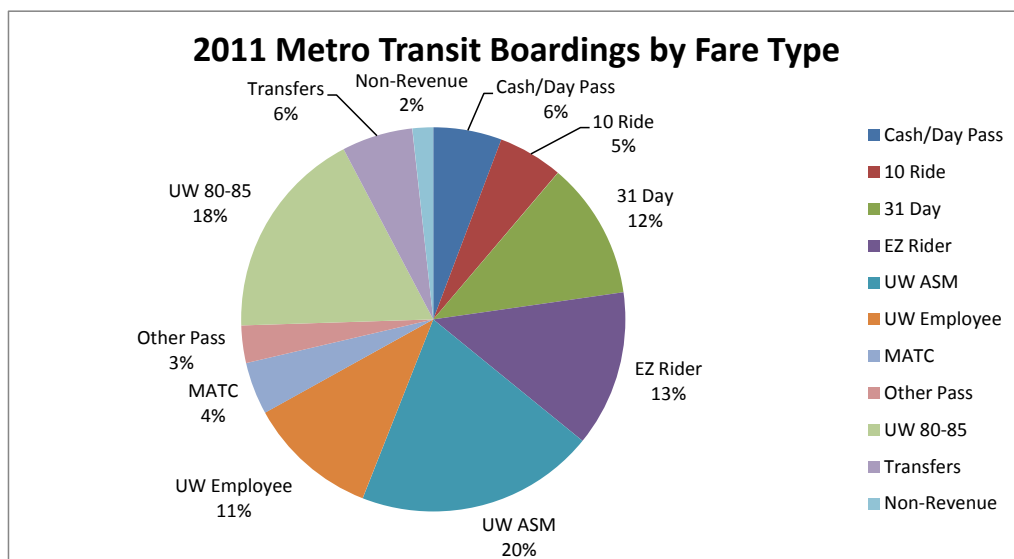
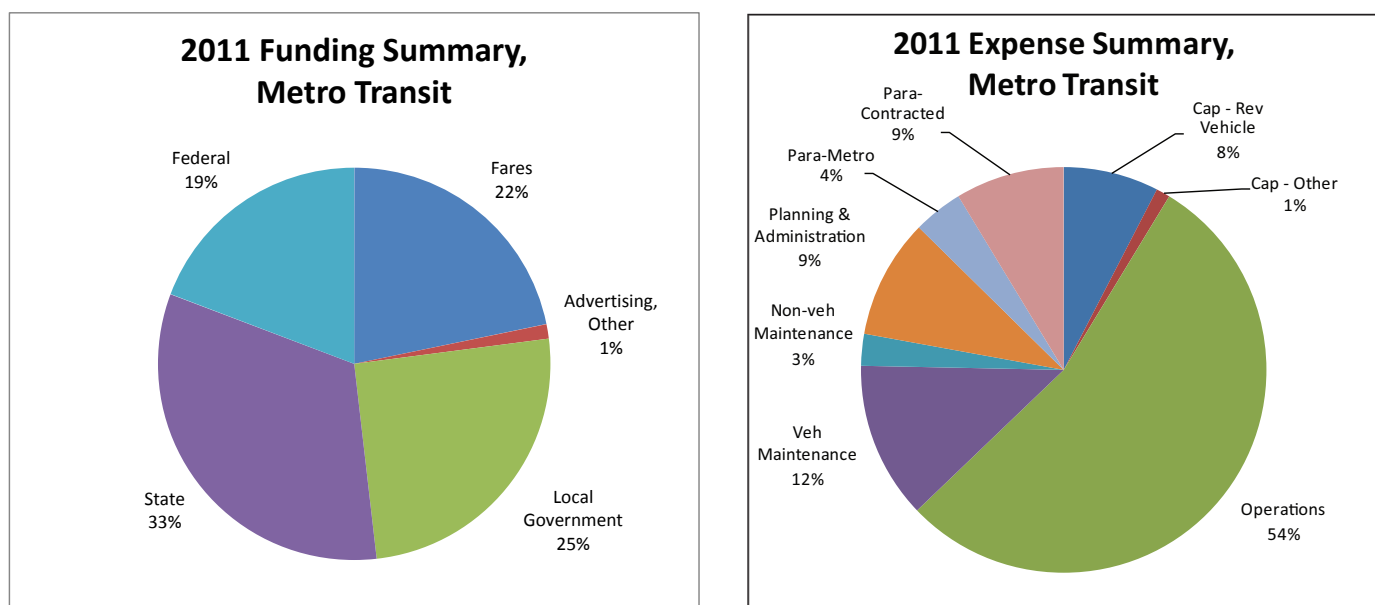


Figure 13
Metro Transit Funding and Expense Summaries, 2011



Source: National Transit Database.



In 2007, Metro expanded its advertising program to include fully-wrapped buses.

Federal Funding

Federal funding for transit through the Federal Transit Administration (FTA) was previously authorized under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU expired in September 2012 and was replaced with a new two-year transportation authorization bill, entitled Moving Ahead for Progress in the 21st Century (MAP-21). MAP-21 made changes in the transit programs, creating some new ones and consolidating some of the former programs. The most important Federal transit programs under MAP-21 are described below.

Urbanized Area Formula Grants (Section 5307)

is the largest of FTA's grant programs and provides grants to support public transportation in populated areas with 50,000 people or more. Funding is distributed by formula based on population, level of transit service provided, and other factors. Since the Madison urbanized area has more than 200,000 people and Metro Transit has more than 100 buses in service during peak periods, Metro's 5307 grants may only be used for capital expenses, with some exceptions. The most significant exception is that operating costs under the category of "preventive maintenance" are eligible. This includes all direct costs, including labor costs, associated with maintaining vehicles and facilities. Other exceptions include equipment leases and the provision of paratransit services (but only for an amount not exceeding 10% of the total grant). Also, MAP-21 repealed the former Job Access and Reverse Commute (JARC) program in SAFETEA-LU, but made those activities (providing job access to low-income individuals) eligible under the Section 5307 program. MAP-21 allocates \$4.9 billion for FY 2013 and \$5 billion for FY 2014, with an estimated \$6.7 million allocated for the Madison area in 2013.

The State of Good Repair Grants (Section 5337)

replaces the Fixed Guideway Modernization program in SAFETEA-LU. These formula grants fund capital projects to maintain rail and high-intensity bus systems using bus-only and high occupancy vehicle (HOV) lanes. Projects are limited to replacement and rehabilitation, or capital projects required to maintain public transportation systems in a state of good repair. Eligible projects will now need to be included in a transit asset management plan. Metro Transit receives State of Good Repair grants based on the bus lane mileage and service, and \$485 thousand is expected in 2013.

The Bus and Bus Facilities Program (Section 5339)

is a formula grant program that replaces the discretionary Bus and Bus Facilities Program (Section 5309) in SAFETEA-LU. Grants are available to replace, rehabilitate, and purchase buses and related equipment, and to construct bus-related facilities. Funding is distributed by formula based on population, vehicle revenue miles, and passenger miles. MAP-21 allocates \$422 million in FY 2013 and \$428 million in FY 2014, with an estimated \$770 thousand allocated for the Madison area in 2013. The change from discretionary allocation of funds to a formula allocation will result in lower overall funding than Metro has received in the past.

The Enhanced Mobility of Seniors and Individuals with Disabilities program (Section 5310)

funds projects that increase the mobility of seniors and persons with disabilities. Funds are apportioned based on each State's share of the targeted populations and under MAP-21 will now be apportioned to both states and large urbanized areas with populations over 200,000 such as Madison. The former New Freedom program was consolidated into this program. The New Freedom program provided grants for

services for individuals that were beyond what is required in the Americans with Disabilities Act. Former New Freedom program funds allocated to the Madison area were primarily used for mobility management services by Dane County.

Fixed Guideway Capital Investment Grants (Section 5309), also known as “New Starts” and “Small Starts,” are used to fund major rail and bus rapid transit projects. Section 5309 funds are competitively awarded. In the early 2000s, they were used for planning purposes for the Transport 2020 commuter rail project and could potentially provide funding for other high capacity transit systems, such as the bus rapid transit system currently being studied. Several changes to the New Starts/Small Starts program were enacted with MAP-21 to streamline project selection and development that are relevant for the Madison area. The “Alternatives Analysis” phase is replaced with “Project Development” and the “Preliminary Engineering” and “Final Engineering” phases are consolidated into one phase. The project evaluation process by the FTA has been streamlined to allow a more expedient approval of lower cost projects.

State Funding

The Wisconsin Department of Transportation funds local public transit systems (both fixed-route and shared-ride taxi) through the **State Urban Mass Transit Operating Assistance Program (Wisconsin State Statutes 85.20)**. Eligible project costs are limited to the operating expenses of the transit system. Funds are distributed in four categories based on population and the location of the transit system. Metro Transit received \$16.2 million in 2012, a decrease from the 2011 level of \$18.0 million. The cities of Monona, Stoughton, Sun Prairie, and Verona receive “Tier B” funding, which is proportioned in uniform percentages of operating expenses (with a 60% maximum) to transit systems with populations higher than 50,000, excluding Madison and Milwaukee. The aforementioned Madison area communities are included in Tier B because of their location in the Madison urbanized area. These cities received a total of \$809,540 in 2012.

Additional state funding is available through the **Specialized Transportation Assistance Program for Counties (Wisconsin State Statutes 85.21)**, which provides funding to counties for specialized transportation programs serving the elderly and persons with disabilities. Funding under the program is appropriated based on the proportion of the state’s elderly and disabled population in each county with a certain minimum appropriation. Section 85.21 funds may not be used to support fixed-route service in the Madison area, but may be used to fund paratransit or other service to the elderly and persons with disabilities.

The state does not currently have a transit capital assistance program.

Local Funding

Local funding is provided primarily by the City of Madison and other local jurisdictions primarily through property taxes. The local share of deficits for service provided outside the City of Madison, or not primarily serving City of Madison residents, is funded through partner agreements. The local funding shares are distributed among these partner communities and entities based on the service hours in those communities or serving those entities and fares collected. The estimated share for each partner based on the 2013 budget is shown in Table 7.

Table 7
2013 Estimated Local Funding Distribution

Partner	Total	Share
City of Madison	\$9,049,807	75.6%
University of Wisconsin	\$1,449,866	12.1%
Madison Metro School	\$551,248	4.6%
City of Fitchburg	\$388,467	3.2%
City of Middleton	\$314,002	2.6%
Town of Madison	\$92,884	0.8%
City of Verona *	\$88,261	0.7%
Madison College	\$21,024	0.2%
V.O. Shorewood Hills **	\$9,337	0.1%
Total	\$11,964,896	

* The City of Verona contracts for peak-period fixed-route service only.

** The Village of Shorewood Hills contracts for paratransit service only.

2013-2017 Metro Transit System Funding and Expenses

Table 8 shows the total projected expenses and revenues for Metro Transit through 2017. Operating expenses include only inflationary cost increases without any net increase in annual revenue service hours. Operating expenses are expected to grow to about \$48.5 million per year in 2017.

Table 8
Metro Transit Projected Expenses and Revenues, 2013-2017

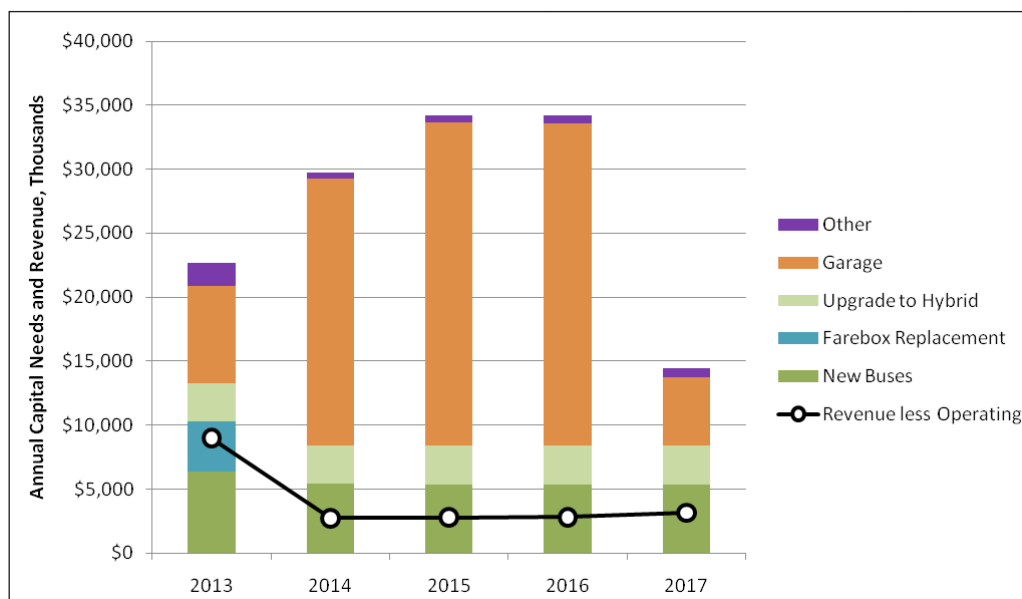
	2013	2014	2015	2016	2017
Expenses					
Capital	\$34,229	\$38,848	\$43,480	\$43,564	\$23,576
Operating	\$44,822	\$45,718	\$46,633	\$47,565	\$48,517
Total Expenses	\$79,051	\$84,566	\$90,113	\$91,129	\$72,093
Revenues					
FTA Section 5307, 5337, and 5339	\$7,992	\$8,072	\$8,152	\$8,234	\$8,316
State Operating Assistance (WI 85.20)	\$16,600	\$16,932	\$17,271	\$17,616	\$17,968
Farebox and Other Revenue	\$17,253	\$17,598	\$17,950	\$18,309	\$18,675
Local Funds	\$13,318	\$13,584	\$13,856	\$14,133	\$14,416
Carry-Over Funds	\$6,292	\$0	\$0	\$0	\$0
Projected Revenues	\$61,455	\$56,186	\$57,229	\$58,292	\$59,375

Capital Projects

The largest regular capital expense for Metro Transit is purchasing new buses. Metro expects to have a five-year contract in place in 2013 to purchase up to 16 buses per year. Assuming the fleet size remains constant at 209 40-foot buses, this replacement rate yields an average life span of 13 years. All of these new buses are planned to be diesel powered with an option to upgrade them to hybrid diesel-electric. Other major capital projects include replacing the fareboxes, new paratransit vans, bus stop amenities, expansion of the North Transfer Point park and ride, and expansion of the bus storage and maintenance facility and/or construction of a separate, new facility.

Projected federal funding levels are expected to decrease for year 2013 and beyond due to the restructuring of the former Bus and Bus Facilities grants with MAP-21. New buses will be purchased in 2013 using unspent carry-over funds from previous years, but the projected available funds for bus replacement in years 2014 through 2017 are insufficient, as shown in Figure 14. Additionally, funding for the expansion or new construction of a maintenance facility has not been allocated. Potential sources for new funds for fulfilling these capital needs may include the restoration of reduced state funding, a regional transit authority, or increased local funding.

Figure 14
2013-2017 Projected Capital Project Needs and Available Funding



Other Public Transit Services

Monona Transit

The City of Monona provides public transportation service within its city limits and to central Madison. The service consists of one peak period fixed route called Monona Express and one point-deviation mid-day route called Monona Lift.

Monona Express operates in a counter-clockwise route in the morning from Monona to Madison via Atwood Avenue and Williamson Street to the Capitol Square, UW Campus, and UW/VA Hospitals, then to Monona via Olin Avenue, John Nolen Drive, and the Beltline Highway. It makes a similar clockwise loop in the afternoon. Monona Express makes four loops each morning and each afternoon using two buses in service.



Monona Express approaches the Capitol Square

Monona Lift makes three clockwise trips from Monona to Madison and returning to Monona, and an additional three trips that circulate within Monona in the mid-day on weekdays only with one bus in service. Elderly and disabled riders may call and arrange for the driver to make deviations to the route and be picked up or dropped off within one-half mile. Although a timetable is published for Monona Lift, all riders are encouraged to call the dispatcher to make sure they are not missed because of the point-deviation nature of the service.

The regular cash fare for Monona Express and Monona Lift is \$3.00 with discounts for ticket books, senior/disabled riders, students, and riders with transfers from Metro Transit. Transfers from Monona Lift are not valid on Metro Transit. A schedule is published listing the intersections served by Monona Transit in both Monona and Madison, and some bus stop signs are present in Monona; however, the bus may also be flagged by passengers along the route. Monona Transit only serves passengers that start or end their trip within the City of Monona. The City of Monona currently contracts with First Transit to provide the service using accessible minibuses.

Table 9
Operating Statistics for Monona Transit, 2011

Monona Transit	Express	Lift
Ridership	9,633	10,202
Driver Hours	2,359	2,259
Driver miles	19,125	38,572
Passenger Revenues	\$23,512	\$5,251

Monona Transit receives operating assistance from the State of Wisconsin that covers about 60% of its operating expenses.

Sun Prairie Shuttle and Shared-Ride Taxi Service

The City of Sun Prairie provides one shuttle route that is open to the public. This service operates three round trips per day, mid-day on weekdays only, between three locations in west Sun Prairie and East Towne Mall in Madison. The fare for the service is \$3.50, and service is provided with minibuses. At the Sun Prairie end, riders may stay on board and request to be dropped off within the service area of the Sun Prairie shared-ride taxi service at the same rate as the taxi (described below).

The City of Sun Prairie also contracts for a shared-ride taxi. The service is open to the general public from 6 a.m. to midnight Monday to Thursday, 6 a.m. to 2:45 a.m. Friday and Saturday, and 7 a.m. to 8 p.m. on Sunday. General fares are a flat rate of \$3.00 for adults within the city of Sun Prairie. Some trips are available outside the city limits at a charge of \$1.75 per mile. Discounts are available for seniors, people with disabilities, youths, and individuals or families that are below 50% of the Dane County median income level.

Table 10
Operating Statistics for Sun Prairie Transit, 2011

Sun Prairie Shuttle and Taxi Service	
Ridership	81,268
Driver Hours	21,563
Driver miles	242,635
Passenger Revenues	\$211,111

Sun Prairie Shuttle and Taxi receives operating assistance from the State of Wisconsin that covers about 60% of its operating expenses.

Stoughton Shared-Ride Taxi Service

Shared-ride taxi service is provided within the city of Stoughton. The service is open to the general public from 6 a.m. to 6 p.m. on weekdays, 6:30 a.m. to 5:30 p.m. on Saturday, and 8 a.m. to noon on Sunday. General fares are a flat rate of \$3.00 for adults within the city of Sun Prairie. Some trips are available outside the city limits, but special charges are assessed. Discounts are available for seniors and people with disabilities.

Table 11
Operating Statistics for Stoughton Taxi, 2011

Stoughton Taxi Service	
Ridership	36,869
Driver Hours	10,398
Driver miles	91,303
Passenger Revenues	\$103,037

Stoughton Taxi receives operating assistance from the State of Wisconsin that covers about 60% of its operating expenses.

Portage Transit

The City of Portage provides one daily peak period transit trip from Portage to the North Transfer Point in the morning, and one trip from the North Transfer Point back to Portage in the evening. The service is provided using minibuses and the fare is \$10 per round trip. Portage is outside the Madison Area Transportation Planning Board's planning area.

Specialized Transportation Services

Several programs are available throughout the Madison area and Dane County that provide specialized transit service to meet the needs of persons that are low-income, are elderly, and/or have a disability. Most of this service is administered by the Adult Community Services Division of the Dane County Department of Human Services (DCDHS), and it is accessible, routed group ride or demand-response service with specific requirements for eligibility and trip purposes. The Dane County Specialized Transportation Commission, which consists of three Dane County Board Supervisors, five citizen appointees (including appointees who represent transit providers, people with low incomes, and people with disabilities), and one Dane County Area Agency on Aging representative, oversees the operation of these programs.

Group Access Service (GAS) provides regularly scheduled weekday group trips for seniors (age 60 and older) and for persons with disabilities within the Madison, Monona, and Middleton areas. Service is provided within five senior coalition areas (East Madison/Monona, North/East Side, West Side, South Madison, and Middleton). The service operates similar to a neighborhood circulator route, connecting residential areas to nearby nutrition sites, senior adult daycare centers, shopping areas, and public libraries. Trips do not generally cross coalition area boundaries.

Within each coalition area, rides are provided each weekday to and from adult daycare in the early morning and late afternoon and to/from nutrition sites during the mid-day. Shopping trips are scheduled in the mid-morning and mid-afternoon. Currently, each area is provided with two grocery store trips, two pharmacy/discount store/public library trips, and one shopping mall trip per week. Door-to-door service is provided as well as assistance with packages. The current cash fare for GAS service is \$1 per one-way trip.

The Adult Community Services Division of DCHS manages the service, and contracts with a private provider on a per-hour basis. The current provider is Transit Solutions. Funding for GAS is provided by Metro Transit using pass-through State Urban Mass Transit Operating Assistance Program (Section 85.20) funding for service provided within Metro's service area. In addition, Dane County uses county levy and highway department funds to pay for the service. In 2011, the program provided about 21,800 one-way trips with a budget of \$336,500.

Table 12

Summary of Dane County Specialized Transportation Services		
Program Name	Eligibility	Service Type
Group Access Service (GAS)	Age 60+ or has a disability, must live in own home or apartment	Routed group service with advance reservation
Rural Senior Group Transportation Program (RSGTP)	Age 60+ or has a disability, must live in own home or apartment	Routed group service with advance reservation
Specialized Transportation Services (STS) for Adults with Disabilities	Has a disability, trip must be for medical purpose	Routed group service with advance reservation
Retired Senior Volunteer Driver Escort Program (RSVP)	Age 60+	Door-to-door service with volunteer drivers
Other Various Transportation Services	Age 60+ or has a disability	Demand response, voucher

Rural Senior Group Transportation Program

(RSGTP) provides routed group transportation service to rural adults aged 60 and over and to people with disabilities who reside outside the area where GAS operates. The Rural Senior Group Program service is generally modeled after the Madison area's GAS service, but it is organized differently in each area based upon a local determination of needs. Service is organized into eight geographic areas of the county: Northwest, North Central, Northeast, Southeast, Mid Central, South Central, Belleville/Montrose, and Southwest. Dane County contracts for service through a competitive bid process for all areas except the Northeast area, where service is provided by the Colonial Club for the elderly and people with disabilities who use Colonial Club services and other activities. Figure 14, on the following page, shows the approximate boundaries of the areas around which the service is organized and the current service providers for those areas.

Trip days and times are arranged by area senior centers or senior service organizations which work with DCHS staff and are responsible for receiving passenger reservations and cancellations. The senior center or organization then notifies the contracted provider of the passengers' schedules and requests for accessible vehicles. Door-to-door service with driver assistance is provided.

Rides are provided to nutrition sites, to senior center activities, and for shopping and selected social activities. The social and recreation trips are organized by the local senior center or organization and are not paid for with County funds. Medical trips are not provided. The fares are: \$0.50 per one-way trip for nutrition trips, \$1.00 for in-town shopping trips, and \$1.50 for out-of-town shopping trips.

In 2011, the program provided about 39,000 one-way trips with a budget of \$336,479. The program is funded through state Specialized Transportation Assistance Program for Counties (Section 85.21) funding and county levy funds. Passenger revenues and state community aids funding cover the remaining costs.

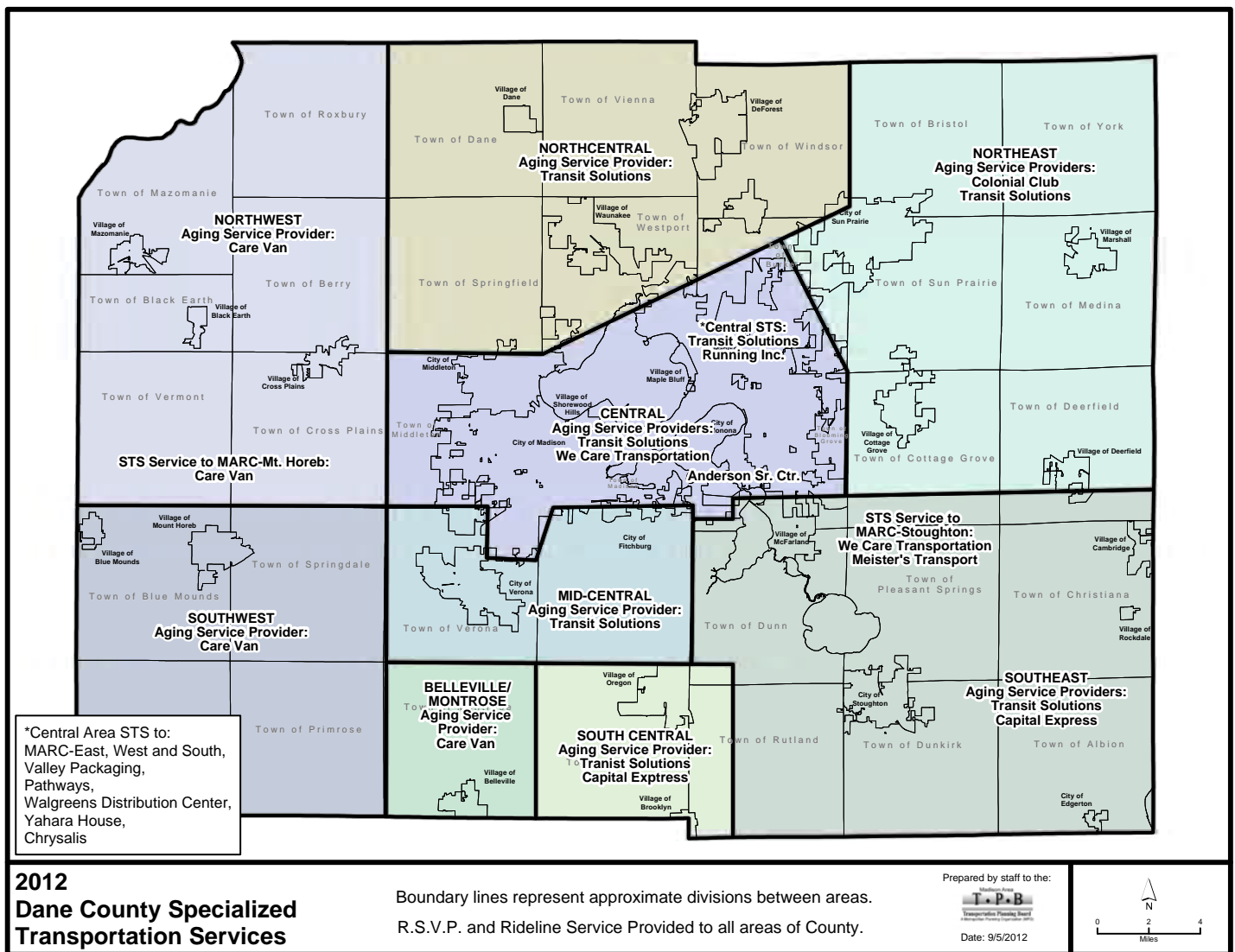
Specialized Transportation Services (STS) for

Adults with Disabilities is a group-ride program that provides specialized transportation services to people 18 years and older with developmental or mental health disabilities to specified vocational centers and work places in Madison, Stoughton, and Mt. Horeb. Along with the Dane County Rideline service, STS is designed to supplement Metro paratransit service, primarily funding rides that fall outside of the Metro paratransit service area.

Social service agencies make referrals to DCHS, which authorizes persons to use the service. Service is provided county-wide on weekdays during the day; hours vary by location. The service is door-to-door and there is currently no fare or donation.

In 2011, the program provided 84,500 one-way trips with a budget of \$1,196,500. The program is funded through state Section 85.21 funding, federal Medicaid and Medical Assistance waiver program funding, state community aids, and county levy funds.

Figure 15



Retired Senior Volunteer Driver Escort Program
(RSVP) relies strictly on volunteer drivers in private auto

mobiles to provide a transportation alternative for people aged 60 and over and for people with disabilities that do not use a wheelchair. RSVP provides door-to-door individual, and in some cases, small group rides when other options are not available. The RSVP service has become an integral part of the transportation services provided to the elderly within Dane County. In the Madison area, frail elderly people who are not eligible for Metro paratransit service especially benefit from the program.

Medical trips are prioritized, but other trip purposes such as nutrition and social services are also served. Service is generally available throughout Dane County and is largely dependent on the availability of volunteer drivers. Rides must be arranged prior to the day a ride is needed. Like many volunteer demand-response systems, this service relies on a three-day to one-week response time, but tries

to accommodate individual short-notice calls depending on origin, destination, and driver availability.

The volunteer drivers are reimbursed at a rate of \$0.50 per mile. Dane County funds the program, using federal funds (Older Americans Act and MA/COP/CIP), state Section 85.20 operating assistance passed through from Metro Transit, and additional local county levy funds. As a condition of federal funding through the Older Americans Act, donations are sought to offset the cost of service, but rides are not refused because of an individual's inability to pay. In 2011, the program provided about 86,700 one-way trips with a budget of \$335,600.

DCDHS administers several **Other Various Transportation Services** to meet the needs of people that have low incomes, are elderly, and/or have disabilities. These programs include:

- ▶ Older Adult Transportation Assistance Program (serves rural adults aged 60 and over who live in their own homes or apartments)
- ▶ Rideline (serves persons with disabilities for vocational purposes)
- ▶ Supplemental Medical Transportation Assistance Program (serves persons with medical treatments which are frequent or of long duration, or that are more than 25 miles from the patient's home)
- ▶ Caregiver Transportation Assistance Program (serves grandparents raising children in addition to people caring for older adults)
- ▶ Rural Access Program for Persons with Disabilities (provides rides via the Rural Senior Group Transportation service, but for younger persons with disabilities)

YW Transit/JobRide is a specialized transportation service provided by the YWCA. YW Transit operates from 9 p.m. to 1 a.m. each night. The service is targeted to potential victims of sexual assault and individuals in domestic violence situations. Crisis calls are prioritized, and rides are generally free. JobRide operates 24 hours per day and provides rides for low-income people to and from work where other transit options are not available. Although JobRide uses vans and attempts to organize group rides, many individual trips are made. JobRide is partially funded through the Wisconsin Department of Transportation's Wisconsin Employment Transportation Assistance Program (WETAP), which uses federal Job Access and Reverse Commute (JARC) funds. In 2011, JobRide provided about 17,100 one-way trips.

In 2011, these programs combined provided 900 one-way trips with a budget of \$15,200. The programs are funded through state Section 85.21 funding, Federal Medicaid and Medical Assistance waiver program funding, state community aids, and county levy funds.

In addition to City of Madison and Dane County transportation services, various other transportation services exist through non-profit organizations and other program-specific transportation services. Most are targeted at specific low-income populations, elderly people, and people seeking medical treatment. Examples of other transportation service providers include the YWCA (YW Transit and JobRide) and the American Cancer Society (Road to Recovery).

