

RECOMMENDED YEAR 2050 REGIONAL LAND USE AND TRANSPORTATION PLAN

1



Credit: SEWRPC Staff

1.1 INTRODUCTION

Southeastern Wisconsin has reached a pivotal point in its development. The 2020 Review and Update of VISION 2050 affirmed that this statement from the originally adopted VISION 2050 is accurate, and that the expected workforce shortage caused by the Region's demographic trends is occurring at a rapid pace. In the four years between the original plan adoption and the development of this Second Edition of Volume III of the VISION 2050 plan report, the Region's notable economic growth has further magnified the need to attract new residents underscored in the originally adopted plan. These new residents need to be attracted at a level unseen in decades, putting Southeastern Wisconsin in direct competition with other metro areas. If the Region does not compete strongly to attract needed workers, economic growth may not continue to occur. The recommendations for land use and transportation in VISION 2050 will improve quality of life throughout the Region and are intended to make the Region more competitive over the next several decades.

While the trends between 2016 and early 2020 discussed above point to the urgency of attracting new residents to Southeastern Wisconsin, this updated version of Volume III was finalized during the first few months of the COVID-19 global pandemic. This was a time of unprecedented uncertainty as it relates to public health, the economy, and transportation, and the Commission recognizes that there could be some degree of change relative to historical and expected trends. Staff will continue to monitor any changing conditions and will consider amendments to the plan if they become necessary prior to the next review and update to be completed in 2024. Despite the potential for changes in response to the pandemic, it is important to continue to pursue VISION 2050 implementation to achieve the significant benefits the plan would have for Southeastern Wisconsin.

**VISION 2050
recommendations
will help make
Southeastern Wisconsin
more competitive
by building on the
Region's strengths.**

This volume of the VISION 2050 plan report presents the recommended year 2050 regional land use and transportation plan for Southeastern Wisconsin. VISION 2050 recommends:

- Encouraging sustainable and cost-effective growth
- Preserving the Region's most productive farmland and primary environmental corridors, which encompass the best remaining features of the Region's natural landscape
- Encouraging more compact development, ranging from high-density transit-oriented development to traditional neighborhoods with homes within walking distance of parks, schools, and businesses
- Significantly improving and expanding public transit, including adding rapid transit and commuter rail, and improving and expanding local and express transit services to support compact growth and enhance the attractiveness and accessibility of the Region
- Enhancing the Region's bicycle and pedestrian network to improve access to activity centers, neighborhoods, and other destinations
- Keeping existing major streets in a state of good repair and efficiently using the capacity of existing streets and highways
- Strategically adding capacity on highly congested roadways, incorporating "complete streets" roadway design concepts to provide safe and convenient travel for all, and addressing key issues related to moving goods into and through the Region

Groundwork for Vision and Plan Development

Volume I of the plan report includes information collected during the initial process to develop VISION 2050 on the existing and historical land use and transportation system in the Region; analyses of that information, including an analysis of progress in the implementation of the previous generation regional plans (year 2035); and forecasts of future needs for resources, land, and transportation based on the data. This information was vital in establishing a basis for preparing the technically sound plan that was originally adopted in 2016.

Extensive public outreach was conducted during each step of the original planning process.

Developing the Vision and Plan

Volume II documents the initial process used to prepare VISION 2050, including the extensive public outreach conducted as part of each step in the process. The process began by engaging residents in visioning for the future, which involved a variety of activities and surveys. The result was an initial vision comprised of a set of VISION 2050 Guiding Statements, which generally describe the desired future direction of growth and change in the Region with respect to land and transportation system development. The feedback obtained from initial visioning activities led into a scenario planning effort. This step involved comparing a series of five conceptual land use and transportation scenarios, including a baseline scenario representing a continuation of current trends and additional scenarios representing a range of possible futures for land use and transportation that could achieve the initial vision. Following public input on the scenarios, a series of three detailed land use and transportation alternative plans were prepared and thoroughly evaluated and compared using 50 criteria based on the Guiding Statements developed earlier in the process. The public input on these

detailed alternatives guided the development of a preliminary recommended regional land use and transportation plan. The Preliminary Recommended Plan was thoroughly evaluated and was the focus of the final round of public input during the initial VISION 2050 process.

The original VISION 2050 included refinement to the Preliminary Plan based on consideration of public input on the Preliminary Plan, as well as input from the Commission's Advisory Committees on Regional Land Use Planning and Regional Transportation Planning, Environmental Justice Task Force, Jurisdictional Highway Planning Committees in each county, and VISION 2050 task forces on key areas of interest.¹

Amendments and Updates Following Original Plan Adoption

Following the adoption of VISION 2050 in 2016, the Commission amended the plan on three occasions and one interim review and update was conducted. One of the three plan amendments incorporated land use changes to accommodate additional residents and jobs directly or indirectly related to the Foxconn manufacturing campus in Racine County. In addition, the amendment incorporated transportation improvements to serve the Foxconn manufacturing campus area, including both highway and transit improvements. The other two plan amendments incorporated targets for a number of performance measures developed by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) into VISION 2050, as required by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act. The established targets are included in Appendix P of this report.

Since 2016, the Commission has updated VISION 2050 through three amendments and one interim review and update.

Every four years, the Commission conducts an interim review and update of the plan, in part to address Federal requirements. The 2020 Review and Update of VISION 2050, guided by the Advisory Committees on Regional Land Use Planning and Regional Transportation Planning, was the first interim update. The 2020 Update reviewed plan implementation to date, current transportation system performance, and the year 2050 forecasts underlying the plan, then identified changes to VISION 2050 based on plan implementation to date and recent changes in technology, demographics, and the economy. The changes were also based on input received from the public and other stakeholders, including two rounds of public involvement held during the review and update process. Changes identified in the 2020 Update have been incorporated into this Second Edition of Volume III of the VISION 2050 plan report.

The VISION 2050 Plan

VISION 2050 includes a recommended land use development pattern and transportation system, together representing a desired future vision for the Region. It was developed to achieve the plan objectives documented in Chapter 3 of Volume II of this report and presented in Figure 1.1 (note: no priority is implied by the order of the plan objectives). These plan objectives are specific goals, or ends, that guided the preparation and evaluation of the alternatives and Preliminary Plan, and would be the desired outcome of the VISION 2050 recommendations presented in this chapter. The objectives are organized under the four important themes for VISION 2050: Healthy Communities, Equitable Access, Costs and Financial Sustainability, and Mobility. To emphasize the importance of these themes throughout the

VISION 2050 was developed to achieve plan objectives under four important themes: Healthy Communities, Equitable Access, Costs and Financial Sustainability, and Mobility.

¹ The Preliminary Recommended Plan is set forth in Chapter 4 of Volume II of this report, and its evaluation is set forth in Appendix H. The refinements that were made to the Preliminary Recommended Plan are discussed in Section 4.5 of Chapter 4 of Volume II.

Figure 1.1
VISION 2050 Plan Objectives Under the Four Plan Themes



HEALTHY COMMUNITIES

This theme revolves around creating healthy communities within our Region, with active transportation options and environmental preservation serving as cornerstones of the theme.

Objective 1.1: Vibrant, walkable neighborhoods that contribute to the Region's distinct character.

Objective 1.2: Active transportation options that encourage healthy lifestyles.

Objective 1.3: Compact urban development and limited rural development that maximize open space and productive agricultural land.

Objective 1.4: Environmentally sustainable development and transportation that minimize the use of nonrenewable resources and adverse impacts on the Region's natural environment, including biodiversity, air, and water.

Objective 1.5: A transportation system that minimizes disruption of neighborhood and community development, including adverse effects on the property tax base.

Objective 1.6: Safe and secure travel environments that minimize loss of life, injury, and property damage.



EQUITABLE ACCESS

This theme focuses on providing access to opportunity for all of the Region's residents.

Objective 2.1: Benefits and impacts of investments in the Region's transportation system should be shared fairly and equitably and serve to reduce disparities between white and minority populations.

Objective 2.2: Affordable transportation and housing that meet the needs and preferences of current and future generations.

Objective 2.3: Reduce job-worker mismatch.



COSTS AND FINANCIAL SUSTAINABILITY

This theme takes into account the need to make wise investment decisions that consider all the direct and indirect costs of developing the Region's land and transportation system.

Objective 3.1: A land development pattern and transportation system that support economic growth and a globally competitive economy.

Objective 3.2: A financially sustainable transportation system that minimizes life-cycle capital and operating transportation costs.

Objective 3.3: Transportation options that minimize private transportation costs.

Objective 3.4: Urban development that can be efficiently served by transportation, utilities, and public facilities.



MOBILITY

This theme is aimed at achieving a multimodal transportation system that serves the mobility needs of all of the Region's residents and provides access to important places and services.

Objective 4.1: A balanced, integrated, well-connected transportation system that provides choices among transportation modes.

Objective 4.2: Reliable, efficient, and universal access to employment centers, educational opportunities, services, and other important places.

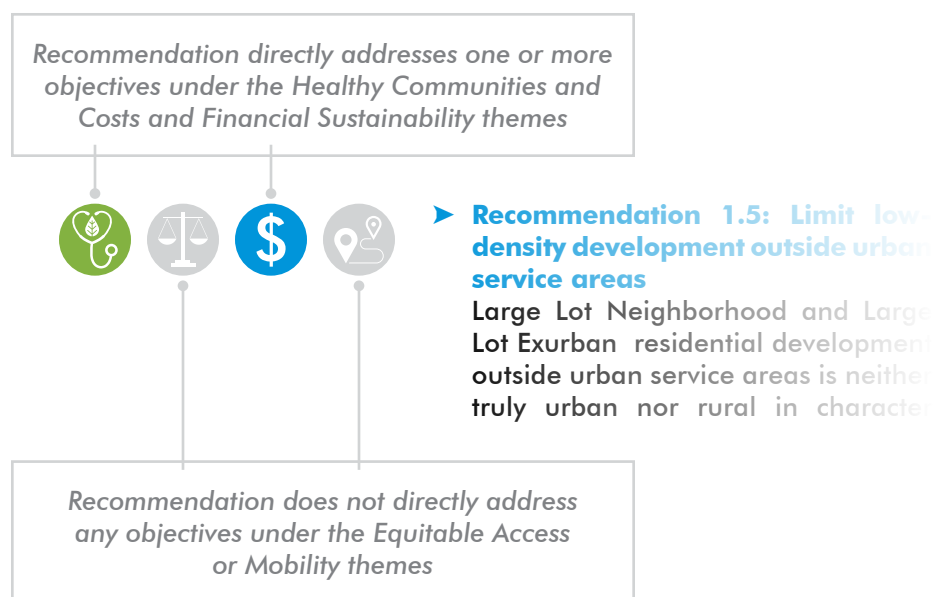
Objective 4.3: Well-maintained transportation infrastructure.

Objective 4.4: An acceptable level of service on the transportation system.

Objective 4.5: Fast, frequent, and reliable public transit services that maximize the people and jobs served.

Objective 4.6: Convenient, efficient, and reliable movement of goods and people.

Figure 1.2
Navigating the Four Plan Themes in the Chapter



recommended plan, plan recommendations that would have a significant impact on achieving objectives under each theme are identified using the icons associated with each theme, as shown in Figure 1.2.

This chapter presents the VISION 2050 plan recommendations, including changes identified in the 2020 Review and Update of VISION 2050. The following section of this chapter describes the VISION 2050 recommendations for land use, including the recommended land use development pattern. Design guidelines that provide additional direction for select land use recommendations are referenced within the chapter and presented in Appendix K of this volume. The subsequent section describes the recommendations for transportation, including the recommended transportation system. The transportation section also compares existing and reasonably expected costs and revenues for the recommended transportation system. This analysis identifies a funding gap for the recommended transportation system and identifies the portion of the recommended system that can be implemented with reasonably expected revenues. The funded portion of the recommended system is referred to as the “Fiscally Constrained Transportation System (FCTS),” and is presented in Chapter 2 of this volume. It is important to recognize that the FCTS does not represent a desired “plan;” rather, it represents the “system” expected to occur without sufficient funding levels to maintain and improve the transportation system as recommended in VISION 2050. Most notably, transit service levels under the FCTS would be expected to decline by about 35 percent rather than more than double as recommended under VISION 2050. There would also be a reduction in the amount of arterial streets and highways that can be reconstructed, widened, or newly constructed. VISION 2050 recommends significantly improving and expanding public transit based on numerous benefits identified during the plan development process and it is critical that the Region’s arterial streets and highways be reconstructed in a timely manner. Significant negative consequences for Southeastern Wisconsin are expected if the recommended transportation system is not achieved due to the funding limitations, and the plan identifies potential ways to address the identified funding gap.

Also included in the plan are equity analyses of the recommended land use and transportation components, which are summarized in this chapter and presented in detail in Appendices L and N, respectively. These analyses focus on evaluating the potential benefits and impacts to people of color, low-income populations, and people with disabilities associated with VISION 2050. Notably, the transportation equity analysis indicates that the recommended transit system would significantly improve transit access for these population groups to jobs, healthcare, education, and other activities. However, the expected transit service decline under the FCTS would result in less access to jobs, healthcare, education, and other daily needs than under VISION 2050. This analysis concludes that without additional funding to implement the VISION 2050 public transit element, a disparate impact on the Region's people of color, low-income populations, and people with disabilities is likely to occur.

1.2 RECOMMENDED LAND USE COMPONENT

Areawide land use planning is necessary in a growing Region with seven counties and almost 150 cities, villages, and towns, where physical and economic development issues transcend political boundaries. While the Region includes only 5 percent of Wisconsin's total area, it accounts for over one-third of the State's population, jobs, and wealth. Geographically, the Region is well-located for continued growth and development. The Region is bounded on the east by Lake Michigan, which provides a unique, substantial, and high-quality water supply; is an unparalleled recreation resource; and is an integral part of a major international transportation network. It is bounded on the south by the metropolitan region of northeastern Illinois and is bounded on the west and north by the fertile agricultural and desirable recreation areas found in the rest of Wisconsin. In addition, many of the most important industrial areas and heaviest population concentrations in the Midwest are within 250 miles of the Region.

An additional 252,000 jobs are forecast for the Region by 2050, which will require an in-migration of workers.

A major focus of VISION 2050 is on achieving more compact development.

The Region of 2050 will be different than the Region of today due to its potential for continued growth and development. It is expected there will be more than 400,000 additional residents and more than 250,000 additional jobs, which will require an in-migration of population and workers. This anticipated growth will create demand for land and improved transportation facilities, and increase pressure on the Region's natural resources.

The land use component of VISION 2050 focuses on compact development and presents a development pattern and recommendations that accommodate projected growth in regional population, households, and employment in a sustainable manner consistent with VISION 2050 plan objectives. The compact development recommended under VISION 2050 ranges from high-density development such as transit-oriented development (TOD), to neighborhoods in smaller communities with housing within easy walking distance of neighborhood amenities such as parks, schools, and businesses.

This range of development is recommended because it has a number of benefits, including:

- Minimizing impacts on natural and agricultural resources
- Minimizing impacts to water resources and air quality
- Positioning the Region to attract potential workers and employers

- Maximizing redevelopment in areas with existing infrastructure
- Minimizing the cost of infrastructure and public services
- Meeting the needs of the Region's aging population
- Providing walkable neighborhoods that encourage active lifestyles and a sense of community
- Reducing the distance needed to travel between destinations
- Providing a variety of housing options near employment
- Supporting public transit connections between housing and employment
- Increasing racial and economic integration throughout the Region²

VISION 2050 recognizes the impact of market forces on the location, intensity, and character of future urban development. It also recognizes the important role of communities in development decisions, and encourages communities to act on the land use recommendations presented in VISION 2050 to make the Region an attractive place for all current and future residents and businesses.

Description of Land Use Component

The land use component of VISION 2050 recommends focusing development within planned urban service areas, preserving environmentally significant lands, and preserving highly productive agricultural lands. Existing local comprehensive plans, input from local planning officials, committed developments, and input from VISION 2050 public outreach activities were considered in allocating increases in regional population, households, employment, and associated land uses to develop the land use component of VISION 2050.

Figure 1.3 illustrates the land use categories to which population, households, and employment were allocated under VISION 2050 (more detailed descriptions are included in Chapter 3 of Volume II).

Map 1.1 presents the land use development pattern recommended under VISION 2050. Tables 1.1 and 1.2 provide information regarding existing and recommended land use. Actual and planned population, households, and employment by county and sub-area are presented in Table 1.3 (the sub-areas are shown on Map 1.2).

VISION 2050 is intended to provide a guide, or overall framework, for future land use within the Region. Implementation of the land use recommendations ultimately relies on the actions of local, county, State, and Federal agencies and units of government in conjunction with the private sector. Detailed design guidelines that serve to facilitate implementation of the recommendations are presented in Appendix K of this volume.

**VISION 2050
implementation relies
on the actions of local,
county, State, and
Federal governments
in conjunction with the
private sector.**

² An equity analysis of the VISION 2050 land use component is presented in Appendix L of this volume.

Figure 1.3 VISION 2050 Land Use Categories

The recommended VISION 2050 land use pattern was developed by allocating new households and employment envisioned for the Region under the Commission's year 2050 growth projections to a series of seven land use categories that represent a variety of development densities and mixes of uses.



MIXED-USE CITY CENTER
Mix of very high-density offices, businesses, and housing found in the most densely populated areas of the Region



MEDIUM LOT NEIGHBORHOOD
(showing lots of about 15,000 square feet)
Primarily single-family homes on ¼- to ½-acre lots found at the edges of cities and villages



LARGE LOT NEIGHBORHOOD (showing lots of about ½ acre)
Primarily single-family homes on ½-acre to one-acre lots found at the edges of cities and villages and scattered outside cities and villages



MIXED-USE TRADITIONAL NEIGHBORHOOD
Mix of high-density housing, businesses, and offices found in densely populated areas



LARGE LOT EXURBAN (showing lots of about 1.5 acres)
Single-family homes at an overall density of one home per 1.5 to five acres scattered outside cities and villages



SMALL LOT TRADITIONAL NEIGHBORHOOD
(showing lots of about 7,000 square feet)
Mix of housing types and businesses with single-family homes on lots of ¼-acre or less and multifamily housing found within and at the edges of cities and villages



RURAL ESTATE
(showing a cluster subdivision with one-acre lots)
Single-family homes at an overall density of one home per five acres scattered outside cities and villages

Land Use Development Pattern: VISION 2050

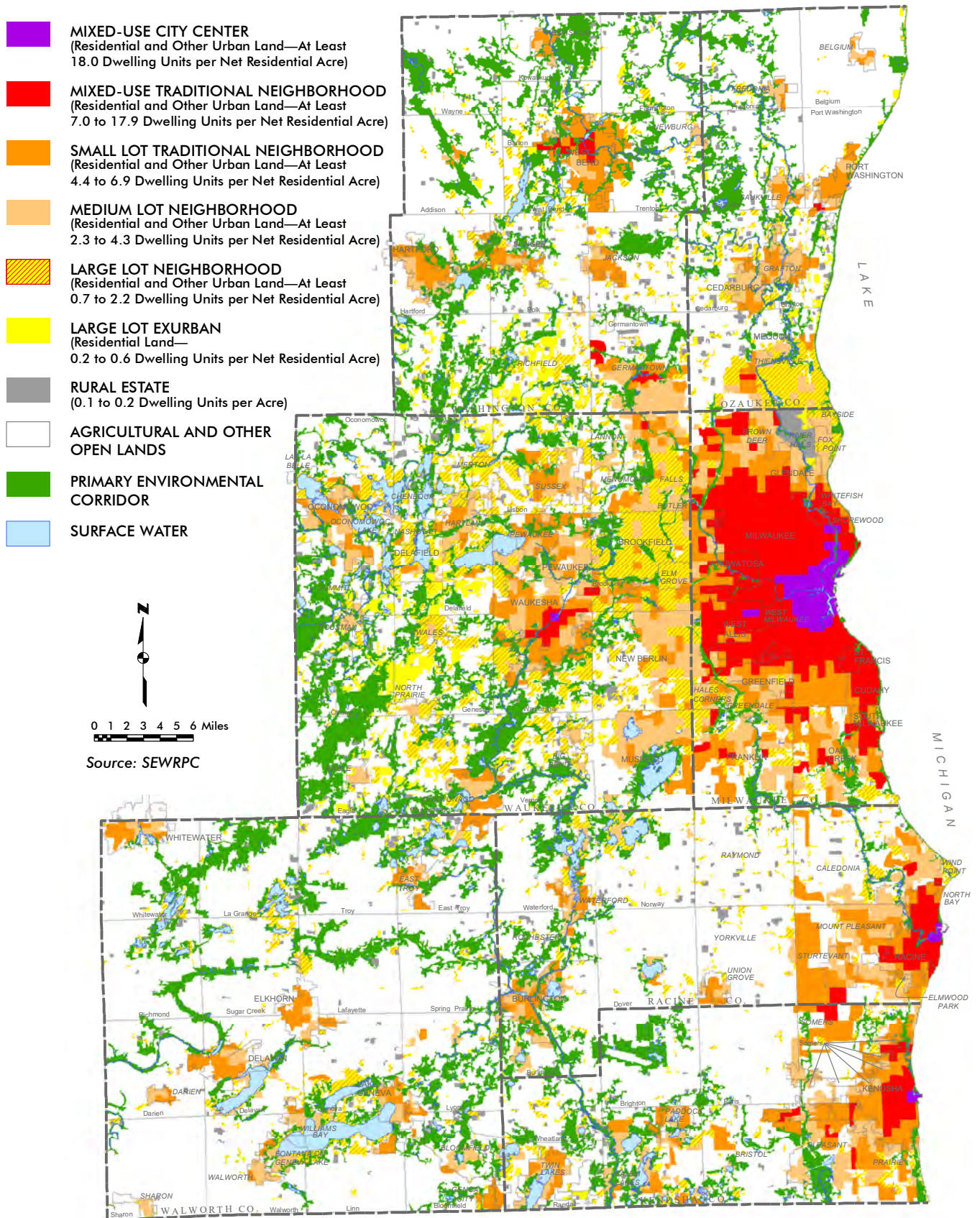


Table 1.1
Existing and Planned Land Use in the Region: 2010 and 2050

Land Use	Existing 2010		Planned Increment		Planned 2050	
	Square Miles	Percent of Total	Square Miles	Percent Change	Square Miles	Percent of Total
Developed Land						
Residential						
Mixed-Use City Center ^a	3.1	0.1	0.3	9.7	3.4	0.1
Mixed-Use Traditional Neighborhood ^b	45.8	1.7	3.3	7.2	49.1	1.8
Small Lot Traditional Neighborhood ^c	41.6	1.5	38.0	91.3	79.6	3.0
Medium Lot Neighborhood ^d	88.2	3.3	6.4	7.3	94.6	3.5
Large Lot Neighborhood ^e	160.5	6.0	4.7	2.9	165.2	6.1
Large Lot Exurban ^f	31.9	1.2	2.7	8.5	34.6	1.3
Rural Estate ^g	29.9	1.1	7.5	25.1	37.4	1.4
Residential Subtotal	400.9	14.9	63.0	15.7	463.9	17.2
Commercial	35.6	1.3	13.9	39.0	49.5	1.8
Industrial	35.2	1.3	9.4	26.7	44.6	1.7
Transportation, Communication, and Utilities	213.8	8.0	13.9	6.5	227.7	8.5
Governmental and Institutional	37.0	1.4	1.9	5.1	38.9	1.4
Recreational ^h	56.0	2.1	6.9	12.3	62.9	2.3
Unused Urban	46.0	1.7	-21.3	-46.3	24.7	0.9
Developed Land Subtotal	824.5	30.7	87.7	10.6	912.2	33.9
Undeveloped Land						
Agricultural ⁱ	1,155.5	43.0	-65.8	-5.7	1,089.7	40.6
Natural Resource Areas						
Surface Water	84.7	3.1	0.0	0.0	84.7	3.1
Wetlands	315.2	11.7	0.0	0.0	315.2	11.7
Woodlands	191.4	7.1	0.0	0.0	191.4	7.1
Natural Resource Areas Subtotal	591.3	21.9	0.0	0.0	591.3	21.9
Unused and Other Open Land ^j	118.5	4.4	-22.0	-18.6	96.5	3.6
Undeveloped Land Subtotal	1,865.2	69.3	-87.7	-4.7	1,777.5	66.1
Total	2,689.7	100.0	0.0	0.0	2,689.7	100.0

Note: Off-street parking area is included with the associated use.