SECTION 3 - Metro Transit System Characteristics and Performance ▶▶▶▶

Introduction

This Transit Development Plan (TDP) takes a data driven approach to combine medium-term planning recommendations with analysis. Serving the vast majority of transit trips in the region, Metro Transit's system characteristics and performance were analyzed with the intention of providing needed information to make data-driven recommendations in Section 4 – Transit Development Plan. Metro regularly monitors the performance of its transit system with monthly route productivity comparisons as well as operating statistics, manual load counts, audits, National Transit Database (NTD) reporting, and other regular or special analysis. The analysis for this TDP goes into greater depth for a specific period of time to further understand how the interconnected parts of the system are performing.

Throughout this section, diametrical routes such as Route 2 are broken into their components on each side of the Madison CBD. For instance, Route 2 consists of a west component from the Madison CBD to the West Transfer Point, and a north component from the Madison CBD to the North Transfer Point. The dividing line is just west of the Capitol Square.

The system performance section of the TDP is divided into two main components: (1) service and (2) ridership.

The first six sections describe the characteristics of transit service, i.e., the frequency, span, coverage, and other basic attributes. For Metro Transit, this data was derived from several sources: the Ride Guide and system map, the GTFS file (version 52), NTD reports, and other historical documents, including past TDPs.

The last five sections describe the performance of the transit systems, particularly ridership and productivity. Ridership data was obtained from a sample of Metro fare box transactions in October 2011.

Methodology and Data Processing for Route Segment and Stop-Level Ridership Estimation

Metro Transit supplied the MPO with weekday fare box boarding data for six weeks in 2011 between September 12 and October 21. This data set consisted of each fare box transaction, including service date, bus number, time, latitude, longitude, block, route, direction, and fare type. The following ridership and route productivity analysis uses the Tuesday through Thursday, Saturday, and Sunday data for the first three weeks in October from this data set. Monday and Friday were removed because riders are more likely to use those days for vacation. In addition, the supplemental school ridership data was removed and was not analyzed for the TDP.

Date Range for the Boarding Data Analysis

October 2011						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Blue – Weekday
Green – Saturday
Purple – Sunday

As of fall 2011, about 10% of Metro's fleet is estimated to have had a malfunctioning connection between the automatic vehicle location (AVL) system and the fare box. As a result, these buses recorded a single erroneous location for every boarding throughout the day. Fortunately, the AVL log was available independently with one-minute time stamps, and the correct boarding locations were retroactively assigned for these buses.

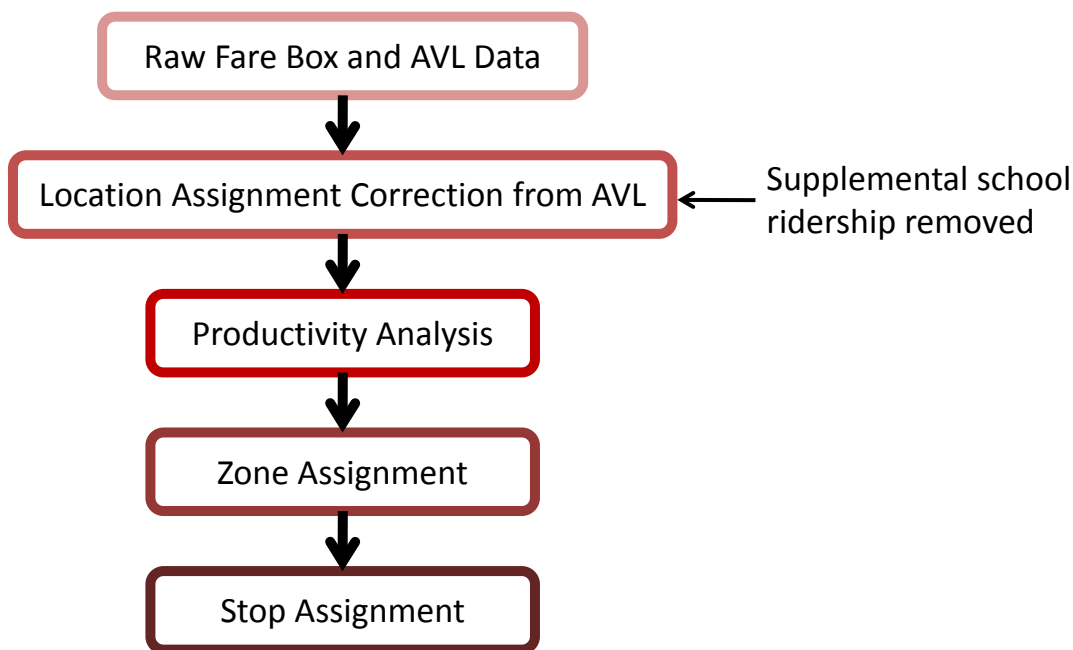
The fare box boarding data is a very complete record for the time period collected. One weakness of the data, however, is that the boarding times appear to be somewhat approximate. That is, while the locations of the data points are relatively close to the transit route, they appear to be scattered along the line rather than clustered at stops. This is likely the result of passengers boarding the bus and processing their fare as the bus is in motion, as well as the margin of error of the system. Another weakness is that boardings on fare-free routes (i.e., routes 80-85) are processed as "free rides" by operators pushing a button each time a passenger boards. It is well known that campus

routes, especially Route 80, have a tendency to become very overcrowded and chaotic, making it difficult for drivers to count riders. As a result, it is assumed that the data for campus routes is not as accurate as the rest of the data.

Once accurate boarding locations were obtained, they were further processed and assigned to zones and bus stops. Each boarding was assigned to a CBD, transfer point, or route zone. CBD boardings are estimated to occur within the UW campus, State Street, or Capitol Square area. This information is useful to determine overall trends about whether ridership is based downtown, at transfer points, or somewhere along the route. The most likely bus stop where the boarding occurred is the closest eligible stop based on the recorded route number and direction.

Alighting data is not available. Metro acquired some Automatic Passenger Counters (APCs) in 2003 that were intended to provide this information. However, the quality and reliability of the data was unsatisfactory and the devices are not currently in use.

Metro Boarding Data Processing Steps



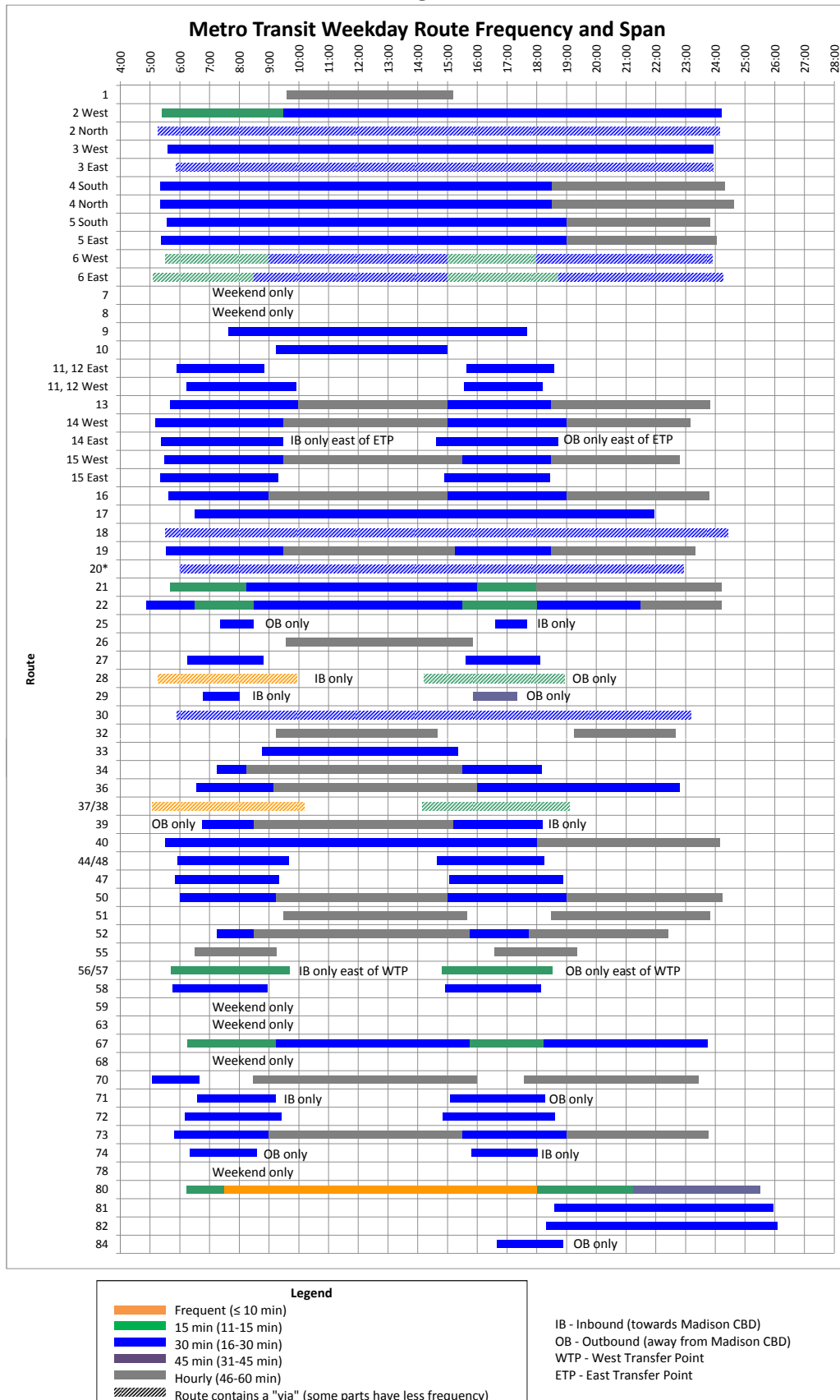
Transit Service Levels

Metro's service generally consists of routes with 30- to 60-minute headways with the exception of a small number of routes with 15-minute peak period service. Each route has predominately 30-minute service during peak periods, and evening/weekend service is mostly hourly, with a mix of 30- and 60-minute routes during the mid-day. Because of Madison's geography, many routes converge along

shared radial corridors through the central area. In these locations – University Avenue, Johnson and Gorham Street, East Washington Avenue, Jenifer Street, and others – service levels are substantially higher.

Figures 16 and 17 show the frequency and span of service for the weekday and Saturday routes, while Figures 18-20 show the total number of buses per hour on the transit network during weekday, mid-day and peak periods, and on weekends.

Figure 16



Note: Diametrical routes that travel through the Madison CBD are split into their east, west, north, and south components.

Figure 17

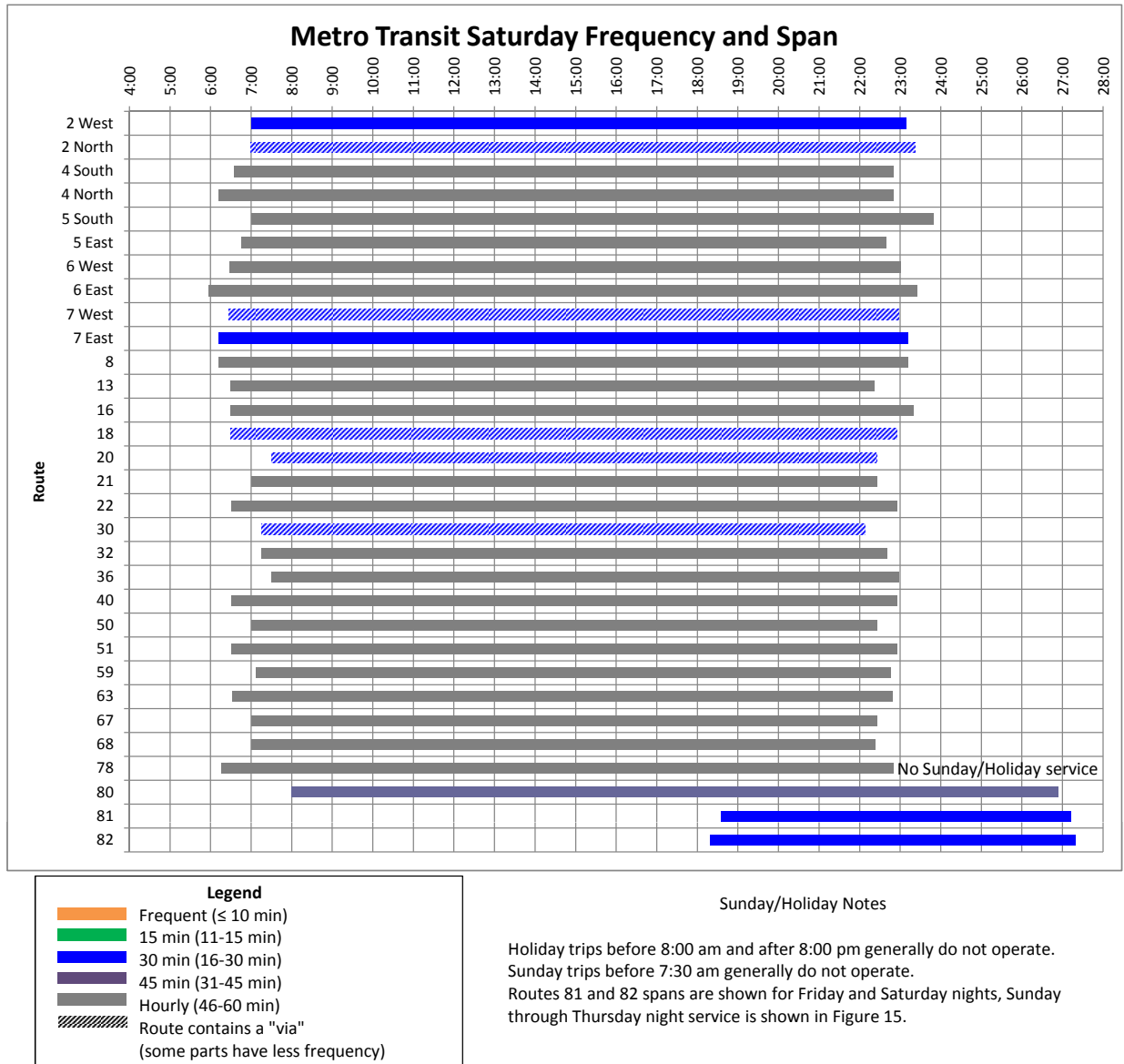
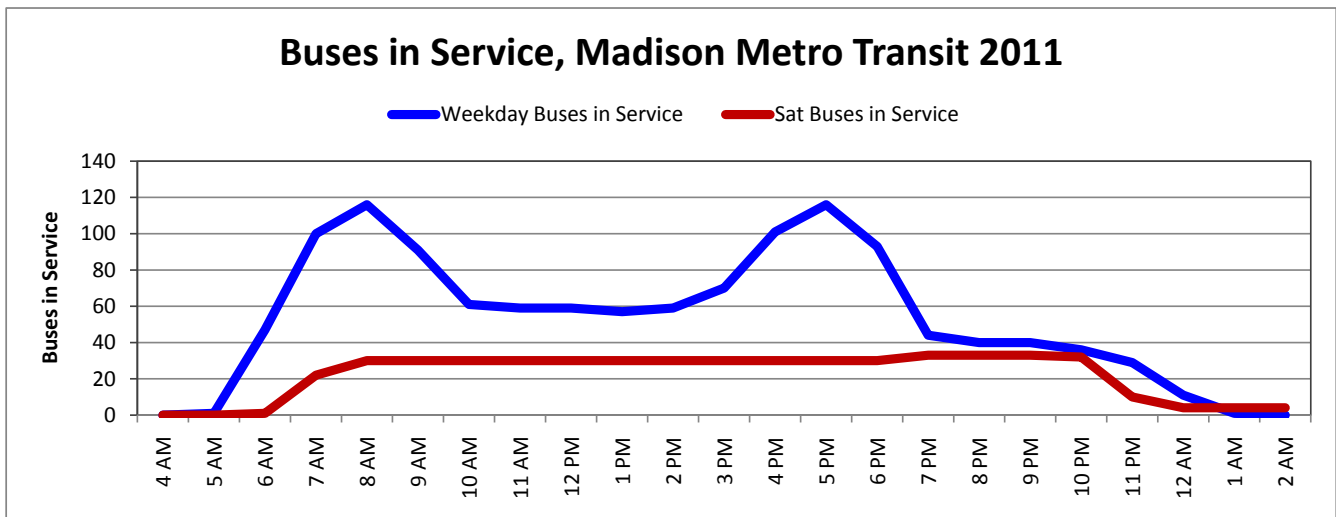
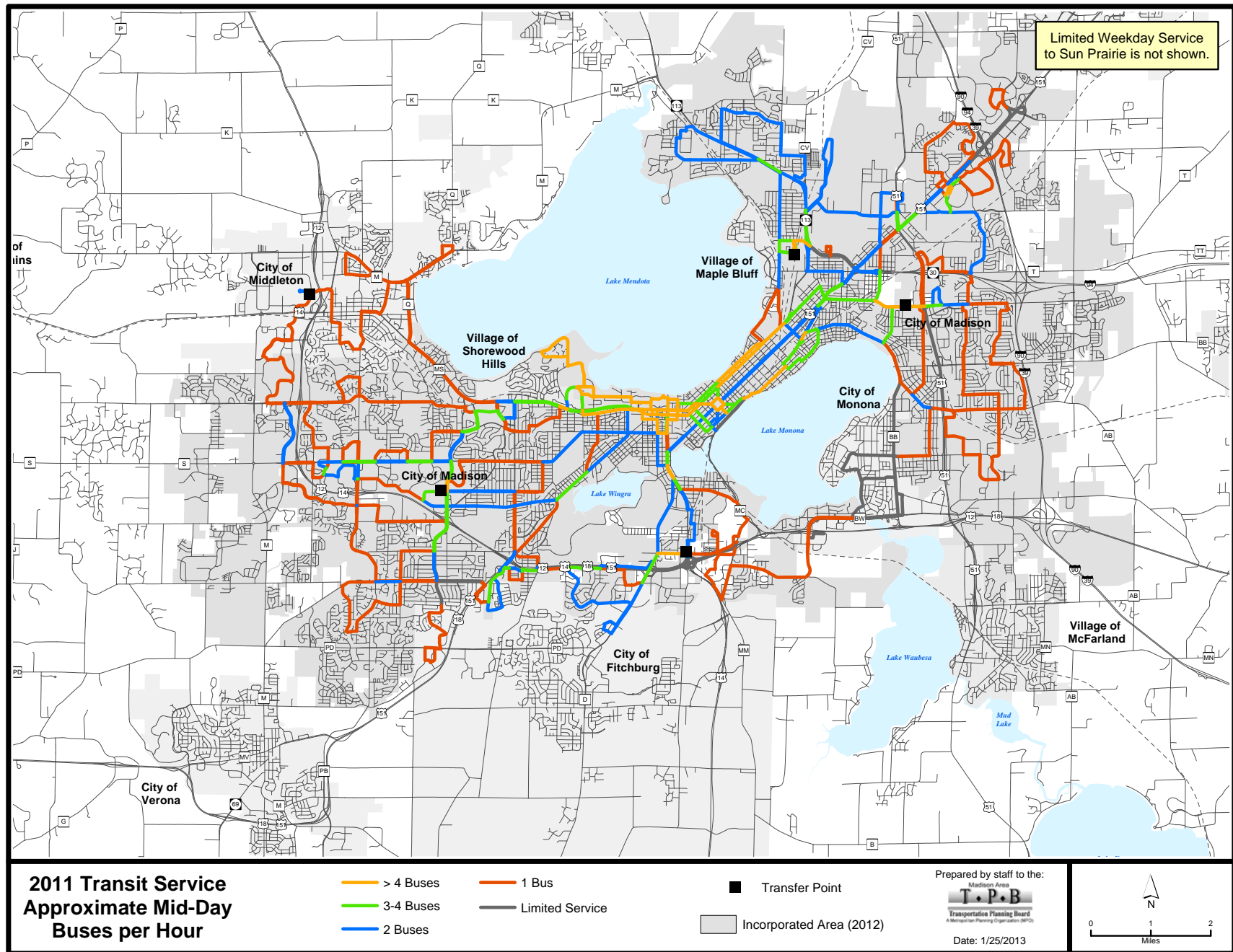


Figure 18



Notes: Buses in service when UW-Madison is in session. Supplemental School Service and Extra Buses are excluded.

Figure 19

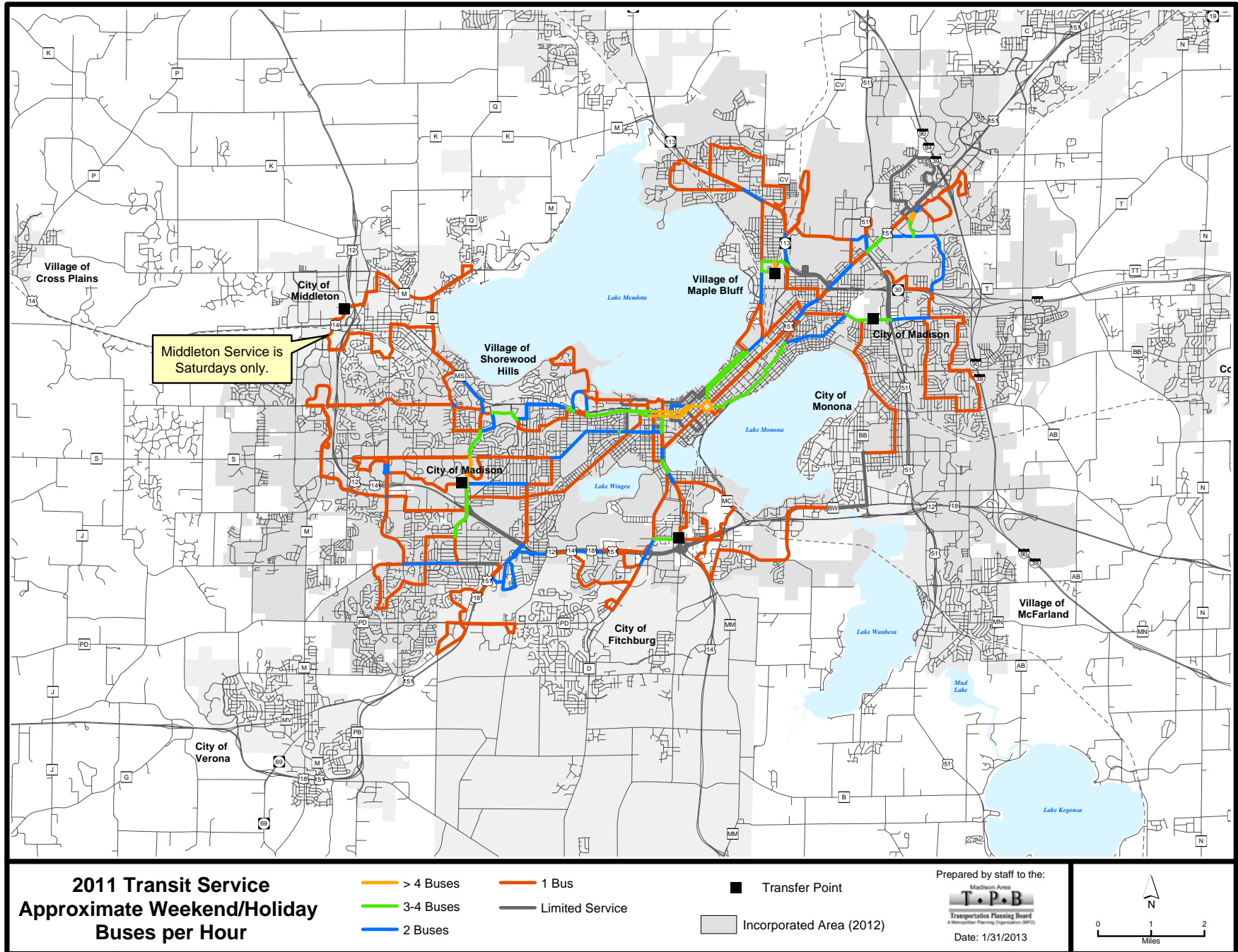


Note: Includes Metro Transit and Monona Transit Service.

[illegible]

Note: Includes Metro Transit and Monona Transit Service.

Figure 21



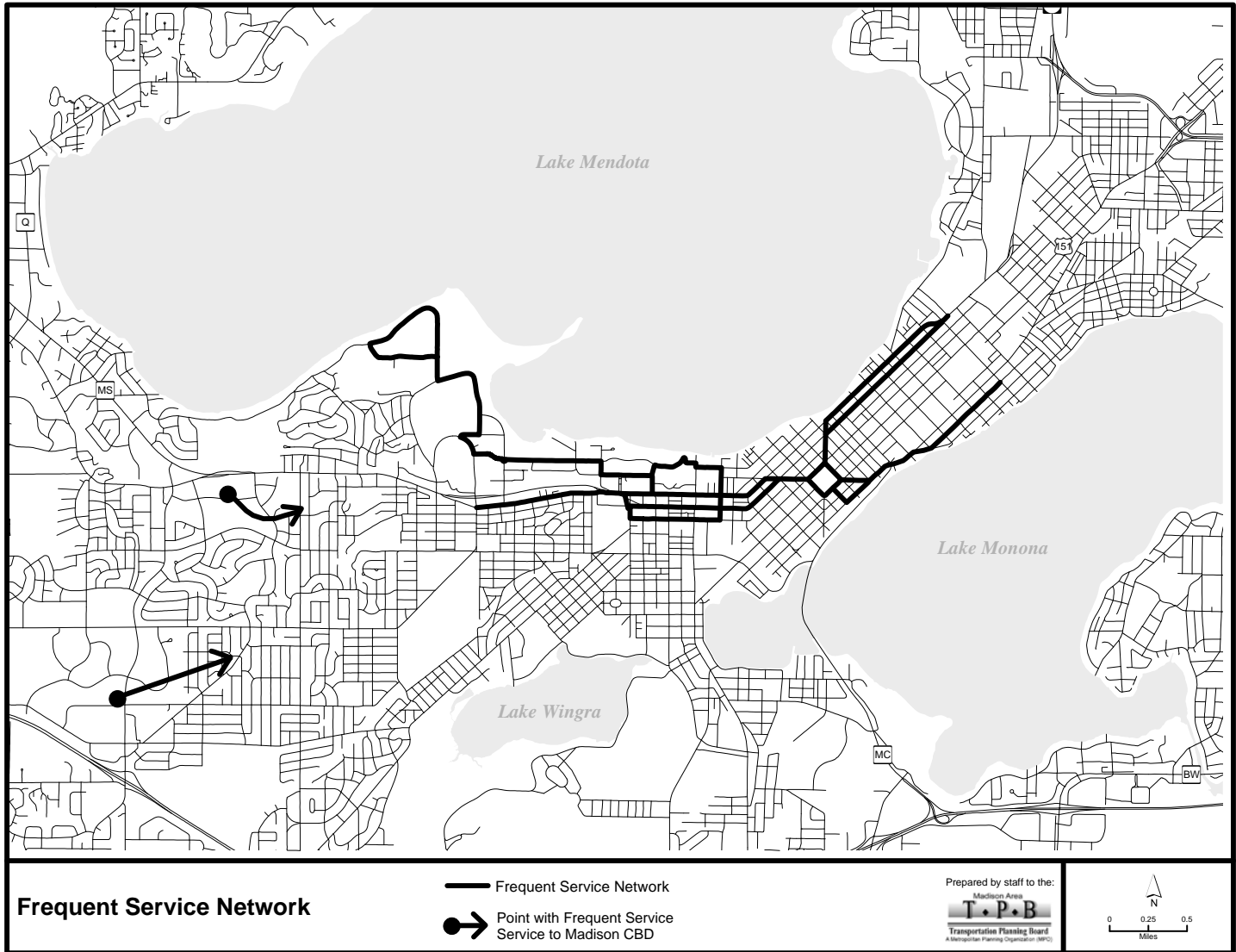
Note: Includes Metro Transit Service. There is no Monona Transit Service on weekends.

Metro employs about 168 buses per hour during the peak period when the University of Wisconsin-Madison (UW) is in session, of which about 116 are used in regular fixed route service. The remaining 52 buses are used for Supplemental School Service and Extra Buses (that is, special, scheduled overflow trips to manage overcrowding). During the weekday mid-day, 59 buses are in service, resulting in a peak-to-base ratio of 1.97, excluding Supplemental School Service and Extra Buses and 2.85 overall. Weekday evening service drops to 40 buses at about 7:30 pm. A total of 30 and 29 buses are in service on Saturdays and Sundays/holidays respectively, until about 6:30 pm when Routes 81 and 82 increase the service level to 33 and 32 buses. Route headways are identical on Saturdays and Sundays with the exception of Route 78, which is Saturday-only.

Service provided with at most 15-minute headways throughout the day is important for many choice transit riders since the short headways allow for reliable trips; a long wait of 20, 30, or more minutes is unacceptable for many individuals making trips outside peak periods when other transportation modes available. Additionally, some riders feel comfortable using the system without detailed schedule information when long waits of more than 15 minutes are not possible.



Figure 22



Frequent Service Network

The Frequent Service Network is defined as a corridor that has regular headways of 15 minutes or less throughout the weekday morning, mid-day, and afternoon/early evening peak period, and service is provided by no more than three routes. Ideally, this high level of service would extend to evenings and weekends. However, this standard would eliminate almost the entire 15-minute service network. The headways must be regular: some areas have four or more buses per hour, as seen in Figures 16 and 17, but the bus trips are not evenly distributed. Therefore, these areas are not included in the Frequent Service Network.

Figure 23 shows the current frequent service network in central Madison with 15-minute or better frequency throughout the weekday peak and mid-day periods. It includes the August 2012 service change, which combined routes 80 and 85 and resulted in the loss of frequent service on Spring, Regent, and Park Streets.

Frequent service is provided by routes 2, 5, 9, and 10 on Johnson and Gorham streets and routes 3, 4, and 10 on Jenifer Street. To provide evenly spaced headways on these corridors, the East Transfer Point has an “offset pulse.” While the North, South, and West transfer points pulse at 0 and 30 minutes after the hour, the East Transfer Point pulses at 15 and 45 minutes after the hour.

University Avenue between Highland Avenue and Breese Terrace is served by all-day routes 2, 9, and 19. Just to the west, the high ridership area along Sheboygan Avenue (Hill Farms) is served by all-day routes 2, 14, and 15. This combination of routes diverges west of Whitney Way and east of Segoe Road, but provides frequent service from the Hill Farms area to central Madison.