^a 18.0 or more dwelling units per net residential acre.

^b 7.0 to 17.9 dwelling units per net residential acre.

^c 4.4 to 6.9 dwelling units per net residential acre.

^d 2.3 to 4.3 dwelling units per net residential acre.

^e 0.7 to 2.2 dwelling units per net residential acre.

^f 0.2 to 0.6 dwelling units per net residential acre.

^g No more than 0.2 dwelling units per acre. The Rural Estate category assumes there would be one acre of developed homesite area per dwelling, the remainder of the area being retained in open space.

^h Includes only intensive use recreational land.

ⁱ Includes farmed wetlands.

^j Includes landfills and mineral extraction sites.

Source: SEWRPC

Table 1.2
Existing and Planned Land Use in the Region by County: 2010 and 2050

Land Use	Kenosha County (square miles)			Milwaukee County (square miles)			Ozaukee County (square miles)			Racine County (square miles)		
	2010	Increment	2050	2010	Increment	2050	2010	Increment	2050	2010	Increment	2050
Developed Land												
Residential												
Mixed-Use City Center ^a	0.1	0.0	0.1	2.8	0.2	3.0	0.0	0.0	0.0	0.2	0.0 ^b	0.2
Mixed-Use Traditional Neighborhood ^c	2.8	1.1	3.9	37.7	1.2	38.9	0.0	0.1	0.1	3.8	0.3	4.1
Small Lot Traditional Neighborhood ^d	4.8	9.3	14.1	12.8	3.0	15.8	2.2	2.2	4.4	4.4	5.6	10.0
Medium Lot Neighborhood ^e	10.1	0.7	10.7	16.3	0.2	16.6	6.9	0.2	7.0	12.9	0.4	13.2
Large Lot Neighborhood ^f	10.4	0.4	10.8	9.0	0.1	9.1	16.2	0.9	17.1	15.7	0.4	16.1
Large Lot Exurban ^g	1.0	0.3	1.3	1.0	0.0	1.0	2.6	0.5	3.1	0.2	0.2	0.4
Rural Estate ^h	3.2	0.6	3.9	1.4	0.0	1.4	3.6	0.8	4.3	4.6	1.2	5.8
Residential Subtotal	32.4	12.4	44.8	81.0	4.8	85.8	31.5	4.6	36.0	41.8	8.0	49.8
Commercial	2.7	1.5	4.2	12.3	1.9	14.2	1.8	1.0	2.9	3.6	1.7	5.3
Industrial	2.9	1.5	4.5	11.2	0.7	11.9	2.0	1.2	3.1	4.3	2.8	7.1
Transportation, Communication, and Utilities	19.4	3.4	22.8	53.2	0.7	53.9	15.9	0.9	16.9	22.7	2.4	25.1
Governmental and Institutional	3.2	0.6	3.8	13.4	0.0	13.4	2.1	0.1	2.2	3.9	0.3	4.2
Recreational ⁱ	5.9	1.5	7.4	12.3	0.2	12.5	4.1	0.4	4.5	5.3	1.0	6.3
Unused Urban	4.5	-3.1	1.4	14.7	-4.5	10.2	3.0	-1.6	1.4	5.8	-2.7	3.1
Developed Land Subtotal	71.1	17.8	88.9	198.1	3.8	201.9	60.4	6.6	67.0	87.4	13.5	100.9
Undeveloped Land												
Agricultural ^j	136.6	-14.1	122.5	15.6	-2.4	13.2	118.2	-4.6	113.6	180.7	-10.8	169.8
Natural Resource Areas												
Surface Water	8.8	0.0	8.8	2.4	0.0	2.4	4.1	0.0	4.1	9.4	0.0	9.4
Wetlands	28.9	0.0	28.9	11.6	0.0	11.6	30.8	0.0	30.8	29.8	0.0	29.8
Woodlands	15.9	0.0	15.9	7.4	0.0	7.4	11.4	0.0	11.4	19.6	0.0	19.6
Natural Resource Areas Subtotal	53.7	0.0	53.7	21.4	0.0	21.4	46.3	0.0	46.3	58.7	0.0	58.7
Unused and Other Open Land ^k	17.1	-3.7	13.4	7.5	-1.4	6.1	10.6	-2.0	8.6	13.8	-2.6	11.2
Undeveloped Land Subtotal	207.4	-17.8	189.6	44.6	-3.8	40.7	175.1	-6.6	168.4	253.2	-13.5	239.7
Total	278.4	0.0	278.4	242.7	0.0	242.7	235.4	0.0	235.4	340.6	0.0	340.6

Table continued on next page.

Table 1.2 (Continued)

Land Use	Walworth County (square miles)			Washington County (square miles)			Waukesha County (square miles)			Region (square miles)		
	2010	Increment	2050	2010	Increment	2050	2010	Increment	2050	2010	Increment	2050
Developed Land												
Residential												
Mixed-Use City Center ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0 ^b	0.0 ^b	0.1	3.1	0.3	3.4
Mixed-Use Traditional Neighborhood ^c	0.0	0.0	0.0	0.6	0.5	1.1	0.9	0.1	1.0	45.8	3.3	49.1
Small Lot Traditional Neighborhood ^d	2.9	4.6	7.4	4.6	5.2	9.7	10.0	8.2	18.1	41.6	38.0	79.6
Medium Lot Neighborhood ^e	9.0	1.2	10.2	7.1	0.5	7.6	25.9	3.3	29.3	88.2	6.4	94.6
Large Lot Neighborhood ^f	16.3	0.6	16.9	19.9	0.2	20.2	72.9	2.1	75.0	160.5	4.7	165.2
Large Lot Exurban ^g	0.9	0.0	0.9	8.3	1.1	9.4	18.0	0.6	18.6	31.9	2.7	34.6
Rural Estate ^h	7.2	1.2	8.4	6.6	2.0	8.6	3.3	1.7	5.0	29.9	7.5	37.4
Residential Subtotal	36.3	7.6	43.9	47.0	9.5	56.5	131.0	16.0	147.0	400.9	63.0	463.9
Commercial	2.4	1.5	3.9	2.7	1.6	4.3	10.2	4.6	14.7	35.6	13.9	49.5
Industrial	2.5	0.5	3.0	2.9	1.1	4.1	9.3	1.6	11.0	35.2	9.4	44.6
Transportation, Communication, and Utilities	26.1	1.6	27.7	26.3	1.8	28.0	50.4	3.1	53.5	213.8	13.9	227.7
Governmental and Institutional	2.9	0.2	3.1	2.7	0.2	3.0	8.8	0.7	9.5	37.0	1.9	38.9
Recreational ⁱ	7.3	1.1	8.4	6.5	0.4	6.9	14.7	2.2	16.9	56.0	6.9	62.9
Unused Urban	3.4	-1.7	1.7	3.1	-1.8	1.3	11.1	-5.8	5.3	46.0	-21.3	24.7
Developed Land Subtotal	80.9	10.7	91.6	91.2	12.9	104.1	235.4	22.5	257.9	824.5	87.7	912.2
Undeveloped Land												
Agricultural ^j	352.6	-8.2	344.4	203.0	-8.8	194.2	148.8	-16.7	132.1	1,155.5	-65.8	1,089.7
Natural Resource Areas												
Surface Water	23.7	0.0	23.7	8.0	0.0	8.0	28.2	0.0	28.2	84.7	0.0	84.7
Wetlands	51.4	0.0	51.4	72.7	0.0	72.7	89.9	0.0	89.9	315.2	0.0	315.2
Woodlands	51.8	0.0	51.8	37.6	0.0	37.6	47.7	0.0	47.7	191.4	0.0	191.4
Natural Resource Areas Subtotal	127.0	0.0	127.0	118.3	0.0	118.3	165.8	0.0	165.8	591.3	0.0	591.3
Unused and Other Open Land ^k	16.0	-2.5	13.5	23.0	-4.0	19.0	30.5	-5.8	24.7	118.5	-22.0	96.5
Undeveloped Land Subtotal	495.5	-10.7	484.9	344.3	-12.9	331.4	345.1	-22.5	322.6	1,865.2	-87.7	1,777.5
Total	576.5	0.0	576.5	435.6	0.0	435.6	580.5	0.0	580.5	2,689.7	0.0	2,689.7

Note: Off-street parking area is included with the associated use.

^a 18.0 or more dwelling units per net residential acre.

^b Less than 0.05 square miles.

^c 7.0 to 17.9 dwelling units per net residential acre.

^d 4.4 to 6.9 dwelling units per net residential acre.

^e 2.3 to 4.3 dwelling units per net residential acre.

^f 0.7 to 2.2 dwelling units per net residential acre.

^g 0.2 to 0.6 dwelling units per net residential acre.

^h No more than 0.2 dwelling units per acre. The Rural Estate category assumes there would be one acre of developed homesite area per dwelling, the remainder of the area being retained in open space.

ⁱ Includes only intensive use recreational land.

^j Includes farmed wetlands.

^k Includes landfills and mineral extraction sites.

Source: SEWRPC

Table 1.3
Existing and Planned 2050 Population, Households, and Employment

County	Planning Analysis Area (See Map 1.2)	Population		Households		Employment	
		Existing 2010	Planned 2050	Existing 2010	Planned 2050	Existing 2010	Planned 2050
Ozaukee	1	7,990	9,880	3,000	3,810	2,840	5,300
	2	18,680	23,040	7,650	9,680	11,350	17,140
	3	32,870	42,820	13,170	17,790	16,560	21,700
	4	26,860	33,360	10,400	13,220	21,750	25,160
	Subtotal	86,400	109,100	34,200	44,500	52,500	69,300
Washington	5	9,070	11,550	3,440	4,620	2,370	2,590
	6	44,380	63,550	17,750	26,710	21,670	28,760
	7	5,660	6,950	2,080	2,710	2,550	2,720
	8	10,830	14,880	4,320	6,220	3,640	5,050
	9	26,890	35,760	10,580	14,710	15,830	22,970
	10	20,000	31,700	7,860	13,050	14,230	21,320
	11	15,050	16,120	5,580	6,280	3,610	3,990
	Subtotal	131,900	180,500	51,600	74,300	63,900	87,400
Milwaukee	12	65,460	66,180	28,430	29,690	43,700	44,780
	13	58,540	60,630	22,350	24,120	38,460	40,080
	14	228,370	229,130	84,810	88,560	68,860	75,100
	15	76,170	86,870	34,660	40,030	44,550	49,140
	16	11,230	19,870	4,940	8,700	72,980	82,510
	17	91,110	94,890	31,200	34,240	54,310	59,700
	18	118,120	116,980	47,710	49,070	53,280	57,070
	19	48,360	58,280	21,340	26,230	56,910	66,980
	20	69,990	70,910	31,180	32,640	48,530	51,490
	21	59,930	62,990	26,850	29,040	28,850	30,520
	22	49,070	51,530	21,760	23,580	22,420	23,870
	23	34,820	49,800	14,200	21,100	23,310	29,480
	24	36,580	51,040	14,180	20,780	19,240	23,850
	Subtotal	947,700	1,019,100	383,600	427,800	575,400	634,600
Waukesha	25	38,580	49,430	15,940	20,850	41,250	46,350
	26	49,620	57,120	19,610	23,390	55,690	65,780
	27	39,590	44,080	16,290	18,890	27,150	34,040
	28	24,140	35,860	9,070	14,060	7,730	13,970
	29	23,020	34,500	8,520	13,630	9,420	14,930
	30	20,160	28,040	8,790	12,580	29,030	34,760
	31	80,000	93,380	31,750	38,290	48,480	57,070
	32	67,440	84,460	25,450	33,450	35,050	47,350
	33	35,800	41,800	13,120	16,050	12,160	20,830
	34	11,550	12,730	4,120	4,710	2,930	3,320
	Subtotal	389,900	481,400	152,700	195,900	268,900	338,400
Racine	35	74,170	74,900	28,620	30,720	37,510	39,520
	36	65,010	98,050	25,790	41,340	25,100	54,930
	37	39,260	46,630	14,490	18,340	15,120	19,370
	38	16,970	20,170	6,750	8,550	10,570	13,180
	Subtotal	195,400	239,800	75,700	98,900	88,300	127,000
Kenosha	39	97,410	108,590	36,710	43,380	45,160	51,490
	40	30,520	70,980	11,420	28,670	17,950	31,170
	41	38,500	71,540	14,520	28,820	11,790	20,070
	Subtotal	166,400	251,100	62,600	100,900	74,900	102,700
Walworth	42	15,040	21,960	5,840	9,130	4,600	6,890
	43	22,170	26,580	8,460	10,910	10,660	12,390
	44	65,020	92,060	25,400	38,860	37,450	50,020
	Subtotal	102,200	140,600	39,700	58,900	52,700	69,300
Region	Total	2,019,900	2,421,600	800,100	1,001,200	1,176,600	1,428,700

Source: SEWRPC

44

PLANNING ANALYSIS AREA

0 1 2 3 4 5 6 Miles

Source: SEWRPC

The map displays 44 numbered regions across several counties. The regions are numbered as follows:

- 1: BELGIUM
- 2: SAUKVILLE, PORT WASHINGTON
- 3: CEDARBURG, GRAFTON
- 4: MEQUON, THIESSVILLE
- 5: KENOSHA
- 6: WEST BEND
- 7: WAYNE
- 8: JACKSON
- 9: SLINGER
- 10: GERMANTOWN
- 11: RICHFIELD
- 12: BROWN, RIVER, FOX, WHITEFISH, SHOREWOOD
- 13: BROWN, RIVER, FOX, WHITEFISH, SHOREWOOD
- 14: MILWAUKEE
- 15: WAUWATOSA
- 16: WEST ALLIS
- 17: GREENFIELD
- 18: ST. FRANCIS
- 19: ELM GROVE
- 20: NEW BERLIN
- 21: HALES CORNERS
- 22: SOUTH MILWAUKEE
- 23: OAK CREEK
- 24: FRANKLIN
- 25: MENOMONEE FALLS
- 26: BROOKFIELD
- 27: MUSKEGO
- 28: MUSKEGO
- 29: JANESVILLE
- 30: PEWAUKEE
- 31: WAUKESHA
- 32: CHENEQUA
- 33: NORTH PRAIRIE
- 34: EAGLE
- 35: RACINE
- 36: MOUNT PLEASANT
- 37: WATERFORD
- 38: BURLINGTON
- 39: SOMERS
- 40: PRAIRIE
- 41: PADDOCK LAKE
- 42: ELKHORN
- 43: WHITEWATER
- 44: DELAVAN

Counties shown include KENOSHA, WAUWATOSA, WAUKESHA, MILWAUKEE, WASHINGTON, OZAUKEE, DELAWARE, and KENOSHA.

Population, Household, and Employment Projections

The Commission prepared population, household, and employment projections for the period 2010 to 2050 at the beginning of the VISION 2050 process.³ As in previous projection efforts, a range of projections were prepared for VISION 2050. This range includes high, intermediate, and low population, household, and employment levels. The high and low projections are intended to provide a range of levels that could conceivably be achieved under significantly higher or lower, but plausible, growth scenarios for the Region. The intermediate projections are considered the most likely to be achieved for the Region. Population would increase from 2,019,900 in 2010 to 2,354,000 in 2050 under the intermediate projection, an increase of 16.5 percent. Households would increase from 800,100 in 2010 to 972,400 in 2050 (21.5 percent increase) and employment would increase from 1,176,600 in 2010 to 1,386,900 in 2050 (17.9 percent increase).

The VISION 2050 land use component has incorporated the eight rapid transit lines and four commuter rail lines recommended in the VISION 2050 transportation component. Consistent with experience nationwide and as envisioned during previous stages of the VISION 2050 process, high-density, TOD would be expected to occur within walking distance of the stations on the rapid transit and commuter rail lines. The land use component has also incorporated additional residents and jobs related to the Foxconn manufacturing campus in Racine County and associated new development in the immediate vicinity of the campus and in other parts of the Region. As a result, total forecast regional population growth from 2010 to 2050 was increased under VISION 2050 from 16.5 percent to 19.9 percent, household growth from 21.5 percent to 25.1 percent, and employment growth from 17.9 percent to 21.4 percent to account for additional anticipated growth and to maintain the intermediate-growth forecast for portions of the Region outside those station areas. Table 1.4 presents existing, intermediate forecast, and revised forecast population, household, and employment levels by county.

Residential Development Within Urban Service Areas

VISION 2050 recommends focusing residential development within urban service areas that typically include public sanitary sewer and water supply service, parks, schools, and shopping areas. Residential development would occur largely as infill, redevelopment, and new development under the Small Lot Traditional Neighborhood, Mixed-Use Traditional Neighborhood, and Mixed-Use City Center land use categories as shown on Map 1.1. About 97 percent of new households would be located within urban service areas.

► Recommendation 1.1: Develop urban service areas with a mix of housing types and land uses

A mix of housing types and land uses would be possible under the Small Lot Traditional Neighborhood, Mixed-Use Traditional Neighborhood, and Mixed-Use City Center land use categories. VISION 2050 recommends that local governments in urban service areas include these land use categories in their comprehensive plans as shown on Map 1.1. The community's zoning and land division ordinances should be consistent with its comprehensive plan. This would allow for the development of multifamily housing and single-family homes on smaller lots (one-quarter acre or less) that tend to be more affordable to a wider range of households than single-family homes on larger lots. This would also encourage the development and redevelopment of walkable neighborhoods by allowing housing in proximity to a mix of uses, such as parks, schools, and businesses.

Urban service areas include public sanitary sewer service, and typically include public water service, parks, schools, and businesses.



VISION 2050 recommends infill and redevelopment in existing urban service areas.

³ Projections are discussed in further detail in Chapter 6 of Volume I.

Table 1.4
Forecast Growth in the Region: 2050

	County	Existing (2010)	Intermediate Forecast (2050)	Plan (2050)
Population	Kenosha	166,400	238,000	251,100
	Milwaukee	947,700	976,700	1,019,100
	Ozaukee	86,400	109,100	109,100
	Racine	195,400	227,700	239,800
	Walworth	102,200	140,600	140,600
	Washington	131,900	180,500	180,500
	Waukesha	389,900	481,400	481,400
	Region	2,019,900	2,354,000	2,421,600
Households	Kenosha	62,600	95,400	100,900
	Milwaukee	383,600	409,600	427,800
	Ozaukee	34,200	44,500	44,500
	Racine	75,700	93,800	98,900
	Walworth	39,700	58,900	58,900
	Washington	51,600	74,300	74,300
	Waukesha	152,700	195,900	195,900
	Region	800,100	972,400	1,001,200
Employment	Kenosha	74,900	101,300	102,700
	Milwaukee	575,400	608,900	634,600
	Ozaukee	52,500	69,300	69,300
	Racine	88,300	112,300	127,000
	Walworth	52,700	69,300	69,300
	Washington	63,900	87,400	87,400
	Waukesha	268,900	338,400	338,400
	Region	1,176,600	1,386,900	1,428,700

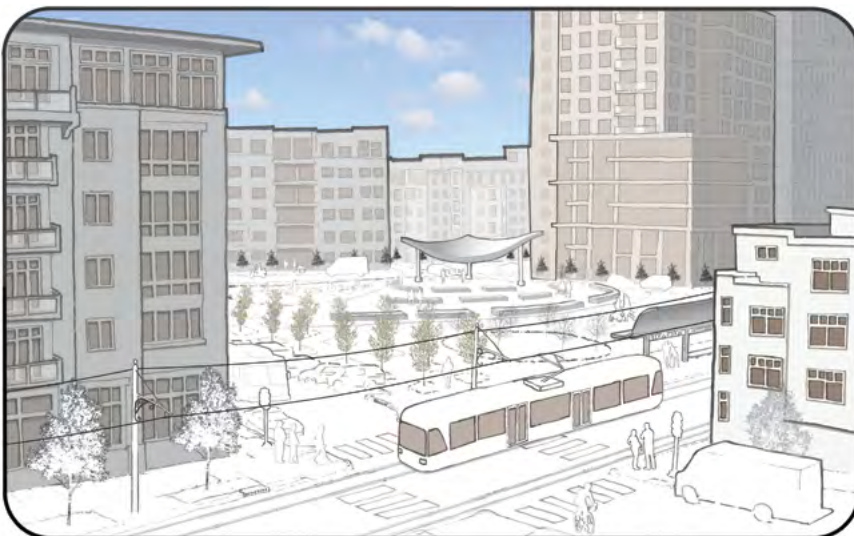
Source: U.S. Bureau of the Census, U.S. Bureau of Economic Analysis, and SEWRPC



► **Recommendation 1.2: Focus TOD near rapid transit and commuter rail stations**

VISION 2050 recommends transit-oriented development (TOD) in areas surrounding rapid transit and commuter rail stations recommended under the transportation component of VISION 2050. Rapid transit and commuter rail are described in more detail under Recommendations 2.1

and 2.2, respectively. Residential development within TODs should occur largely in multifamily buildings or buildings with a mix of uses such as commercial-retail space on the ground floor and dwellings on upper floors. Some buildings may have a mix of commercial-retail space on the ground floor with office space on upper floors. Public plazas, parks, and other governmental and institutional uses may also be incorporated into TOD. Streets and sidewalks within TODs should provide convenient and safe access for walking and bicycling to the transit station.