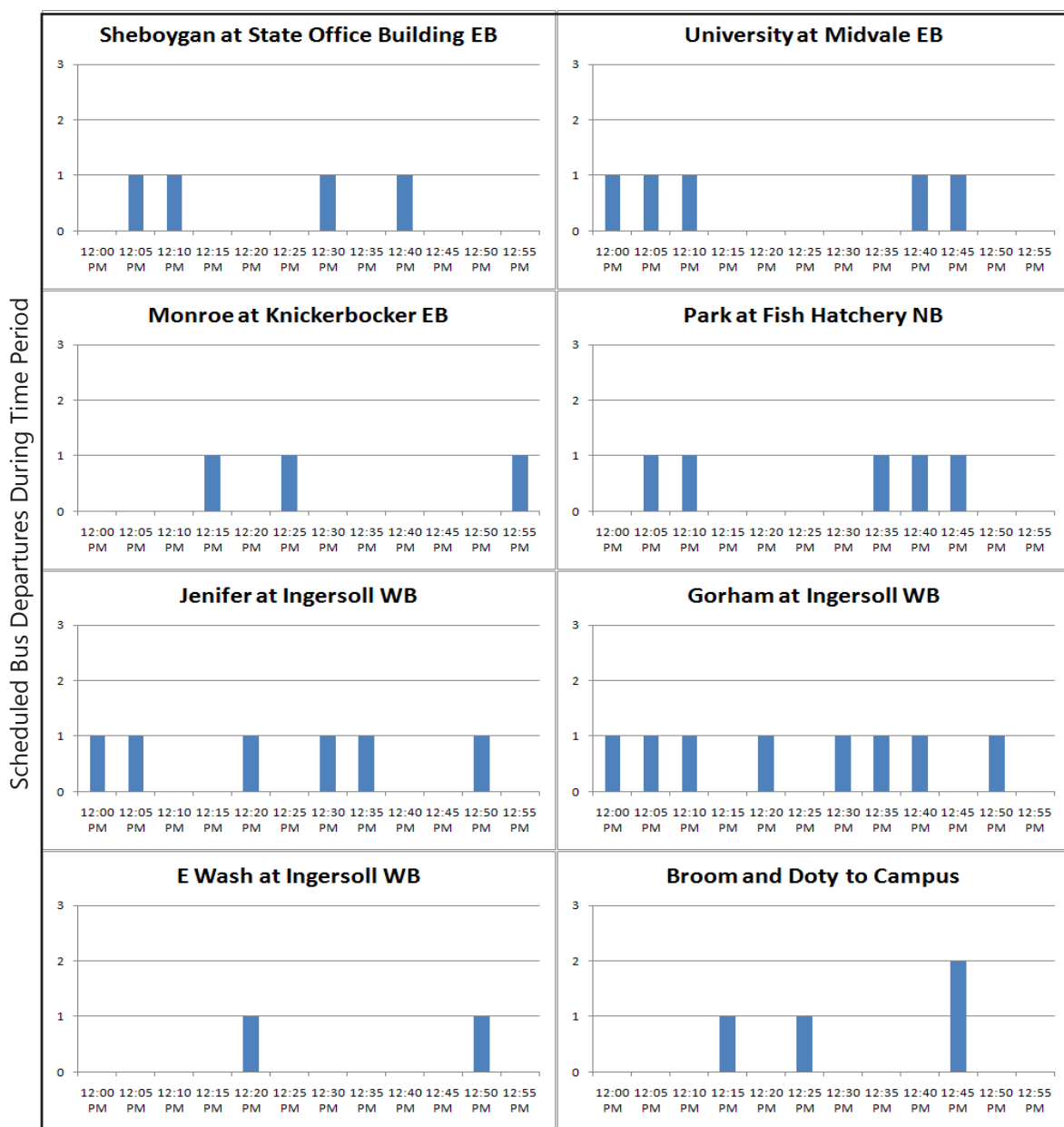
Schedule Distribution

Figure 23 shows the distribution of scheduled bus service at several key locations located along Madison's major transit arteries during the weekday mid-day. Some bus clumping is inevitable because of various different routes overlapping on the corridors. However, there are few instances where two buses are scheduled to arrive within five minutes of each other.

Two major challenges exist to distributing bus arrival times more evenly on corridors shared by several routes. First, timed transfers at the transfer points require that all routes

serving them arrive in pulses every 30 to 60 minutes to meet peripheral routes without forcing waiting times for transfers of 15 minutes or more. For instance, Routes 4, 5, and 13 all leave the South Transfer Point at 30 minutes past the hour; as a result, there is a clump of arrival times on Park Street at Fish Hatchery Road between 5 and 15 minutes later. Second, several routes share more than one corridor, so adjusting a schedule on a route to optimize one corridor may result in worse clumping on another corridor.

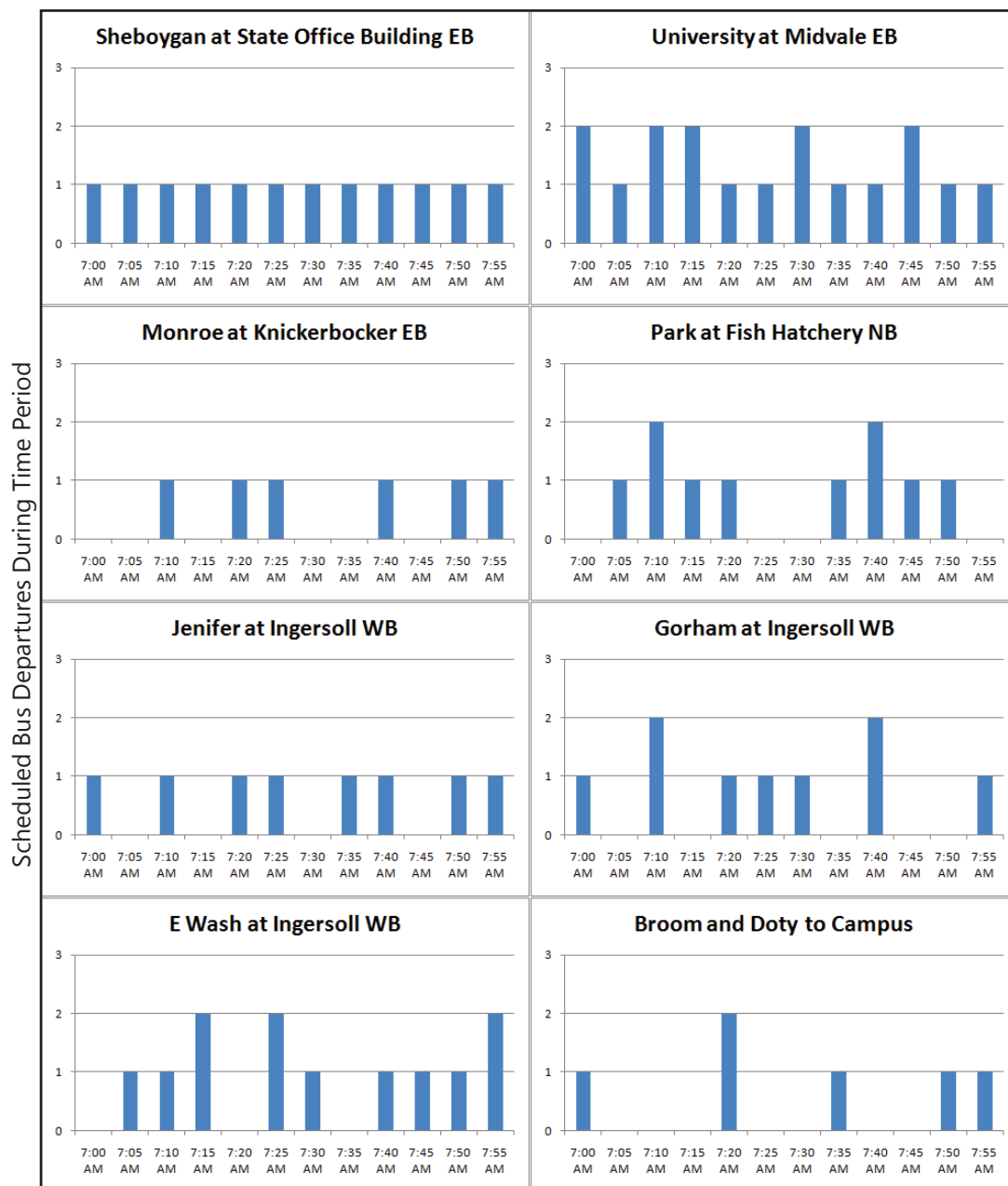
Figure 23
Bus Schedule Distribution for Selected Locations During the Mid-day Period



Note: Extra Buses and Supplemental School Service are shown.

Figure 24 shows the distribution of scheduled bus service at several key locations along Madison's major transit arteries during the weekday morning peak period from 7 to 8 AM. Scheduled bus arrivals at other locations are also relatively evenly spaced throughout the hour.

Figure 24
Bus Schedule Distribution for Selected Locations During the Morning Peak Period

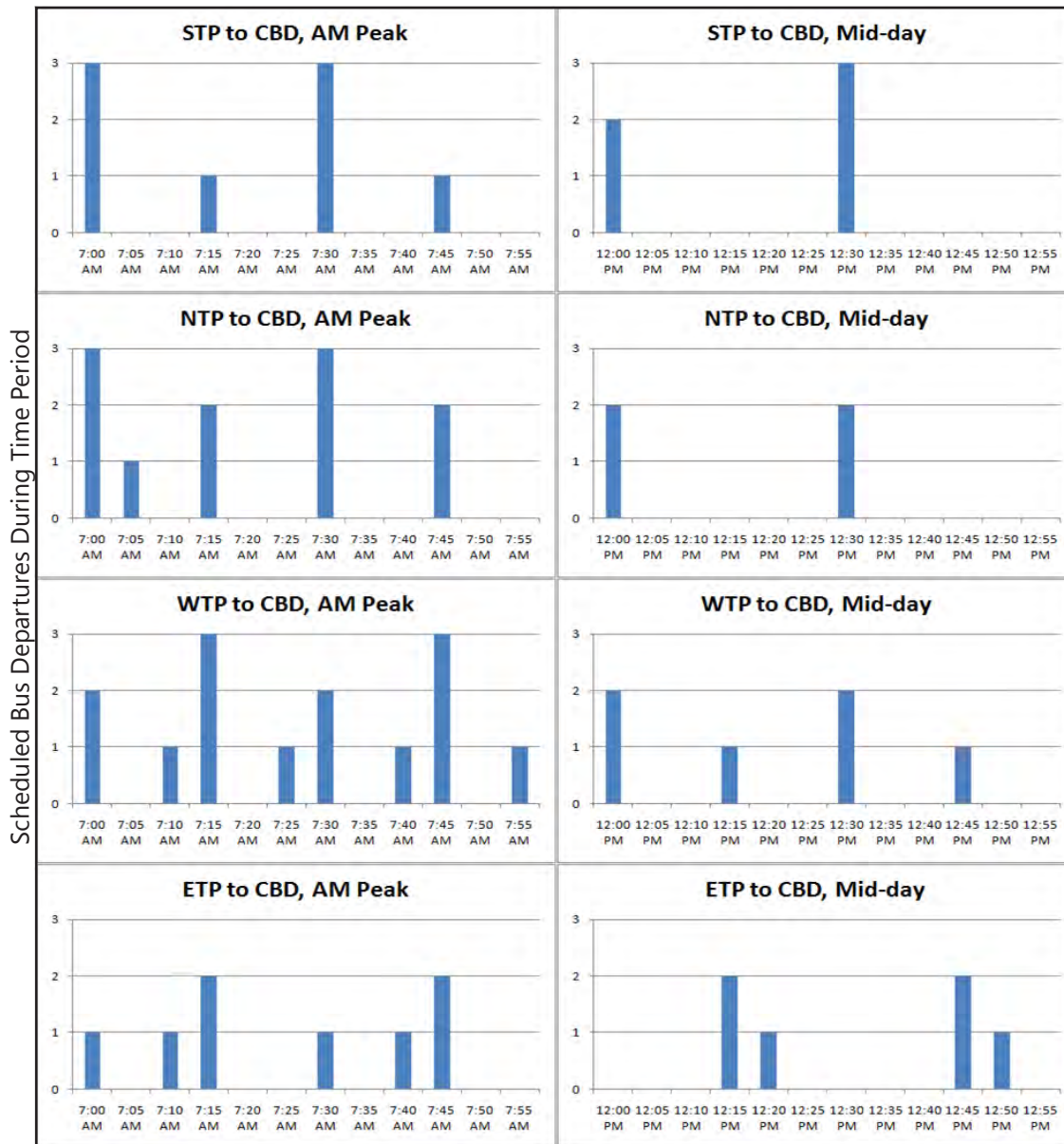


Note: Extra Buses and Supplemental School Service are shown.

The transfer points, in contrast, show substantial duplication of trips from the transfer point to the Madison CBD. Figure 25 illustrates this. The duplication is necessary because of the pulse transfer system designed to coordinate these trips with connecting peripheral service. To some degree, supplemental commuter service is designed to fill

in the gaps between pulses at the transfer points. Besides creating lower effective headways between the transfer points and the CBD, this technique maximizes the availability of limited bus stalls at the transfer points and, in some cases, is used to meter passenger volumes onto routes with available capacity.

Figure 25
Bus Schedule Distribution for the South, North, West, and East Transfer Points



Note: Extra Buses and Supplemental School Service are shown.

Transit Travel Times

Like most transit systems, travel times to points around Madison are generally longer by transit than by auto, and more so considering the wait time associated with using transit. Average travel times from the Capitol Square to several points around the Madison area were calculated for the afternoon peak period as well as the weekday mid-day period. The transit travel times were calculated using a weighted average of scheduled trip times for a representative half-hour or hour that included all desirable possible trips and their associated average wait times. Wait times are considered to be one-half the total wait time, assuming riders arrive randomly. Auto travel times were calculated using Google Maps driving directions avoiding freeways. Figures 26 and 27 and Table 11 show these travel times.

Travel times during the peaks are generally lower because of the overlay peak-only routes that provide higher frequency, more direct service, and in some cases, fewer stops. Travel times, not including the wait time, are gener-

ally 1.5 to 2.5 times longer by transit than by auto. Points in peripheral areas that require riders to travel through transfer points (West Towne Mall, Raymond Road at Prairie Road, Caddis Bend, the Richmond Hill area, Dane County Airport, and Warner Park) have particularly high mid-day travel times compared to auto times.

Transit travel times are influenced by several factors, including frequency, route directness, stop spacing, traffic signal timing, traffic congestion, ridership levels, and the volume of passengers using strollers, wheelchairs, and other devices. To account for running time variability and uneven travel times between transfer points some trips have longer waits at time points than others.

Figure 26 shows travel times from the Capitol Square to various points within Metro's service area. These values include the fastest possible time with no wait, the longest possible trip with maximum wait, and the average total trip time (including wait). Numerical values are shown in Table 11.

Figure 26

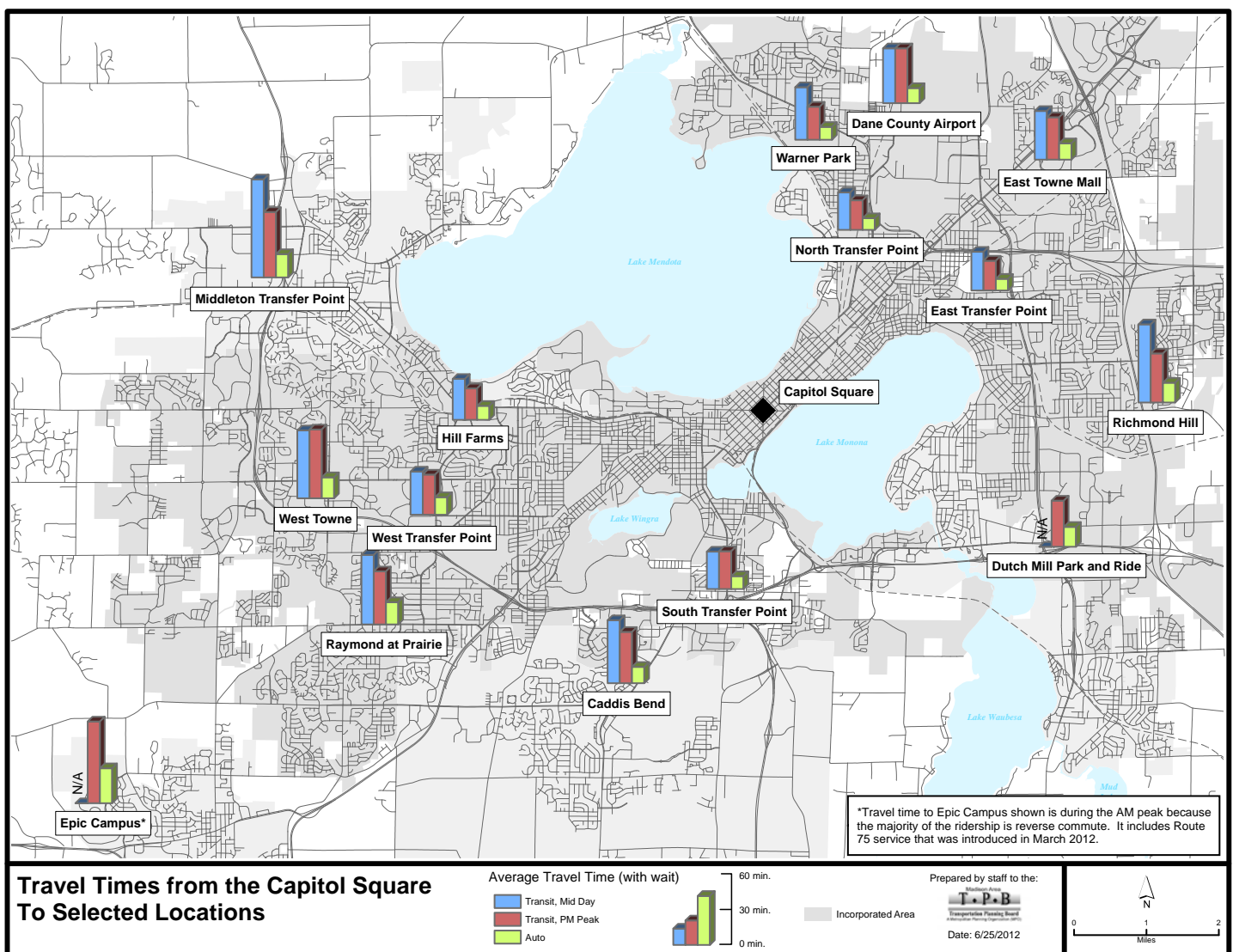


Figure 27

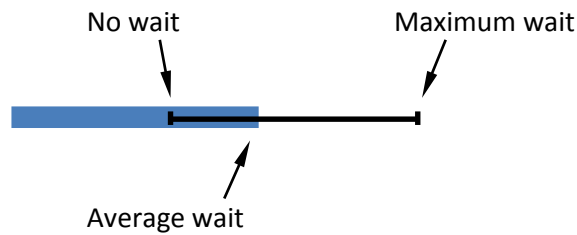
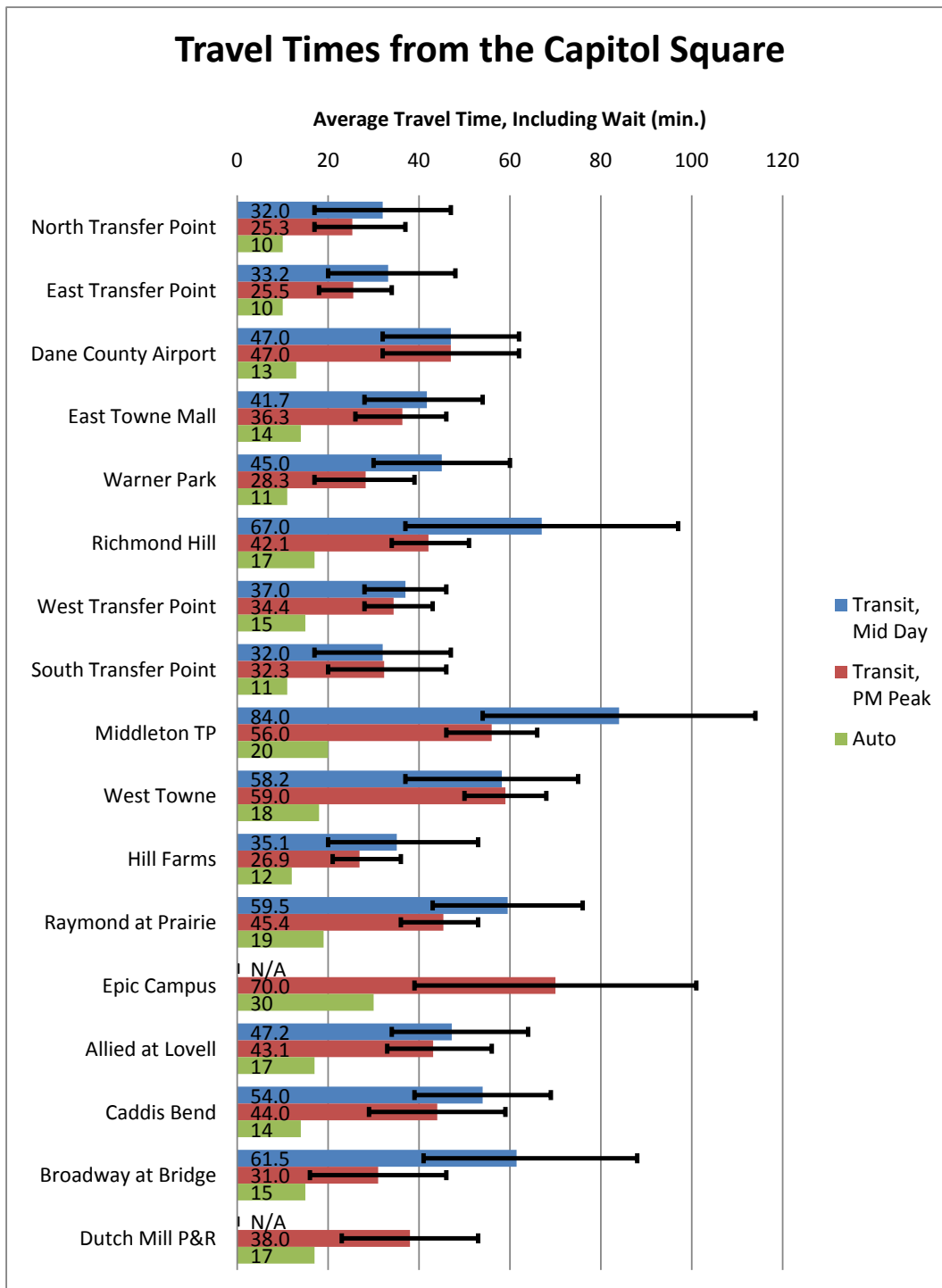


Table 13
Travel Times From the Capitol Square to Various Points Within Metro's Service Area

Capitol Square To:	Travel Time in Minutes							Ratio Mid-Day	Ratio PM Peak
	Mid-Day		Weighted Average	PM Peak		Weighted Average	Auto		
	Min	Max		Min	Max				
North Transfer Point	17.0	47.0	32.0	17.0	37.0	25.3	10	3.2	2.5
East Transfer Point	20.0	48.0	33.2	18.0	34.0	25.5	10	3.3	2.6
Dane County Airport	32.0	62.0	47.0	32.0	62.0	47.0	13	3.6	3.6
East Towne Mall	28.0	54.0	41.7	26.0	46.0	36.3	14	3.0	2.6
Warner Park	30.0	60.0	45.0	17.0	39.0	28.3	11	4.1	2.6
Richmond Hill	37.0	97.0	67.0	34.0	51.0	42.1	17	3.9	2.5
West Transfer Point	28.0	46.0	37.0	28.0	43.0	34.4	15	2.5	2.3
South Transfer Point	17.0	47.0	32.0	20.0	46.0	32.3	11	2.9	2.9
Middleton TP	54.0	114.0	84.0	46.0	66.0	56.0	20	4.2	2.8
West Towne	37.0	75.0	58.2	50.0	68.0	59.0	18	3.2	3.3
Hill Farms	20.0	53.0	35.1	21.0	36.0	26.9	12	2.9	2.2
Raymond at Prairie	43.0	76.0	59.5	36.0	53.0	45.4	19	3.1	2.4
Epic Campus	---	---	N/A	39.0	101.0	70.0	30	--	2.3
Allied at Lovell	34.0	64.0	47.2	33.0	56.0	43.1	17	2.8	2.5
Caddis Bend	39.0	69.0	54.0	29.0	59.0	44.0	14	3.9	3.1
Broadway at Bridge	41.0	88.0	61.5	16.0	46.0	31.0	15	4.1	2.1
Dutch Mill P&R	---	---	N/A	23.0	53.0	38.0	17	N/A	2.2

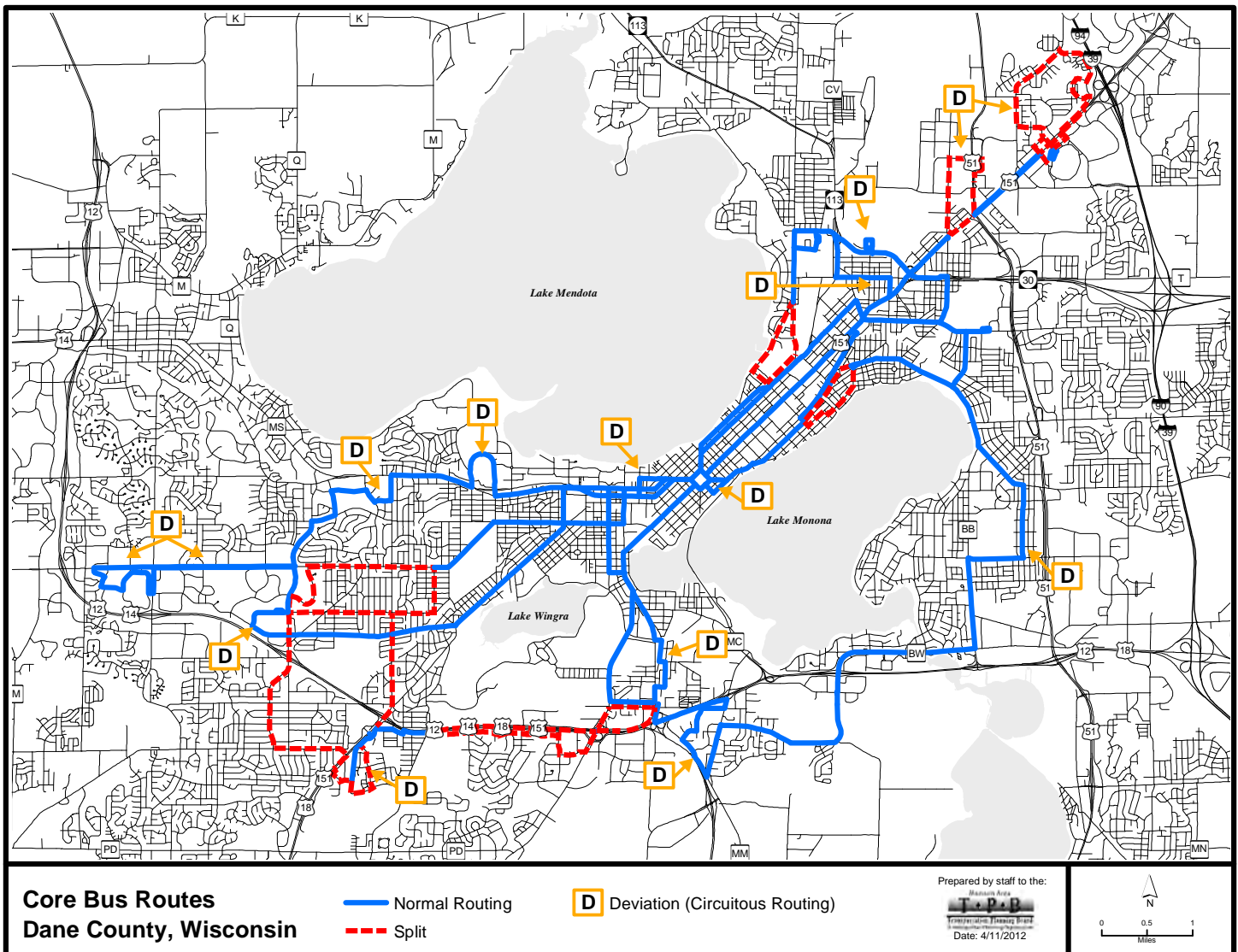
Route Directness and Simplicity

Transit route directness has a large impact on travel times. Deviations (transit route segments that depart the main transit corridor and then return to the corridor) result in delay for passengers who are not using the stops along the deviation. Route splits or “vias” (transit route segments where alternating trips serve one of two or more possible patterns) generally do not increase end-to-end travel time, but they are confusing for riders and reduce the effective frequency where the route is split. Generally, route devia-

tions and splits have been minimized by Metro to reduce travel time and confusion, but many exist to provide area coverage and sufficient service to activity centers.

The core routes are shown below in Figure 28, which highlights the route splits and deviations. Routes 2, 3/7, 6, and 18 all contain splits. All of these routes have 30-minute all-day frequency or better to maintain a minimum frequency of one bus per hour throughout the route. Peripheral, circulator, and commuter routes may also contain splits and deviations.

Figure 28





Bus stop spacing — the distance between bus stops — involves a trade-off between area coverage with convenient pedestrian access to transit and the speed/reliability of the transit service. Bus stops placed excessively close together may result in a higher number of starts and stops that increase travel time; however, bus stops that are spread too far apart may increase the walking distance or reduce the ¼-mile coverage area of the transit system.

Several transit corridors in central Madison and peripheral Madison shown in Figure 29 were analyzed to determine the general characteristics of bus stop spacing in the Metro Transit service area. The central Madison corridors consist of a variety of higher speed urban arterials (East Washington Avenue, Park Street, and University Avenue) and lower speed streets (Jenifer Street, Johnson/Gorham streets, Mills Street, and Monroe Street). Madison's geography is relatively free of bridges, open space, steep topography, and other features that would necessitate more closely or widely spaced stops that would influence this analysis.

Bus Stops and Amenities

Metro has about 2,000 bus stops throughout the service area. About half of the stops are near-side (buses stop before they pass through an intersection) and about half are far-side (buses stop after they pass through an intersection), with about 300 stops located mid block or within an intersection. The bus stops within central Madison are more likely to be near-side than are bus stops within the peripheral service area. As described in Section 2, 193 bus stops are equipped with shelters.

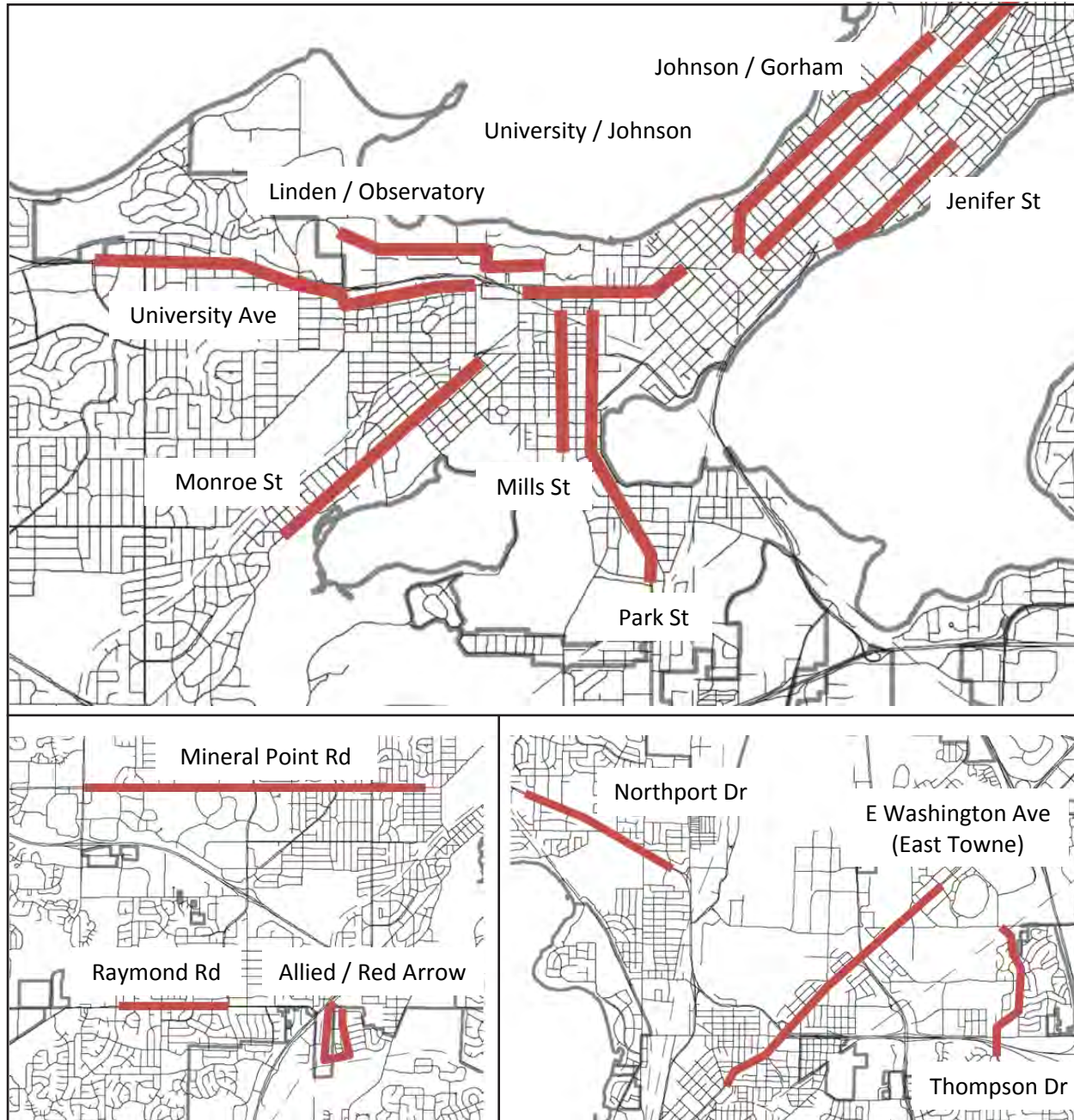
Table 14
Number and Location of Metro Bus Stops

Location	Number
Far Side	931
Near Side	808
Other	297
Total	2,036



Corridors in Central Madison and Peripheral Madison Analyzed for Bus Stop Spacing

E Washington Ave
(Isthmus)



In general, the higher speed roadways in central Madison have a longer average stop spacing (0.14 to 0.18 miles) than do lower speed roadways (0.10 to 0.12 miles). Exceptions occur at Linden Drive and Observatory Drive – the routing for part of Route 80 – where stops are 0.15 miles apart, on average. The peripheral corridors, which are mostly higher speed roadways, generally have a longer

average stop spacing (0.14 to 0.20 miles) than the central corridors. Unsurprisingly, central Madison corridors generally have a higher average number of boardings per stop: 16 to 90 average boardings per weekday (excluding the Madison CBD and UW Campus) compared to 12 to 27 on peripheral corridors.

Table 15
Bus Stop Spacing Analysis

Corridor	From	To	Avg Weekday Boarding Per Stop	Total Distance (miles)	Number of Stops	Average Spacing (miles)
Central Madison						
University / Johnson	Randall	State	425	1.99	16	0.12
Linden / Observatory	Charter	University Bay	316	2.63	18	0.15
E Washington Ave (Isthmus)	Webster	Milwaukee	37	4.73	27	0.18
Johnson / Gorham	Cap Sq	First	67	3.47	28	0.12
Jenifer St	Baldwin	Blount	27	1.49	15	0.10
Park St	University	Wingra	78	2.58	18	0.14
Mills St	University	Erin	33	1.74	15	0.12
Monroe St	Breese	Glenway	16	3.04	25	0.12
University Ave	Breese	Segoe	90	2.98	21	0.14
Peripheral Madison						
Mineral Point Rd	Gammon	Toepfer	12	5.99	30	0.20
Allied / Red Arrow	Thurston	Thurston	18	2.50	18	0.14
Raymond Rd	Whitney	McKenna	16	1.99	12	0.17
Northport Dr	Packers	Kennedy	23	3.05	16	0.19
E Washington Ave (East Towne)	Milwaukee	Eagan	27	5.33	27	0.20
Thompson Dr	Swanton	Lien	10	2.73	18	0.15

Figure 30

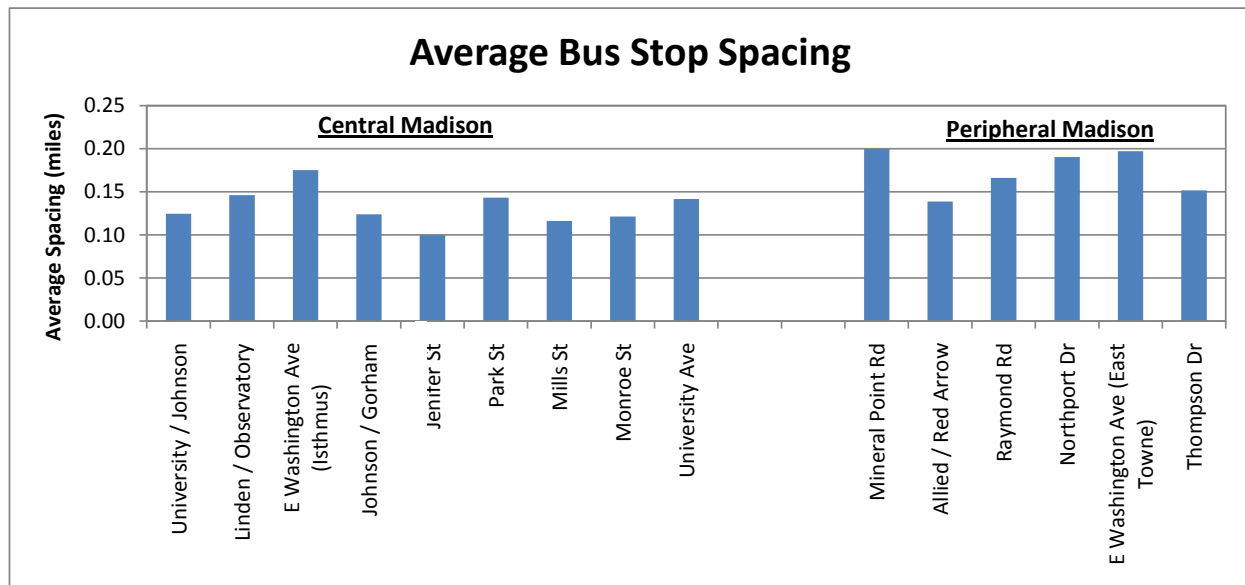
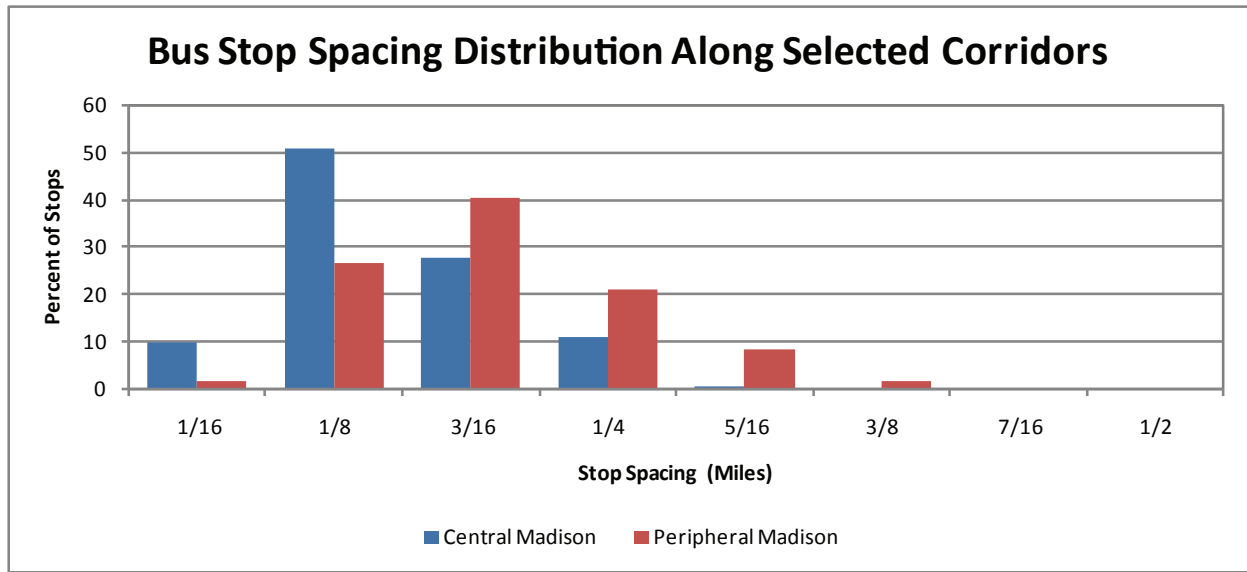


Table 13 and Figure 30 show the average bus stop spacing and boardings per stop for the different corridors. Figure 30 shows the bus stop spacing distribution in 1/16-mile increments for the selected corridors in the central and peripheral areas. Both central and peripheral areas have a relatively normal distribution of bus stop spacing with

few outliers. In the central Madison area corridors (shown in blue), about 50% of bus stops are about 1/8 mile apart. The majority of the rest are 3/16- to 1/4 -mile apart, with a few closer together. In the peripheral Madison corridors, bus stops are a little further apart on average, with 40% being about 3/16-mile apart.

Figure 31



The bus stop spacing distribution for each corridor is shown on the following pages in Figures 32 and 33. Monroe Street, Jenifer Street, and Johnson and Gorham Streets have the closest spaced stops where the vast majority of stops are 1/8-mile apart, with some even closer. The major arterial streets have a slightly longer stop spacing. On University Avenue, most stops are 3/16-mile apart; Park Street has a mixture of 1/8-mile and 1/4 -mile spacings. Figure 34 on page 3-23 shows the location of stops in the central area with 1/4 mile buffers. It highlights the overlap in service coverage with the closely spaced stops.



Figure 32
Bus Stop Spacing Distribution for Central Madison Corridors

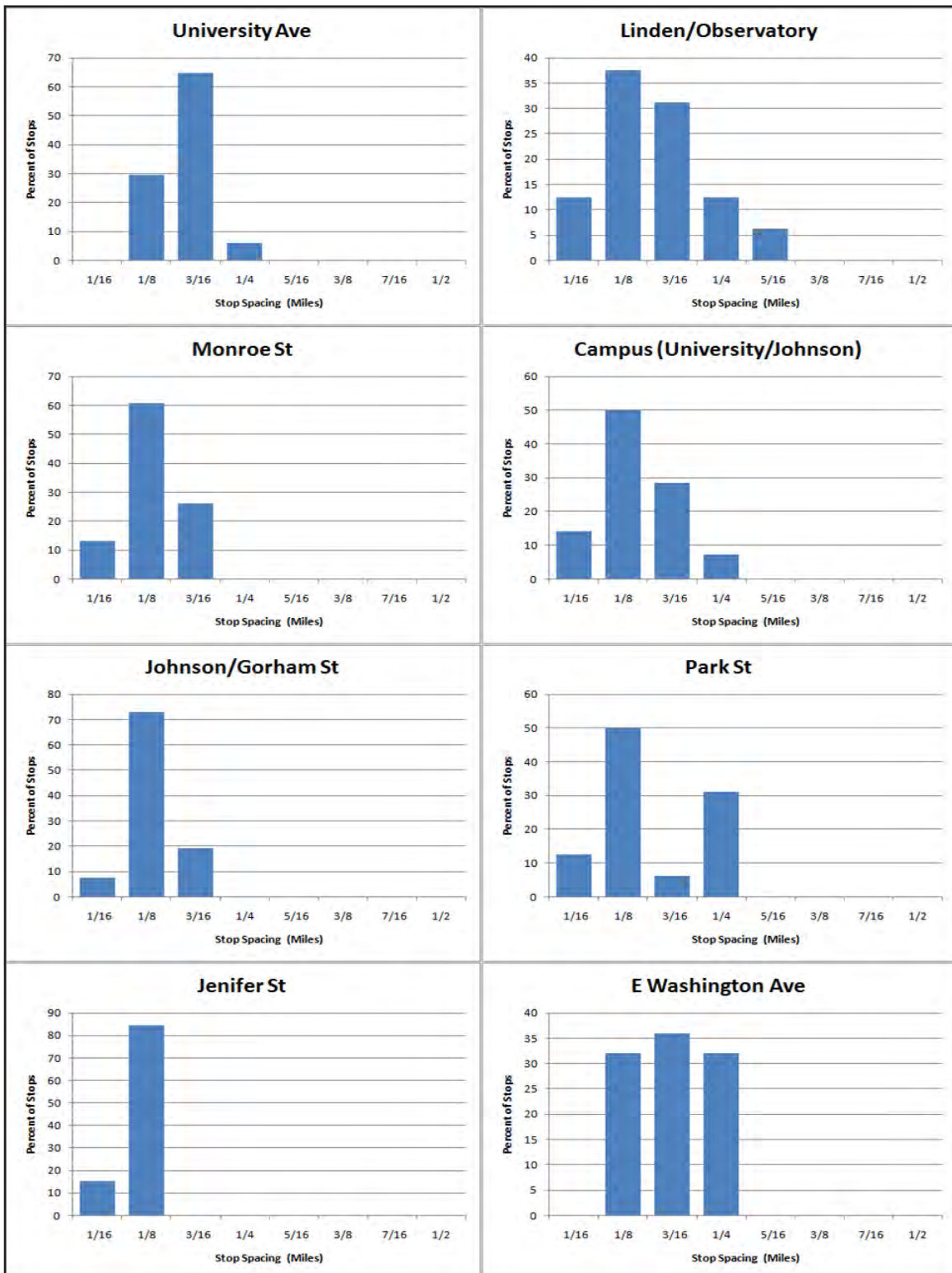


Figure 33
Bus Stop Spacing Distribution for Peripheral Madison Corridors

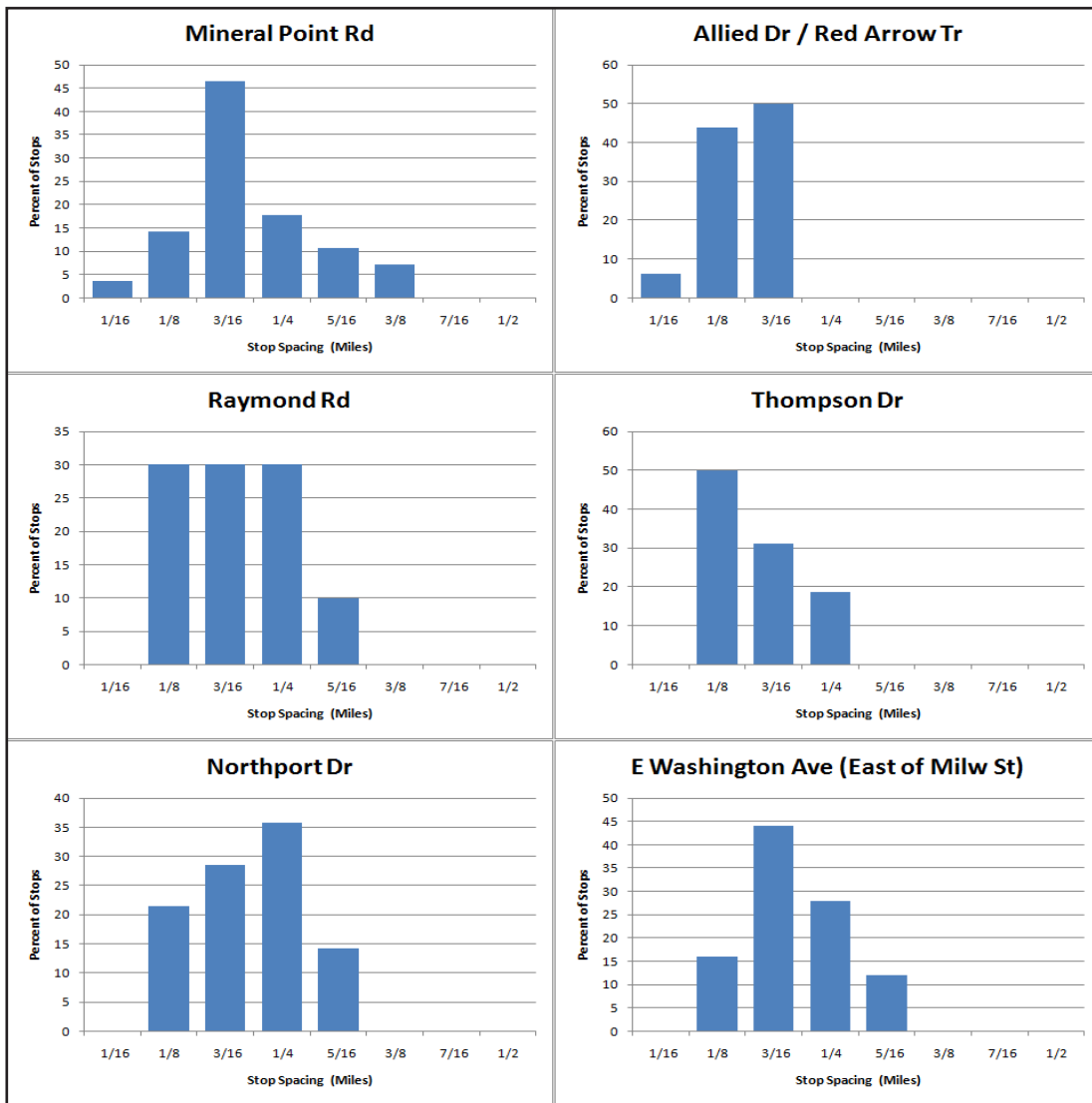
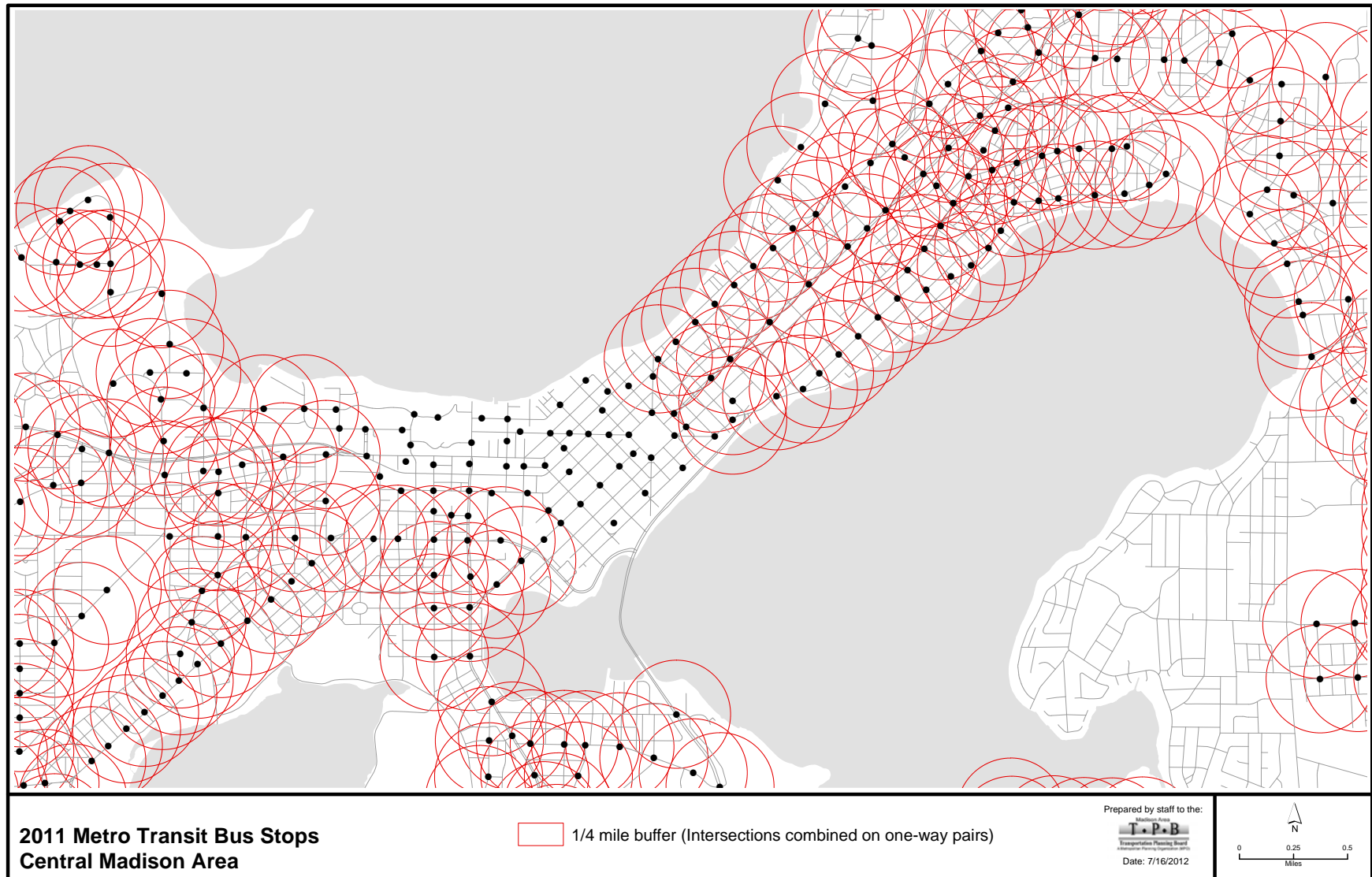


Figure 34



Note: Intersections with bus stops in the central Madison area with 1/4-mile buffers, excluding the Madison CBD. Each point and buffer represents a single stop, stop pair, or intersection with multiple stops in different directions.

Service Area

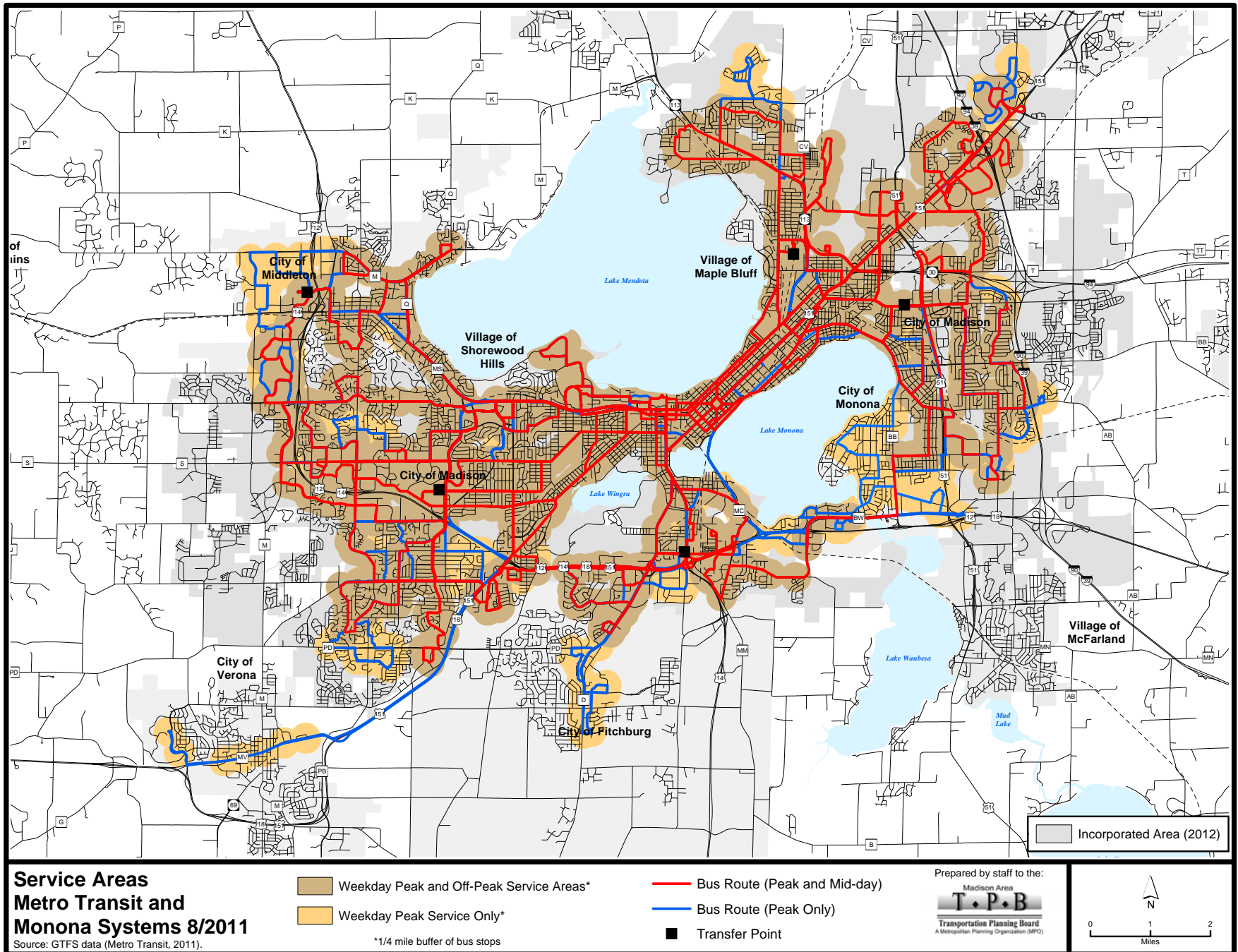
Transit's service area, for the purposes of this TDP, is defined as the geographic area within $\frac{1}{4}$ -mile of a bus stop with regularly scheduled transit service throughout most of the day. These service standards are met by most Metro bus stops and the Monona Transit system. Additional areas are covered by peak-only service, service with a limited number of trips (e.g., the Sun Prairie Shuttle), shared-ride taxi, and specialized demand-response transportation.

The service area for all routes is 62 square miles. The 2010 population within the service area was approximately 235,100 persons. This includes 85% of the City of Madison's population, 70% of the City of Middleton's population and 51% of the population of Fitchburg.

Figures 34 and 35 on the following pages show the weekday and weekend fixed-route service area.

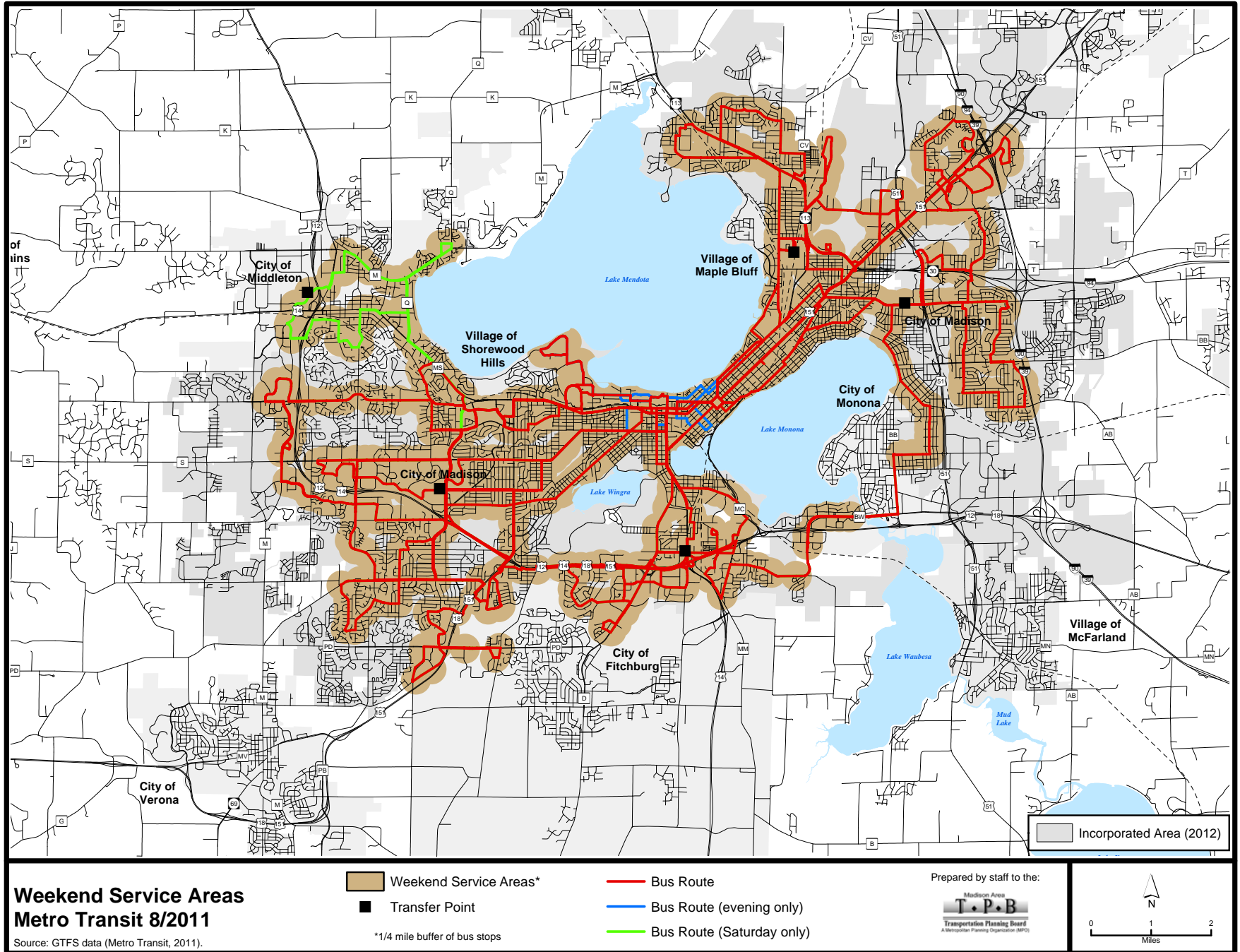


Figure 35



Note : Metro Transit and Monona Transit combined weekday service area and weekday peak-only service area.

Figure 36



Ridership

In 2011, Metro ridership was 14.9 unlinked passenger trips, an increase of 10% over 2010 and surpassing the previous all-time ridership record of 14.0 million set in 1979 during the energy crisis. Figure 36 shows Metro service and ridership from 1997 to 2011.

Metro publishes monthly Route Productivity Reports detailing transit boardings by route. Seasonal ridership correlates strongly to the UW schedule. In July 2011, ridership dropped to a little more than half the high in March and

October. This seasonal variation in ridership is generally accommodated with Extra Buses and with trips on routes 14, 15, 28, 37, and 38 that are shaded in the Ride Guide indicating that they do not operate during the UW's winter break, the summer, and on other specific holidays. In addition, campus circulator routes have substantially reduced recess schedules.