A Transit-Oriented Development

Credit: SEWRPC

TOD is a focus of VISION 2050 because it supports healthy communities, mobility, and revitalization of urban areas. Despite these benefits, TOD could result in gentrification and displacement of low-income households, if development strategies to address those possibilities are not implemented. Concerns regarding gentrification and displacement of low-income households were expressed during VISION 2050 public outreach activities. Table 1.5 includes strategies to address those concerns through the provision of mixed-income housing in TODs. Local governments with recommended rapid transit or commuter rail stations should incorporate these strategies into their land use policies. TOD design guidelines are included in Appendix K.

When pursuing TOD, it is important to include strategies for mixed-income housing.

► **Recommendation 1.3: Focus new urban development in areas that can be efficiently served by essential municipal facilities and services**

VISION 2050 is a systems-level plan that includes generalized boundaries for urban service areas, which are shown on Map 1.3.⁴ Urban service areas include public sanitary sewer service. In addition, they typically include public water supply, parks, schools, and shopping areas. Urban services can be extended and provided to compact development in a more efficient and cost-effective manner than to lower-density development. Local government land use policies should allow development as recommended under Recommendation 1.1 to facilitate efficient and cost-effective provision of services to urban development. It is recommended that local governments consider limiting new development in the Medium Lot Neighborhood⁵ and Large Lot Neighborhood⁶ land use categories to existing vacant lots, as infill development in existing neighborhoods with similar residential densities, or where commitments have been made to such development through approved subdivision plats or certified survey maps.



Urban services can be provided to compact development at a lower cost than to lower-density development.

Residential Development Outside Urban Service Areas

VISION 2050 recommends residential development outside urban service areas occur in the Rural Estate land use category using cluster subdivision design. About 3 percent of new households would be located outside urban service areas.

► **Recommendation 1.4: Consider cluster subdivision design in residential development outside urban service areas**

VISION 2050 recommends that the demand for homes in an open space setting be accommodated on a limited basis through Rural Estate development where there would be no more than one home per five acres. Residential development at this density can accommodate future demand for living in an open space setting while minimizing impacts on the natural resource and agricultural base, maintaining rural character, and avoiding excessive demands on rural public facility and service systems, especially when cluster subdivision design is used. Local and county government land use policies should allow cluster subdivision design with no more than one acre of residential land (house and yard area) for each dwelling while maintaining an overall density of one home per five acres. Design guidelines to implement cluster subdivision design are included in Appendix K.



Illustration of Cluster Subdivision Design
Credit: SEWRPC

⁴ Table 1.6 presents area and population served with public sanitary sewer and water in 2010 and recommended to be served under VISION 2050.

⁵ Primarily single-family homes on quarter- to half-acre lots.

⁶ Primarily single-family homes on one-acre lots.

Table 1.5
Mixed-Income Housing Strategies for TOD

Strategy	Description
Density Bonus	A density bonus is a flexible zoning regulation that allows additional residential units beyond the maximum for which a parcel is zoned in exchange for providing or preserving affordable housing units. Several local governments in the Region have adopted planned unit development (PUD) ordinances that allow for increased density as an incentive to provide public amenities. Local governments with rapid transit or commuter rail stations should develop density bonus programs or update existing PUD regulations to allow for increased density as an incentive for mixed-income housing.
Parking Regulations	Reducing the amount of required parking can lower construction costs for residential projects, and possibly be used as an incentive for including affordable housing units. A Transit Cooperative Research Program review of TOD case studies ^a found that personal vehicle trip generation was lower and transit use was higher than average for residents of TODs with high-quality transit service. The study found that the parking-to-housing-unit ratios could be lowered as much as 50 percent in TODs that have good transit connectivity to major employment centers. Lower parking ratios could result in an increase of 20 to 33 percent in the number of housing units and lower total construction costs, even with the additional units. Local governments should review parking-to-housing-unit ratio requirements for residential buildings, and consider alternatives such as shared parking with other uses in station areas.
Public/Private Partnerships	Public/private partnerships can be used as an incentive for developing mixed-income housing TOD through a number of options. Tax increment financing (TIF) can be used to publicly fund infrastructure such as parks, parking structures, and streetscape elements to encourage development. In addition, local governments can streamline rezoning and permitting processes. Land assembly and brownfields may also be issues within urban centers. Local governments can assist developers with land assembly and obtaining brownfield mitigation grants.
Targeted Funding	Government funding for affordable housing could be targeted to areas with rapid transit and commuter rail stations to encourage mixed-income TOD. An example would be to create a scoring category for the Wisconsin Housing and Economic Development Authority (WHEDA) Qualified Allocation Plan that would provide an incentive to locate Low-Income Housing Tax Credit (LIHTC) developments in station areas.

^a Transit Cooperative Research Program Report 128.

Source: SEWRPC



► **Recommendation 1.5: Limit low-density development outside urban service areas**

Large Lot Neighborhood and Large Lot Exurban⁷ residential development outside urban service areas is neither truly urban nor rural in character. Development of this nature generally precludes the provision of centralized sewer and water supply service and other urban amenities. VISION 2050 does recognize existing commitments to this type of development even though such development is not consistent with VISION 2050 objectives. This results in a small portion of the planned households in the Region being allocated to accommodate Large Lot Neighborhood and Large Lot Exurban development outside urban service areas where there are approved subdivision plats and certified survey maps. VISION 2050 recommends that local and county government land use policies limit Large Lot Neighborhood and Large Lot Exurban development beyond urban service areas to commitments to such development made during or before the VISION 2050 planning process. VISION 2050 also recommends limiting other development beyond urban service areas to highway-oriented business, utility, and recreational uses.

Commercial and Industrial Land

VISION 2050 recommends focusing new commercial and industrial development within urban service areas as infill, redevelopment, and new development.



► **Recommendation 1.6: Provide a mix of housing types near employment-supporting land uses**

Commercial land and business parks should be developed in mixed-use settings where compatible, or near a mix of housing types to avoid job-

⁷ Single-family homes on one and a half-acre to just under five-acre lots.

Planned Public Sanitary Sewer and Water Supply Service Areas: VISION 2050

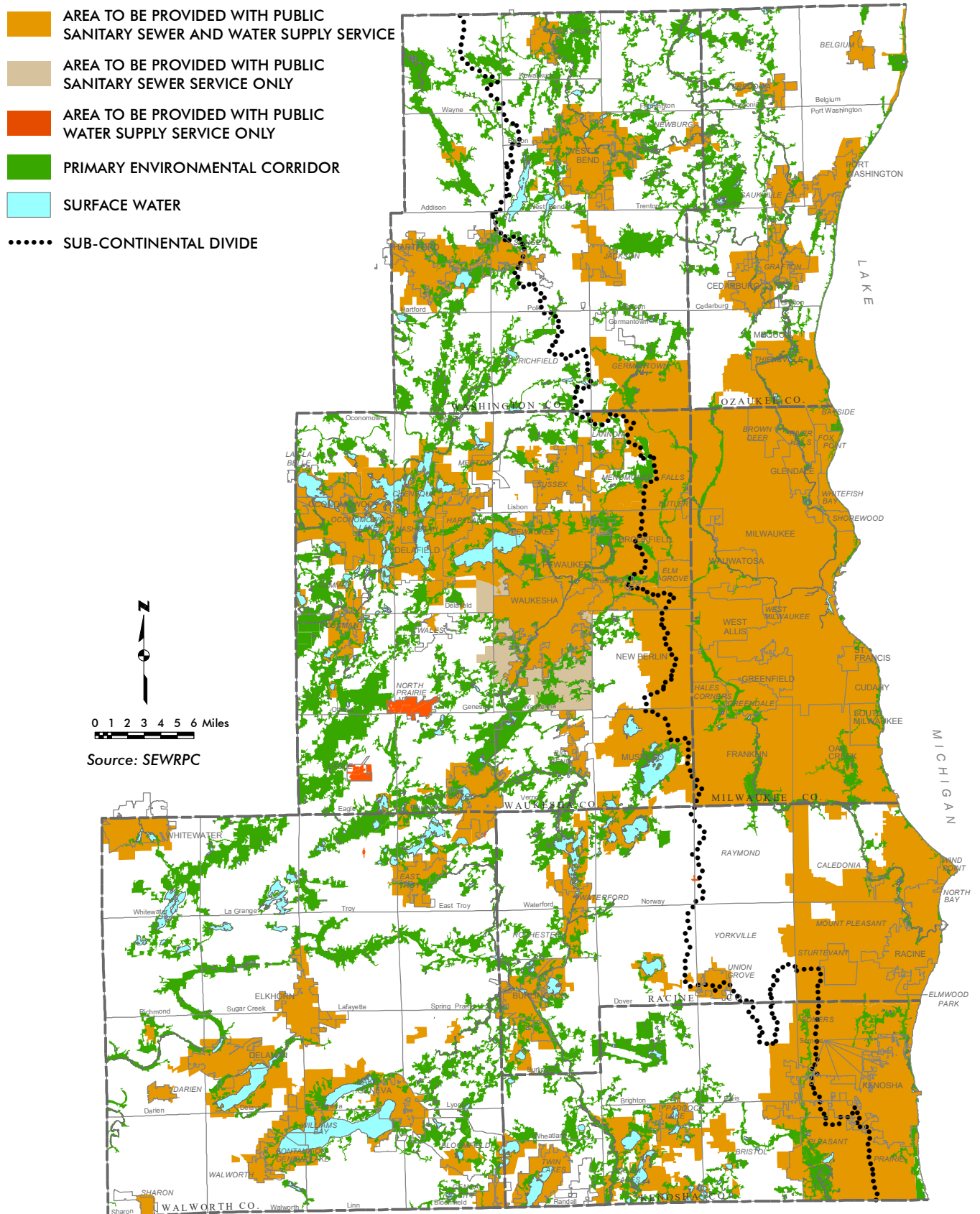


Table 1.6

Area and Population Served by Public Sanitary Sewer and Public Water: 2010 and 2050

	County	Area				Population			
		2010		2050		2010		2050	
		Square Miles	Percent	Square Miles	Percent	Population	Percent	Population	Percent
Public Sanitary Sewer	Kenosha	45.8	16.5	65.0	22.7	150,200	90.3	241,300	96.1
	Milwaukee	198.7	81.9	206.1	84.9	947,000	99.9	1,019,100	100.0
	Ozaukee	33.3	14.1	40.2	17.1	67,800	78.5	94,800	86.9
	Racine	57.0	16.7	69.2	20.3	176,100	90.1	222,900	93.0
	Walworth	30.3	5.3	40.8	7.1	70,500	69.0	113,100	80.4
	Washington	29.1	6.7	40.4	9.3	84,300	63.9	135,000	74.8
	Waukesha	130.3	22.4	154.1	26.5	301,100	77.2	425,600	88.4
	Region	524.5	19.5	615.6	22.9	1,797,000	89.0	2,251,800	93.0
Public Water	Kenosha	34.7	12.5	54.0	19.4	125,800	75.6	202,700	80.7
	Milwaukee	187.3	77.2	194.7	80.2	938,400	99.0	1,019,100	100.0
	Ozaukee	23.4	9.9	30.3	12.9	55,800	64.6	80,400	73.7
	Racine	44.3	13.0	56.6	16.6	154,900	79.3	195,700	81.6
	Walworth	24.4	4.2	34.9	6.1	63,400	62.0	103,000	73.3
	Washington	27.1	6.2	38.4	8.8	80,100	60.7	129,200	71.6
	Waukesha	102.6	17.7	124.9	21.5	261,500	67.1	365,400	75.9
	Region	443.8	16.5	533.6	19.8	1,679,900	83.2	2,095,500	86.5

Source: SEWRPC

worker mismatches. Local government land use policies should allow a mix of housing types and land uses as recommended under Recommendations 1.1 and 1.2 to promote accessibility between housing and jobs.



Local government land use policies should allow a mix of housing types near major economic activity centers to promote accessibility between housing and jobs.

► Recommendation 1.7: Encourage and accommodate economic growth

Major economic activity centers are defined as areas containing concentrations of commercial and/or industrial land with at least 3,500 employees or 2,000 retail employees. A total of 62 centers have been identified that have either reached major center status, or are anticipated to by 2050, based on existing employment, forecast employment growth, and input from local governments (see Map 1.4). VISION 2050 recommends continued development of major economic activity centers to encourage economic growth, including a focus on developing and redeveloping long-established major centers. In addition, local government land use policies should allow a mix of housing types as recommended under Recommendations 1.1 and 1.2 near major economic activity centers to promote accessibility between housing and jobs.

Governmental and Institutional Land

VISION 2050 recommends that new governmental and institutional developments, such as schools and libraries, be provided to meet the needs of the Region's planned population. VISION 2050 also envisions a system of major governmental and institutional centers throughout the Region, including: county courthouses and administrative offices, State and Federal office buildings, medical complexes,⁸ universities,⁹ technical colleges, and major cultural centers. These major centers are shown on Map 1.5.

⁸ Includes medical centers with 600 or more beds.

⁹ Includes institutions with accredited bachelor's degree programs that have a total enrollment of 4,500 or more students.

Map 1.4 Major Economic Activity Centers: VISION 2050

- EXISTING MAJOR ECONOMIC ACTIVITY CENTER IN 2010 TO BE RETAINED
- RECOMMENDED MAJOR ECONOMIC ACTIVITY CENTER: 2050

MAJOR ECONOMIC ACTIVITY CENTER TYPE

G GENERAL PURPOSE CENTER

I INDUSTRIAL CENTER

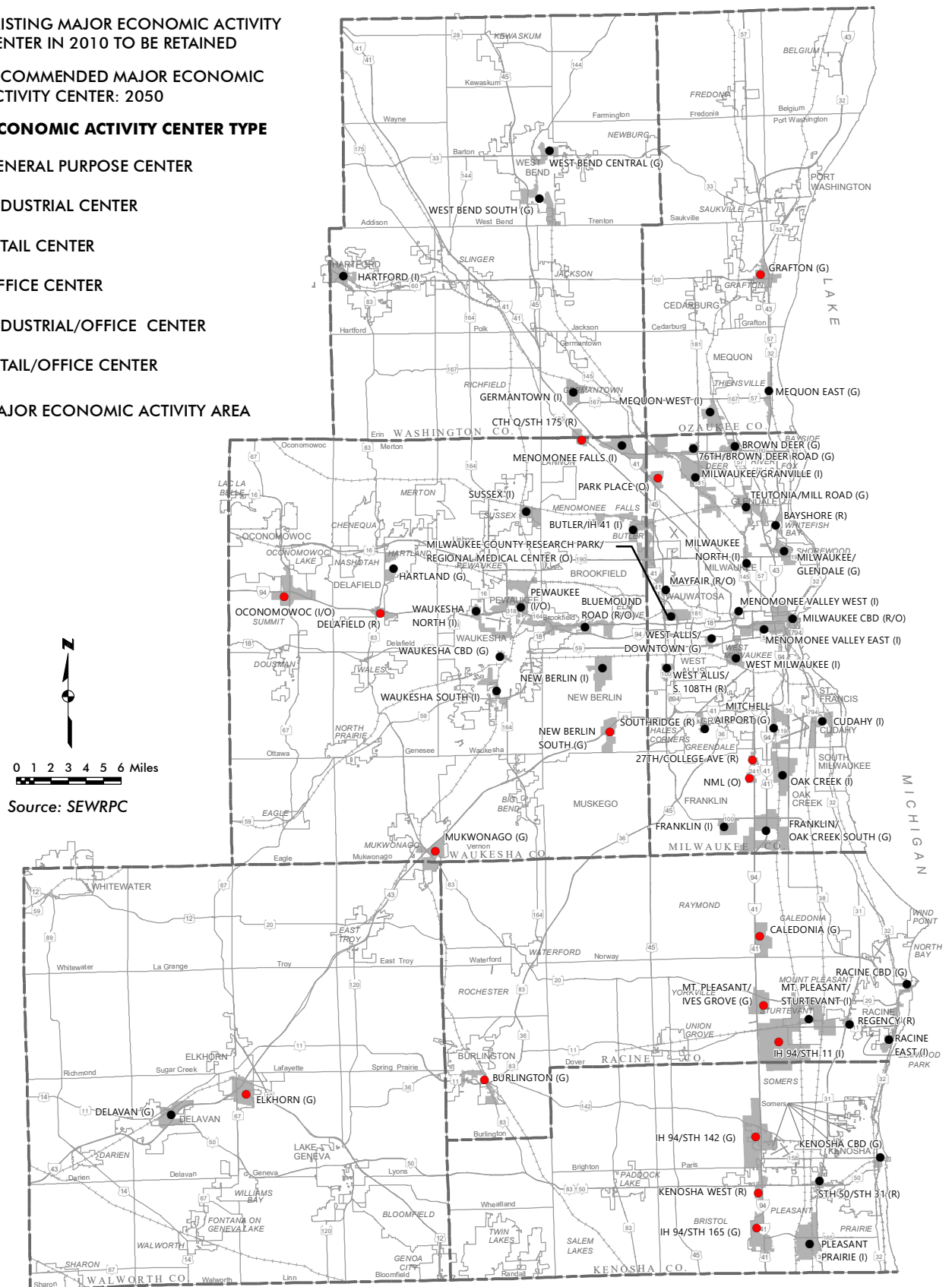
R RETAIL CENTER

O OFFICE CENTER

I/O INDUSTRIAL/OFFICE CENTER

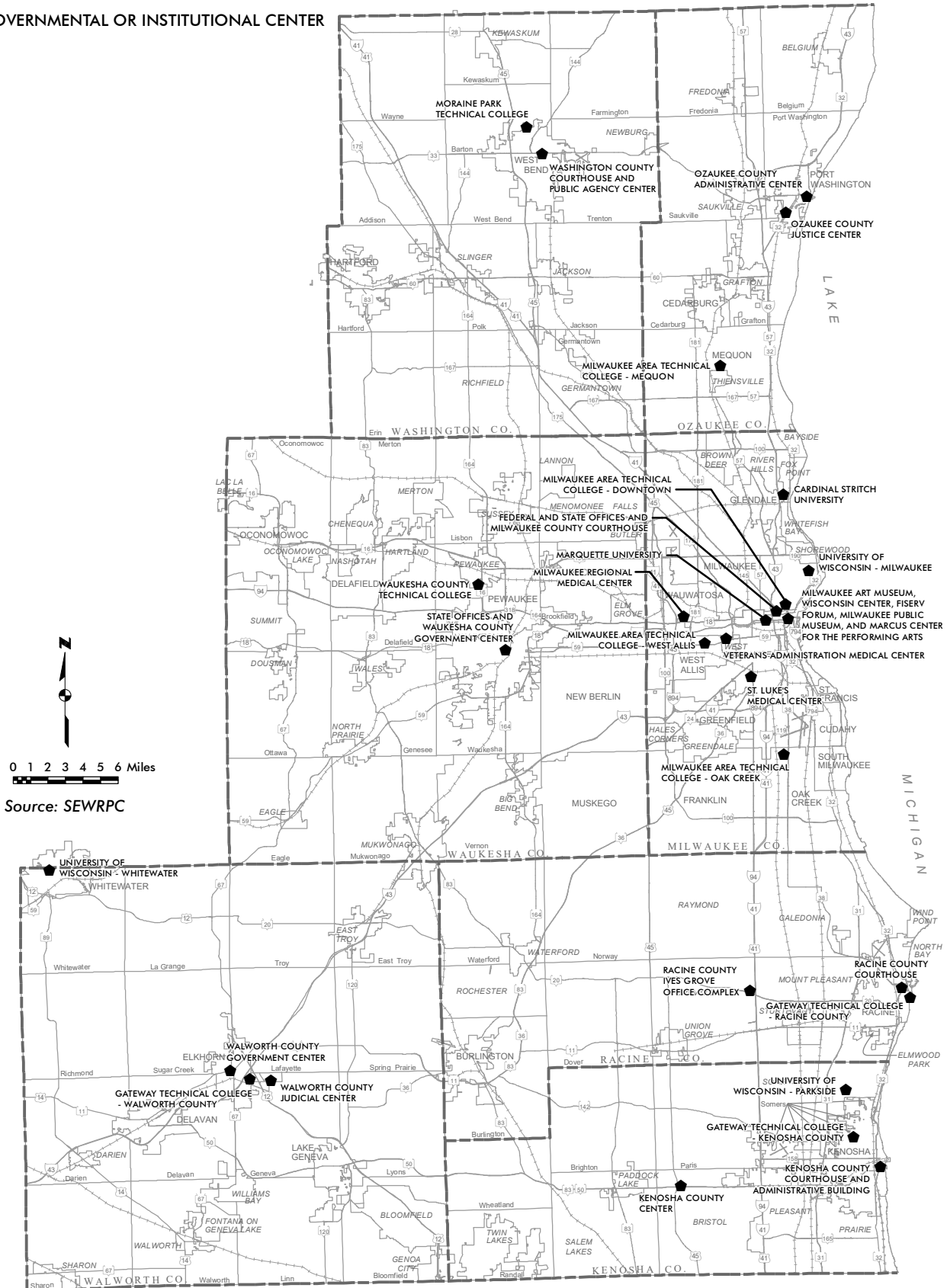
R/O RETAIL/OFFICE CENTER

MAJOR ECONOMIC ACTIVITY AREA



Map 1.5 Major Governmental and Institutional Centers: VISION 2050

GOVERNMENTAL OR INSTITUTIONAL CENTER



► **Recommendation 1.8: Provide new governmental and institutional developments in mixed-use settings**

VISION 2050 recommends that new governmental and institutional uses occur in mixed-use settings to the greatest extent possible to be accessible to the greatest number of residents possible.



Transportation, Communication, and Utility Land

VISION 2050 envisions that land devoted to transportation, communication, and utilities will increase due to land needed for streets and highways, airport expansions, and utility facilities. Major transportation and utility centers envisioned under VISION 2050 are shown on Map 1.6.

Recreational Land

VISION 2050 recommends an expansion of recreational land based on park site acquisition and development proposals set forth in county and local park and open space plans and the neighborhood parks attributable to new urban development. VISION 2050 also envisions a system of 32 major parks of regional size and significance as shown on Map 1.7.¹⁰ Major parks have an area of at least 250 acres and provide opportunities for a variety of resource-oriented outdoor recreational activities. Map 1.7 also shows major special-use outdoor recreation and nature study sites.¹¹

► **Recommendation 1.9: Provide neighborhood parks in developing residential areas**

VISION 2050 recommends reserving land for parks as new residential neighborhoods are developed within urban service areas (design guidelines are included in Appendix K).