Like most transit systems, weekday ridership is much stronger than weekend ridership. During the week, Wednesday had the highest ridership, and Saturday ridership substantially outperformed Sunday ridership. Figure 37 shows Metro ridership by month and day of the week.

Figure 37

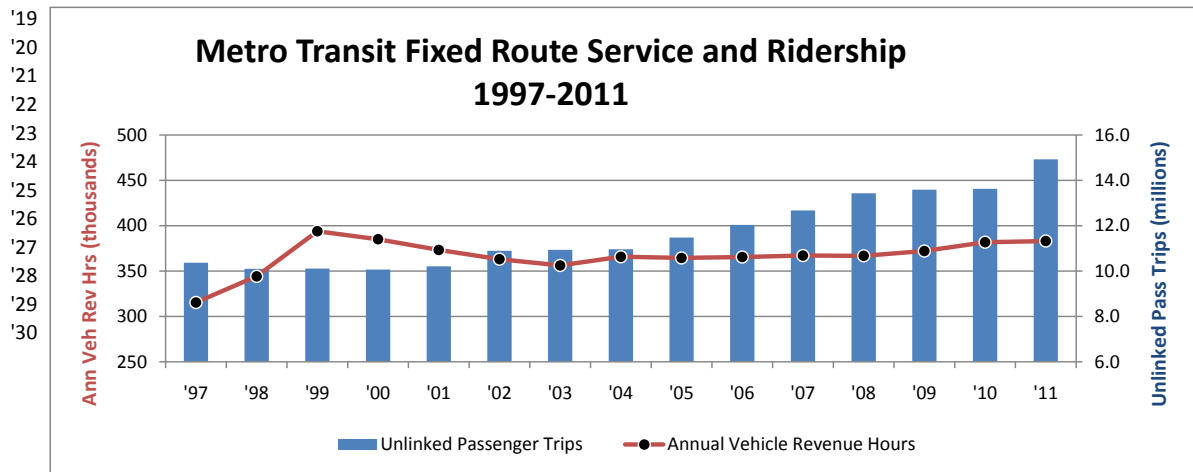
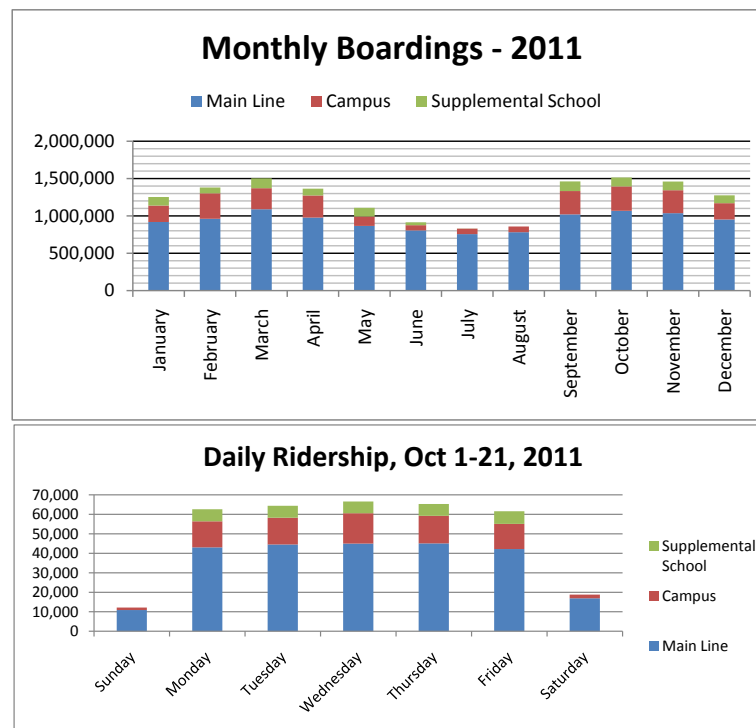


Figure 38



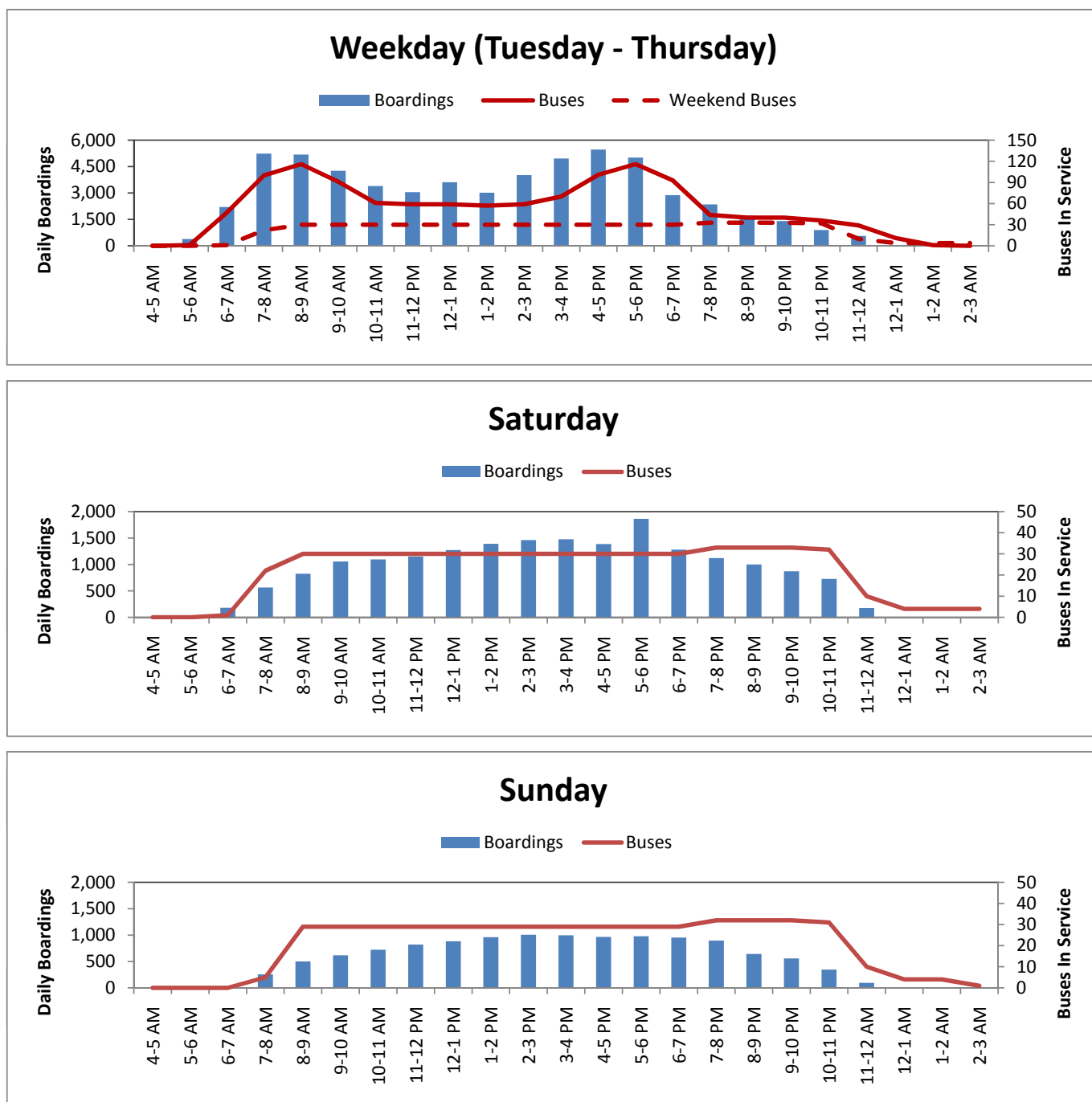
Note: Supplemental School Service not included.

For the analysis period described on Page 3-1 (Tuesdays, Wednesdays, and Thursdays October 4-20) weekday boardings peaked between 7:15 and 8:15 a.m. (5,615 boardings) and between 3:45 and 4:45 p.m. (5,926 boardings). Average weekday ridership for these nine days was 59,612, resulting in a transit peak hourly factor of 9.4% (i.e., 9.4% of daily boardings occurred within the peak hour). Saturday and Sunday boardings generally peak in the early afternoon.

Figure 38 shows the distribution of Metro service and boardings throughout the day. Note that the Saturday and Sunday charts have a different axis scale than the weekday

chart; however, all charts show the Daily Boarding Buses in Service axis as an amount 40 times the amount shown on the buses in service. As a result, where the blue bar is equal in height to the red line, the total system efficiency is 40 boardings per hour per bus. Service supply and boardings are generally well matched throughout the weekday. Although overall system efficiency is about the same, at a little more than 40 boardings per service hour, heavy tidal flows (that is, empty buses in one direction with full buses in the reverse direction) during peak periods result in noticeable overcrowding on some routes.

Figure 39
Boardings and Number of Buses in Service by Time of Day



Note: Data for October 1-21, 2011. Excludes Supplemental School Service and Extra Buses.

Route Productivity

Route productivity is one of the basic metrics used to measure the performance of a transit route, corridor, or entire system. Metro regularly publishes the monthly Route Productivity Comparison, an index showing total monthly ridership and productivity (in terms of boardings per revenue service hour) for each route. The Route Productivity Comparison is a useful tool for tracking changes in route performance over time, but it is not appropriate for comparing routes to other routes.

The productivity analysis for the TDP features several additional layers of analysis that are not available with the monthly Route Productivity Comparison.

- Separate days and time periods were used. The TDP analysis includes productivity for each route during the weekday mid-day (9:30 a.m. to 3:30 p.m.), weekday morning peak (6:30 to 9:30 a.m.), and Saturday mid-day (9:30 a.m. to 3:30 p.m.). The weekday afternoon peak, weekday early morning, weekday evening, Saturday morning and evening, and Sunday time periods were not analyzed; however, system-wide hourly passenger volumes and service levels are shown in Figure 39. Weekday afternoon peak period boardings occur more heavily within the UW campus/Madison CBD, so it is not useful to stratify them as shown in Figure 40; it would be more useful to know where people exit in the afternoon peak periods, which is not known.
- Diametrical routes were split into separate routes. Core and commuter routes that travel through Central Madison serve unique travel markets south/west and east/north of the Madison CBD. Splitting these lines into their radial components provides a more detailed view of how the system is performing and can be used to determine if new route patterns should be investigated.
- One-way pairs were combined. Much of Metro's peak-only service operates as reverse-commute routes designed to utilize deadhead (non-revenue bus movements to the terminal) hours combined with a peak-direction commuter route designed to serve trips from residential areas to central Madison, such as Routes 37 and 38. These boardings and service hours need to be combined in order to compare this service with conventional two-way transit service.
- Boardings at the four major transfer points and within the UW Campus and Madison CBD were identified. Separating these boardings from

boardings along the route provides some insight as to whether riders are using one route in particular, or if they are using any number of routes to travel from a transfer point to central Madison or to circulate within central Madison.

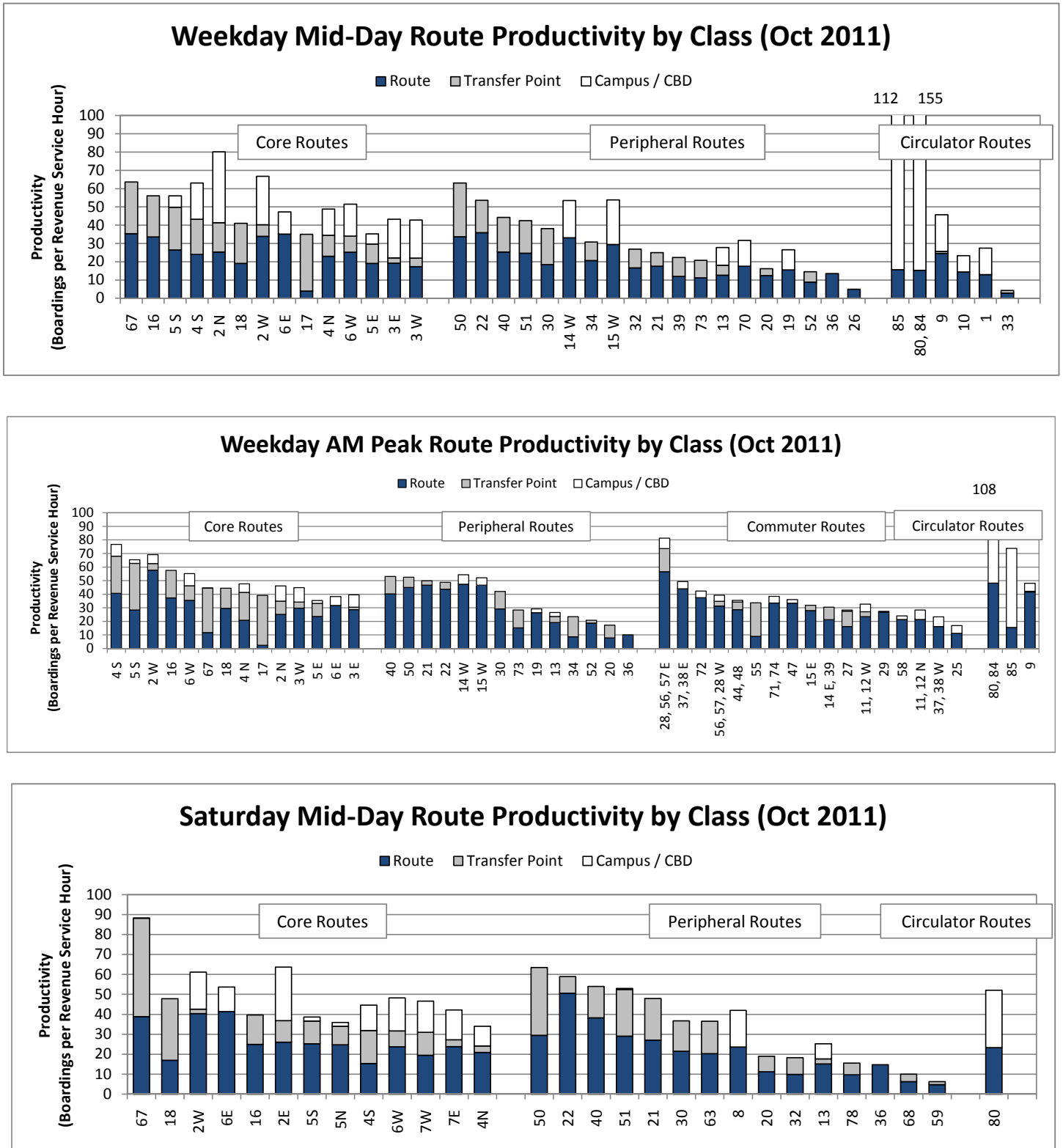
A key shortcoming of the route productivity analysis is that some transferring taking place at the transfer points is not accounted for because of the interlining of routes. Passengers who stay on board as a bus continues from one route to another do not process another fare, and thus are not counted on the second route.



The service hours used for each route were calculated to include the recovery time at the end of the route. Diametrical routes that were split into their east, west, north, and south components were split just west of the Capitol Square. Service hours from scheduled Extra Buses were not included because Extra Buses are typically scheduled only a few minutes ahead of the published trip, and in this case, a scheduled trip with its paired extra trip are treated as one unit with a passenger load that exceeds the capacity of one bus.

Route productivity for each route is shown in Figure 40. The suffixes N, S, E, and W indicate the radial part of a split diametrical route. Note that the boardings for each route, route segment, or route segment combination are split into three categories: Route, Transfer Point, and Campus/CBD. The routes are sorted from highest to lowest productivity based on boardings along the route and at transfer points only. It is anticipated that a substantial amount of boardings within the UW campus/Madison CBD are not route-specific; Routes 80, 84, and the discontinued Route 85 are probably an exception to this.

Figure 40
Metro Transit Route Productivity



The utility and performance of peripheral routes can also be described by the population and employment coverage served by each route. This information, normalized by route service hours, along with the weekday mid-day route productivity for comparison, is shown in Figure 40. For instance, Route 51 has a relatively high route productivity of 42 boardings per revenue hour. It serves a population of 11,440 and an employment base of 4,100 employees with, on average, 0.5 buses in service (Route 51 is a 30-minute

loop with hourly mid-day service). The total population and employment per bus in service is $(11,400 + 4,100) \div 0.5 = 31,000$. Route productivity should correspond with population and employment coverage; however, there are some noticeable differences: Route 73 has relatively low productivity but high coverage, while Route 22 has high productivity but lower coverage. This is likely due to more nuanced demographic information, such as income and auto ownership.

Figure 41

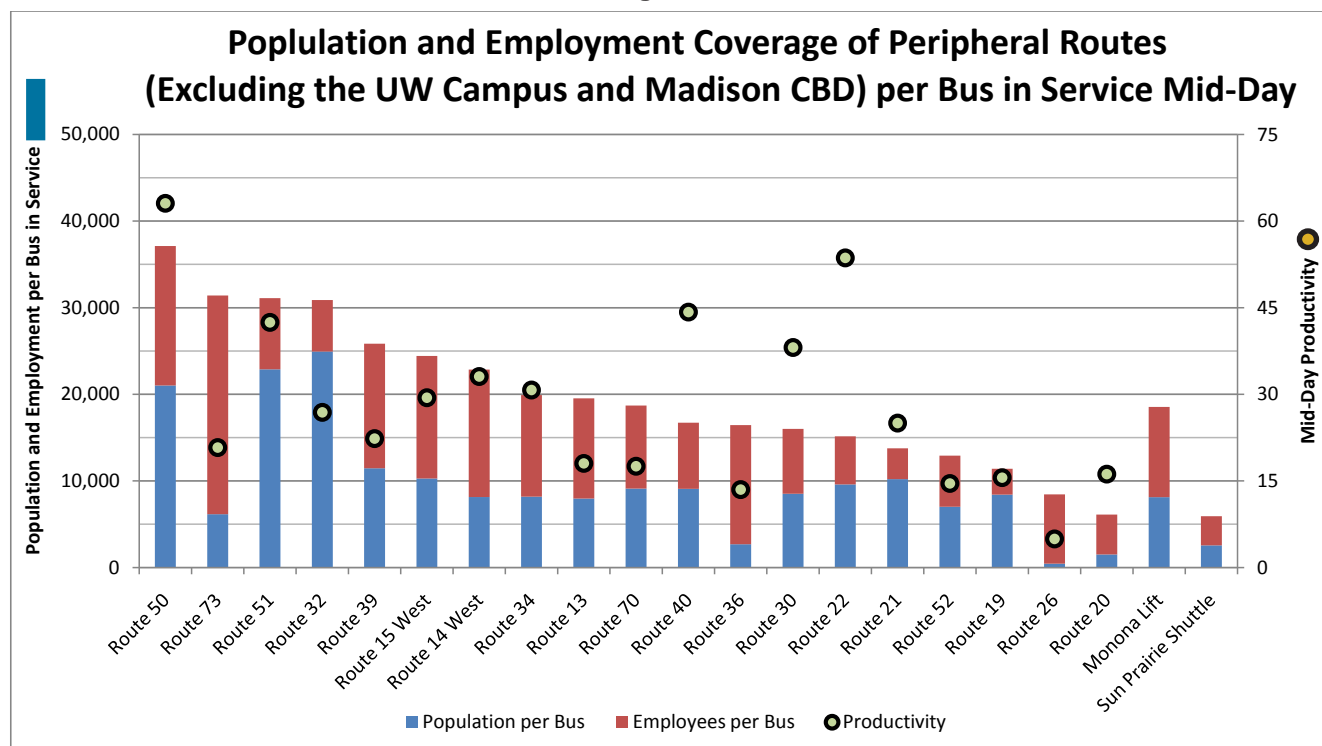


Figure 41 shows the weekday Metro Transit boardings on all routes by intersection. This data does not include Supplemental School Service, but it does include Extra Buses and UW campus routes – all boardings on routes 1-85. The boardings are also calculated at the stop level, but were aggregated to the intersection level for two reasons: complex intersections with several routes stopping at different stops may have many overlapping small circles, making it appear that those have low ridership; and consolidating the large amount of circles into a more manageable number produces a map that more easily conveys ridership patterns. The accuracy of the map between adjacent intersections likely contains small errors; however, the overall patterns accurately reflect known ridership levels.

Consistently high ridership in the UW campus and Madison CBD area can be easily seen as well as at the four major transfer points (with a lighter color). Corridor ridership is heaviest along University Avenue and the Isthmus. High concentrations in peripheral locations can be seen at the major shopping malls, Madison College, and at Madison high schools. Figure 42 also shows the information for Saturdays with similar trends, but without the boarding concentrations seen at Madison College and the high schools and even more pronounced concentrations at the malls.

Figure 42

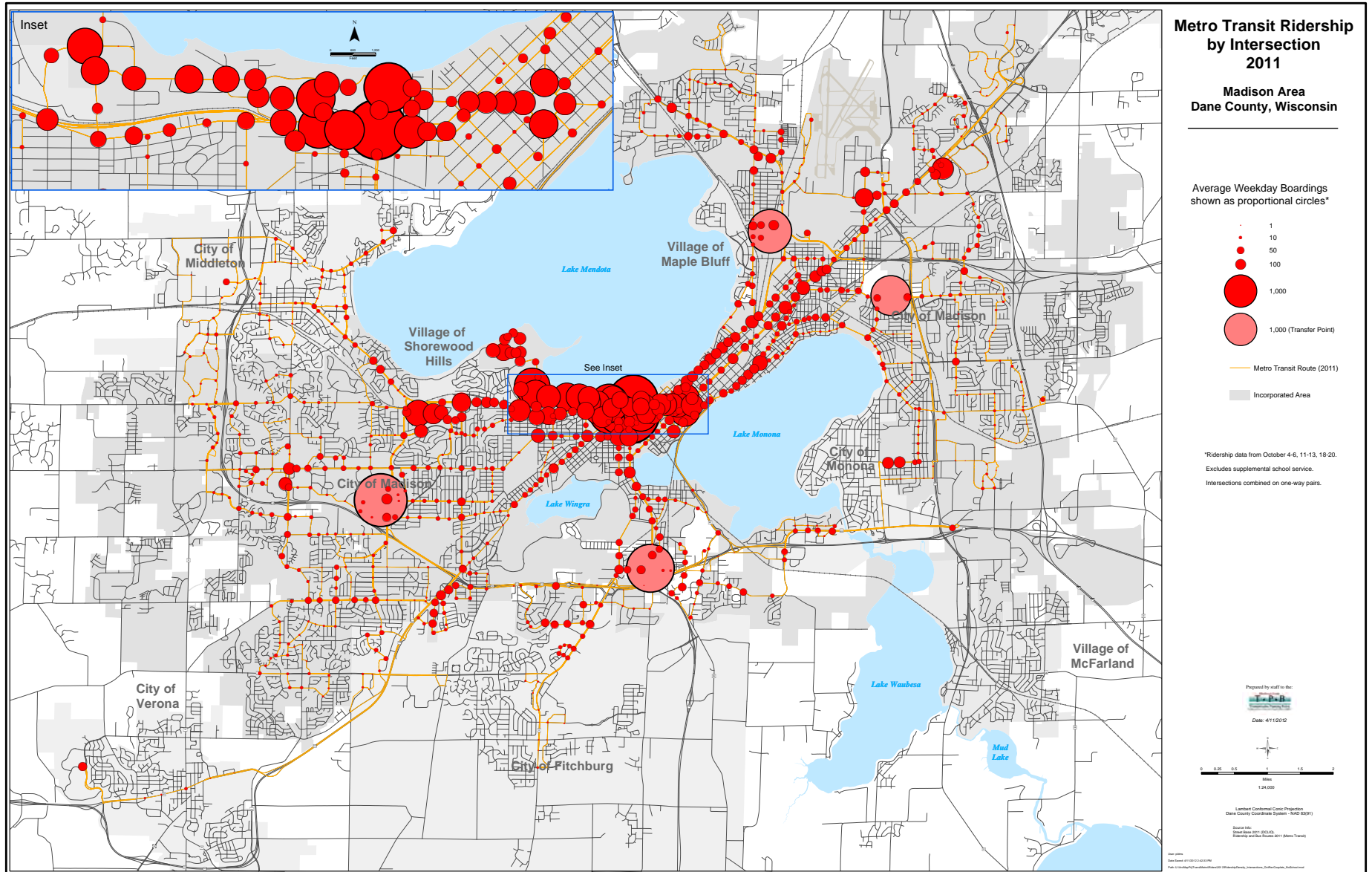
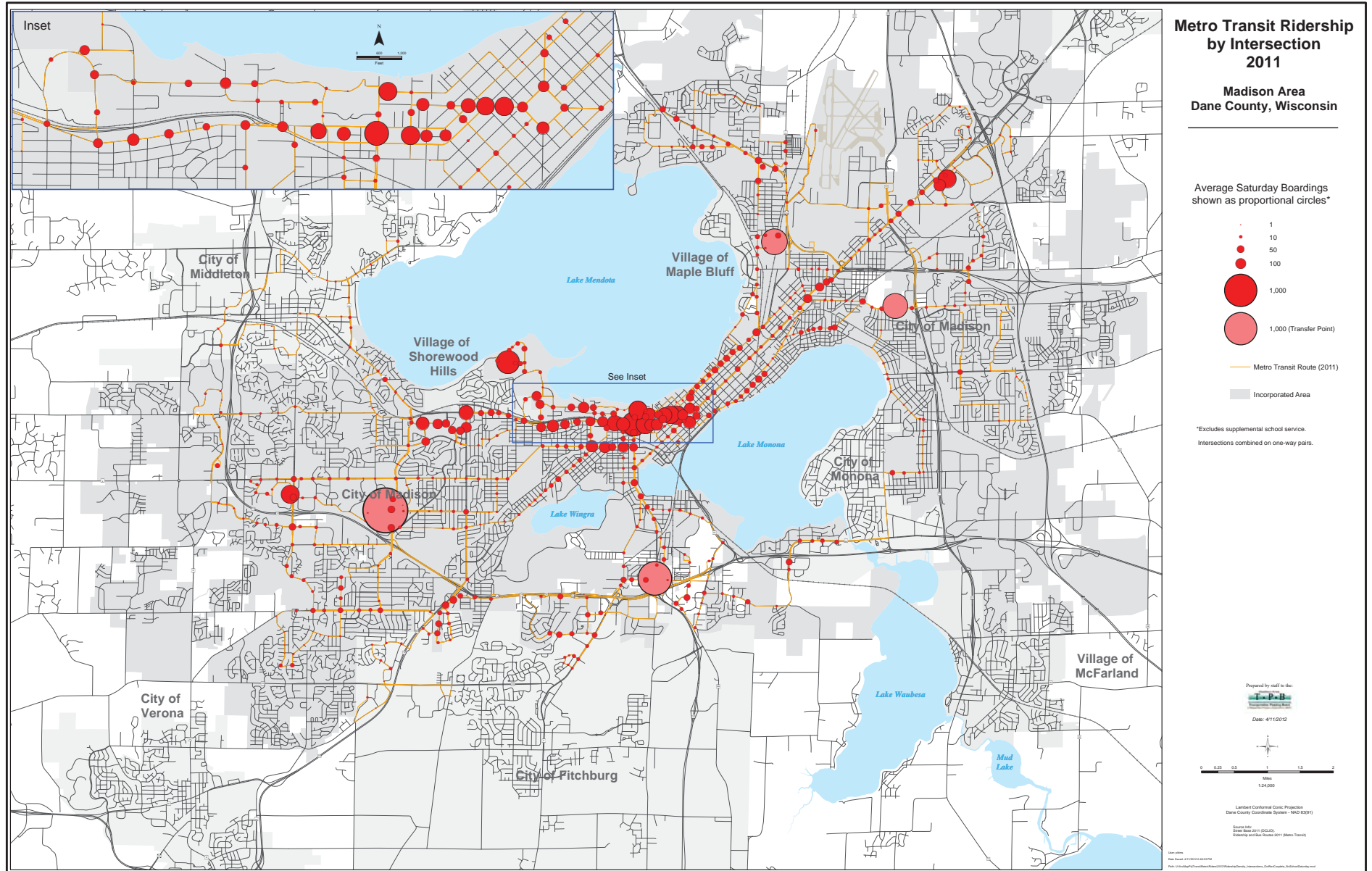


Figure 43



Reliability and On-Time Performance

Reliability and on-time performance metrics are not readily available for the Metro Transit system. However, observations by Metro staff, as well as complaints from bus operators and passengers, have been used to identify needs for improvements in the system.

Route 18 experiences regular on-time performance problems and missed connections between the South Transfer Point and West Transfer Point, particularly the “via Coho” version of the route. To alleviate some of these problems, Route 18 via Coho was rerouted from Reetz Road and Hammersley Road to Raymond Road and Whitney Way with limited stops. A more complete solution, described in the potential service changes in Section 4 – Transit Development Plan, would route both versions of Route 18 via the Beltline Highway with corresponding changes to Route 40; however, this change would require an investment in service hours.

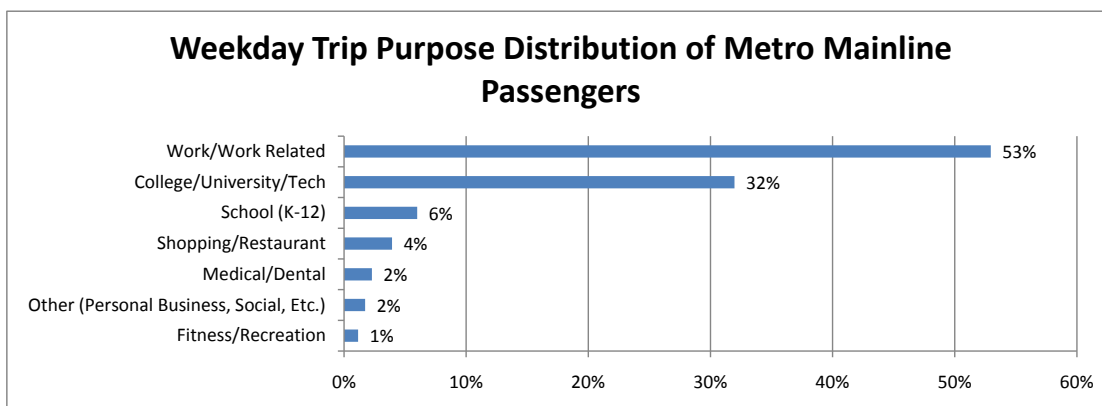
The weekend Route 7 is a combination of Route 3 (West Transfer Point to East Transfer Point) and Route 6 via Tokay (West Transfer Point to Capitol Square). In contrast to Route 3, with a 60-minute scheduled travel time from the East Transfer Point to the West Transfer Point, Route 7 has a 45-minute scheduled travel time, combined with a more streamlined routing. However, the more direct routing is often not sufficient to reduce the scheduled travel time by 15 minutes, and connections are often missed. The schedule was changed so that Route 7 now leaves the East and West Transfer Points three minutes before the normal pulses (:57/:27 at the West Transfer Point and :12/:42 at the East Transfer Point). This change has reduced the number of missed connections, but it is an irregularity and problems remain, particularly during summer Saturdays with congestion in central Madison and when unpredictable delays occur.

2008 Metro On Board Survey

An on-board survey was completed in 2008 by Cambridge Systematics, Inc. for the City of Madison. The goal of the survey was to support transit route and operations planning, to improve the understanding of public transit customers and receive feedback on service, and to provide origin-destination data to improve the transit component of the regional transportation model. About 6,700 surveys were collected on mainline routes and 4,500 on UW campus routes during the weekday morning peak and mid-day periods. Some key results of the study are summarized below.

- ▶ 83% of trips were from home to work or school (91% were work-or school-related). See Figure 44.
- ▶ 52% of respondents had a vehicle that they could have used for the trip.
- ▶ 92% of respondents walked to the bus stop, 7% drove or were dropped off, and 1% biked.
- ▶ 75% of those walking to the bus stop walked two blocks or less.
- ▶ 20% of respondents transferred or planned to transfer to complete their trip.
- ▶ 71% of respondents took at least four one-way bus trips per week.
- ▶ 66% of respondents were Metro Transit riders for five years or less.
- ▶ The 18-24, 25-34, and 35-54 age groups each represented about 25-30% of respondents.
- ▶ About 41% of respondents had a household income of \$10,000 to \$75,000. 44% had a lower household income; 15% had a higher household income.

Figure 44



Source: 2008 Metro on-board survey

Customer Feedback

In 2011, Metro Transit received 3,445 comments, requests, complaints, and commendations. This number has remained relatively constant for the last few years, with 3,200 in 2010, 3,426 in 2009, and 3,757 in 2008. The feedback is tracked in a database and categorized, with 255 interactions (7.4%) categorized as “compliment” – this number has also remained relatively steady since 2008. The remaining feedback was related to a wide array of Metro’s services and facilities. Some of the top categories for fixed route transit were customer pass-ups (280), driving behavior (238), rude driver (147), early bus (143), and late bus (108). The top complaint for paratransit service was late bus (150).

The 2008 on-board survey asked passengers to rate various aspects of Metro’s service on a scale of one to four (four being the best). Most aspects received a score of about three on the main-line routes. Bus crowding was rated lowest (2.5) and safety on the bus was rated highest (3.3). Campus service consistently rated slightly lower than main-line service.

SECTION 4 - Transit Development Plan ►►►►

Introduction

This section describes improvements and planning activities that are planned to take place between 2013-2017. Some actions – particularly long range items like expanding the Metro Transit maintenance facility and implementing bus rapid transit – will likely extend beyond the traditional limits of the TDP planning horizon; however, specific activities are planned within the next five years that are necessary to eventually achieve those outcomes.

Transit Service Planning Guidelines and Performance Standards

Transit planning guidelines and performance standards for the fixed-route system have been developed as part of the TDP to guide short- and long-term transit planning activities and to publish expectations for transit system characteristics and performance. The guidelines are not intended to be a rigid document, and deviations from it are to be expected. However, transit planning guidelines provide direction and parameters for agency staff in designing services, making facility improvements, and identifying unmet needs. Use of performance standards ensures service is being provided as efficiently and effectively as possible. The guidelines and standards provide a consistent approach to issues, requests, and concerns that may arise with regards to service and facilities. Also, transit planning based on such guidelines has the potential to ensure transparency in the decision-making process.

The transit service planning guidelines and performance standards are included in Appendix A. The planning guidelines are general in nature and mainly address basic transit planning concepts such as routing, service levels, and facilities. The chapters include:

1. Introduction
- SECTION 1 – FIXED ROUTE TRANSIT SERVICE PLANNING/DESIGN GUIDELINES
2. Route Classification
3. Route Alignment
4. Service Frequency
5. Service Span
6. Bus Stops
7. Service Change Prioritization
8. Detours
- SECTION 2 – PERFORMANCE STANDARDS
9. Service Coverage / Route Justification
10. Scheduling / On-Time Performance

The performance standards in Section 2 of Appendix A detail expectations that can be reasonably met for fixed-route transit service. All new and existing service should meet, come close to meeting, or be expected in the future to meet these standards.

2013-2017 Transit Development Plan Recommendations

The TDP recommendations are outlined below. They are grouped into three areas; (a) Service Planning, Facilities, and Other Recommendations; (b) Fixed-Route Service Improvements; and (c) Regional Express Commuter Service.

Service Planning, Facilities, and Other Recommendations

Transit Planning and Service Development

1. Adopt the Transit Service Planning Guidelines and Performance Standards in Appendix A and use as a guide for annual service adjustments.
2. Continue Metro Transit staff involvement in City of Madison land use planning and development review processes to promote transit-supportive development in areas where transit service is envisioned in the future. Offer and encourage other communities to involve Metro staff in their planning and review processes.
3. MPO staff should work with Capital Area Regional Planning Commission (CARPC) staff to integrate transit service planning considerations into the Future Urban Development Analysis plans being developed in cooperation with local communities and into Urban Service Area amendment reviews.
4. Improve the utility of existing transit service by increasing the directness and frequency of routes where appropriate.
5. Extend service to transit supportive areas that are currently unserved by transit, particularly low income neighborhoods, and also introduce new commuter express service.
6. Improve transit service performance monitoring by maintaining area-specific ridership information and adding on-time performance as part of the monitoring program.

In addition to the monthly route productivity reports, consider publishing more detailed performance reports. These reports would separate time of day (peak, mid-day, weekend), segment diametrical routes, and combine paired one-way routes. Update the stop-level ridership information as needed. Track and report on-time performance for fixed-route transit service system-wide and by route, as practical and appropriate.

7. Optimize transit schedules to reduce overcrowding and bus clumping while enhancing connections at the transfer points and in other places.
8. Develop and improve transfers outside the transfer point system where routes intersect or have common routing.

Coordinate schedules and provide facilities at bus stops as appropriate.

9. Explore the feasibility of point-deviation and other alternative service delivery methods in low density areas or at low use times as a cost effective way to extend service to new communities.

This project is needed to bring these corridors into compliance with the Transit Planning Guidelines of spacing bus stops, in general, between 3/16- and 1/4-mile (990 to 1,320 feet) apart. The stop consolidation program should include substantial public outreach and sufficient data collection and analysis to identify the appropriate bus stops for removal or relocation.

11. Develop a comprehensive bus stop inventory to identify and track facilities such as boarding platforms, benches, shelters, schedule information, and signage, along with information on pedestrian access and significant nearby land uses. Use the inventory, boarding information, and socioeconomic data to help prioritize facility improvements.

This information would be used to assess the facility needs throughout the system. Existing databases track the location and presence of a shelter. This should be expanded to include the shelter type, presence of a bench, platform surface, sidewalk needs, ridership information, signage information, presence of schedule information, and other variables.

12. Add boarding platforms, shelters, benches, and other passenger facilities as appropriate given the usage characteristics at bus stops.

Transit Facilities Development

10. Adopt a bus stop consolidation program to remove or relocate excessive bus stops in central Madison, particularly on the Jenifer Street, Johnson Street, Gorham Street, and Monroe Street corridors.



A bus rapid transit operated by Community Transit in Snohomish County, WA.



A 60-foot articulated bus operated by the Chicago Transit Authority.

13. Coordinate with the City of Madison Engineering Department, City of Madison Traffic Engineering Division, and other local jurisdictions to implement pedestrian facility improvements and transit-supportive roadway changes. These include bus lanes, in-lane bus stops, relocation of near-side bus stops to far-side, and traffic signal and other operational changes to reduce unnecessary delay for buses and to improve safety.
14. Work with the City of Madison Planning Department, University of Wisconsin-Madison, and others to locate a site for a new inter-city bus terminal.

The new bus terminal should be in a location that is easily serviceable by transit without adding new routes or introducing splits and deviations.

15. Work towards making all bus stops ADA compliant.

Install concrete boarding platforms and work with other City of Madison departments and local jurisdictions to complete the sidewalk network along transit routes, including crosswalk improvements.

16. Double-sign, relocate, or close near-side bus stops to improve the operating environment and reduce confusion.



A near-side bus stop has been "double signed," replacing the single sign with "BOARD BUS AT CORNER" This design is less confusing for passengers trying to find the correct place to wait.

Double-signing, or installing stand-alone “No Parking” signs in conjunction with the bus stop sign, allows the bus stop sign to be relocated to the boarding platform and may reduce illegal parking. Relocating or closing near-side bus stops has several benefits, including reduced conflict with right-turning traffic and crossing pedestrians.

Medium to Long Range Transit Planning

17. Increase the capacity of the bus garage and/or construct a new facility.

Increasing bus garage capacity is necessary for the expansion of the transit system envisioned by this Transit Development Plan. The current garage is located in a prime Transit Oriented Development redevelopment area, making an eventual sale and complete move a distinct possibility. This is likely to occur in more time than the five years covered in this plan. A planning effort is underway that may recommend 1. expanding the existing facility at 1101 East Washington Avenue, 2. adding a second permanent or temporary facility to operate with the existing facility, or 3. replacing the existing facility with one or more new facilities. Locations of new facilities should be chosen in east, south and/or west Madison to reduce deadheading. Pursue short-term solutions to facilitate day-to-day operations and expand the fleet to accommodate new service. Develop site analysis criteria to prioritize expansion concepts.

18. Develop concepts for bus rapid transit (BRT) and plan for its implementation in the next five to ten years pending the outcome of the Transit Corridor Study (BRT Study). See Figure 44 illustrating a potential BRT system.

The Transit Corridor Study, expected to be completed in early 2013, will likely recommend four corridors for bus rapid transit development: University Avenue to West Towne Mall, Park Street to Fitchburg, East Washington Avenue to East Towne Mall, and Sherman Avenue to north Madison. Potential future extensions (e.g., to the new UW Research Park, Middleton, and east Madison) will also be identified.

19. Expand the capacity of the park-and-ride lot at the North Transfer Point and construct additional formal park-and-ride lots near transfer points and at other locations where opportunities arise.

Plan for new owned or leased park-and-ride lots and provide new commuter service to existing under-utilized park-and-ride lots such as Lot 13-02 in east Verona and 13-04 in the American Center. New park-and-ride lots should be located in areas that can easily be served by existing routes.

Metro Paratransit Service

20. Continue to coordinate with other specialized transportation service providers to provide the best service for passengers while eliminating duplicative service.
21. Continue mobility training programs and incentives and investigate other innovative ways to encourage the migration of passengers from paratransit to fixed-route service.
22. Continue to work with paratransit riders, employers, staff, and service agencies to efficiently schedule trips and combine rides when practical.

Metro Fleet

23. If feasible and recommended by the Bus Size Study, diversify the fleet with 30-foot and 60-foot articulated buses.

The Bus Size Study is expected to be completed in 2013. It may recommend diversifying the fixed-route bus fleet with smaller and larger buses to match the demand. This change could reduce Metro's costs by reducing fuel



Many overlapping routes converge in central Madison: core routes with all-day service, as well as peak-period only commuter routes, weekend-only routes, and campus circulators. Consolidating overlapping services and improving the clarity of the signage and information improves the usability of the system for new and occasional riders.



A bus, bicycle, and right-turn only lane on Mineral Point Road.

consumption and reducing the number of extra bus trips. Larger buses may reduce the number of standees and pass-ups on busy routes. Smaller buses may also improve Metro's image by having fewer empty seats on some peripheral routes.

24. Reduce emissions by purchasing alternative-fueled vehicles and reducing unnecessary idling.

Hybrid-diesel buses have been shown to reduce fuel and maintenance costs. Other fuel options, such as compressed natural gas, should be explored.

25. Replace the current fare boxes with modern units.

The existing fare boxes have reached or exceeded their life expectancy. New fare boxes are expected to reduce Metro's maintenance costs and to increase its fare revenue due to fewer instances of fare boxes being out of order. Replacement fare boxes should include the ability to deploy contactless smart cards that have greater flexibility in storing monetary credit, purchased rides, passes, and transfers. New technology also could allow riders to pay fares with smart phones.

Passenger Information and Marketing

26. Improve the System Map and Ride Guide to optimize their legibility and accuracy.

Consider innovative mapping strategies like assigning colors, line types, or line weights based on the route classification and identifying a "Frequent Transit Network" consisting of transit corridors with consistent 15-minute or better service throughout the weekday.

27. Metro should undertake a comprehensive system re-branding and way-finding marketing campaign. Preferably, Metro should hire an outside marketing firm to facilitate and complete this branding effort.
28. Add static schedule information to unsheltered bus stops that receive moderate to heavy use, and electronic real-time arrival displays to very heavy-use bus stops.
29. Maintain, support, improve, and expand online transit tracking and trip planning data and services such as Metro Transit Tracker, Google Maps, BusRadar, and Mobile UW.

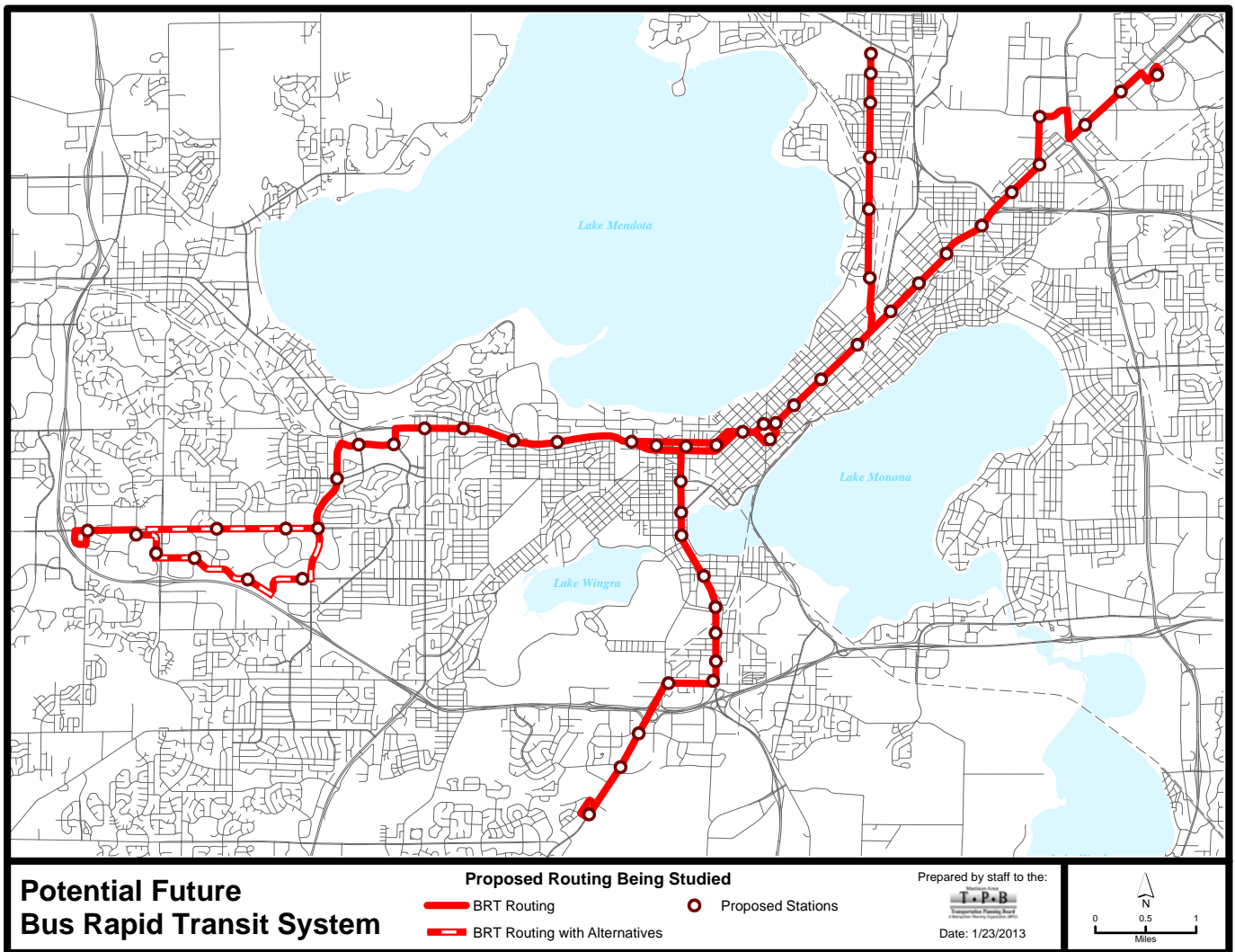
Funding, Fares, and Transportation Demand Management

30. Collaborate and negotiate with transit partners to ensure that the transit system is funded equitably. Work collaboratively with communities within and around the service area to coordinate Metro Transit's service with other transit systems and/or work to recruit them as transit partners.
31. Maintain a fare structure that is equitable, affordable, and capable of maintaining adequate service levels.
32. Continue efforts to maximize public and private funding sources.

Examples include retail, advertising, the incorporation of transit facilities as part of new developments or impact fee/special assessment programs for roadway improvements, and the private sponsorship of bus shelters or new service to employers.

33. Continue efforts to reach regional agreement on a new finance and governance structure, such as a representative regional transit authority, for regional transit service.
34. Continue to support and expand the unlimited ride pass programs and Commute Card program, and coordinate with other alternative transportation promotion efforts by Metro, the Madison Area Transportation Planning Board (MPO), and other agencies and organizations.

Figure 45



Fixed-Route Service Improvements

The potential future service change concepts presented in this Transit Development Plan to summarize minor to moderate modifications that have been identified by staff and others to potentially address the inconsistencies between the existing transit system and the Transit Planning Guidelines. They range from small adjustments and extensions to more systematic changes that involve restructuring several different routes. Major system-wide restructuring concepts involving changes to the transfer point system and the introduction of bus or rail rapid transit systems are not anticipated to be feasible within the five year planning horizon of the TDP.

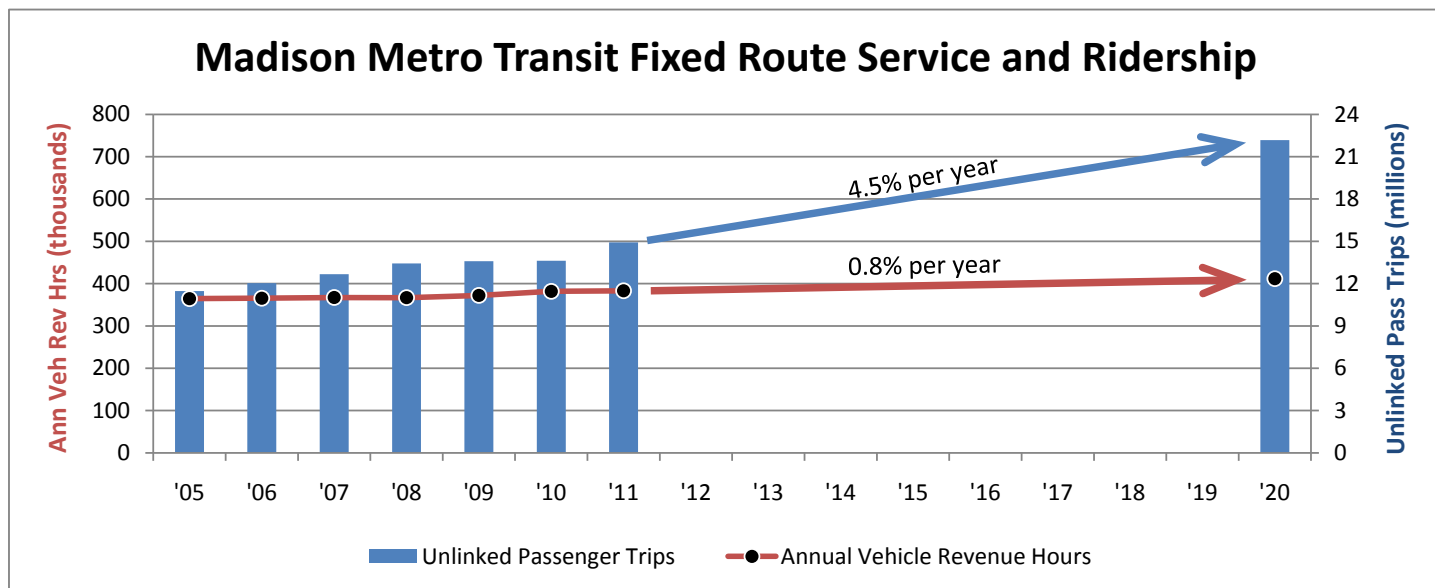
Metro Transit's fixed-route ridership has been growing at an average rate of about 4.5% per year since 2005 while revenue vehicle hours have been increasing at about 0.8% per year. With the exception of reductions to UW-Madison campus bus service in 2012 and some associated loss in ridership, these trends are generally expected to continue, with year-to-date ridership in October 2012 outpacing year-to-date October 2011 ridership for fixed-route, non-campus circulator service. At this rate, year 2020 service would consist of about 412,000 annual service hours with 22.2 million rides; ridership would double by about 2027 as shown in Figure 45. Overcrowding issues that are becoming more severe show that this disconnect between ridership growth and service growth is not ultimately sustainable. Because of this, many of the fixed-route service improvements listed in this TDP are not possible with today's funding, and are shown as potential expansions should funding become available.

Potential service changes are presented in three categories: Priority 1 (short term, 1-3 years), Priority 2 (medium term, 3-5 years), and Priority 3 (long term, new service as development and funding allow). These are not intended to be rigid categories, but they are intended to separate desirable or needed improvements to today's transit service from longer range improvements that are more conceptual in nature. Metro regularly monitors and adjusts its service through annual service changes that are vetted through the City of Madison Transit and Parking Commission, local units of government, and the public. These potential changes would need to go through the same process before implementation.

These potential future service changes were developed by Metro and MPO staff in coordination with the TDP steering committee, including representation from potentially affected municipalities. Additional details about each potential change, as well as the intent and rationale for each, are outlined in Appendix B.

The potential future service change concepts, along with their estimated annual costs, are outlined in Tables 14-16. Cost estimates are based on the number of buses in service for several different time periods, including a.m. and p.m. peaks, weekday mid-day, weekday evenings, and weekends. These time periods are estimated at 3 hours for each peak period, 6 hours for the weekday mid-day, 6 hours for the weekday evening, and 16 hours for each Saturday or Sunday. A year is estimated to have 250 weekdays and 115 weekends (Saturdays, Sundays, and holidays). The estimated cost for service is \$75 per hour – an increase over Metro's general estimates for marginal service changes of \$60-65 per hour, but less than Metro's fully allocated cost of \$110 per service hour.

Figure 46



Note: Projected annual vehicle revenue hours and unlinked passenger trips for Metro Transit, assuming service levels and ridership continue to rise at the same rate they did between 2005 and 2011.

Table 16
Priority 1 (Short-Term) Potential Fixed-Route Transit Improvements

Priority 1 - Short Term (1-3 years)					
Routes	Action	Cost *	Goals	Annual Cost **	Annual Hrs
2, 3	Eliminate Sherman via (Route 2) and Division via (Route 3). All trips operate via Fordem and Winnebago, respectively.		4	\$0	0
6, 20	Eliminate Route 6 Hayes via, all trips operate via MATC. Reroute Route 20 via Portage and Hayes.		2, 3, 4, 5, 7, 8, 10	\$0	0
12	Eliminate routing on Lake Point and Waunona.		2, 8, 10	\$0	0
27, 29	Eliminate Route 29, extend Route 27 to Dane County Regional Airport and North Towne Center P&R.		2, 4, 7, 8, 10	\$0	0
14, 15, 25, 27	Establish an express stop pattern on East Washington Avenue from the Capitol Square to Milwaukee Street.		2, 3, 8, 10	\$0	0
11, 15, 56, 57, 71, 72, 74	Establish an express stop pattern on University Avenue from the UW to Segoe Road.		2, 3, 8, 10	\$0	0
2	Improve weekday peak and mid-day service to every 15 minutes between the West Transfer Point and Capitol Square.	\$\$\$ MD	3, 4, 5, 9, 10	\$337,500	4,500
9, 10, 33	Reduce the number of buses in the mid-day rotation from six to four, restructure to eliminate service west of UW campus, duplicative service on Johnson / Gorham, and Route 33.	-\$ MD	8	-\$225,000	-3,000
14, 15, West Madison	Extend a new peak-only route to Colony Drive and west Madison, similar to the peak-period Route 14 routing west of Rosa Road. Reroute the peak-period Route 14 to be similar to the mid-day Route 14, and reroute Routes 14 and 15 from Sheboygan Avenue to Regent Street and Old Middleton Road, respectively.	\$\$\$ PK	2, 3, 5, 10	\$337,500	4,500
3, 6, 7	Convert Route 7 to Route 3 on weekends. Reduce Route 6 weekend headways from 60 to 30 minutes.	\$\$\$ WD	1, 2, 3, 4, 6	\$414,000	5,520
8, 78	Combine Routes 8 and 78 into one route from the Capitol Square to Middleton via Bluff. Extend Middleton service to include Sundays.	\$ Sundays	2, 4, 6, 8, 9	\$69,000	920
11, 12, 39	Extend Routes 11 and 12 (peak) and Route 39 (off-peak) to Owl Creek.	\$ PK, WD 0.5 \$ MD, EV	6, 9	\$225,000	3,000
16	Reduce weekday headways from 60 to 30 minutes throughout the weekday.	1.5 \$ MD, EV	1, 2, 4, 9	\$337,500	4,500
18, 40	Reroute Route 18 via Coho to the Beltline Highway between the South Transfer Point and Seminole Highway. Restructure Route 40 so that alternating trips are based out of the West Transfer Point.	0.5 \$ PK, MD \$ EV, WD		\$363,000	4,840
28	Reduce headways from 10-15 minutes to 7.5 minutes during the school year from the NTP to UW.	\$\$\$ PK	2, 3, 5, 8, 10	\$337,500	4,500
50	Reduce weekday headways from 60 to 30 minutes throughout the weekday.	0.5 \$ MD, EV	1, 2, 4, 8, 9	\$112,500	1,500
Total				\$2,308,500	30,780

Table 17
Priority 2 (Medium-Term) Potential Fixed-Route Transit Improvements

Priority 2 - Medium Term (3-5 years)					
Routes	Action	Cost *	Goals	Annual Cost **	Annual Hrs
2, 6	Combine Route 2-West with Route 6-East and reduce weekday headways from 30 to 15 minutes. Combine Route 2-North with Route 6-West.	\$\$ PK \$\$\$\$ MD	2, 4, 5, 7	\$675,000	9,000
4, 5	Reduce evening and weekend headways from 60 to 30 minutes.	\$\$\$\$ EV, WD	1, 2, 4, 9	\$1,002,000	13,360
10, 38	Eliminate Oakridge via. Reroute from Jenifer and Broom/ Basset to First and East Washington. Extend Route 10 span to include peaks.	\$\$ PK	2, 3, 5, 10	\$225,000	3,000
52, 55	Reroute from Beltline and Verona Road to Whitney Way, Fitchrona, and Nesbitt. Reduce Headways from 60 to 30 minutes.	\$ PK	1, 5, 7, 8, 9, 10	\$112,500	1,500
51, 56, 57	Eliminate Route 51 and operate Routes 56 and 57 south of the WTP as a two-way loop.	\$ MD, EV, WD	4, 6, 9	\$363,000	4,840
3, 58	Eliminate Route 58 and reduce Route 3 peak headways from 30 to 15 minutes.	-0.5 \$ PK	4, 8	-\$56,250	-750
75	Reduce headways from 90 to 30 minutes.	\$\$\$ PK	1, 2, 7, 10	\$337,500	4,500
Grandview Commons	Restructure Routes 14 and 15 east of the ETP to provide service east of I-39/90.	\$ PK	6, 10	\$112,500	1,500
Fitchburg	Introduce a new peripheral route from the WTP to STP via Red Arrow/Allied, King James, McKee, E Cheryl, and Fish Hatchery.	\$\$ PK, MD, EV \$ WD	6, 7, 9	\$813,000	10,840
West Madison	Restore a commuter loop route from the UW to Mineral Point Road and Odana.	\$ PK	2, 4, 7	\$112,500	1,500
Total				\$3,696,750	49,290

Table 18
Priority 3 (Long-Term) New Service as Development and Funding Allows

Priority 3 - Long Term (New Service as Development and Funding Allows)					
Routes	Action	Cost *	Goals	Annual Cost **	Annual Hrs
Monona	Provide open-door service on Broadway and Monona Drive. Introduce a via that covers Monona Drive from Nichols/Pflaum to Buckeye		1, 4, 6, 7, 8	\$0	0
Middleton	Eliminate Routes 70 and 78 and operate Routes 71 and 72 off peak.	\$\$ MD, EV, WD	2, 4	\$726,000	9,680
Nine Springs	Extend Routes 44 and 48 to E Cheryl and Syene.	\$ PK	6, 7, 10	\$112,500	1,500
URP Ph II	Introduce a new peripheral route from the WTP to Pleasant View via Odana and Watts.	\$ - \$\$	2, 6, 7, 10	\$713,250	9,510
Sprecher East	Extend Route 36 from High Crossing Blvd to the ETP as a two-way route via Crossroads, Lien, Reiner, Sprecher, and Milwaukee Street.	\$\$ PK \$ MD, EV, WD	6, 7	\$588,000	7,840
Sun Prairie	Extend Route 26 to serve West Sun Prairie interlined with a new route serving East Sun Prairie as a two-way loop replacing the existing shuttle service to/from East Towne.	\$ MD \$\$ EV, WD	2, 4, 6, 7, 9	\$613,500	8,180
Total				\$2,753,250	36,710

Regional Express Commuter Service

In addition to the service change recommendations listed above which are mostly within Metro's existing service area, ongoing planning work is active for a system of regional express buses, primarily serving Dane County communities that are currently unserved by transit. This service would be designed mainly to serve home-based work trips during the conventional commute hours of about 7-9 a.m. and 4-6 p.m. on weekdays. Although the largest share of employment that these routes would serve is in the Madison CBD and UW campus areas, the service would also likely serve reverse commutes to employment areas in communities outside Madison, such as the Waunakee Business Park and the proposed Nine Springs neighborhood in Fitchburg.

Several regional express commuter bus lines are already in place; future routes are intended to build on and incorporate them. Metro routes 55 and 75 are the best examples of regional express service with direct, limited-stop express

service between the Epic campus in west Verona and the West Transfer Point (Route 55) and Capitol Square (Route 75). These routes are primarily designed to serve reverse commute trips to Epic, but are also effective at serving Verona commuters who work in Madison. In addition, Monona Express provides fast, direct, express service between residential areas in Monona and the Madison CBD.