Environmentally Significant Land

VISION 2050 recommends minimizing the impacts of new development on environmentally significant lands. New urban development should avoid environmentally significant lands, particularly primary environmental corridors. To the extent possible, new urban development should also avoid secondary environmental corridors and isolated natural resource areas. In addition, to the extent possible, new development should attempt to preserve other wetlands, woodlands, natural areas, critical species habitat sites, and park and open space sites outside environmental corridors.¹²

New development should avoid environmentally significant lands.

► **Recommendation 1.10: Preserve primary environmental corridors**

The most important elements of the natural resource base of the Region, including the best remaining woodlands, wetlands, prairies, wildlife habitat, surface water and associated floodplains and riparian buffers park and open space sites, scenic views, and natural areas and critical species habitat sites, occur in linear patterns in the landscape termed environmental corridors. The most important of these have been identified as primary environmental corridors, which are at least two miles long, 200 feet wide,



The Region's most important natural resources occur in environmental corridors.

¹⁰ The sites in Milwaukee County identified as "Lake Michigan North" and "Lake Michigan South" on Map 1.7 refer to clusters of parks along the Lake Michigan shoreline. Lake Michigan North includes Back Bay, Juneau, Lake, McKinley, O'Donnell, and Veterans County Parks; Bradford Beach; and Lakeshore State Park. Lake Michigan South includes Bay View, Grant, Sheridan, South Shore, and Wauwatosa County Parks.

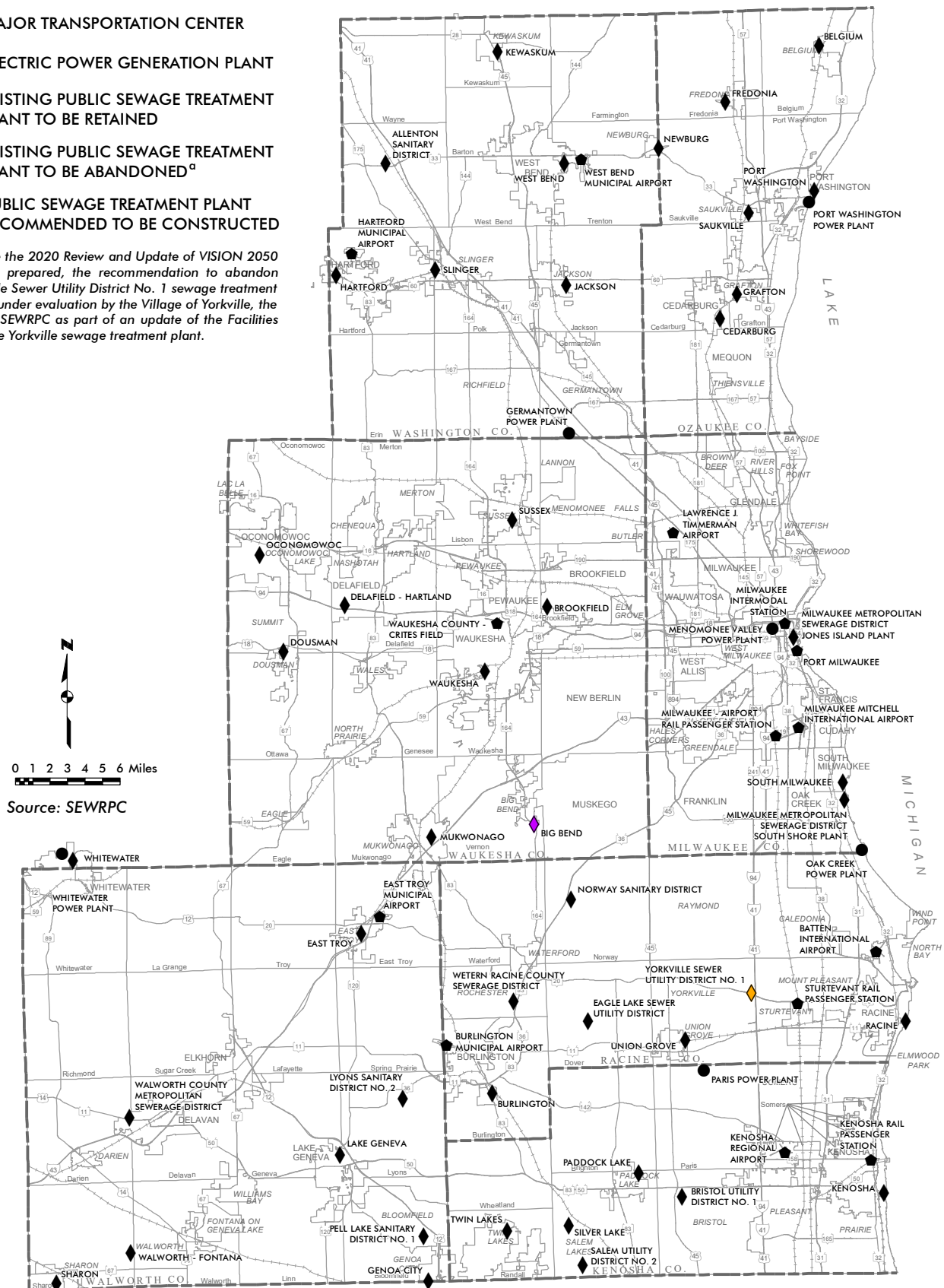
¹¹ Major nature sites are public or private sites, other than sites identified as regional park sites, that are at least 100 acres in size and that have, or are proposed to have, an indoor interpretive nature center.

¹² The different types of environmentally significant lands are defined in Chapter 2 of Volume I and the design guidelines presented in Appendix K.

Map 1.6 Major Transportation and Utility Centers: VISION 2050

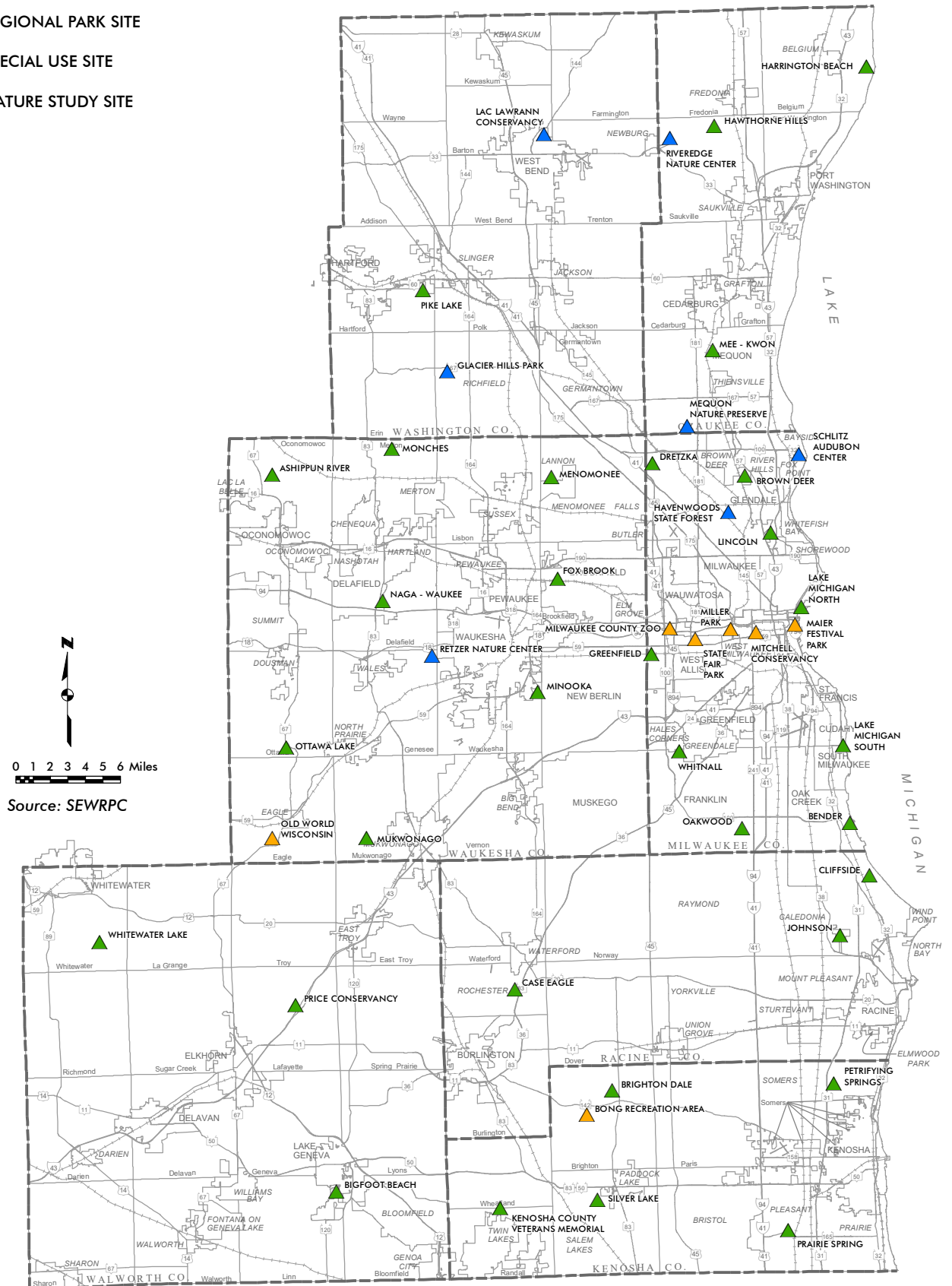
- MAJOR TRANSPORTATION CENTER
- ELECTRIC POWER GENERATION PLANT
- EXISTING PUBLIC SEWAGE TREATMENT PLANT TO BE RETAINED
- EXISTING PUBLIC SEWAGE TREATMENT PLANT TO BE ABANDONED^a
- PUBLIC SEWAGE TREATMENT PLANT RECOMMENDED TO BE CONSTRUCTED

^a At the time the 2020 Review and Update of VISION 2050 was being prepared, the recommendation to abandon the Yorkville Sewer Utility District No. 1 sewage treatment plant was under evaluation by the Village of Yorkville, the DNR, and SEWRPC as part of an update of the Facilities Plan for the Yorkville sewage treatment plant.



Map 1.7 Major Outdoor Recreation Centers: VISION 2050

- ▲ REGIONAL PARK SITE
- ▲ SPECIAL USE SITE
- ▲ NATURE STUDY SITE



and 400 acres in size. They are typically located along major stream valleys, along the Lake Michigan shoreline, or around major lakes. VISION 2050 recommends limiting development within the primary environmental corridors to essential transportation and utility facilities and compatible outdoor recreation facilities. Rural Estate residential development in upland corridors could also occur. Cluster subdivision design should be used if such development does occur (design guidelines are discussed in Chapter 3 of this volume and Appendix K). Local and county government land use policies, including comprehensive plans and land use ordinances, should incorporate this recommendation and related design guidelines. Planned primary environmental corridors are shown on Map 1.1 and existing primary environmental corridors are shown on Map 2.22 in Chapter 2 of Volume I. Table 1.7 shows that planned primary environmental corridors would encompass 493 square miles in 2050, which is an increase of about 2 percent over the existing area.¹³



► **Recommendation 1.11: Preserve secondary environmental corridors and isolated natural resource areas**

Other concentrations of natural resources have been identified as secondary environmental corridors or isolated natural resource areas. Secondary environmental corridors contain a variety of resource features and are at least one mile long and 100 acres in area. Isolated natural resource areas are concentrations of natural resources of at least five acres in size that have been separated from the environmental corridor network by urban or agricultural use. Existing secondary environmental corridors and isolated natural resource areas are shown on Map 2.22 in Chapter 2 of Volume I. It is recommended that local governments consider preserving secondary environmental corridors as natural, open space; or as drainage ways, stormwater detention or retention areas, or as local parks or recreation trails in developing areas. It is also recommended that local governments consider preserving isolated natural resource areas in natural open uses insofar as practicable, including incorporation as parks, protected open space, or for use as stormwater detention or retention areas where appropriate, as determined in local plans.



► **Recommendation 1.12: Preserve natural areas and critical species habitat sites**

A comprehensive inventory of the Region's natural areas and critical species habitat sites¹⁴ was conducted as part of the regional natural areas and critical species habitat protection and management plan. The vast majority of natural areas and critical species habitat sites are located within environmental corridors and isolated natural resource areas. VISION 2050 recommends preserving all identified natural areas and critical species habitat sites.

¹³ Primary environmental corridor delineations include certain farmed floodplains and other lands that are expected to revert to more natural conditions over time, eventually becoming part of the adjacent environmental corridors as envisioned in local sewer service area plans and local and county comprehensive plans. The delineation of primary environmental corridors was modified on Map 1.1 to reflect re-establishment of natural resource features resulting from such restorations. VISION 2050 also supports planned efforts to restore other farmland and open space to more natural conditions that result in the re-establishment of wetlands, woodlands, prairies, grasslands, and forest interiors.

¹⁴ Natural areas are tracts of land or water that contain plant and animal communities believed to be representative of the pre-European settlement landscape. Critical species habitat sites are other areas that support endangered, threatened, or rare plant or animal species.

Table 1.7
Existing and Planned Environmental Corridors and
Isolated Natural Resource Areas in the Region: 2010 and 2050

	County	2010		Planned Increment		2050	
		Square Miles	Percent of Total	Square Miles	Percent of Total	Square Miles	Percent of Total
Primary Environmental Corridors	Kenosha	45.1	9.3	1.9	4.2	47.0	9.5
	Milwaukee	15.5	3.2	2.2	14.2	17.7	3.6
	Ozaukee	33.8	7.0	0.2	0.6	34.0	6.9
	Racine	36.9	7.6	1.2	3.3	38.1	7.7
	Walworth	106.3	22.0	-1.0	-0.9	105.3	21.4
	Washington	97.6	20.2	1.4	1.4	99.0	20.1
	Waukesha	148.8	30.7	3.3	2.2	152.1	30.8
	Region	484.0	100.0	9.2	1.9	493.2	100.0
Secondary Environmental Corridors	Kenosha	10.6	13.4	0.4	3.8	11.0	13.7
	Milwaukee	5.7	7.2	-0.6	-10.5	5.1	6.3
	Ozaukee	8.4	10.6	0.6	7.1	9.0	11.2
	Racine	11.2	14.2	1.0	8.9	12.2	15.1
	Walworth	14.8	18.8	-0.1	-0.7	14.7	18.3
	Washington	16.2	20.5	0.3	1.9	16.5	20.5
	Waukesha	12.1	15.3	-0.1	-0.8	12.0	14.9
	Region	79.0	100.0	1.5	1.9	80.5	100.0
Isolated Natural Resource Areas	Kenosha	6.5	9.3	--	--	6.5	9.4
	Milwaukee	3.7	5.3	-0.1	-2.7	3.6	5.2
	Ozaukee	6.3	9.1	-0.2	-3.2	6.1	8.8
	Racine	13.2	19.0	0.2	1.5	13.4	19.3
	Walworth	14.4	20.7	0.3	2.1	14.7	21.2
	Washington	11.3	16.2	-0.1	-0.9	11.2	16.2
	Waukesha	14.2	20.4	-0.4	-2.8	13.8	19.9
	Region	69.6	100.0	-0.3	-0.4	69.3	100.0

Source: SEWRPC

Agricultural Land

VISION 2050 recommends minimizing the impacts of new development on productive agricultural land, including highly productive Class I and II soils (prime agricultural land) as classified by the U.S. Natural Resources Conservation Service. Some Class I and II farmland located in the vicinity of existing urban service areas may be converted to urban use as a result of planned expansion of those urban service areas to accommodate efficient regional growth. Also, as previously discussed, a small amount of residential development is anticipated outside planned urban service areas. A total of 1,090 square miles would remain in agricultural use under VISION 2050, which is 94 percent of the existing area.

► Recommendation 1.13: Preserve productive agricultural land

VISION 2050 recommends a compact urban development pattern that would minimize the conversion of agricultural land to urban uses, including prime agricultural lands and other productive agricultural lands. Local and county government land use policies should incorporate VISION 2050 recommendations, which include:

- A compact development pattern for urban service areas
- Cluster subdivision design to minimize the impact of Rural Estate development on agricultural land



Compact development minimizes the conversion of agricultural land to urban uses.

- Limiting Large Lot Neighborhood and Large Lot Exurban development beyond urban service areas to commitments to such development made during or before the VISION 2050 planning process



► **Recommendation 1.14: Preserve productive agricultural land through farmland preservation plans**

The Wisconsin Farmland Preservation law (Chapter 91 of the *Wisconsin Statutes*) requires counties to update their farmland preservation plans as one of the conditions for continued landowner participation in the Farmland Preservation tax credit program. Kenosha, Ozaukee, Racine, Walworth, Washington, and Waukesha Counties have prepared and adopted farmland preservation plans that have been certified by the Wisconsin Department of Agriculture, Trade, and Consumer Protection. Each plan identifies land to preserve for agricultural and agricultural-related uses, which is shown on Map 3.7 in Chapter 3 of Volume I. Farmland preservation areas may not include any areas that are planned for nonagricultural development within 15 years after the date the plan is adopted. VISION 2050 recommends continued agricultural use in these areas. Therefore, no incremental development was allocated to farmland preservation areas identified in county farmland preservation plans outside planned urban service areas under VISION 2050.



VISION 2050 recognizes a need to improve access to healthy foods for low-income residents in the Region's "food deserts."

► **Recommendation 1.15: Develop a regional food system**

VISION 2050 recognizes the relationship between the Region's urban centers and agricultural resources. The compact development pattern recommended by VISION 2050 would help to preserve agricultural land. In addition, the Region's urban centers provide a market for agricultural products from the Region. VISION 2050 also recognizes the need to make healthy foods accessible in all areas of the Region. A number of census tracts in the Region with concentrations of low-income households are "food deserts," which the U.S. Department of Agriculture defines as an area where residents are more than one mile from a large supermarket or grocery store.¹⁵ VISION 2050 recommends developing a regional food system that connects food producers, distributors, and consumers to ensure access to healthy foods throughout the entire Region. In addition to encouraging supermarkets and grocery stores near residential areas, local government land use policies should consider allowing urban agriculture, such as vertical farming and community gardens on vacant lots. Local governments should also support farmers markets as an alternative source of healthy foods. There are a number of organizations in the Region that could partner with local governments to better connect food production, distribution, and land use policy.

Lake Michigan and groundwater are the two major sources of water for development in the Region.

Water Supply

The residential, commercial, industrial, institutional, and agricultural land uses in the Region rely on two major sources of water supply: surface water supply primarily from Lake Michigan, and groundwater supplied from both deep and shallow aquifer systems. Groundwater is susceptible to depletion in quantity and deterioration in quality as a result of urban and rural development, and diversion of Lake Michigan water west of the subcontinental divide that bisects the Region is constrained by the Great Lakes – St. Lawrence River Basin Water Resources Compact. The Commission recognizes the relationship between land use planning and water supply and has prepared and adopted a regional water supply plan.

¹⁵ At least 500 people or 33 percent of the census tract's population must reside more than one mile from a supermarket or large grocery store in an urban area and 10 miles in a rural area.

The year 2035 regional land use plan served as the basis for the regional water supply plan. It was indicated at the beginning of the water supply planning effort that the land use plan would be amended if water resource constraints were identified due to the development pattern recommended under the land use plan. The water supply planning effort found that water supply would not be a limiting factor within the Region with respect to the recommended development pattern either east or west of the subcontinental divide. The water supply plan also found that implementing the recommended development pattern would have benefits, such as preserving areas with high groundwater recharge potential. This is due to the focus of the year 2035 land use plan on infill, redevelopment, and compact development within planned urban service areas. The forecast population under the year 2035 plan of 2,276,000 residents is about 94 percent of the forecast population under VISION 2050 (2,421,160 residents) and the forecast employment under the year 2035 plan of 1,368,300 jobs is about 96 percent of the forecast employment under VISION 2050 (1,428,700 jobs). Therefore, the regional water supply plan conclusion that water supply would not be a limiting factor within the Region with respect to the development pattern recommended under the year 2035 regional land use plan also applies to VISION 2050.

► **Recommendation 1.16: Preserve areas with high groundwater recharge potential**

VISION 2050 land use recommendations carry forward the focus on infill, redevelopment, and compact development within planned urban service areas embodied in the year 2035 regional land use plan. The VISION 2050 development pattern would result in about 96 percent of areas with high or very high groundwater recharge potential remaining in open space or agricultural use. Areas with high or very high groundwater recharge potential are shown on Map 2.19 in Chapter 2 of Volume I. Design guidelines for areas with high groundwater charge potential are included in Appendix K.

Sustainable Land Use

Sustainable land use concepts relate to arranging land uses and site features to protect natural resources, and avoid converting productive agricultural land and other rural areas to urban use. VISION 2050 recommendations embody sustainable land use concepts through higher-density, mixed-use development/redevelopment in compact urban service areas. In addition to preserving natural and agricultural resources, compact, mixed-use development promotes healthy communities through opportunities for more travel by transit, walking, and bicycling. Compact development is also more energy efficient and results in less greenhouse gas emissions than lower-density development. In addition, the cost of extending and maintaining sewer pipes, water mains, and local roads, and providing fire protection, school transportation, and solid waste collection all decrease as density increases.

► **Recommendation 1.17: Manage stormwater through compact development and sustainable development practices**

The compact development pattern recommended by VISION 2050 would minimize impervious surface coverage of new development in the Region. Additional sustainable development measures can be used to increase stormwater infiltration and reduce negative impacts on water quality, such as green roofs, porous pavement, rain gardens, and biofiltration and infiltration facilities. VISION 2050 recommends that local and county governments incorporate the VISION 2050 land use recommendations into their land use policies to minimize the amount of impervious surface in the Region. Local and county governments should also encourage



The VISION 2050 land use development pattern would preserve 96% of areas with high or very high groundwater recharge potential.

VISION 2050 recommendations embody sustainable land use concepts.



sustainable development practices, which are described in the design guidelines included in Appendix K.



- **Recommendation 1.18: Target brownfield sites for redevelopment**
VISION 2050 recommends that local governments target brownfield sites for cleanup and redevelopment as a key element in planning for the revitalization of urban areas. Tools such as Tax Increment Financing (TIF) and State and Federal brownfield remediation grants and loans may assist in these efforts.

The VISION 2050 transportation component includes six elements:

- **Public transit**
- **Bicycle and pedestrian**
- **Transportation systems management**
- **Travel demand management**
- **Arterial streets and highways**
- **Freight transportation**

VISION 2050 recommends a significant improvement and expansion of public transit—more than doubling existing service levels.

1.3 RECOMMENDED TRANSPORTATION COMPONENT

The transportation component of VISION 2050 includes the following six elements: public transit, bicycle and pedestrian, transportation systems management, travel demand management, arterial streets and highways, and freight transportation. Each element is described below, including specific plan recommendations. Figure 1.4 provides key definitions for the different types of transportation investment recommended in VISION 2050. A financial analysis of the VISION 2050 transportation component is also described later in the chapter, including identification of anticipated funding gaps related to implementing plan recommendations and potential revenue sources to achieve the full plan. In addition to the transportation recommendations in this section, Appendix M of this volume provides specific VISION 2050 recommendations for the portion of Jefferson County that is located outside of the seven-county Region, but within the Milwaukee urbanized area.¹⁶

As required by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act, the Commission established targets for a number of performance measures developed by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The established targets are included in Appendix P of this volume and summarized later in this chapter.

Description of Public Transit Element

The public transit element of VISION 2050 recommends a significant improvement and expansion of public transit in Southeastern Wisconsin, including four commuter rail lines, eight rapid transit lines, and significantly expanded local bus, express bus, commuter bus, and shared-ride taxi services. Map 1.8 displays the routes and areas served by the various components of the recommended transit element. Altogether, service on the regional transit system would be increased from service levels existing in 2018 by about 113 percent measured in terms of revenue transit vehicle-hours of service provided, from about 4,870 vehicle-hours of service on an average weekday in the year 2018 to 10,350 vehicle-hours of service in the year 2050 (see Table 1.8).

The recommended service improvements and expansion include expansion of service area and hours, and significant improvements in the frequency and speed of service. Table 1.9 shows the span of service hours and frequencies under VISION 2050.

¹⁶ The Commission and Jefferson County entered into a cooperative agreement to provide the necessary transportation planning and programming services for the County's portion of the Milwaukee urbanized area, including the inclusion of this area in VISION 2050.

Figure 1.4

Transportation System Definitions

The recommended VISION 2050 transportation system is comprised of different types of transportation investment, with some of the key types defined and illustrated below.

Local Transit

Lower-speed routes with closely spaced stops, primarily with buses (or streetcars) operating over arterial and collector streets and in mixed traffic (can also include shared-ride taxi, shuttles, demand-responsive microtransit, or shared-use automobiles through partnerships with transportation network companies like Uber and Lyft)

Express Transit

Limited-stop, higher-speed routes, with buses operating in mixed traffic or in reserved street lanes and stops typically spaced every ½ to one mile

Rapid Transit

Either bus rapid transit (BRT) or light rail transit lines, with vehicles operating in exclusive lanes and using signal priority or preemption, and stations typically spaced every ½ to one mile

Commuter Transit

Longer-distance routes or lines, with either buses operating on freeways or rail vehicles operating in a rail corridor (i.e., commuter rail) and stops or stations typically spaced every three to five miles

On-Street Bicycle Facility

Accommodations for bicycles provided on surface arterial streets, with either standard facilities (bicycle lanes, paved shoulders, and widened outside travel lanes) or enhanced facilities

Off-Street Bicycle Path

Separate from motor vehicle traffic and typically developed in former railway rights-of-way and parkway corridors

Enhanced Bicycle Facility

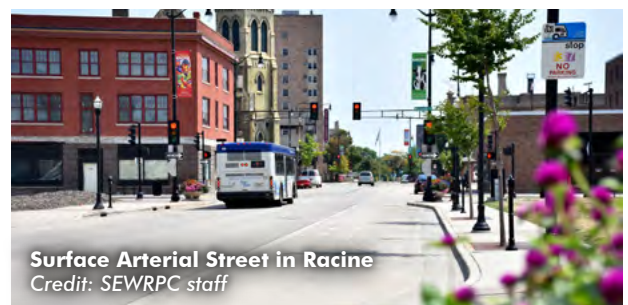
On-street bicycle facilities that go beyond the standard facilities to provide a comfort level similar to off-street paths, with examples including protected bicycle lanes, buffered bicycle lanes, raised bicycle lanes, and a separate path within a road's right-of-way

Surface (or Standard) Arterial Street

Major streets with primarily at-grade intersections that may also provide direct access through driveways

Freeway

Divided arterial highway with full access control and grade separations (over- and under-passes) at all interchanges, providing the highest degree of mobility



Map 1.8

Transit Services: VISION 2050

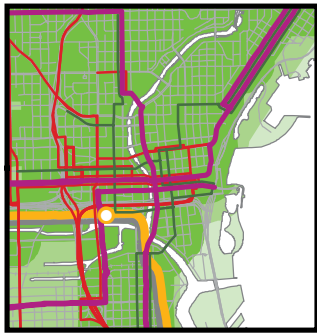
TRANSIT SERVICES

- RAPID TRANSIT LINE
- EXPRESS BUS ROUTE
- COMMUTER RAIL LINE & STATION
- COMMUTER BUS ROUTE & PARK-RIDE
- INTERCITY RAIL
- STREETCAR LINE

LOCAL TRANSIT SERVICE AREA AND PEAK FREQUENCY

- EVERY 15 MINUTES OR BETTER
- LESS FREQUENT THAN EVERY 15 MINUTES
- ONE DAY ADVANCE-RESERVATION
SHARED-RIDE TAXI

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



0 1 2 3 4 5 6 Miles

Source: SEWRPC

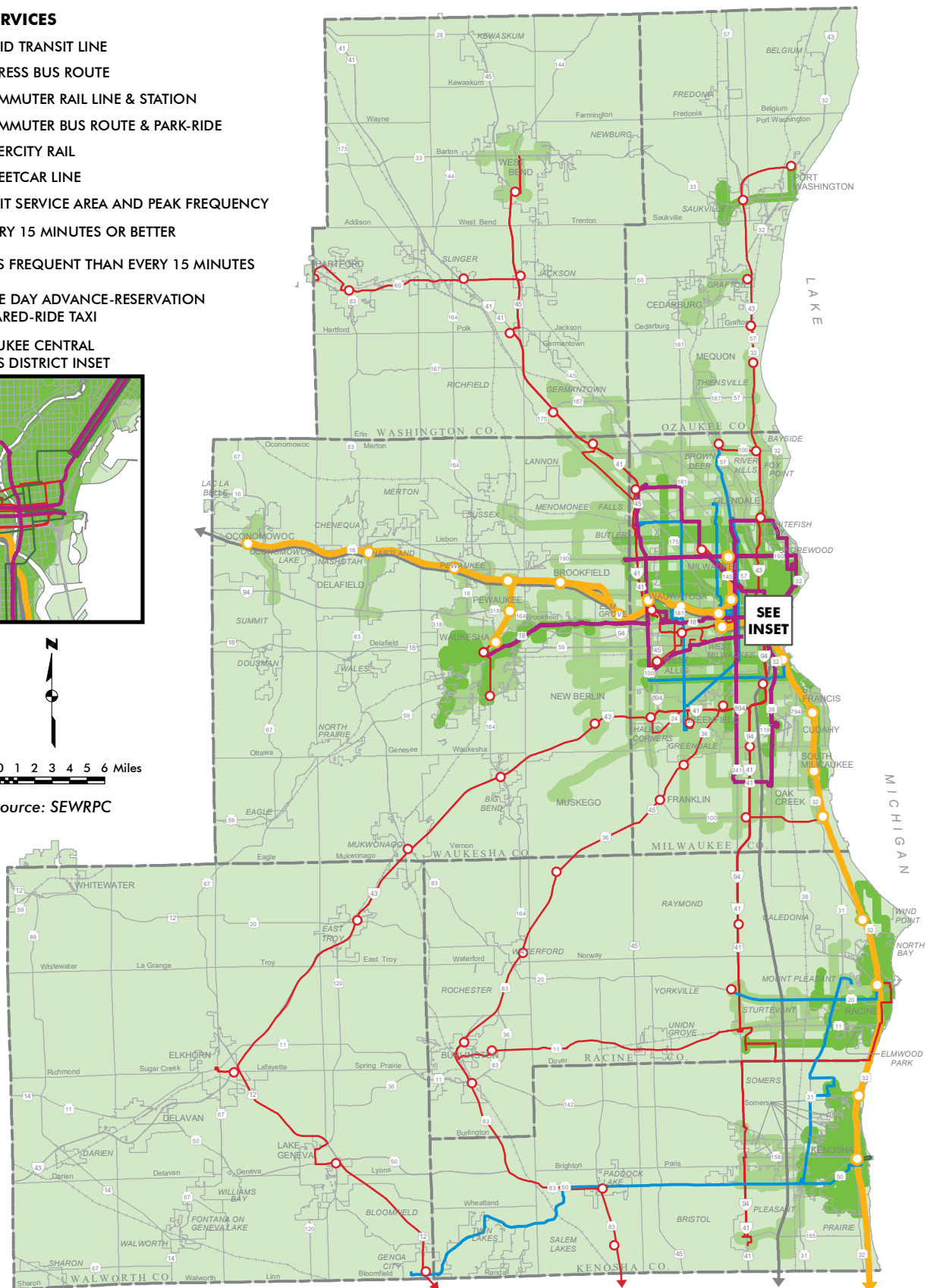


Table 1.8
Fixed-Route Public Transit Service Levels: VISION 2050

Average Weekday Transit Service Characteristics	Existing (2018)	Plan (2050)
Revenue Vehicle-Hours		
Rapid Transit	--	1,170
Commuter Rail	10	190
Commuter Bus	290	990
Express Bus	880	870
Local Transit	3,690	7,130
Total	4,870	10,350
Revenue Vehicle-Miles		
Rapid Transit	--	23,500
Commuter Rail	100	8,200
Commuter Bus	5,700	24,300
Express Bus	10,400	12,670
Local Transit	46,100	84,100
Total	62,300	152,770

Source: National Transit Database, MCTS, and SEWRPC

Table 1.9
Transit Service Hours and Frequency: VISION 2050

Service Type	Weekdays/ Weekends	Existing (2015)		Plan (2050)	
		Service Hours	Service Headways	Service Hours	Service Headways
Rapid Transit	Weekdays	No service	No service	Up to 24 hours a day	8 – 15 minutes
	Weekends	No service	No service	Up to 24 hours a day	10 – 15 minutes
Commuter Rail	Weekdays	6 a.m. – 2 a.m.	30 – 360 minutes	6 a.m. – 2 a.m.	15 – 30 minutes
	Weekends	7 a.m. – 2 a.m.	60 – 480 minutes	7 a.m. – 2 a.m.	15 – 60 minutes
Commuter Bus	Weekdays	5 a.m. – 10 a.m. 12 p.m. – 8 p.m. many services peak direction only	10 – 225 minutes many services peak direction only	4 a.m. – 11 p.m. both directions	10 – 60 minutes both directions
	Weekends	8 a.m. – 11 p.m. KRM Bus only	90 – 240 minutes KRM Bus only	7 a.m. – 11 p.m. both directions	30 – 120 minutes both directions
Express Bus Milwaukee County	Weekdays	4 a.m. – 2 a.m.	10 – 35 minutes	4 a.m. – 2 a.m.	10 – 15 minutes
	Weekends	5 a.m. – 2 a.m.	20 – 45 minutes	5 a.m. – 2 a.m.	12 – 15 minutes
Kenosha and Racine Counties	Weekdays	6 a.m. – 7 p.m.	60 – 75 minutes	5 a.m. – 12 a.m.	15 – 60 minutes
	Weekends	No service	No service	5 a.m. – 12 a.m.	30 – 60 minutes
Local Transit Milwaukee County	Weekdays	4 a.m. – 2 a.m.	10 – 70 minutes	Up to 24 hours a day	10 – 60 minutes
	Weekends	5 a.m. – 2 a.m.	12 – 100 minutes	Up to 24 hours a day	12 – 60 minutes
Remainder of Region	Weekdays	6 a.m. – 10 p.m.	30 – 60 minutes	5 a.m. – 12 a.m.	15 – 60 minutes
	Weekends	6 a.m. – 10 p.m.	30 – 60 minutes	5 a.m. – 12 a.m.	30 – 60 minutes

Source: SEWRPC

The recommended expansion of public transit discussed in the following pages would have significant costs to the Region's taxpayers and is not recommended without due consideration of the increased public revenue that would be required to build and operate this investment. However, the significant improvement and expansion of public transit is essential for Southeastern Wisconsin's future for many reasons:

- Public transit expands traffic carrying capacity in the Region's heavily traveled corridors and densely developed activity centers, helping to mitigate congestion in crowded corridors. Rapid transit (either bus rapid transit or light rail) provides a reliable alternative to driving on congested roadways, with consistent travel times and minimal wait times.
- Fixed-guideway transit investment can guide development by focusing jobs and housing around its stations, leading to more compact, walkable neighborhoods that encourage active transportation and improve public health.
- The regionwide transit system recommended under VISION 2050 (including shared-ride taxi service in rural parts of the Region) would assist residents across Southeastern Wisconsin in aging in place, without needing to move from their home as their ability to drive declines. As Chapter 2 of Volume I notes, there will be a significant increase in the proportion of the Region's population aged 75 and older in the near future.
- For the 1 in 10 households in the Region without access to a car, households that are more likely to be minority or low income than the overall proportion of the Region's population, transit is vital to providing access to jobs, healthcare, education, and other daily needs. Improving and expanding public transit would significantly improve this access for people of color, low-income residents, and people with disabilities. Conversely, a continuing decline in transit due to a lack of funding, as the financial analysis later in this chapter expects, would likely result in a disparate impact on these population groups.
- Although many of the Region's jobs are currently accessible via transit, the lack of fast, frequent transit service in much of the Region limits access to a large number of the Region's jobs for households without access to a car due to excessive travel time. Approximately 1,422,000 of the Region's residents (or 70 percent of the Region's year 2050 population) would be able to use transit to reach 10,000 jobs or more in less than 30 minutes under VISION 2050, compared to 499,000 residents (or 21 percent) under the Trend.¹⁷
- In addition to providing access to daily needs for households without a car, a robust transit system can provide employers with access to a larger labor force, increasing the number of available candidates for job openings.

¹⁷ VISION 2050 is compared to a "Trend" alternative future, under which the transportation system and land use development and funding trends of the last 15 to 20 years are projected to continue to the year 2050.

- Other than Milwaukee, only three out of the 39 metropolitan areas with more than 1.5 million residents in the United States (Cincinnati, Detroit, and San Antonio) do not currently have light rail, bus rapid transit, or commuter rail. Although transit alone does not make a metro area successful, it is one of the amenities expected of an economically competitive city.
- Replacing a car with transit use would save an average Southeastern Wisconsin household about \$4,500 per year, money that can be saved or spent on other goods. By 2050, providing the recommended transit system would result in \$144 million being saved annually by the Region's residents compared to the Trend.
- In dense areas, parking garages can be a significant part of the cost of a development, with each space costing an average of \$20,000 to \$25,000 to build. Providing fast and frequent transit service has been shown to decrease the demand for parking, allowing communities to reduce or eliminate parking requirements, developers to build fewer spaces, and commercial and residential tenants to pay less.
- Fast, frequent transit service also reduces the need for multi-car garages to be built for single-family homes in dense urban areas, allowing for more green space and larger yards without increasing lot size.
- Although the effect is expected to be somewhat limited, carbon emissions from transportation are expected to be 2 percent less under VISION 2050 than the Trend, due to the reduced dependence on cars and the recommended compact land development pattern reducing the distance between destinations.
- An expansive transit system can provide economic resiliency. Should the Region experience greater economic success than currently predicted, the increase in congestion caused by a growing workforce could have significant negative impacts without a reliable alternative to driving. Similarly, should fossil fuel prices rise dramatically before alternative methods of powering cars and trucks are more mainstream, the negative impacts on the Region's residents and its economy would be significant without a robust transit system to provide an alternative to driving.

Achieving these benefits for the Region will require additional revenue, likely from an increase in local taxes, such as a sales tax. Implementing the transit recommendations would also be most easily implemented by a regional transit agency that would construct, manage, and operate the recommended transit system, although a regional transit agency is not required to achieve VISION 2050. This is discussed further in the Financial Analysis section of this chapter.

► **Recommendation 2.1: Develop a rapid transit network**

VISION 2050 recommends eight rapid transit corridors (either bus rapid transit or light rail), with dedicated transit lanes and transit signal priority or preemption. Stations would be spaced every one-half to one mile and would include off-board fare payment, real-time information screens, and raised platforms. Service would be provided every 15 minutes or better for nearly the entire day, with service being provided 24 hours a day in some corridors. Fares would be identical to that of local fixed-route



VISION 2050 recommends eight rapid transit corridors intended to provide travel times competitive with those of an automobile.

and express bus services. The intent of the recommended rapid transit services is to provide travel times that are similar to the travel time of an automobile using parallel arterial street and highway facilities during congested peak periods. The eight bus rapid transit or light rail corridors recommended are shown in purple on Map 1.8 and would travel:

- From downtown Waukesha to downtown Milwaukee via the Milwaukee Regional Medical Center, predominately on E. Main Street, W. Blue Mound Road, and Wisconsin Avenue.
- From Bayshore Town Center in Glendale to downtown Milwaukee via the University of Wisconsin-Milwaukee, predominately on N. Oakland Avenue, N. Prospect Avenue, and N. Farwell Avenue.



A Bus Rapid Transit Vehicle
Credit: Greater Cleveland Regional Transit Authority

- From the Park Place complex on the northwest edge of Milwaukee to downtown Milwaukee, predominately on W. Fond du Lac Avenue.
- From the retail centers located around the intersection of S. 108th Street and W. Cleveland Avenue in West Allis to downtown Milwaukee, predominately on W. National Avenue.
- From Northwestern Mutual's Franklin Campus on S. 27th Street to downtown Milwaukee via General Mitchell International Airport, predominately along S. Howell Avenue and S. 1st Street.
- From Bayshore Town Center in Glendale to W. Drexel Avenue, predominately on 27th Street.
- From the Park Place Complex on the northwest edge of Milwaukee to the retail centers located around the intersection of S. 108th Street and Cleveland Avenue in West Allis via Mayfair Mall, predominately on N. Mayfair Road and S. 108th Street (STH 100).
- From Shoppers World of Brookfield at N. 124th Street and W. Capitol Drive to the University of Wisconsin-Milwaukee, predominately on Capitol Drive.



A Light Rail Transit Vehicle
Credit: MetroTransit



The recommended commuter rail lines and improved commuter bus services would provide travel times competitive with cars over longer distances.

► **Recommendation 2.2: Develop commuter rail corridors and improve and expand commuter bus services**

VISION 2050 recommends four commuter rail lines and a significant improvement and expansion of existing commuter bus services. Both types of commuter services would provide frequent service, with service every 15 minutes in the peak in both directions and every 30 to 60 minutes in both directions at other times. Commuter bus services would be extended to serve new areas, and existing services would run in both directions throughout the day. Fares would start at the same level as local, express, and rapid services, and would increase with travel distance. Map 1.8 shows the recommended commuter bus services in red (park-ride lots served by commuter bus are identified by circles) and commuter rail services in orange (station locations are identified by circles). The recommended commuter services would generally have stops or stations at least two miles apart and are intended to provide travel times that are competitive or better than cars over longer travel distances.

- Commuter Rail Service** – The commuter rail corridors recommended by VISION 2050 would connect Kenosha, Racine, Milwaukee, Wauwatosa, Brookfield, Waukesha, Oconomowoc, and communities in between by making upgrades to existing freight rail corridors to allow passenger rail at speeds of up to 79 miles per hour, providing a fast service connecting many of the larger population centers in the Region with vehicles similar to that shown in the photo. In addition to the four corridors recommended by VISION 2050, there are a number of other freight rail corridors in the Region that could be utilized for commuter rail, should an entity be interested in pursuing their development. These additional corridors are not included in VISION 2050 because they are forecast to have markedly lower ridership than the four corridors recommended by VISION 2050, but are shown on Map 1.9 as an acknowledgment that they could be pursued in the future.



A Commuter Rail Vehicle
Credit: SEWRPC Staff

- Commuter Bus Service** – The commuter bus services recommended by VISION 2050 mostly provide radial service connecting communities of the Region with downtown Milwaukee. A few services also provide connections between communities or existing park-ride lots and the recommended commuter rail services, including connections between communities in Walworth, Racine, and Kenosha Counties and Metra commuter rail services in northeastern Illinois. Wherever there is sufficient shoulder width, transit operators are encouraged to work with the Wisconsin Department of Transportation (WisDOT) to permit buses to travel on highway shoulders whenever regular travel lanes are congested, which would assist commuter bus services in achieving travel times that are competitive with cars (known as bus-on-shoulder operations, and discussed further under Recommendation 4.1 of the transportation systems management element).

► **Recommendation 2.3: Improve existing express bus service and add service in new corridors**



VISION 2050 recommends additional express bus services in the Region, and improvements to the existing express bus services that would not be replaced by rapid transit lines. In the Milwaukee area, the express route serving 27th Street would be extended north to Brown Deer Road and south to Southridge Mall in Greendale along W. Forest Home Avenue, and both that route and the express route serving Sherman Boulevard would see increased frequency. Additional express routes would be added on 76th Street and Oklahoma Avenue in Milwaukee County, traveling from the Ives Groves Park-Ride to the Corinne Reid-Owens Transit Center in Racine County, traveling from Genoa City to the Metra Station in Kenosha County, and connecting the western part of the City of Racine to the western part of the City of Kenosha. Stops would be spaced at least one-half mile apart, and therefore the services would provide better travel times than local bus routes. Express services in Milwaukee County would come at least every 15 minutes nearly the entire day, and services in Kenosha and Racine Counties would come every 15 minutes during the peak and every 30 minutes at other times. Fares would be identical to those charged for rapid and local fixed-route services.