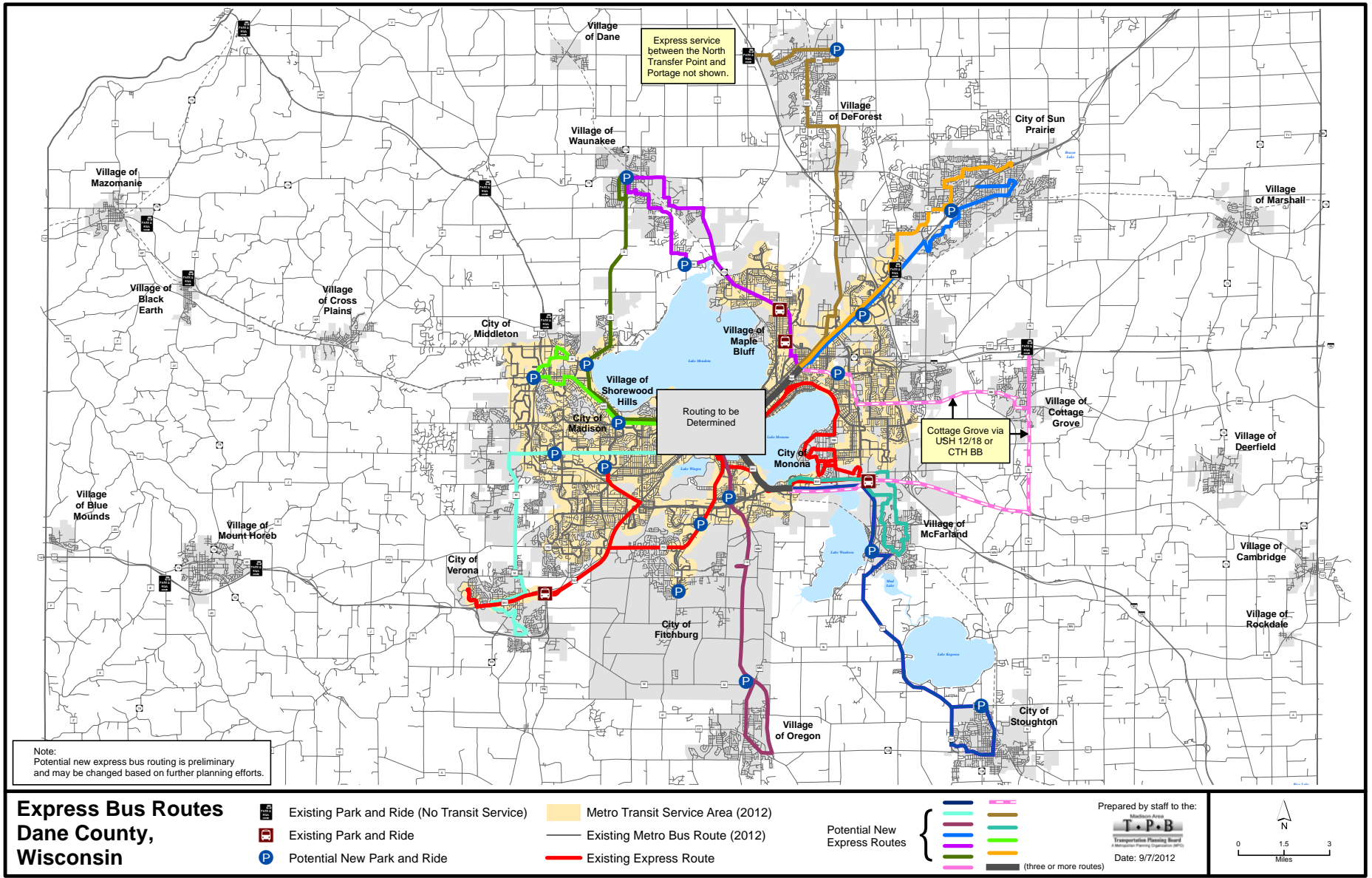
The routing for these lines was refined from past regional express bus planning efforts, in coordination with the intergovernmental coordinating committee, consisting of representation from the affected communities. In addition, several possible locations for new park-and-ride lots were identified based on routing, land uses, and highway access. The stop patterns for each line are envisioned to be local stops in the primary communities served, local stops in the Madison CBD and UW campus areas, and limited (one to two per mile) or no stops in between.

Figure 46 on the following page illustrates potential routings for such service along with potential park-and-ride facility locations.

Table 19
Potential New Planned Express Commuter Service

Line	Routing
Waunakee West	Central Madison to Waunakee via University Avenue, Allen Boulevard, Century Avenue, and CTH Q.
Waunakee East	Central Madison to Waunakee via Packers Avenue and Northport Drive.
Stoughton	Central Madison to Stoughton via John Nolen Drive, Beltline Highway, and USH 51, including a deviation to serve downtown McFarland.
McFarland	Extend routes 11 and 12 to McFarland.
Cottage Grove	Central Madison to Cottage Grove via East Washington Avenue, Milwaukee Street, and Cottage Grove Road or via John Nolen Drive, Beltline Highway, and CTH N.
Sun Prairie East	Central Madison to Sun Prairie via East Washington Avenue, USH 151, O'Keeffe Avenue, and Main Street.
Sun Prairie West	Central Madison to Sun Prairie via East Washington Avenue and Grand Avenue.
DeForest	Central Madison to DeForest via East Washington Avenue, USH 51, and CTH V.
Oregon	Central Madison to Oregon via USH 14.
Verona	Central Madison to Verona via Mineral Point Road and CTH M.

Figure 47
Potential Future Regional Express Commuter Service



Appendix A

Transit Service Planning/Design Guidelines and Performance Standards

2013-2017 TDP

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Introduction

These transit planning guidelines and performance standards for Metro Transit's fixed-route system have been developed as part of the Transit Development Plan to guide short- and long-term transit planning activities and to publish expectations for transit system characteristics and performance. The guidelines are not intended to be a rigid document, and deviations from it are to be expected. However, transit planning guidelines provide direction and parameters for agency staff in designing services, making facility improvements, and identifying unmet needs. Use of performance standards ensures service is being provided as efficiently and effectively as possible. The guidelines and standards provide a consistent approach to issues, requests, and concerns that may arise with regards to service and facilities. Also, transit planning based on such guidelines has the potential to ensure transparency in the decision-making process.

The Fixed Route Transit Service Planning/Design Guidelines in Section 1 are general in nature and mainly address basic transit planning concepts such as routing, service levels, and facilities. The Performance Standards in Section 2 detail expectations that can be reasonably met for fixed-route transit service.

SECTION 1 – FIXED ROUTE TRANSIT SERVICE PLANNING/DESIGN GUIDELINES

Route Classification

Public transit services address the varied travel needs of the urban area population and the different mix and density of land uses within the area. Metro Transit's fixed routes are classified according to their function within the overall transit network, and correlate with routing design, service frequency, and service span. The four route categories are **Core**, **Peripheral**, **Commuter**, and **Circulator**. Some routes serve a combination of functions and don't fit neatly into a particular category. In some cases, geographical areas are served by different routes at different times – such as Route 32, a peripheral route that is replaced by Routes 14 and 15 during peak periods.

Table 1
Route Categories

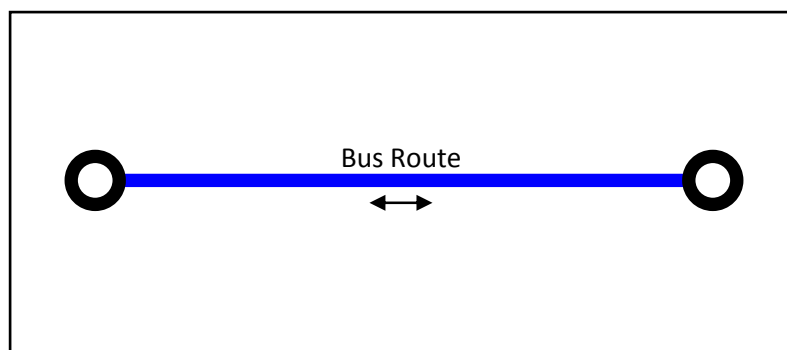
Route Category	Description
Core Routes	The core routes are major routes that operate in high volume travel corridors through the central part of the urban area. They form the backbone of the transit system and primarily operate from transfer point to transfer point along diametrical lines, via the CBD. A subset of Core Routes, Connector Routes are circumferential lines that connect transfer points without serving the CBD (Routes 16, 17, and 18).
Current Routes	2, 3/7, 4, 5, 6+67, 16, 17, 18
Peripheral Routes	Peripheral Routes are secondary routes that connect outlying residential neighborhoods or activity centers with the transfer points. In some cases, they are radial lines serving the CBD, but are shorter, have lower ridership, and/or have less regional importance than the Core Routes. A subset of Peripheral Routes, Flexible Routes have a demand-response component in order to maximize the area coverage in low density areas (Monona Lift).
Current Routes	13, 14-West/8, 15-West/68, 19, 20, 21, 22, 26, 30, 32, 34, 36, 39, 40, 50, 51, 52/59, 70, 73/63, Monona Lift, Sun Prairie Shuttle
Commuter Routes	Commuter Routes provide weekday peak-period service from residential areas to education and employment centers – primarily the Madison CBD, but also other locations. The commuter routes may provide the only service to peripheral neighborhoods, supplement core or peripheral routes, or replace peripheral routes. They may be one-way routes (traveling from residential neighborhoods to employment/education centers in the morning and the reverse in the afternoon only) or two-way routes (traveling both ways during the morning and afternoon peak periods). A subset of Commuter Routes, Express Routes , have limited or no stops in some part of their route in order to make the routes more competitive with driving (Routes 25, 29, 48, 55, 56, 57, 74, and 75).
Current Routes	11, 12, 14-East, 15-East, 25, 27, 28, 29, 37, 38, 44, 47, 48, 55, 56, 57, 58, 71, 72, 74, 75, 84, Monona Express, Portage Public Transit
Circulator Routes	Circulator Routes operate within the geographical confines of major activity centers, or between an activity center and a nearby residential area.
Current Routes	1, 9, 10, 33, 80, 81, 82

Route Alignment

Spacing of bus route corridors should ideally be as close to one-half (1/2) mile as possible to maximize service efficiency and frequency. This assumes a service coverage area of one-quarter (1/4) mile on either side of the route. Closer spacing of route corridors may be needed in some areas due to geographical constraints, such as the Isthmus and Madison CBD. However, routes that are excessively close together have lower frequency than routes that are spaced out given constant service hours, and should be avoided.

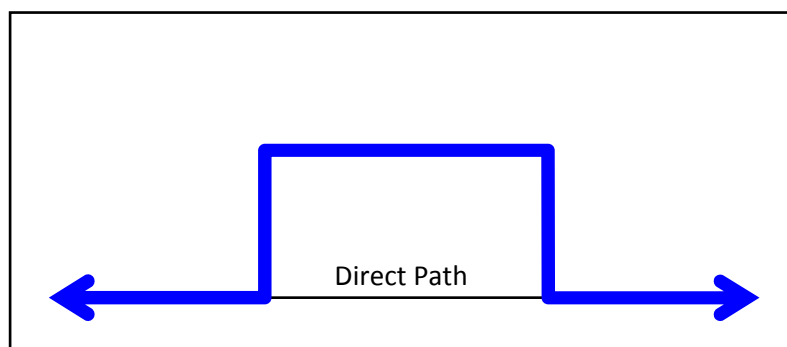
Direct routes are generally preferred wherever possible. They are fast, direct, and easy to understand.

Figure 1
Direct Route



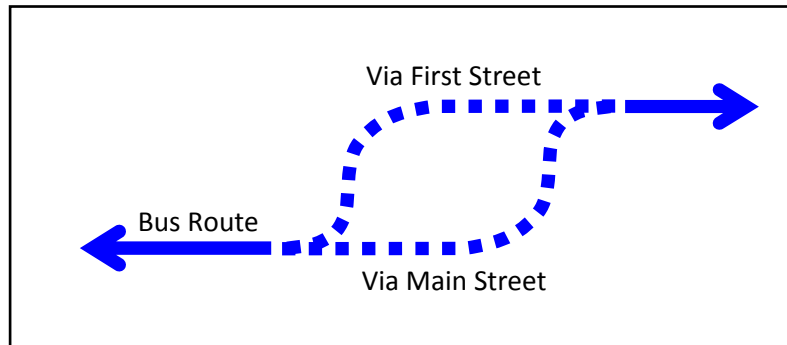
Route deviations describe transit routes that depart from the direct path to serve high-ridership destinations and populations or provide area coverage, and then return to the corridor. An example of a route deviation is Route 2 near the UW Hospital. Bus routes should be designed to minimize travel time by maximizing directness and reducing the number of deviations.

Figure 2
Route Deviation



Route splits or "vias" describe transit routes where alternating trips serve one of two or more possible patterns in order to maximize area coverage and efficiency. An example of a route split is Route 6 between the West Transfer Point and Glenway Street, where some trips operate "Via Mineral Point" and others "Via Tokay".

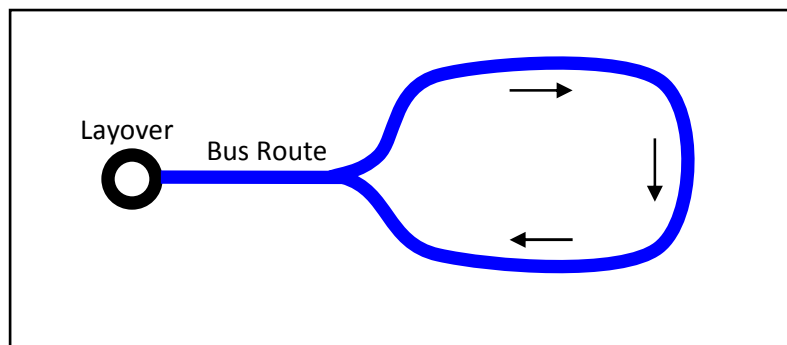
Figure 3
Route Split



Core routes, circulator routes, and other high-frequency routes should operate with the minimum number of route deviations and splits as possible to avoid sacrificing travel time and reliability and to provide a more robust, comprehensible high-frequency mass transit system. However, in many cases – especially on peripheral and commuter routes – route deviations and splits are more cost effective and convenient than providing a separate route to serve destinations or provide area coverage.

One-way loops are mainly used on peripheral routes to maximize service coverage, and on commuter routes to match the service with the land use (i.e., to provide outbound morning service to employment centers and inbound morning service to residential areas). Examples of one-way loops are Route 32 (peripheral) and Route 15 west of Gammon Road (commuter). One-way loops, other than commuter routes, should be “live loops” – buses should not have a layover halfway through the loop with passengers on board – and should have a cycle times of 30 minutes or less. One-way peripheral loops should predominantly operate in one direction – the direction may reverse at some point during the day to reflect predominant travel patterns, but alternating directions should be avoided to avoid confusion for passengers. One current exception to this guideline is Route 50, a peripheral loop route on Madison’s southwest side with hourly mid-day service. The route alternates directions in order to provide two-way service between residential areas and retail areas without a 30-minute layover at the West Transfer Point.

Figure 4
One-way Loop Route



Transit routes should be designed with an optimum **route length**. Routes that are excessively long become unreliable because delays accumulate along the line. Routes that are excessively short are not useful because they require unnecessary transfers and are not competitive with walking and other modes. To the extent possible, the end-to-end travel time of a route should be between 30 and 90 minutes, although some circulator routes may be shorter. In order to provide 30- and 60-minute timed transfers at transfer points, routes and through-routed combinations should be designed with **cycle times** that are evenly divisible by 30 or 60 minutes.

Transit network planning involves a tradeoff between many, overlapping, low-frequency routes and fewer, high-frequency routes. Many overlapping, low-frequency routes maximize the availability of one-seat rides while providing high frequency where it is needed; however, they may result in a transit network that is difficult to understand for new and occasional users. Transit networks with fewer, high-frequency routes tend to be simpler and easier to use, but rely more heavily on transfers, which is a deterrent to some riders. Opportunities to consolidate duplicative routes should be identified if they have a positive impact on the system. The presence of many overlapping routes is inevitable to some degree in the Madison area because the geography of the Isthmus requires that all routes serving central Madison use a few transit corridors.

Service Frequency

Transit service frequency is the most basic measure of level of service for transit because it determines how long people have to wait for the bus and, in some cases, if the trip can be made by bus. All routes should have a minimum frequency of one bus per hour when they are operating. Headways of more than 60 minutes represent an extremely low level of service, and fixed routes that cannot support this standard should be consolidated with other routes or deleted and replaced with flexible routes or other alternative service delivery methods. Peak morning and evening service should have a minimum frequency 30 minutes.

Routes should generally have a consistent frequency throughout each time period where practical. The time periods are defined below.

Table 2
Standard Time Periods

Time Period	Description
Mid-day	Monday through Friday, 9:30 am to 3:30 pm
Peak Period	Monday through Friday, 6:30 am to 9:30 am and 3:30 pm to 6:30 pm
Evening	Monday through Friday, 6:30 pm to End of Service
Weekend/Holiday	Saturdays, Sundays, and holidays Beginning of Service to End of Service

Although frequency should be determined by demand, Table 3 lists the general ranges of frequencies for the different route categories and the 15-minute network.

The **15-Minute Network** is the group of corridors in the transit system that have consistent 15-minute or better service throughout the morning and afternoon peak periods and mid-day on weekdays in both directions. This service standard allows transit riders to use the system without a schedule, which is attractive for occasional transit users making a variety of transit trips. The 15-minute headways may be provided by one route or a group of two or three routes, but the service must not contain any service gaps that are 20 minutes or longer. The current 15-minute network primarily consists of the central transit corridor (University Avenue and Johnson Street, State Street, and the Capitol Square), University Avenue from Highland Avenue to Breeze Terrace, Johnson Street and Gorham Street as far out as Baldwin Street, Jenifer Street as far out as Baldwin Street, and Route 80. Consistent 15-minute service is also available from the West Transfer Point and Hill Farms to central Madison. The 15-minute service network should be maintained, expanded, and promoted when opportunities arise.

Table 3
General Frequency Guidelines for each Route Category

Route Category	Headway (minutes)		
	Peak	Mid-day	Evening/Weekend
Core Routes	15-30	15-30	30
Peripheral Routes	30	30-60	60
Commuter Routes	15-30	None	None
Circulator Routes	10-20	10-20	15-30
15-Minute Network	7.5-10	10-15	15-30

In general, no transit corridors should have headways that are less than five minutes because the service would normally be better utilized to improve frequency in other parts of the system. Corridors with many overlapping routes resulting in excessively short headways may be consolidated to improve system efficiency. Ridership demand that cannot be met with five-minute headways should be accommodated with larger vehicles (e.g. articulated buses or rail modes) rather than excessive service levels. Headways less than five minutes are likely unavoidable through the Madison CBD during peak periods.

Table 4
Productivity Standards and Frequency Change Prompts

Route Category	Average Productivity*		
	Increase Frequency	No Change	Reduce Frequency or Restructure
Core Routes	More than 50	25-50	Less than 25
Peripheral Routes	More than 50	25-50	Less than 25
Commuter Routes	More than 50	25-50	Less than 25
Circulator Routes	More than 80	40-80	Less than 40

* Boardings per revenue service hour, weekdays in March or October including AM peak, mid-day, and PM peak.

Route design, frequency, and scheduling are intended to minimize overcrowding, which can result in pass-ups, lateness, excessive standing, inability to accommodate wheelchairs and strollers, and safety concerns. Metro's current fleet of 40-foot buses accommodates 35-38 seated passengers and room for additional standees. The peak loads on all trips should not exceed 55 to 60 riders at the maximum point. To the extent possible, standing loads for more than 15 minutes should be avoided.

Service Span

The hours of service operation should match the ridership demand generated by the land activities and the route function. Service periods should also accommodate the travel needs of persons who depend on the transit system as their primary means of transportation to the extent possible. The system as a whole should have a consistent span so that riders can count on routes operating until a predictable, standard time. The span of commuter service may be tailored to the specific employment centers that they serve. Table 5 shows the desirable service span for each route category. This goal shows longer service spans than Metro's existing service provides, including the extension of weekday service to 1:00 am and the extension of Saturday/Sunday/Holiday service to midnight to serve the needs of second shift workers and others that need to travel late at night.

Table 5
Desirable Service Span

Route Category	Weekday	Saturday/Sunday/Holiday
Core Routes	5:30 am – 1 am	7 am – 12 am
Peripheral Routes	5:30 am – 1 am	7 am – 12 am
Commuter Routes	6:30 – 9:30 am, 3:30 – 6:30 pm	None
Circulator Routes	Varies	Varies

Bus Stop Spacing

The spacing of bus stops involves a trade-off between the competing goals of maximizing access to the transit system and maximizing travel speed, on-time performance, and efficiency. The general goal is to space bus stops as far as possible without removing substantial walk access to the service. This maximum distance is generally considered to be one-quarter mile.

Bus stop location, and therefore spacing, is often driven by the geometry of the street network and the presence of ridership generators. A range is given below for bus stop spacing targets to account for this non-uniformity. Generally, **longer routes with higher frequency** should have a stop spacing towards the upper end of the range since they are more vulnerable to delays and missing a bus is less of a penalty. **Shorter routes with lower frequency** should have a stop spacing towards the lower end of the range since they are less vulnerable to delays and missing a bus can cause a wait of up to 60 minutes or worse.

Table 6
Bus Stop Spacing Guidelines

Route Category	Bus Stop Spacing Guidelines
Core Routes	3/16 to 1/4 mile (330-440 yards), no stops should be less than 1/8 mile (220 yards).
Peripheral Routes	3/16 to 1/4 mile (330-440 yards), no stops should be less than 1/8 mile (220 yards). Flexible routes may have flag stop service where passengers may request a stop anywhere along the line.
Commuter Routes	3/16 to 1/4 mile (330-440 yards), no stops should be less than 1/8 mile (220 yards). Limited stop service should be 1/2 to one mile and express service may have no stops.
Circulator Routes	3/16 to 1/4 mile (330-440 yards), no stops should be less than 1/8 mile (220 yards).

Bus Stop Location and Amenities

Bus stops should be sited so that they meet bus stop spacing goals while also maximizing the utility for transit passengers. The considerations in Table 7, along with judgment, should be used to site bus stops.

Table 7
Factors for Locating Bus Stops

Consideration	Discussion
Ridership	Bus stops should be located where transit ridership is the highest relative to adjacent stops. High ridership areas do not necessarily need more bus stops than lower ridership areas.
Attractions	Bus stops should be located close to ridership generating attractions, such as schools, retail and employment centers, and apartment buildings, to the extent practical.
Street Crossings	Bus stops should be located where transit riders have access to the safe and convenient street crossings, to the extent practical. Facilities that support safe and efficient street crossings are traffic signals, marked crosswalks, and bicycle/pedestrian overpasses.
Operations	Bus stops should be located where bus operators can easily enter and exit the stop with minimal delay and without excessive negative impacts on other traffic.
Other	Other factors may be used to determine the best placement for bus stops, including future land use plans, amenities for waiting passengers, lighting, bicycle parking, and community input.

A major decision on locating bus stops is whether to place them near side an intersection (the bus stops before entering the intersection), far side (the bus stops after exiting the intersection), or mid-block. The general preference for new bus stops or relocated bus stops is far side, alleviating the problems with near side bus stops described below. Mid-block bus stops are discouraged unless they immediately serve a destination because they generally lack crosswalks and are difficult to locate for passengers. In some cases, such as in-lane bus stops at traffic signals, near-side bus stops are the most appropriate.

Many bus and streetcar stops were historically placed near side. Near side bus stops provide closer access from the bus door to the curb ramp, particularly useful at bus stops without boarding platforms during wintry weather. However, bus operators are sometimes blocked from serving near side bus stops by traffic queues. Dwelling buses may create a blind spot for passing traffic that is hazardous for right-turning vehicles and crossing pedestrians. Additionally, parked vehicles may make it difficult for bus operators to see waiting riders at near side bus stops or they may be mistaken for pedestrians crossing the street. Near side bus stops require more parking removal to properly access the curb than far side bus stops, and when not provided, it is difficult for operators to square the rear wheel with the curb.

The basic amenities at bus stops include a sign, concrete platform, bench, printed schedule, and shelter. All shelters have printed schedule information and benches. In general, the level of amenities at bus stops should be proportional to the ridership, and upgrades should be prioritized by bus stop ridership. In some cases, other factors are taken into account, such as difficult construction, land uses, or transfers. Table 8 shows recommended thresholds for installing amenities.

Table 8
Bus Stop Amenity Guidelines

Amenity	Daily Boardings
Sign	All bus stops
Platform	All bus stops
Bench	15 or more
Schedule	15 or more
Shelter	30 or more

Service Change Prioritization

Service changes generally consist of adding service, removing service, or changing service in response to budgeting needs, changes in ridership patterns, or other needs. The prioritization of these needs is outlined below in Table 9.

Table 9
Service Change Prioritization

#	Goal	Example
1	Bring existing service into compliance with minimum service standards	Adjust the frequency and span to meet the minimum service level for the route category or corridor
2	Improve travel times	Reduce walking distance, wait time, or in vehicle travel time
3	Improve transit reliability	Reduce late buses or missed connections
4	Improve usability of the system	Make the system simpler to use or reduce transfers
5	Reduce overcrowding	Shift resources from underutilized service to overcrowded service
6	Increase service coverage	Add new service to outlying communities or peripheral residential areas
7	Increase accessibility to employment, school, shopping, and services	Add new peak period reverse-direction service
8	Improve cost effectiveness	Implement no-cost or cost-saving improvements
9	Improve mobility in areas with concentrations of low-income and transit dependent populations	Improve service in underserved peripheral neighborhoods with low auto ownership
10	Reduces congestion on high traffic volume roadways	Increase transit use on congested corridors identified in the Congestion Management Plan

SECTION 2 – PERFORMANCE STANDARDS

Service Coverage / Route Justification

Service coverage should be maximized in order to provide transit service to as many people as possible; however, expanding area coverage with low-frequency and low-productivity routes contradicts the goal of maximizing service intensity in the system core and maximizing system-wide productivity. To that end, unproductive routes that provide a small amount of area coverage and are underutilized should be deleted, restructured, or avoided. As a guideline, all peripheral routes should provide service coverage to at least 5,000 people, 5,000 jobs, and average 15 mid-day weekday boardings per hour. A route may be deficient in one or more of these criteria, but all routes should have a mid-day productivity of at least 10 boardings per service hour. This standard is met by most existing bus routes, as shown in Figure 5.

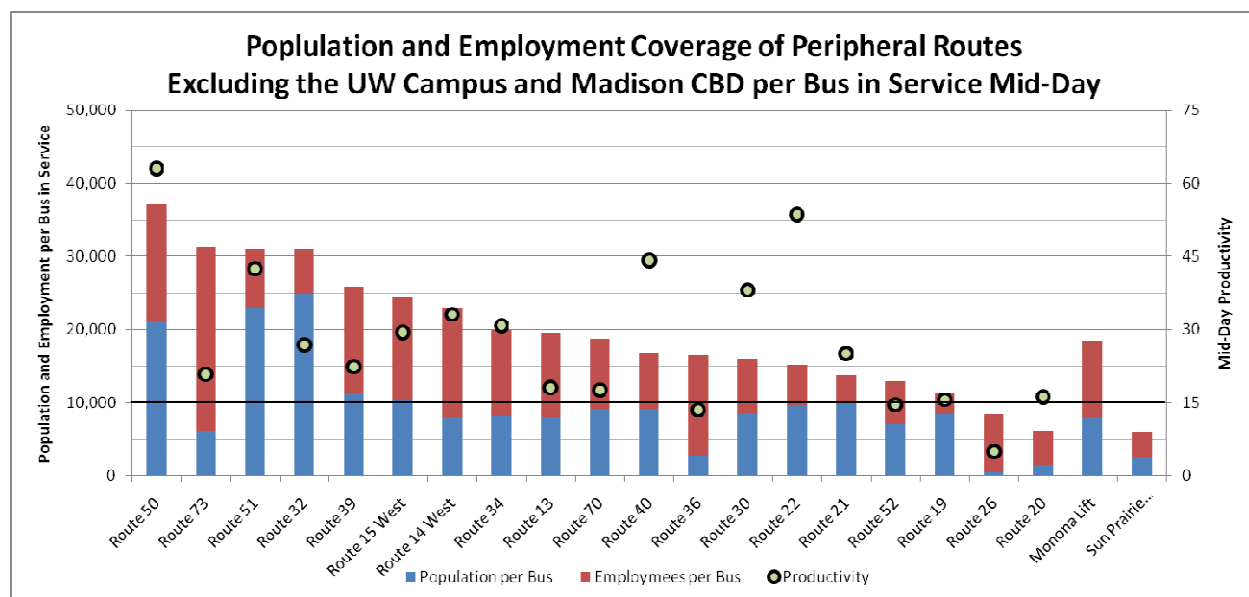
Table 10
Service Coverage / Route Justification Guidelines

Service Coverage / Route Justification Guidelines	
Productivity (boardings per hour)*	15
Employment served per bus in service**	5,000
Population served per bus in service**	5,000

* Boardings per revenue service hour, mid-day weekday during March or October.

** Excluding the UW Campus and Madison CBD for March or October weekday mid-day.

Figure 5



- Population totals are from the 2010 Census, 100% count at the census block level within ¼-mile of the transit route outside the UW Campus and Madison CBD.
- Employment totals are from InfoUSA 2011, MPO adjusted within ¼-mile of the transit route outside the UW Campus and Madison CBD.
- Productivity is from the October 4-20, 2011 sample, mid-day weekday.

On-Time Performance

Bus trips should be scheduled to maximize on-time performance while minimizing unnecessary delays at time points and transfer points. On-time performance for routes with timed transfers should be measured as the percent of trips that arrive after the next pulse, i.e., transfers are missed and the next scheduled trip for that bus begins late. These trips are generally scheduled to arrive a few minutes before the pulse and may arrive after their scheduled arrival but not be counted as late. On-time performance for routes without timed transfers should be measured as the percent of trips that arrive at time points more than five minutes late. While on-time performance should generally be maximized, a route with near 100% on-time performance may impose excessive delays on passengers and may be susceptible to running early causing riders to miss the bus. Because of the timed-transfer system, low-frequency routes with timed transfers should be held to a higher standard than frequent routes where riders often do not use schedules.

Similar to ridership performance monitoring, on-time performance monitoring should take place in March and October, when school is in session and the weather is fair. Excessively wintry or rainy conditions, or special events, will likely cause any on-time performance to suffer. To some degree, the ambitious goals set in Table 11 take this variability into account.

Relatively little existing on-time performance data was available to establish these goals, they should be revised if real-world data collection proves that they are inappropriate.