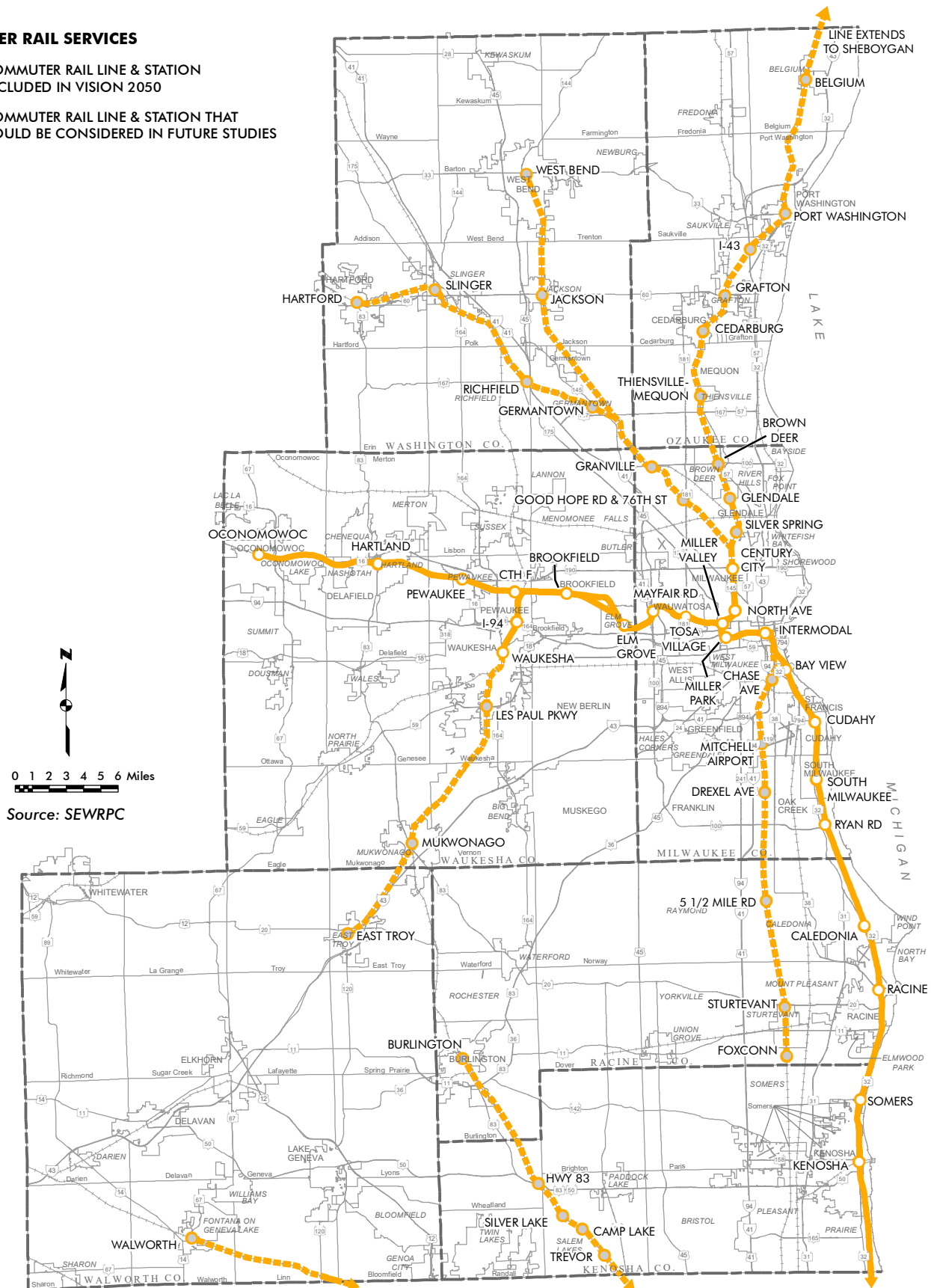


Travel on the improved and expanded express bus routes would be faster than local bus routes due to stops being spaced further apart.

Potential Extensions of the Commuter Rail Network: VISION 2050

COMMUTER RAIL SERVICES

-  COMMUTER RAIL LINE & STATION INCLUDED IN VISION 2050
-  COMMUTER RAIL LINE & STATION THAT COULD BE CONSIDERED IN FUTURE STUDIES



► **Recommendation 2.4: Increase the frequency and expand the service area of local transit**



VISION 2050 recommends an expansion of local transit service, including improving the frequency and expanding the service area of local bus services, expanding streetcar service, extending shared-ride taxi service to any areas of the Region without local bus service, and continuing to provide paratransit service in areas served by local bus service. Map 1.8 shows the area served by local transit services of different types, with the shared-ride taxi service area shaded the lightest green, followed by areas served by less frequent local fixed-route bus service the next shade darker, and then areas served by frequent local fixed-route bus service the darkest shade of green. Streetcar service is shown as a dark green line. The paratransit service area is not shown, but paratransit service would be provided wherever the accessible shared-ride taxi service would not be available.

- **Local Transit Service** – The recommended expansion of local transit service focuses on developing new transit services to suburban employment centers, new services connecting businesses and residents to nearby commuter and rapid services, and improving the frequency of local transit service in corridors and areas not served by rapid and express service. In addition to traditional fixed-route bus services, alternatives could include the operation of shuttles, microtransit (a form of demand-responsive transit that can be a useful alternative to traditional local bus service by using smaller vehicles and, in some cases, flexible routes and schedules), and shared-use automobiles through partnerships with transportation network companies like Uber and Lyft. When compared to the existing transit services provided in the Region, Map 1.8 demonstrates both the expansion of local service and the improved frequency of existing local services. Fares for local transit services are recommended to be identical to those charged for rapid and express services.
- **Streetcar Service** – The recommended expansion of streetcar service within Milwaukee is represented by the lines shown on Map 1.8. At the time VISION 2050 was updated in 2020, the City of Milwaukee was operating service on an initial line of the Hop Streetcar and had mostly constructed an extension to the Lakefront. The transit system recommended by VISION 2050 includes further streetcar extensions that have been identified for implementation over the next decade by the City, including connections to Bronzeville, Walker's Point, the University of Wisconsin-Milwaukee, and other neighborhoods adjacent to downtown Milwaukee.
- **Shared-Ride Taxi Service** – VISION 2050 recommends expanding accessible shared-ride taxi service across much of the Region, wherever local fixed-route transit service is unavailable. The recommended service would be 24-hour advance reservation, requiring riders to call a day ahead of their planned journey to schedule a ride, and would provide rides to all members of the general public who have a journey with at least one end outside the service area of local fixed-route bus or streetcar service. Service is recommended to be available as early as 5 a.m. and as late as 2 a.m., depending on the day of the week, and fares are recommended to be as low as those charged for local fixed-route, express, and rapid transit services for shorter journeys, with longer journeys charged a premium similar to those on commuter services.

One focus of expanding local transit service is on improving connections to suburban employment centers and to commuter and rapid transit services.

Shared-ride taxi service is envisioned wherever local fixed-route transit service is unavailable.

- **Paratransit Service** – VISION 2050 recommends that paratransit service be provided consistent with the Federal Americans with Disabilities Act (ADA) of 1990. Under ADA provisions, all transit vehicles that provide conventional fixed-route transit service must be accessible to people with disabilities, including those using wheelchairs. All public entities operating fixed-route transit systems must provide paratransit service to people with disabilities who are unable to use fixed-route transit services consistent with Federally specified eligibility and service requirements. The complementary paratransit service must serve any person with a permanent or temporary disability who is unable to independently board, ride, or disembark from an accessible vehicle used to provide fixed-route transit service; who is capable of using an accessible vehicle, but one is not available for the desired trip; or who is unable to travel to or from the boarding or disembarking location of the fixed-route transit service. The recommended paratransit service would be available during the same hours as the local, express, and rapid fixed-route transit services, and be provided to eligible people on a 24-hour advance reservation basis. Fares on paratransit are Federally required to be no more than twice the amount charged for local fixed-route services.



► **Recommendation 2.5: Improve intercity transit services and expand the destinations served**

Intercity rail and bus services provide transit connections between the Region and destinations outside Southeastern Wisconsin. Because the primary focus of intercity transit services is to connect communities within the Region to communities in other parts of the State and the remainder of the Midwest, the Commission uses long-range plans completed by WisDOT

as the basis of the Commission's recommendations for intercity transit services. VISION 2050 recommends that the number of intercity bus services be expanded and that existing services be enhanced with increased service frequencies. Two new intercity rail lines are recommended, one connecting Chicago to Minneapolis and St. Paul via Milwaukee and Madison, and another connecting Chicago to Green Bay via Milwaukee and the Fox Valley. Both services would be operated as extensions of the existing Amtrak Hiawatha service from Chicago, and all three lines would operate at speeds up to 110 miles per hour. Map 1.10 shows the segments of the intercity services recommended by WisDOT that are within the Region, and the stations that would be served within the Region.



An Intercity Passenger Rail Trainset
Credit: Michael Kolanowski



Transit-first design features include transit signal priority systems, dedicated lanes for transit, and "bus bulbs."

► **Recommendation 2.6: Implement "transit-first" designs on urban streets**

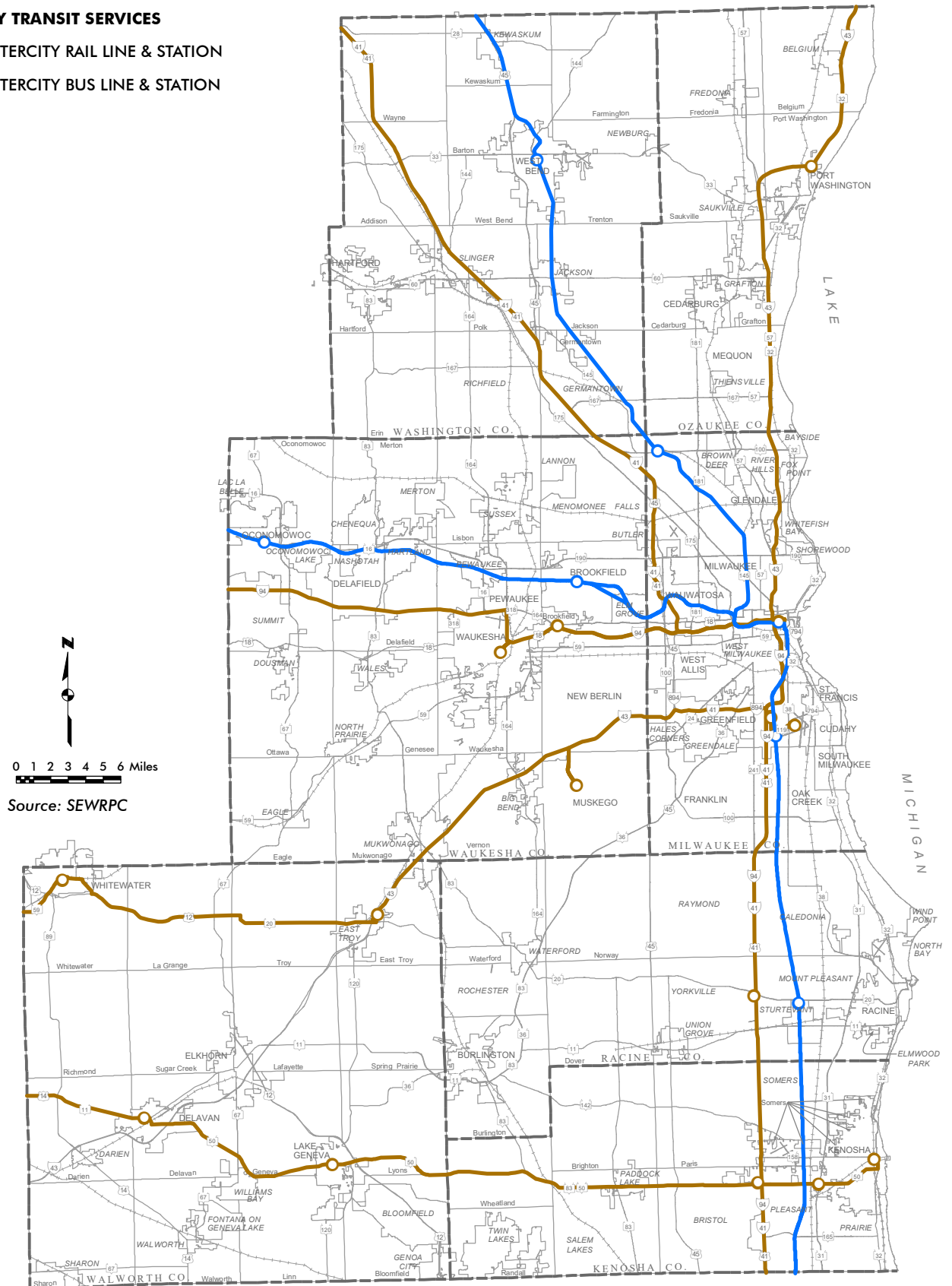
VISION 2050 recommends that transit operators work with local governments during the reconstruction of a roadway to include transit-first features on the roadway when it carries rapid, express, or major local transit routes, including transit signal priority systems, dedicated lanes for transit, and "bus bulbs" at significant transit stops. Transit signal priority systems could also be added when existing signals along a roadway are being modified.

- **Transit Signal Priority Systems** – Transit signal priority systems allow a transit vehicle to modify the normal traffic signal operation as it approaches the intersection to reduce the travel time delay associated with traffic signals; either by shortening red lights

Map 1.10 Intercity Transit Services: VISION 2050

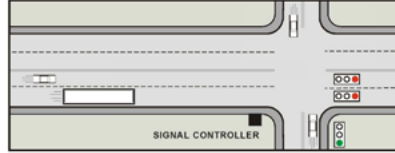
INTERCITY TRANSIT SERVICES

- INTERCITY RAIL LINE & STATION
- INTERCITY BUS LINE & STATION

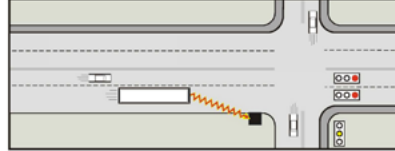


RED TRUNCATION

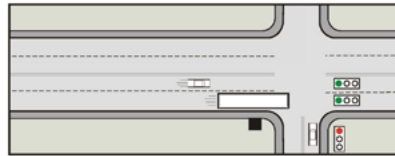
Bus approaches red signal



Signal controller detects bus;
terminates side street green phase early

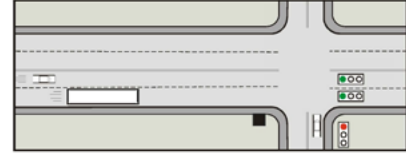


Bus proceeds on green signal

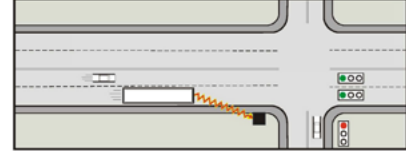


GREEN EXTENSION

Bus approaches green signal



Signal controller detects bus;
extends current green phase



Bus proceeds on extended green signal

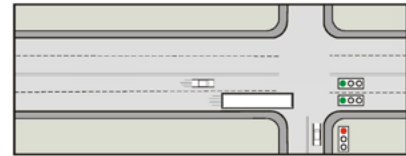


Illustration of a Transit Signal Priority System

Credit: Transit Capacity and Quality of Service Manual, Third Edition

(referred to as red truncation) or extending green lights (referred to as green extension). Transit signal priority systems work best when queue jump lanes or dedicated transit lanes are also provided. Such transit signal priority is currently used for the Hop Streetcar. VISION 2050 recommends implementing transit signal priority systems along all rapid, express, and major local transit routes.

- **Dedicated Transit Lanes** – Dedicated lanes allow transit vehicles to bypass vehicle queues at traffic signals. Dedicated lanes along congested arterial streets and highways can reduce transit travel times and improve transit travel time reliability during peak travel periods. Such lanes are currently provided along portions of Bluemound Road in Waukesha County and portions of the Hop Streetcar route. Dedicated lanes may be provided via auxiliary lanes, or where right-of-way is constrained, through peak-period, peak-direction curb-lane parking restrictions. VISION 2050 recommends the use of dedicated lanes along all rapid transit routes. Dedicated bus lanes could also be considered to improve express and major local transit routes.



Illustration of a Bus Bulb (in Yellow)

Credit: NACTO

- **Bus Bulbs** – Bus bulbs provide additional space for waiting passengers, provide room to implement many of the enhancements listed in Recommendation 2.7, allow for additional on-street parking by removing the approach or departure space needed for a standard bus stop, and increase transit travel speeds by eliminating the need for a bus to weave in and out of traffic to serve a stop. In addition to bus bulbs, the reconstruction of a roadway should consider other transit-friendly elements, including providing enhanced pedestrian accommodations (discussed further under Recommendation 3.5). These accommodations, which can include highly visible crosswalks and curb extensions and pedestrian median islands to reduce crossing distances at intersections, should be considered for increasing pedestrian safety near transit stations and stops.

► **Recommendation 2.7: Enhance stops, stations, and park-ride facilities with state-of-the-art amenities**

VISION 2050 recommends that transit operators, business improvement districts, neighborhood associations, and local governments coordinate to significantly enhance local bus stops and park-ride facilities, particularly those with significant boardings. These enhancements include improved information on bus stop signs and polls, shelters at more stop locations, accessible paths to and from all stops, real-time information screens, radiant heating, and raised platforms for boarding. For park-ride facilities, these stop enhancements should also include bike lockers.



► **Recommendation 2.8: Accommodate bicycles on all fixed-route transit vehicles**

VISION 2050 recommends that all fixed-route transit vehicles in the Region be able to accommodate bicycles, either on a rack on the front of the bus for local buses, or on board rapid transit and commuter transit vehicles.



► **Recommendation 2.9: Implement programs to improve access to suburban employment centers**

Recommendations 2.1 through 2.5 recommend a robust and expansive transit system, one that will take time to develop and construct. In addition, even once the full recommended transit system is completed, there will be some smaller suburban employment centers that will not be served by fixed-route transit, and others that will be served but may not currently be designed to accommodate pedestrians, making the “last-mile” journey from the bus stop to a place of employment difficult. For these reasons, VISION 2050 recommends that the Commission continue to support and expand the efforts of the Workforce Mobility Team, created in 2018 through a collaboration between the Commission and the Regional Transit Leadership Council. The Team is staffed by the Commission and provides assistance to employers in the Region who experience challenges retaining and attracting workers as a result of those workers having limited or no commuting transportation options available. VISION 2050 also recommends a series of programs be considered to improve access to suburban employment centers.



- **Vanpool Programs** – Vanpool programs allow multiple individuals to carpool to work on a larger scale. They generally work well in situations where at least five employees of one or more businesses located near each other all commute from approximately the same area, and the distance between work and home is relatively long. Vanpools should be considered in Southeastern Wisconsin where a specific journey from a population center to an employment center is not served with a relatively easy trip via the fixed-route transit system.
- **Network Transportation Companies** – Network transportation companies, such as Uber or Lyft, provide on-demand taxi service accessed by users via a smartphone app. These companies could connect individuals to employment opportunities not served by transit that are relatively close to—but beyond walking distance of—a rapid, commuter, or express transit line. Network transportation companies could be used in these instances to fill a gap in the transit network by providing on-demand rides to complete the last segment of a transit rider’s journey to work. If multiple transit riders have the same destination, most network transportation companies offer services that allow individuals to split a fare, reducing costs for each rider.

- **Pedestrian Facility Enhancements** – Many suburban office and industrial parks do not have continuous sidewalks along both sides of a road, marked cross walks at intersections, or sidewalks from the road to a business’s front door. These gaps in the pedestrian network can make completing a journey to work difficult for a transit rider. VISION 2050 recommends that transit operators and local governments work with business park associations and large employers to ensure that an accessible sidewalk network is provided between bus stops and businesses’ front doors.
- **Job Access Programs** – As previously mentioned, even at its full build out, the recommended fixed-route transit system will not provide access to every job within the Region. In some instances, it may not be reasonable for an individual to take transit or another alternative mode to work, and a private automobile may be required. To address this, VISION 2050 recommends that all levels of government support job access programs, including driver’s license recovery programs and low-interest vehicle loan programs for low-income individuals, to assist low-income individuals in accessing job opportunities.



Undertaking activities to promote transit use can attract new transit users and encourage residents to use public transit more often.

► **Recommendation 2.10: Provide information to promote transit use**

VISION 2050 recommends a range of activities to be undertaken by transit agencies in the Region to promote transit use and enhance the quality of transit service, including real-time and trip planning transit information and transit marketing. Promoting transit use and enhancing the quality of service would increase its desirability, attracting new transit users and encouraging residents to use public transit more often.

- **Real-Time and Trip Planning Transit Information** – Real-time transit information—such as transit vehicle arrival and departure times and maps that display where vehicles are located in real time—make transit services more attractive by addressing rider uncertainties and reducing perceived wait times. As of 2020, MCTS, the City of Racine (RYDE), and the Hop Streetcar all had mobile applications that allow transit users to access real-time information about each service. VISION 2050 recommends widespread provision of real-time information for all transit operators at transit centers, transit stops, on websites, and on mobile devices. Additionally, transit operators should continue to provide real-time information and up-to-date routing data to companies that include such information in their mapping applications.
- **Joint Marketing and Research Among Transit Operators** – The Region’s transit operators would collectively benefit from joint marketing and research efforts. VISION 2050 recommends that transit agencies collaborate to advertise their respective services and conduct joint research involving emerging technologies that would enhance transit service, including innovative fare payment systems that facilitate intersystem transfers (discussed under Recommendation 2.11).



► **Recommendation 2.11: Implement a universal fare system and free transfers across all transit operators**

As transit operators invest in new fare systems across the Region, VISION 2050 recommends that operators coordinate to use the same fare system. This would require significant cross-agency coordination

on accounting and procurement, but could offer large benefits to the public by allowing riders to more easily use multiple transit services to complete a journey. Many other metropolitan areas across North America with multiple transit operators have achieved a universal fare system as part of a regionwide adoption of a smart card fare system similar to the MCTS M-Card. Either as part of adopting a universal fare system or as a separate initiative, operators are encouraged to make transfers between services free, with no rider paying more than the cost of one trip on the most expensive transit service used during a journey. In 2019, Milwaukee County, in partnership with Waukesha County, the City of Milwaukee, and the City of Waukesha, obtained funds to expand the Ride MCTS mobile application to include additional transit operators, which could begin to implement a universal fare program in the Region.

A consistent fare system would allow riders to more easily use multiple transit services to complete a journey.

► **Recommendation 2.12: Consider implementation of proof-of-payment on heavily used transit services**

One of the significant causes of delays that make travel times on local transit services uncompetitive with the automobile is the amount of time a bus spends at stops, waiting for passengers to pay their fare and board (known as “dwell time”). One method of significantly reducing dwell times on transit services where more than four or five riders board at a stop is to allow people to board the bus at any door, and validate their paper ticket or tap their fare card at a reader placed a few steps inside the bus. Using multiple doors allows multiple passengers to load in significantly less time, and placing the card reader or ticket validator further inside the bus allows the buses doors to close and the vehicle to begin moving before all passengers have paid. This concept is called “proof-of-payment” because it relies on occasional checks by transit system staff to ensure that riders have paid their fare, and has been shown to measurably increase the speed of buses where it has been implemented, including on certain bus routes in Los Angeles and on all bus routes in San Francisco. VISION 2050 recommends that transit operators in the Region, particularly MCTS, study the possibility of implementing proof-of-payment on some or all transit routes.