Table 11

Headway	On-Time Performance Goal
15 minutes or less	90%-98%
More than 15 minutes	95%-98%

Appendix B

Conceptual Future Service Change Concepts

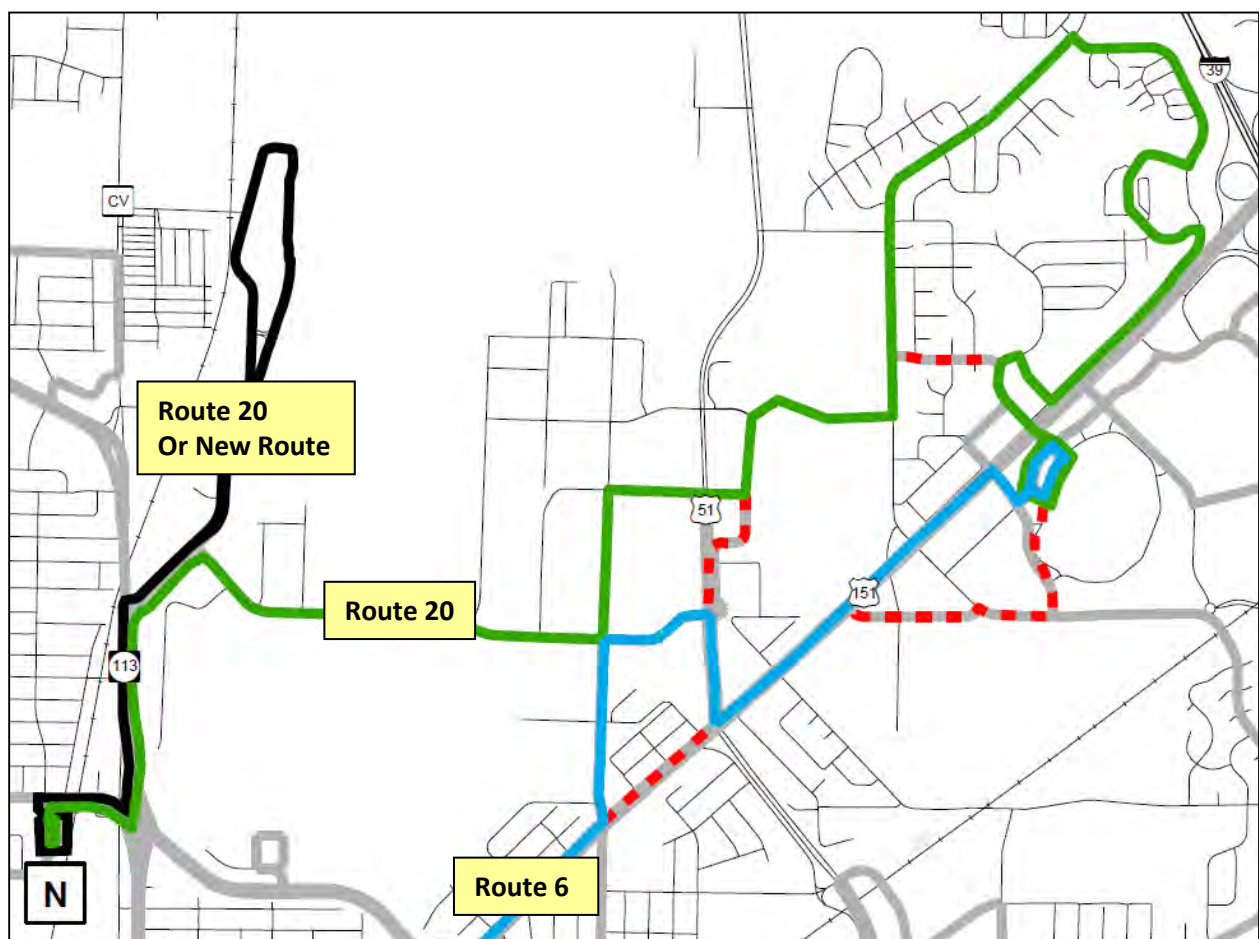
Routes 2 and 3: Eliminate Sherman via (Route 2) and Division via (Route 3). All trips operate via Fordem and Winnebago, respectively. (4)

Currently, Route 2 splits between Baldwin Street and Sherman / Fordem Avenues and Route 3 splits between Baldwin Street and Division Street / Atwood Avenue. Alternating trips operate “Via Sherman” or “Via Fordem” and “Via Winnebago” or “Via Division.” Removing these splits would make the system easier to use and less confusing. The vias have similar levels of ridership; Fordem Avenue and Winnebago Avenue were chosen because they are more direct and provide service to more transit supportive land uses. Because of the limited pedestrian connections between Sherman Avenue and Fordem Avenue, some local service should remain on Sherman Avenue, such as Route 28 or a modified Route 9. Some local service should likely remain on Division Street, such as Routes 10 and 38.



Routes 6 and 20: Eliminate Route 6 Hayes via, all trips operate via MATC. Reroute Route 20 to Portage and Hayes Roads. (2, 3, 4, 5, 7, 8, 10)

Currently, Route 6 generally follows one of two circuitous pathways between the Capitol Square and East Towne Mall. Removing this split would make the system easier to use and less confusing. Streamlining the routing for Route 6 through the Madison College by rerouting it from Kinsman Boulevard to Anderson Street would reduce travel times as well as further simplify the line. The areas left unserved by this change would be served by a modified Route 20 that would use the new Bartillon Drive connection between USH-51 and Portage Road. This change would require a transfer for riders traveling between Portage / Hayes Roads and central Madison, but would provide additional connections at the North Transfer Point and improve the utilization of Route 20 by providing it a unique market east of the Dane County Airport. This change builds on past simplifications of Route 6 and may be considered an incremental approach to bus rapid transit in the East Washington Avenue corridor.

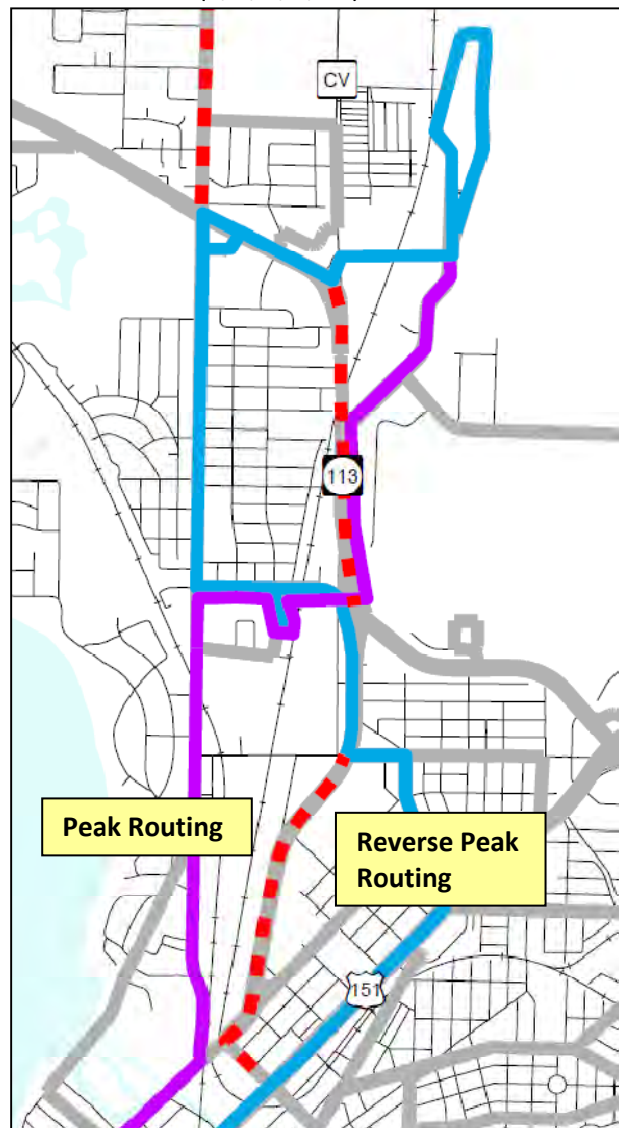


Route 12: Eliminate routing on Lake Point Drive and Waunona Way. (2, 8, 10)

Currently, Route 12 deviates north of Broadway one to two blocks between the Capitol Square and Dutch Mill Park & Ride. This deviation provides extremely little peak-period-only coverage and adds about four minutes to trips. Removing this deviation would make the system easier to use and less confusing because buses would follow a more logical path and Routes 12 and 16 would serve the same bus stops. This change builds on past simplifications in this area, such as the removal of the deviation south of Broadway for Route 11 in August 2012. Upgrades to pedestrian infrastructure along Broadway in the early 2000's reduced the need for deviations in this area. This change is expected to affect about 27 daily boardings – the heaviest used stop, at 14 daily boardings, is the stop at Bridge Road and Lake Point Drive, one block north of Broadway.

Routes 27 and 29: Eliminate Route 29, extend Route 27 to Dane County Regional Airport and North Towne Center P&R. (2, 4, 7, 8, 10)

Route 29, with only two round trips per day, has very low utility north of Delaware Boulevard and is duplicative of Route 21, which continues through the North Transfer Point to central Madison. Restructuring Routes 27 and 29 may improve the efficiency of the system while providing direct reverse commute service to Dane County Airport and making the system easier to use and less confusing. Providing a direct route from central Madison to North Sherman Avenue may be considered an incremental approach to bus rapid transit in north Madison.



East Washington Avenue service: Establish an express stop pattern on East Washington Avenue from the Capitol Square to Milwaukee Street. (2, 3, 8, 10)

Routes 14, 15, 25, 27, 29, 37, 56, and 57 provide peak period service on East Washington Avenue. Establishing a pattern of express stops to serve these routes while Route 6 continues to provide service to local stops may improve travel times during peak periods. This change may be considered an incremental approach to bus rapid transit in the East Washington Avenue corridor.

University Avenue service: Establish an express stop pattern on University Avenue from the Capitol Square to Segoe Road. (2, 3, 8, 10)

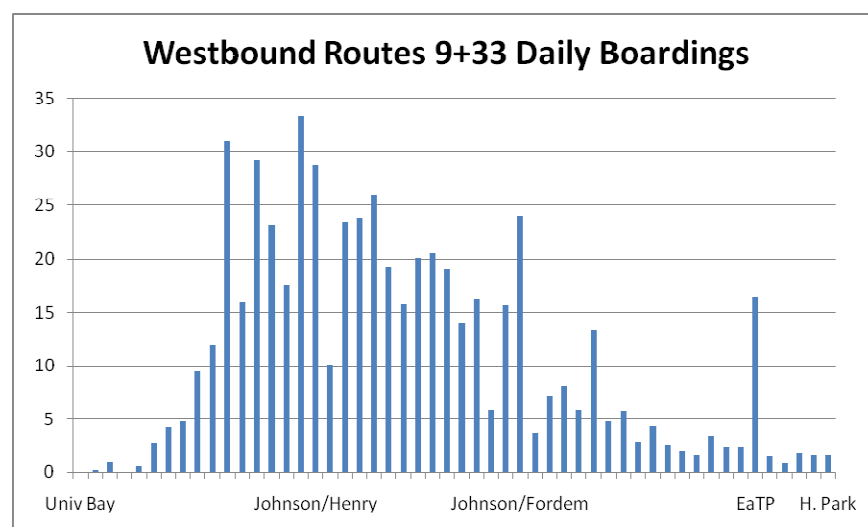
Routes 11, 12, 15, 28, 37, 38, 56, 57, 70, 71, 72, and 74 provide peak period and mid-day service on University Avenue west of Campus Drive. Establishing a pattern of express stops to serve these routes while Route 2 continues to provide service to local stops may improve travel times, particularly during peak periods. This change may be considered an incremental approach to bus rapid transit in the University Avenue corridor.

Route 2: Improve weekday peak and mid-day service to every 15 minutes between the West Transfer Point and Capitol Square.

The west half of Route 2 is very productive throughout the mid-day, peak periods, evenings and weekends. This change would enhance the quality of service in this busy corridor, reduce overcrowding, and allow for several other improvements (see Routes 9, 10, and 33 and Routes 14, 15, west Madison).

Routes 9, 10, and 33: Reduce the number of buses in the mid-day rotation from six to four, restructure to eliminate service west of UW campus, duplicative service on Johnson / Gorham, and Route 33. (8)

Routes 9 and 33 are an interlined pair during the mid-day with a cycle time of 90 minutes and a three-bus rotation. While Route 9 enjoys reasonably high overall productivity of about 45 mid-day weekday boardings per revenue service hour, it's utility drops off substantially east of about Fordem Avenue. Route 33 provides virtually no utility and has the lowest productivity of any route during the mid-day at less than five boardings per revenue service hour.



Route 10 currently operates as a mid-day only two-way loop with alternating trips traveling out via Johnson Street and in via Jenifer Street or out via Jenifer Street and in via Gorham Street. Route 10 was established as a circulator route when the transfer point system was established. At that time, all four transfer points pulsed at :00 and :30, which resulted in Routes 2, 3, 4, and 5 serving Jenifer, Johnson, and Gorham Streets at about the same time with about a 30-minute gap, which was filled by Route 10 during the mid-day. In the early 2000's, the East Transfer Point's pulse was changed to :15 and :45 which separated Route 3 from Route 4 and Route 2 from Route 5; and Route 10 was deleted. However, Route 10 was reinstated after several requests for direct service from between Jenifer Street and the UW campus as well as other places. The mid-day weekday productivity for Route 10 (14 boardings per revenue service hour) is low because the modifications at the East Transfer Point reduced its utility, and it competes for riders with Routes 2, 3, 4, 5, and 9.

This change would improve system efficiency by reducing the number of buses in the mid-day rotation from six to four as well as make the system easier to use and less confusing. Route 9 would operate from the East Transfer Point to UW campus via Johnson and Gorham Streets and Route 10 would operate from Atwood Avenue and Division Street to UW campus via Jenifer Street.

Routes 14 and 15, West Madison: Extend a new peak-only route to Colony Drive and west Madison and reroute the peak-period Route 14 to be similar to the mid-day Route 14. Reroute Routes 14 and 15 from Sheboygan Avenue to Regent Street and Old Middleton Road, respectively. Introduce a new peak-only route from Sheboygan Avenue to UW campus. (2, 3, 5, 10)

These improvements are directly or indirectly related to each other. Restructuring the peak-period Route 14 would make the system easier to use and less confusing because Route 14 would follow the same routing throughout the day west of the Capitol Square.

Ridership on Routes 14 and 15 have grown to the point where overloading has become a concern and extra buses have been deployed on both routes. During peak periods, Routes 14 and 15 are often at or near capacity when they pass Sheboygan Avenue. Removing this deviation is expected to reduce travel times on these routes by several minutes. It is expected that Route 2 service level s would be increased in order to maintain consistent 15-minute service along Sheboygan Avenue off peak (see Route 2). The peak period capacity and service lost on Sheboygan Avenue would be replaced by a frequent peak-only route directly connecting Hill Farms and the UW campus, which would likely replace some overload trips in that corridor.

Routes 3, 6, and 7: Convert Route 7 to Routes 3 and 6 on weekends and reduce weekend headways on Route 6 from 60 to 30 minutes. (1, 2, 3, 4, 6)

Route 7 is currently operated as a weekend-only route that replaces Route 3 and the Route 6 via Tokay. This is an efficiency measure that removes several deviations and reduces the cycle time from 120 minutes (Route 3) to 90 minutes. This allows relatively high frequency (30 minutes) between the East Transfer Point and West Transfer Point, provides timed transfers at the West Transfer Point, and reduces travel times. However, Route 7 suffers from chronic unreliability, often arriving at the transfer points after the pulse. Route 7 leaves the East Transfer Point three minutes before the pulse, but delays and missed connections continue to affect the quality of service on Route 7 and other routes. Converting Route 7 to Route 3 would add one bus into the weekend service rotation, increase travel times between the East and West Transfer Points, and cause 15-minute or more waits at the West Transfer Point, but it would solve the reliability problems, reduce confusion, and increase service on Monroe Street. This change also removes the service on Tokay Boulevard provided by Route 7. To provide this service, Route 6 weekend frequencies would be reduced from 60 minutes to 30 minutes with the Tokay via in operation. Improving frequencies on Route 6 on weekends would also improve service on the East Washington Avenue corridor which currently has mid-day Saturday productivity of over 40 boardings per hour excluding the Madison CBD, and service on Hayes Road which is every two hours.

Routes 8 and 78: Combine Routes 8 and 78 into one route from the Capitol Square to Middleton via Bluff. Extend Middleton service to include Sundays. (2, 4, 6, 8, 9)

Routes 8 and 78 are weekend-only routes that replace parts of weekday-only Routes 14 (serving Bluff and Regent Street from the Capitol Square) and 70 (serving Middleton). Combining these two routes into one route from the Capitol Square to Middleton via Bluff Street may provide some operational efficiencies and would provide more direct service between Madison and Middleton that is more similar to regular weekday service. Direct Saturday service between Middleton and the West Transfer Point would be lost, however, since Route 73 does not operate on weekends. Route 78 is currently operated on Saturdays only; adding service to Sundays would further improve travel options in Middleton.

Routes 11, 12, and 39: Extend Routes 11 and 12 (peak-period) and Route 39 (off-peak) to southeast Madison. (6, 9)

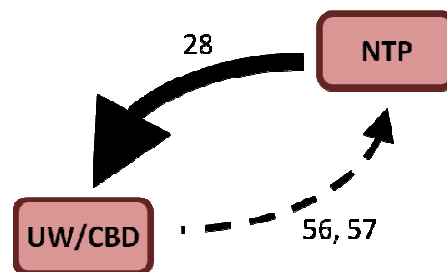
The area in southeast Madison south of the Beltline Highway and east of USH 51 (Marsh Road and Owl Creek) is rapidly developing, and the many residents are low income. Current Metro service is limited to Supplemental School Service. Extending regular fixed-route service to this neighborhood would likely consist of converting Route 39 in the mid-day from a one-way loop to a two-way linear route and extending it south via Marsh Road with, ideally, a cycle time of 90 minutes. During the peak periods, Route 39 would be unchanged and Routes 11 and 12 would be extended to provide direct service to central Madison with transfers available to Route 16 on Broadway to serve trips to Monona Grove High School.

Route 16: Reduce weekday headways from 60 to 30 minutes throughout the weekday. (1, 2, 4, 9)

Route 16 was created in the mid 2000's when several peripheral loop routes anchored to the South and East Transfer Points were consolidated, resulting in improved system efficiency and overall utility. Route 16 is considered a core route because it is part of the cross-town network of routes that connect the transfer points. It also has relatively high mid-day weekday productivity of 56 boardings per revenue service hour and provides service to high density, low-income neighborhoods near Rimrock Road, along Broadway, and in other areas, which would benefit from increased service levels. Currently, Route 16 operates "closed-door" along parts of Broadway and Monona Drive through the City of Monona, which provides transit service with its Monona Lift and Monona Express service. The utility and area coverage provided by Route 16 would be improved by providing service along this portion of its route.

Route 28: Reduce headways from 10-15 minutes to 7.5 minutes during the school year from the North Transfer Point to UW campus. (2, 3, 5, 8, 10)

Route 28 provides frequent, direct peak period service between the north side of the Isthmus and UW campus. The reverse peak flow of buses is handled with Routes 56 and 57. The Route 28/56/57 system has very high peak period productivity and increasing service levels is warranted.

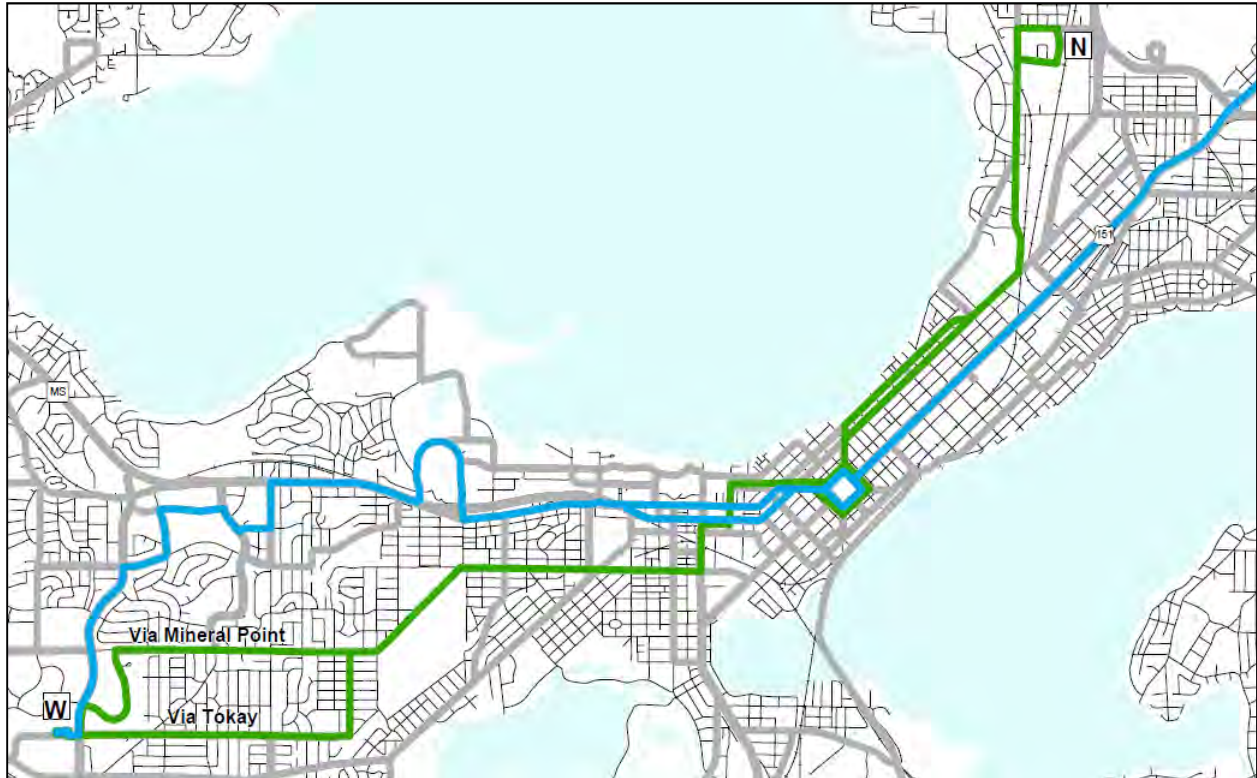


Route 50: Reduce weekday headways from 60 to 30 minutes throughout the weekday. (1, 2, 4, 8, 9)

Route 50 currently provides 30-minute headways during peak periods and 60-minute headways at other times (weekday mid-days, weekday evenings, and weekends). It is a loop route with alternating directions designed to connect neighborhoods in southwest Madison with retail areas as well as the West Transfer Point. Improving the service levels is supported by the high productivity of the route during weekday mid-days and weekends and would make the route easier to use and understand, particularly considering the alternating direction pattern.

Routes 2 and 6: Combine Route 2-West with Route 6-East and reduce weekday headways from 30 to 15 minutes. Combine Route 2-North with Route 6-West. (2, 4, 5, 7, 10)

Routes 2-West (West Transfer Point to Capitol Square) and 6-East (Capitol Square to East Towne) are highly productive routes serving high concentrations of residential areas, employment centers, and education. Combining them and improving the service on the resulting route from the West Transfer Point to East Towne would be an investment in a high volume transit corridor and support transit oriented development in the Isthmus. Routes 6-West and 2-North would also be combined. This change may be considered an incremental approach to bus rapid transit in the east-west corridor.



Routes 4 and 5: Reduce evening and weekend headways from 60 to 30 minutes. (1, 2, 4, 9)

Improving evening and weekend service levels on Routes 4 and 5 would strengthen core transit service connecting the transfer points and Madison's central neighborhoods.

Routes 10 and 38: Eliminate Oakridge via and reroute Route 38 from Jenifer Street and Broom / Basset Streets to First Street and East Washington Avenue. Extend Route 10 span to include peak periods. (2, 3, 5, 10)

Route 38 provides peak-only commuter service to Madison's east side. It also provides direct service from Jenifer Street to the UW campus, bypassing the Capitol Square. Rerouting Route 38 from Jenifer Street to East Washington Avenue would reduce travel times, ease overcrowding, and increase reliability. The Route 10 service span would be increased to include peak periods to replace service lost on the Jenifer Street and Broom / Bassett Street corridors.

Routes 52 and 55: Reroute Route 55 from the Beltline Highway and Verona Road to Whitney Way, Fitchrona Road, and Nesbitt Road. Reduce Headways from 60 to 30 minutes. Eliminate Route 52 during peak periods. (1, 5, 7, 8, 9, 10)

Combining Routes 52 and 55 would improve connections between Epic Campus, Fitchburg / Southwest Madison, and the West Transfer Point. Increasing the service levels on Route 55 would provide more flexibility to commuters using that route.

Routes 51, 56, and 57: Eliminate Route 51 and operate Routes 56 and 57 south of the West Transfer Point. (4, 6, 9)

The service area provided by Route 51 is limited by the 30-minute cycle length dictated by pulses at the West Transfer Point. Extending service to the developed areas along McKee Road would require a route structure similar to Routes 56 and 57 south of the West Transfer Point.

Routes 3, 58: Eliminate Route 58 and reduce Route 3 peak headways from 30 to 15 minutes. (4, 8)

Route 58 is identical to Route 3 east of Whitney Way. It provides very little peak-only coverage south of the West Transfer Point with low productivity – the majority of Route 58’s service area is duplicated by Routes 50 and 57. Replacing Route 58 trips on Monroe Street and Odana Road with Route 3 trips would make the system easier to use and less confusing.

Route 75: Reduce peak headways from 90 minutes to 30 minutes. (1, 2, 7, 10)

Increasing the service levels on Route 75 would provide more flexibility to commuters using that route.

Grandview Commons: Restructure Routes 14 and 15 east of the ETP to provide service east of I-39/90. (6, 10)

The Grandview Commons development has added a substantial number of new residential dwelling units in a neighborhood designed with New Urbanism techniques. Extending peak-period transit service to this neighborhood would provide commuting alternatives.

Fitchburg: Create a new route from the South Transfer Point to the West Transfer Point via central Fitchburg, McKee Rd, King James Way, and Red Arrow Trail and delete Route 52. (6, 7, 9)

This new route would connect the majority of Fitchburg with its city center at Lacy Road as well as the West and South Transfer Points. It would cover the area currently served by Route 52, which would be deleted.

West Madison: Restore a commuter loop route from the UW campus to Mineral Point Road and Odana Road. (2, 4, 7)

Route 53 was a peak-only route that looped around Mineral Point Road, Whitney Way, and Odana Road before serving the UW/VA Hospitals and UW campus. This route would provide a one-seat ride between the UW campus and near west Madison. It would likely be combined with Routes 11 and 12 east of the Capitol Square.

Appendix C

Definitions and Acronyms

Americans with Disabilities Act (ADA) – A civil rights law enacted in 1990 that prohibits discrimination based on disability. The ADA includes guidelines and minimum standards for public infrastructure and requires that fixed-route public transit service be supplemented with demand-response paratransit.

Automatic Vehicle Location (AVL) – A system that tracks and records the movement of transit buses.

CTH – County Trunk Highway

Capitol Loop – The set of one-way streets around the Wisconsin State Capitol one block outside the Capitol Square, consisting of Webster Street, Dayton Street, Fairchild Street, and Doty Street.

Capitol Square – The set of one-way streets around the Wisconsin State Capitol, consisting of Pinckney Street, Mifflin Street, Carroll Street, and Main Street.

Central Business District (CBD) – The commercial center of a city, commonly referred to as “downtown”. The Madison CBD generally consists of the few blocks surrounding the Capitol Square.

Central Madison – The area of Madison generally bounded by Highland Avenue, Regent Street, and the Yahara River, encompassing UW-Madison, the Madison CBD, and the Isthmus.

Contracted Services Oversight Subcommittee (CSOS) – A subcommittee to the Transit and Parking Commission that considers policy matters relating to contracted transportation service, including but not limited to service standards, performance targets, route additions, extensions or contractions, changes in schedules, fare structures, hours of service, equipment, marketing and advertising programs, and other matters.

Cycle Time – The time required for a bus to travel through a route or group of interlined routes and return to the starting location.

Frequency – The number of times a bus will pass a point on the route in a given amount of time, generally stated as buses per hour. The frequency is the inverse of the headway.

Global Positioning System (GPS) – An electronic system that uses space-based satellites to determine the position of an object on Earth, used for Automatic Vehicle Location (AVL) systems.

Headway – The time between buses that pass a point, generally stated in minutes. The headway is the inverse of Frequency.

IH – Interstate Highway

Intelligent Transportation Systems (ITS) – Electronic systems designed to improve transportation systems. Examples of ITS include video surveillance equipment, real time information signs, and transit signal priority.

Interlining – The practice of scheduling bus trips so that a bus serves one route to its terminal and then continues as a separate route.

The Isthmus – The residential, commercial, and industrial area in Madison between Lake Monona and Lake Mendota, generally bounded by Butler Street and the Yahara River.

Layover – Recovery time, generally at one or both ends of a transit route. A layover is required because of the variability in transit run times. Layovers are also used for driver changes and short driver breaks to the extent possible because they minimize the inconvenience to passengers. Most layovers in the Metro system operate at the transfer points and Capitol Square.

Madison Metropolitan School District (MMSD) – The public school system serving the Madison area, including the City of Madison, Fitchburg, Shorewood Hills, Maple Bluff, and Blooming Grove. The MMSD includes elementary school, middle school, and high school.

Metro Transit (Metro) – The provider of the majority of public transportation in the Madison area. Metro is a City of Madison utility that provides fixed-route and paratransit service in the City of Madison and several surrounding communities.

Metropolitan Planning Organization (MPO) – The Madison Area Transportation Planning Board (MPO) is a policy body responsible for cooperative, comprehensive regional transportation planning and decision making for the Madison Metropolitan Planning Area.

Monona Transit – The provider of public transportation in the City of Monona. Monona Transit operates two routes, Monona Lift – a flexible demand-response route and Monona Express – a peak-only commuter route. Both routes connect to central Madison but are not available for trips within Madison.

National Transit Database (NTD) – A publicly available source for transit data in the United States. All transit operators that are recipients of grants from the Federal Transit Administration are required to submit certain data in a standardized format.

Regional Transit Authority (RTA) – An independent body that plans, oversees, and operates transit systems that cover multiple jurisdictions.

Regional Transportation Plan (RTP) – This document is an overall system-level plan that serves as a guide for transportation system planning and development in the Madison region. The plan was updated in 2012 and has a planning horizon of 2035.

Ride Guide – A Metro Transit publication with fixed-route timetables and other basic information.

STH – State Trunk Highway

Shuttle – A transit route that primarily serves two or very few stops. Examples of shuttles include the Sun Prairie Shuttle and Metro Transit Route 17.

Split (Via) – A split in a route where alternating trips take different paths. Route splits in the Metro system are commonly called “vias” because they are denoted on the head signs with the word “VIA” plus the primary street that the route will use.

Time Point – A published time at a bus stop in a transit schedule. Buses must not pass a time point before the scheduled time. A small amount of recovery time may be built into time points for buses that are behind schedule.

Transfer Point – A transit center that accommodates timed transfers between routes and layovers in the Metro transit system.

Transit Development Plan (TDP) – A short- to medium-range plan intended to identify transit needs and proposed improvements for a five-year planning horizon.

Transit and Parking Commission (TPC) – The body make recommendations to the City of Madison Common Council regarding policies on all transit and parking matters. The TPC is made up of three members of the City of Madison Common Council and six citizens that are appointed by the Mayor of Madison.

USH – United States Highway

University of Wisconsin-Madison (UW-Madison) – The University of Wisconsin is a state-wide system of public higher education. The Madison campus is centered in central Madison roughly between University Bay Drive and Lake Street on the south shore of Lake Mendota. The UW has an enrollment of over 40,000 students with a fall and spring semester in session from early September to late December and late January to mid May, respectively.

Utility – The effectiveness of transit service to meet the needs and desires of transit riders.