► **Recommendation 2.13: Promote and expand transit pricing programs**

VISION 2050 recommends building on existing transit pricing programs conducted by the Region’s transit operators. Transit pricing programs involve a number of strategies that promote transit ridership, thus increasing transit use and reducing traffic volume and congestion, by providing discounted fares and providing more flexibility and accessibility for transit riders. These strategies include college and university transit pass programs and employer transit pass programs.



- **College and University Transit Pass Programs** – College and university transit pass programs provide unlimited transit use to students through a reduced fee included in student tuition and fees. MCTS has implemented a transit pass program at six area colleges and universities. This program encourages students to use transit instead of driving a personal vehicle to class, reducing the amount of traffic and congestion, particularly near campuses. Reducing the amount of vehicular traffic also improves pedestrian and bicycle safety around college and university campuses. VISION 2050 recommends expanding the MCTS college and university transit pass programs to include additional colleges and universities and establishing similar programs for other transit systems in the Region.

- **Employer Transit Pass Programs** – Employer transit pass programs involve a partnership between transit operators and employers that provide discounted transit passes—annual, monthly, or weekly—to employees. Employer transit pass programs provide employees a safe and easy commute to work and help employers attract and retain employees. MCTS has implemented the Commuter Value Program, which provides transit passes to employers at a reduced fee, allowing those employers to offer discounted transit passes to their employees. VISION 2050 recommends expanding existing employer transit pass programs such as the MCTS Commuter Value Program and encourages other transit operators to negotiate annual or monthly fees with individual employers to provide discounted transit passes to employees.



► **Recommendation 2.14: Expand “guaranteed ride home” programs**

A guaranteed ride home program provides a free ride home to transit users in cases of emergencies, unplanned overtime, or other unexpected issues. A guaranteed ride home program is currently offered to MCTS Commuter Value Program members and Washington County Commuter Express riders. VISION 2050 recommends expanding the guaranteed ride home program to include other transit operators.

VISION 2050 recommends a well-connected bicycle and pedestrian network that improves access to activity centers, neighborhoods, and other destinations in the Region.

Description of Bicycle and Pedestrian Element

The ability to support biking and walking is an important component of improving quality of life and achieving healthy, vibrant communities. While the Region has a colder climate and the proportion of residents that currently travel by bicycle is small, improving the bicycling and walking environment can have numerous benefits to the Region’s residents. As the alternatives evaluation presented in Appendix F of Volume II showed, well-connected infrastructure and a development pattern that provides a mix of uses within short distances make it easier to bike and walk. This encourages people to incorporate active travel into their daily routine, which can improve their health and reduce their healthcare costs. It is also important to integrate bicycle and pedestrian travel and public transit travel, which often begins and ends by either biking or walking. Recognizing the benefits of encouraging active transportation, the bicycle and pedestrian facilities element of VISION 2050 recommends a well-connected bicycle and pedestrian network that improves access to activity centers, neighborhoods, and other destinations in the Region. The element seeks to encourage bicycle and pedestrian travel as a safe, attractive alternative to driving.

Bicycle recommendations for VISION 2050 include providing on-street bicycle accommodations on the arterial street and highway system (non-freeways), expanding the off-street bicycle path system, implementing enhanced bicycle facilities in key regional corridors, and expanding bike and scooter share program implementation. As shown in Table 1.10, VISION 2050 recommends approximately 2,997 miles of standard on-street bicycle accommodations, 393 miles of enhanced bicycle facilities, and 731 miles of off-street bicycle paths. Map 1.11 shows the recommended bicycle network, which identifies on-street bicycle facilities, potential corridors for enhanced bicycle facilities, off-street bicycle paths, and nonarterial street connections to the off-street bicycle network.

VISION 2050 also includes recommendations for the location, design, and construction of pedestrian facilities. VISION 2050 further recommends that local communities develop bicycle and pedestrian plans to supplement the regional plan.

Table 1.10
Miles of Bicycle Facilities: VISION 2050

Bicycle Facility	Estimated Mileages	
	Existing (2019)	Plan (2050)
On-street Accommodations		
Standard	893.9	2,997.3
Enhanced	106.9	392.7
Off-Street Paths	310.6	730.5

Source: SEWRPC

► **Recommendation 3.1: Expand the on-street bicycle network as the surface arterial system is resurfaced and reconstructed**

VISION 2050 recommends that as the existing surface arterial street system of about 3,300 miles is resurfaced and reconstructed segment-by-segment, bicycle accommodation be considered and implemented, if feasible, through bicycle lanes, paved shoulders, widened outside travel lanes, or enhanced bicycle facilities (defined in Recommendation 3.3).¹⁸ Bicycles are prohibited from using freeway facilities by State law.¹⁹ It also recommends that bicycle accommodation be considered and implemented on newly constructed surface arterials.

The surface arterial street system of the Region provides a network of direct travel routes serving virtually all travel origins and destinations within Southeastern Wisconsin. Arterial streets and highways—particularly those with high-speed traffic or heavy volumes of truck or transit vehicle traffic—require one of the standard or enhanced bicycle improvements described in the previous paragraph to safely accommodate bicycle travel. VISION 2050 considers providing one type of bicycle facility to be sufficient to accommodate bicycles on an arterial. In other words, if a separate path is provided adjacent to an arterial, bicycle lanes or another type of bicycle facility may not be necessary to accommodate bicycles on that arterial. Land access and collector streets, because of low traffic volumes and speeds, should be capable of accommodating bicycle travel with no special accommodation for bicycle travel. In addition to accommodating bicycles on arterials, VISION 2050 encourages bicycle travel through intersections be appropriately accommodated.

► **Recommendation 3.2: Expand the off-street bicycle path system to provide a well-connected regional network**

VISION 2050 recommends that a system of off-street bicycle paths be provided between the Kenosha, Milwaukee, Racine, Round Lake Beach, and West Bend urbanized areas and the cities and villages within the Region with a population of 5,000 or more located outside these five urbanized areas. These off-street bicycle paths would primarily be located in natural resource and utility corridors and are intended to provide reasonably direct connections between the Region's urbanized and small urban areas on safe and aesthetically attractive routes with separation

¹⁸ There may be locations on arterials in urban environments where on-street bicycle accommodations may not be feasible. For example, on Brady Street in the City of Milwaukee, the right-of-way is restricted by two traffic lanes and two parking lanes. In these instances, nearby nonarterial streets may be considered sufficient for accommodating bicycle travel rather than implementing an accommodation on the arterial.

¹⁹ The Hoan Bridge in Milwaukee is part of a freeway facility (IH 794) and, therefore, does not include a bicycle accommodation under VISION 2050. Should State law change to allow bicycles on the Hoan Bridge, or the Hoan Bridge not be designated a freeway, bicycle accommodation should be considered.



VISION 2050 envisions an extensive on-street bicycle network, made up of bicycle lanes, paved shoulders, widened outside travel lanes, and enhanced bicycle facilities.



The recommended off-street bicycle path system would connect the Region's urbanized areas and each city and village outside an urbanized area with a population of 5,000 or more.

Map 1.11

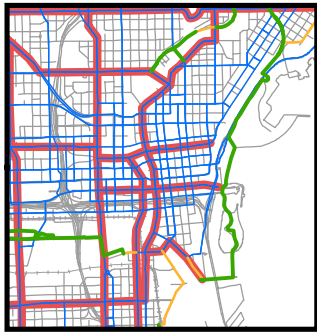
Bicycle Network: VISION 2050

BICYCLE FACILITIES

- OFF-STREET BICYCLE PATH
- ARTERIAL STREET OR HIGHWAY WITH BICYCLE ACCOMMODATION (IF FEASIBLE)
- NONARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK
- RECOMMENDED CORRIDOR FOR ENHANCED BICYCLE FACILITY^a

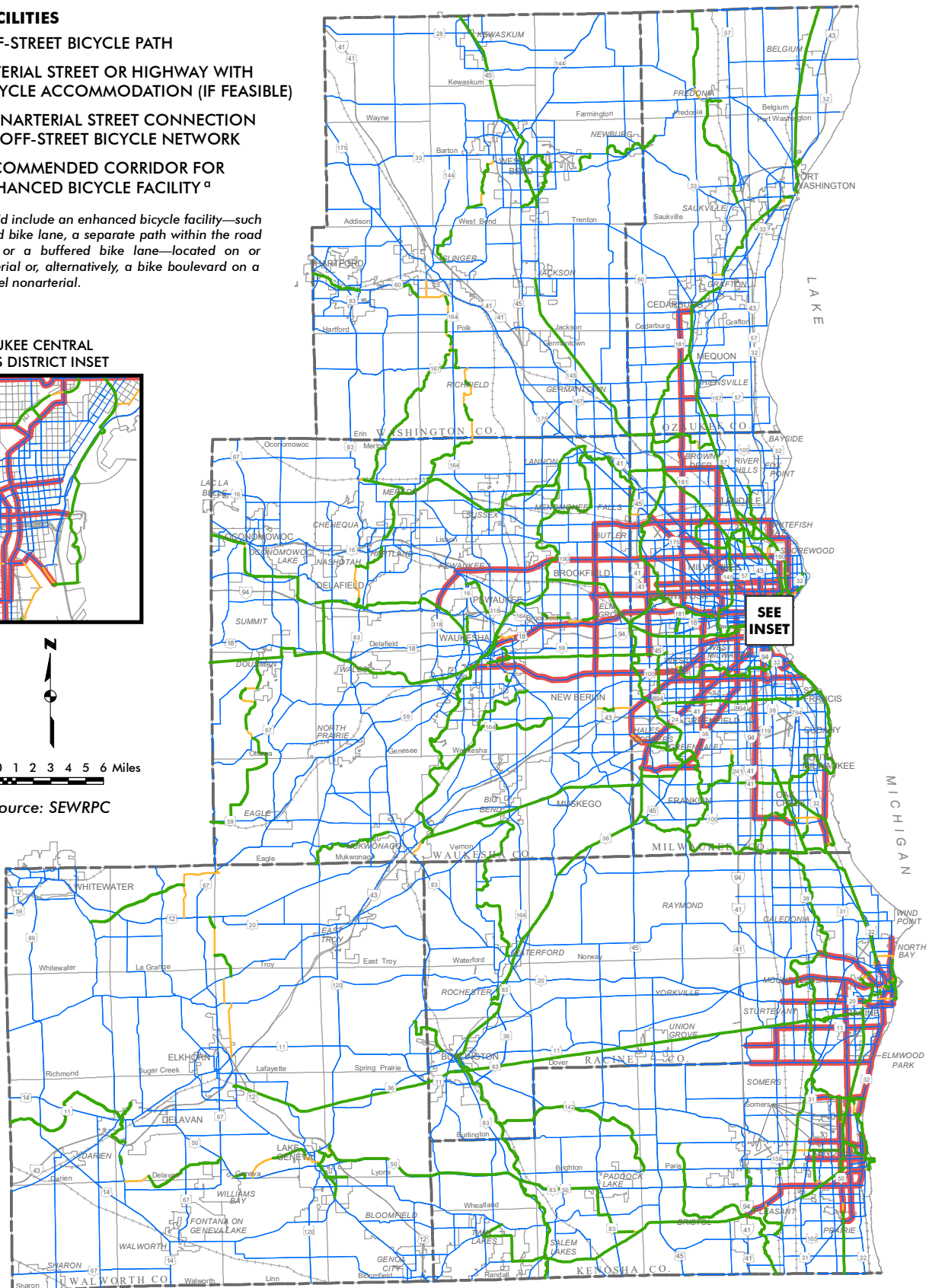
^a Corridor would include an enhanced bicycle facility—such as a protected bike lane, a separate path within the road right-of-way, or a buffered bike lane—located on or along an arterial or, alternatively, a bike boulevard on a nearby parallel nonarterial.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



0 1 2 3 4 5 6 Miles

Source: SEWRPC



from motor vehicle traffic. Some on-street bicycle connections would be required to connect segments of this system of off-street paths. These connections, if provided over surface arterials, should include some type of bicycle accommodation—bicycle lanes, paved shoulders, widened outside travel lanes, enhanced bicycle facilities, or separate parallel bicycle paths. If provided over a nonarterial collector or land access street, they may not require special accommodation.

Bicycle connectivity under VISION 2050 would be improved through the construction of on- and off-street bicycle improvements to address gaps in the regional bicycle network. Gaps include those between cities and villages with populations of 5,000 or more where on- or off-street bicycle facilities either do not exist or only exist in intermittent segments. They also include those between two off-street path segments where a viable connection could be made by constructing either an on- or off-street bicycle facility between the path segments. Bicycle connectivity ensures that bicyclists have direct routes to destinations and reduces out-of-direction travel. An evaluation of bicycle connectivity and an analysis of gaps in the Region's on- and off-street network is presented in Appendix H.

Map 1.12 shows the regional off-street bicycle path system, which includes existing and recommended paths as well as surface arterial and nonarterial connections to the path system. VISION 2050 envisions expanding the existing 311 miles of off-street paths to approximately 731 miles of off-street paths. In addition to providing off-street paths and on-street connections to paths, VISION 2050 encourages off-street paths to be appropriately marked through an intersecting street.

► **Recommendation 3.3: Implement enhanced bicycle facilities in key regional corridors**

VISION 2050 recommends a network of enhanced bicycle facility corridors through the Kenosha, Milwaukee, and Racine urbanized areas that would connect multiple communities, serve important regional destinations, and link segments of the off-street bicycle path system. Enhanced bicycle facilities—such as protected, buffered, and raised bicycle lanes and separate paths within a road right-of-way—are bicycle facilities on or along an arterial that go beyond the standard bicycle lane, paved shoulder, or widened outside travel lane. They are meant to improve safety, define bicycle space on roadways, and provide clear corridors for bicycle usage. These corridors would be about two blocks in either direction of an arterial street or highway and would either involve implementing an enhanced bicycle facility on or along the arterial street or implementing a bike boulevard on a parallel nonarterial, which is a low-speed street optimized for bicycle traffic. Bike boulevards may also be implemented in residential neighborhoods outside of these enhanced bicycle corridors. Bike boulevards should be considered as an alternate bicycle facility when a nearby arterial street has limited right-of-way that restricts construction of a standard or enhanced bicycle facility. VISION 2050 recommends expanding the existing 107 miles of enhanced bicycle facilities to a network of approximately 393 miles of enhanced bicycle facility corridors that would link multiple communities throughout Kenosha, Milwaukee, Ozaukee, Racine, and Waukesha Counties.

Particular consideration should be given to enhancing the treatment of existing and recommended enhanced bicycle facilities at intersections. Dashed white lines for protected,



The enhanced bicycle facility corridors identified in VISION 2050 would connect multiple communities, serve important regional destinations, and link segments of the off-street system.



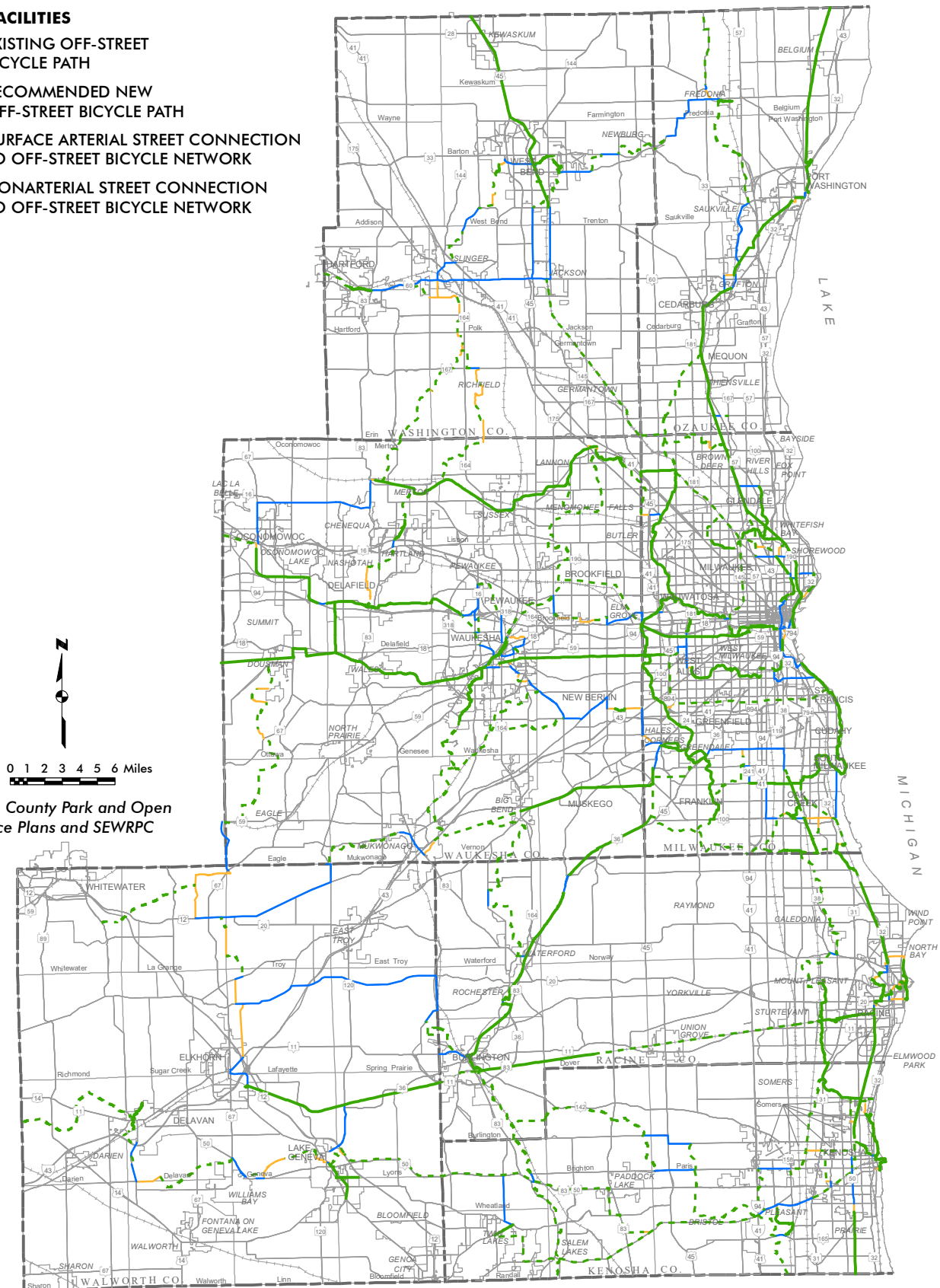
A Protected Bike Lane
Credit: People for Bikes

Map 1.12

Off-Street Bicycle Path System: VISION 2050

BICYCLE FACILITIES

- EXISTING OFF-STREET BICYCLE PATH
- - - RECOMMENDED NEW OFF-STREET BICYCLE PATH
- SURFACE ARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK
- NONARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK



Source: County Park and Open Space Plans and SEWRPC

buffered, and raised bicycle lanes should be used through intersections to clearly define space and the intended path for bicycles. Colored pavement between the dashed lines can further make these facilities visible in the intersection. In addition, a separate path within a road right-of-way should be brought into the functional area of the intersection to increase the visibility of bicyclists.

The continued implementation of on-street bicycle accommodations, particularly enhanced bicycle facilities, can improve the level of comfort experienced by bicyclists. Appendix H of Volume II includes an evaluation of the safety and comfort of streets based on factors that include presence of a bicycle facility, traffic volumes and traffic speeds, surrounding land use, and parking turnover rates, all of which can either encourage or deter a bicyclist to use that roadway. Based on that evaluation, the existing arterial street network has about 800 miles of arterial streets with high levels of bicycle comfort. Under VISION 2050, there would be approximately 1,900 miles of arterial streets with high levels of bicycle comfort due to the increase in on-street bicycle accommodations and the implementation of enhanced bicycle facilities in key regional corridors.

► **Recommendation 3.4: Expand bike and scooter share program implementation**



Bike and scooter share programs provide residents and visitors with options to use bicycles, e-bikes, or scooters for short trips within and between downtown areas and adjacent neighborhoods. These programs are most effective in serving high-density areas with a mix of residential and commercial uses. They have been shown to provide a viable option for utilitarian, commuter, and other shorter-distance trips and for reducing trips by automobile. They can also provide important first-mile/last-mile connections, functioning as a feeder service to transit systems to extend the reach of transit services and often encouraging an increase in trips using both of these modes.



A Bike Share Station
Credit: Bublr Bikes

Standard “docked” bike share programs, such as those operated in the Cities of Milwaukee, Wauwatosa, and West Allis and the Village of Shorewood, offer opportunities for people to use a bicycle from designated stations. Dockless bike and scooter share programs pose unique challenges, but can expand the geographic coverage area of standard bike share since they do not need to be returned to designated stations. Including adaptive bicycles in either standard or dockless bike share programs expands accessibility for users of all abilities. E-bikes can also provide additional value to bike share systems by enabling riders to travel longer distances with less effort, helping them to get to destinations faster, and reducing physical obstacles to bicycling, such as climbing hills.

VISION 2050 recommends expanding bike and scooter share programs, including those that incorporate adaptive bicycles and e-bikes, to make these options a viable mode of travel for more short distance trips in the Region. VISION 2050 also recommends that local governments adopt and enforce regulations that address potential safety concerns relating to this type of micromobility, including requiring that users obey traffic laws and that dockless bike and scooter parking is located in safe locations that do not impede the pedestrian clear zone.



Pedestrian recommendations seek to improve accessibility and connectivity, while addressing pedestrian safety.

► **Recommendation 3.5: Provide pedestrian facilities that facilitate safe, efficient, and accessible pedestrian travel**

VISION 2050 recommends that sidewalks be provided along streets and highways in areas of existing or planned urban development based on identified criteria presented in the design guidelines; that gaps in the pedestrian network be addressed through neighborhood connections to regional off-street bicycle paths, transit, and major destinations; that sidewalks be designed and constructed using widths and clearances appropriate for the levels of pedestrian and vehicular traffic in any given area; and that terraces or buffered areas be provided, where feasible, between sidewalks and streets for enhancing the pedestrian environment. VISION 2050 further encourages making efforts to maximize pedestrian safety at street crossings, including:

- The timing of walk signal phases
- The construction of pedestrian median islands in wide, heavily traveled, or otherwise hazardous roadways
- The construction of curb extensions (“bulb-outs”) that narrow the crossing distance for pedestrians at intersections
- Implementing speed humps, raised crosswalks, and raised intersections to slow traffic and increase the visibility of pedestrians

VISION 2050 also emphasizes that all pedestrian facilities be designed and constructed in accordance with the Federal Americans with Disabilities Act (ADA) and its implementing regulations. The ADA requires all pedestrian facilities that access public and commercial buildings and services to accommodate people with disabilities. Consistent with ADA requirements, VISION 2050 encourages communities with 50 or more employees to maintain updated ADA transition plans, which evaluate and plan for physical improvements to address accessibility for people with disabilities.

VISION 2050 also recommends the development of walkable neighborhoods for the health and vibrancy of communities in the Region. Walkability refers to the ease by which people can walk in an area to various destinations such as schools, parks, retail services, and employment. Walkability can be increased through compact development patterns that have a number of destinations that are within walking distance. Sidewalks with good accessibility provide a safe place for people to reach these destinations and a well-connected network of sidewalks and bicycle facilities can encourage residents to walk or bike rather than drive. Under VISION 2050, approximately 844,000 residents would live in walkable areas compared to approximately 702,600 residents who currently live in walkable areas.



► **Recommendation 3.6: Prepare local community bicycle and pedestrian plans**

VISION 2050 recommends that local units of government prepare community bicycle and pedestrian plans to supplement the regional plan. The local plans should provide for facilities to accommodate bicycle and pedestrian travel within neighborhoods, providing for convenient travel between residential areas and shopping centers, schools, parks, and transit stops within or adjacent to the neighborhood. Local communities should also consider developing pedestrian safety action plans for improving pedestrian safety through street redesign and other engineering

countermeasures. Implementation of Safe Routes to School programs by local communities and school districts should be encouraged in their local planning efforts to further address bicycle and pedestrian safety near schools. In addition, local units of government should encourage more compact and walkable development patterns through local land use policies in order to facilitate safe and efficient pedestrian and bicycle travel.

Description of Transportation Systems Management Element

Transportation systems management (TSM) involves managing and operating existing transportation facilities to maximize their carrying capacity and travel efficiency. TSM recommendations for VISION 2050 relate to freeway traffic management, surface arterial street and highway traffic management, and major activity center parking management and guidance. The specific TSM measures within each of the three categories collectively would be expected to result in a more efficient and safer transportation system.

Freeway Traffic Management

Freeway traffic management strategies include measures that improve the operational control, advisory information, and incident management on the regional freeway system. Some of these measures are currently in use in Southeastern Wisconsin and are recommended to be expanded and enhanced. Several newer technologies also provide potential opportunities, and certain measures not currently used in the Region are recommended to be considered for future implementation. Essential to implementing freeway traffic management measures is the State Traffic Management Center (TMC) in the City of Milwaukee, from which all freeway segments in the Milwaukee area are monitored, freeway operational control and advisory information is determined, and incident management detection and confirmation is conducted. Freeway traffic management measures are described below, along with recommendations related to specific measures.

► Recommendation 4.1: Implement freeway operational control measures

VISION 2050 recommends measures to improve freeway operation—both during average weekday peak traffic periods and during minor and major incidents—through monitoring of freeway operating conditions and control of traffic traveling on and entering the freeway. This would include expanding and enhancing current operational control measures, such as traffic detectors and freeway on-ramp meters, and considering measures that are not currently in use, or not in widespread use, such as ramp meter control strategies, lane use control, speed limit control, part-time shoulder use, junction control, and truck restrictions.

- **Traffic Detectors** – Traffic detectors measure the speed, volume, and density of freeway traffic, and are used in operational control as well as advisory information and incident management. Traffic detectors have been implemented at about one-half mile intervals on the freeways in Milwaukee County and on IH 94 in Waukesha County, and at about one- to two-mile intervals on IH 94 in Kenosha and Racine Counties. The data collected from these detectors are monitored by the TMC to detect freeway system travel speed and time, traffic congestion, traffic flow breakdowns, and incidents. Freeway ramp meter traffic entry rates could be modified based upon the traffic volume and congestion indicated by the traffic detectors. Travel information on traffic congestion and delays are provided to freeway system users through the WisDOT website and on variable message signs. Traffic speeds and congestion indicated by traffic

Recommended transportation systems management measures aim to manage and operate existing transportation facilities to maximize their carrying capacity and travel efficiency.



Recommended measures to improve freeway operation involve monitoring freeway operating conditions and controlling traffic on and entering the freeway.

detectors could instantaneously identify the presence of a freeway incident. VISION 2050 recommends that existing freeway system traffic detectors be maintained, and that traffic detectors be installed on the freeway system as it is reconstructed throughout the Region at one-half mile intervals. The only exceptions for installing detectors on freeway segments may be those segments with current and expected future traffic volumes that would be substantially less than freeway traffic carrying design capacity, including IH 43 north of STH 57 in Ozaukee County, USH 45 north of the Richfield Interchange and IH 41 north of STH 60 in Washington County, and IH 43 and USH 12 in Walworth County.

- **Ramp Meters** – Ramp meters are traffic signals located on freeway entrance ramps used to control the rate of vehicles entering onto a freeway segment by breaking up platoons, or groups, of cars to achieve a more efficient operation of the adjacent freeway segment and the downstream freeway system. To encourage ridesharing and transit use, preferential access for high-occupancy vehicles (HOV) is provided at ramp meter locations to allow the HOVs to bypass traffic waiting at a ramp-metering signal. There are currently about 121 freeway on-ramps in the Milwaukee area equipped with ramp meters. Buses and HOVs receive preferential access at 55 of the 121 on-ramp-meter locations. VISION 2050 recommends that ramp meters be installed on all freeway on-ramps in the Region as the freeway system is reconstructed, with HOV preferential access provided at metered ramps (dependent on right-of-way and on-ramp geometric constraints), particularly those that would be used by existing and planned public transit. The only exception for ramp meter installation may be those freeway segments previously identified that would be expected to carry current and future traffic volumes well below their design capacity.
- **Active Traffic Management** – In addition to the freeway operation and control measures widely utilized within the Region's freeway system, VISION 2050 recommends that active traffic management (ATM) strategies not currently in use, or not in widespread use, on the Region's more heavily traveled freeways be considered for future implementation to improve their operating conditions. ATM strategies allow the dynamic operation of the freeway system based upon freeway system traffic volume, speeds, and congestion during peak hour traffic, traffic incidents, and inclement weather. ATM would include strategies for managing both the traffic traveling on the freeway and the traffic entering and exiting the freeway. ATM strategies include ramp meter control, lane control, speed limit control, part-time shoulder use, junction control, truck restrictions, queue control, and dynamic rerouting. These strategies can be employed concurrently, and operated through advanced traffic management software, to more effectively manage the most heavily traveled freeways. The following provides a description of each of these types of ATM strategies.
 - **Ramp Meter Control** – Ramp meter control strategies are implemented to control the release rates of vehicles onto a freeway segment. Release rates may be determined by a "pretimed" rate or, preferably, based upon adjacent freeway system traffic volume and congestion. A successful ramp meter control strategy minimizes total travel delay on the freeway

system, or along a particular freeway corridor, while providing equitable average and maximum delays at each ramp meter and avoiding the extension of vehicle queues onto surface streets. This may necessitate expanding freeway on-ramps to ensure sufficient storage space for queued vehicles, which should be considered and addressed during the reconstruction of the regional freeway system. Coordination with signals on arterial streets providing access to ramps with controlled meters may be necessary to avoid backups on the ramps and “flushing,” or emptying, of the queues onto the freeway system.



A Ramp Meter
Credit: Caltrans

- **Lane Use Control** – Lane use control strategies utilize overhead variable message signs—such as the intelligent lane control signals (ILCS) shown in the adjacent photo—to inform motorists of lane closures, allowing them to safely merge into adjoining lanes. This strategy may also be used to close lanes in sections of freeway without an adequate shoulder to allow emergency vehicles to more quickly reach incident locations. Lane use control with an ILCS system could also be used in conjunction with the part-time shoulder use strategy (described below) by indicating when the shoulders would be available for use by through traffic. ILCS are typically spaced about one-half mile apart to allow at least one ILCS to be visible to motorists at all times. WisDOT has implemented a lane use control system at the entrance to the Mitchell Interchange tunnel for northbound IH 94 traffic traveling west on IH 894 to advise motorists of any incidents or lane closures in the tunnel that would not be visible to approaching drivers. Based on the cost to construct and maintain ILCS technology, the strategy may only be practical for implementation in the most heavily traveled freeway corridors or sections of freeways without adequate shoulders.



Lane Use Control Signals
Credit: WSP/Parsons Brinckerhoff

- **Speed Limit Control** – Speed limit control, or speed harmonization, strategies utilize ILCS—often in conjunction with lane use control strategies—to allow the adjustment of the speed limit based on current traffic volumes, operating speeds, roadway surface conditions, and/or weather conditions. The speed limits for the segments of freeway upstream of slower or congested traffic can be lowered to provide a more gradual deceleration between free-flowing traffic and congested traffic, which can reduce the number and severity of rear-end crashes. The adjusted speed limits can be either enforceable or advisory to motorists.
- **Part-Time Shoulder Use** – Part-time shoulder use is a quick and inexpensive way to address capacity issues on the regional freeway system by allowing motorists to travel on shoulder lanes in times of congestion and reduced travel speeds during peak periods or in instances of traffic incidents or special events. Implementation may be limited to transit use as bus-on-shoulder (BOS)—increasing the reliability of transit service in congested corridors and encouraging increased transit use by the public—or as an HOV



Bus-on-shoulder
Credit: Minnesota Department of Transportation

lane—encouraging motorists to carpool. It may be necessary to construct emergency refuge areas at frequent intervals along the portions of freeway shoulder where use as a through lane is permitted, as vehicles would not be able to use the shoulder for refuge purposes during its use as a through lane.



Dynamic Message Signs Show Junction Control Activated (bottom) and Not Activated (top)

Credit: Caltrans

- **Junction Control** – Junction control dynamically changes the lanes used by traffic approaching or departing from an interchange using signs and lighted pavement markers. This measure is useful at entrance ramps that experience high enough demand (at certain times of the day or prior to or following special events) and where traffic on the adjacent freeway segment does not provide sufficient gaps for merging vehicles. It is also useful for exit ramps where long queues back onto the mainline freeway. Junction control can be used to indicate the availability during peak times of part-time shoulder use, which can be utilized to provide additional ramp capacity.
- **Dynamic Truck Restrictions** – Dynamic truck restrictions limit truck traffic to a particular lane or set of lanes, typically the rightmost lanes, during peak travel periods. This strategy restricts the movement of trucks and enables passenger cars and light trucks to flow more freely without the disruption of a truck changing lanes or impeding traffic. Dynamic truck restrictions, which can also include buses and vehicles towing trailers, may increase left lane travel speeds and stabilize traffic flow during peak travel periods.
- **Queue Warning** – Queue warning is a strategy that involves alerting motorists of upcoming slower speeds and congestion utilizing variable message signs and flashing lights. This strategy is intended to allow motorists sufficient time to more gradually decelerate between free-flowing traffic and congested traffic, which can reduce the number and severity of rear-end crashes. A queue warning system could also use infrastructure-to-vehicle (I2V) or vehicle-to-vehicle (V2V) technology to detect existing queues and send the queue information directly to vehicles equipped with such technology.
- **Dynamic Rerouting** – This strategy involves providing motorists with appropriate alternate arterial routes—freeway or surface arterials—when a segment of freeway is experiencing extremely congested conditions. The alternate routes are determined based on current traffic conditions along nearby arterial routes. Information on the alternative routes could be provided through the 511 Wisconsin traveler information website and system, through variable message signs on the freeway, and via the media. Similar to the queue warning systems, dynamic rerouting could also use I2V technology to send rerouting information directly to vehicles equipped with such technology.



► **Recommendation 4.2: Implement advisory information measures for the freeway system**

VISION 2050 recommends expanding and enhancing advisory information measures that provide real-time advisory information on current travel conditions to motorists.

- **Variable Message Sign (VMS)** – A VMS is a permanent or portable device used by the TMC to display dynamic messages providing real-time information to motorists about downstream freeway traffic conditions such as current travel times, lane and ramp closures, and where travel delays begin and end. It is also used to display AMBER Alerts in the event of a child abduction, as well as other similar alerts. VMS is currently deployed at 32 locations along the freeway system, and at 32 locations on surface arterials that connect with the freeway system. VISION 2050 recommends that VMS be provided on the entire freeway system as it is reconstructed, and on surface arterials leading to the most heavily used freeway system on-ramps. As I2V technology becomes more advanced and has more widespread use, perhaps the use of VMS technology, which has a higher cost to employ, will no longer be necessary.



A Variable Message Sign
Credit: WisDOT

- **WisDOT Traveler Information Website** – The 511 Wisconsin traveler information website (www.511Wi.gov) provides up-to-date information about traffic conditions using data collected from freeway system traffic detectors. The information provided on the website includes color-coded maps depicting the level of freeway traffic congestion, travel times and delays, locations of confirmed incidents, trucker information, winter road conditions, and views of traffic from a closed-circuit television (CCTV) camera network. In addition, the website includes information on current and upcoming construction projects. In 2015, WisDOT also launched a free 511 Wisconsin smart phone app, which allows users to receive instant notifications of traffic alerts. In addition, WisDOT provides traffic and construction-related announcements through social media sites, such as Twitter and Facebook. In conjunction with its website, WisDOT has deployed a statewide 511 traveler information system, which allows the public to dial “511” and receive automated messages about current travel conditions along their desired route through a series of predetermined automated menus. VISION 2050 recommends that WisDOT continue to improve its website and “511” system for providing advisory information to motorists. Some of these improvements could include development of a hands-free mobile phone app and addition of roundabout, park-ride, rest area, and more truck information, such as inclusion of a truck parking information system.

The 511 Wisconsin traveler information website and smartphone application are ready sources of up-to-date information about traffic conditions.

- **Highway Advisory Radio (HAR)** – HAR is a system of low-power radio transmitters licensed for State use that transmit prerecorded messages concerning ongoing highway construction projects, traffic conditions during special events, and AMBER Alerts. HAR systems are generally very localized and directed to motorists at a specific location along a specific route. Currently, there are 14 HAR site locations with 18 flashing signs located on IH 94 in Kenosha, Milwaukee, Racine, and Waukesha Counties; on IH 43 in Ozaukee and Milwaukee Counties; and on IH 41/USH 45 in Milwaukee and Washington Counties. VISION 2050 recommends that WisDOT continue to utilize the HAR system as deemed necessary.
- **Dynamic Route Planning** – Emerging technologies continue to make traffic data readily available to the public, allowing motorists to access real-time traffic information via computer, mobile device,

and in-car navigation systems. There is also an increasing number of private crowd-sourced traffic information providers, such as Waze, which rely on users providing current traffic conditions. WisDOT entered an agreement in late 2016 to share real-time freeway operation and advisory information with Waze and Google Maps to notify users about lane closures, major traffic events, or other incidents. In turn, the TMC receives real-time crowdsourced information from these apps to confirm and, if necessary, respond to user-reported incidents such as disabled vehicles, hazards in the roadway, or unexpected congestion. This technology provides an additional information-sharing platform that allows motorists to know when and how to modify their routes, and provides more information to traffic management professionals, allowing them to better monitor and respond to incidents, potentially decreasing incident response time and reducing traffic congestion. VISION 2050 recommends that WisDOT continue this partnership and that WisDOT and local governments consider future partnerships to enable the exchange of traffic information and data. It is expected that such opportunities will increase as connected vehicle technology and wireless data communication continues to advance.



WisDOT's Traffic Incident Management Enhancement (TIME) Program is critical to incident management.

► **Recommendation 4.3: Implement incident management measures for the freeway system**

VISION 2050 recommends expanding and enhancing incident management measures that detect, confirm, and remove as quickly as possible incidents on the freeway system, and on freeway system shoulders, including accidents, debris, and stopped vehicles. Measures that enhance incident management include freeway service patrols, CCTV, freeway location reference markers, crash investigation sites, ramp closure devices, and alternate route designations. Critical to incident management is the Traffic Incident Management Enhancement (TIME) Program sponsored by WisDOT, which brings together and coordinates transportation engineering, law enforcement, emergency responders, tow and recovery, and other freeway system operational interests at monthly meetings to improve and enhance freeway incident management and safety. Incident management of the freeway system could also be enhanced by expanding the TMC to include on-site safety, media, and maintenance personnel. As well, WisDOT could expand the development and use of predetermined strategies, referred to as Integrated Corridor Management (ICM), to manage traffic on the freeway and adjacent arterial highways, particularly during incidents. These strategies were deployed as part of the Zoo Interchange reconstruction project.

- **Closed-Circuit Television (CCTV) Cameras** – CCTV cameras provide live video images to WisDOT and the Milwaukee County Sheriff's Department, which allow for the rapid confirmation of congested areas and the presence of an incident, and the determination of the appropriate response to the incident. Currently, there are 168 CCTV cameras covering most of the Region's heavily traveled freeways, along with 56 CCTV cameras on surface arterials parallel and connecting with the freeway system primarily located in Milwaukee and Waukesha Counties. VISION 2050 recommends that the CCTV camera network be provided on the entire regional freeway system as it is reconstructed, with the possible exception of the freeway segments identified previously that carry existing and future traffic volumes well below their design capacity.

- **Enhanced Reference Markers** – Enhanced reference markers assist motorists in identifying specific locations along a freeway segment when reporting incidents. These markers are typically small signs provided at one-tenth or two-tenths of a mile intervals along the freeway system that typically display the highway shield and mile marker. Enhanced reference markers are currently provided along much of the freeway system in the Region at each one-tenth or two-tenths of a mile. VISION 2050 recommends that freeway location reference markers be provided on the entire regional freeway system, including the following segments that do not currently have markers: IH 894 in Milwaukee County, IH 43 in Milwaukee County between Silver Spring Drive and North Avenue, IH 43 in Ozaukee County north of STH 60, IH 43 and USH 12 in Walworth County, USH 45 in Washington County, and STH 16 in Waukesha County.

- **Freeway Service Patrols** – Freeway service patrols consist of specially equipped vehicles designed to assist disabled motorists and assist in clearance of incidents. Freeway service patrol vehicles may be equipped to provide limited towing assistance, as well as minor services such as fuel, oil, water, and minor mechanical repairs. Freeway service patrols are currently operating in Milwaukee County and as part of freeway construction projects. VISION 2050 recommends expanding freeway service patrols to serve the entire regional freeway system, and providing greater coverage, including all-day weekday and weekend service and increased vehicle coverage to achieve one vehicle per 12 to 15 miles of freeway. An exception would be the freeway segments identified previously that carry existing and future traffic volumes well below their design capacity.



A Freeway Service Patrol Vehicle
Credit: WisDOT

- **Ramp Closure Devices** – Ramp closure devices allow for the closure of freeway on-ramps during major traffic incidents, inclement weather, or special events. They allow law enforcement and public works vehicles to be deployed to incident locations as needed, without requiring the use of these vehicles to block access to freeway ramps. Ramp closure devices are currently deployed at interchanges on IH 94 in Kenosha, Milwaukee, Racine, and Waukesha Counties; on IH 43 in Milwaukee, Walworth, and Waukesha Counties; and on IH 794 and IH 894 in Milwaukee County. VISION 2050 recommends that WisDOT expand implementation of ramp closure devices throughout Southeastern Wisconsin.



A Ramp Closure Device
Credit: WisDOT

- **Crash Investigation Sites** – Crash investigation sites are designated safe zones for distressed motorists to relocate to if they are involved in an incident on the freeway. Currently, there are 33 crash investigation sites on the Region's freeway system with 25 of the 33 sites in Milwaukee County. VISION 2050 recommends that WisDOT evaluate the extent of use and associated benefits of existing crash investigation sites, and consider expansion as needed to serve the entire regional freeway system.
- **Alternative Routes** – Alternate route designations are clearly marked and signed surface arterial streets and highways that provide a secondary route to be used by motorists during major

freeway incidents, ramp closures, or during times of extreme congestion. VISION 2050 recommends that WisDOT and the Regional Planning Commission, together with the concerned and affected local governments, continue to examine potential designation of alternate routes.

- **Law Enforcement Freeway Refuge Site** – A law enforcement freeway refuge site is a location along the freeway mainline where law enforcement vehicles can park to monitor traffic and respond to traffic incidents. These sites are particularly desirable along segments of freeway without an adequate shoulder, which require law enforcement vehicles to continuously circulate on these segments. VISION 2050 recommends that WisDOT consider installing law enforcement freeway refuge sites at appropriate locations along the freeway system.

Surface Arterial Street and Highway Traffic Management

Surface arterial street and highway traffic management strategies are measures that improve the operation and management of the regional surface arterial street and highway network. Some of these measures are currently in use in the Region and are recommended to be expanded and enhanced. Surface arterial street and highway traffic management measures are described below, along with recommendations related to specific measures, including advisory information, traffic signal coordination, intersection traffic engineering improvements, curb-lane parking restrictions, and access management.



► Recommendation 4.4: Improve and expand coordinated traffic signal systems

Coordinated traffic signal systems provide efficient progression of traffic along arterial streets and highways, reducing travel time delay and increasing reliability, and allowing motorists to travel through multiple signalized intersections without stopping. There are several coordination system types, including:

- Time-based coordination relies on devices within each traffic signal controller to accurately keep time, with signal coordination based on a prescribed signal timing plan programmed into each individual traffic signal controller.
- Interconnected pre-timed coordination is based on the remote communication (i.e., hard wiring or radio connection) between each individual traffic signal controller and a master traffic signal controller.
- Traffic responsive system are interconnected systems of traffic signals that respond to information provided by traffic detectors over several cycles—or minutes—to determine appropriate traffic signal cycle lengths and phasing.
- Real-time adaptive systems use technology that allows the adjustment of green times and signal cycle lengths on a real-time basis as data are gathered and evaluated along the corridor.
- Central computer control systems are based on a central computer facility that receives and analyzes traffic information provided by traffic detectors, and develops appropriate signal cycle lengths, offsets, and phasing. The system then communicates this information to the individual traffic signal controllers.

In the Region, coordinated traffic signal systems currently range from systems comprising two traffic signals to systems comprising 100 traffic signals. Approximately 1,200 of the 1,700 traffic signals in the Region, or about 71 percent, are currently part of a coordinated signal system. VISION 2050 recommends that Commission staff work with State and local governments to document existing and planned arterial street and highway system traffic signals and traffic signal systems, and develop recommendations (including prioritization) for improvement and expansion of coordinated signal systems. The intent is to identify signal coordination corridors that should receive high priority for Federal and State funding, such as FHWA Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds. VISION 2050 also recommends the preparation and implementation of coordinated traffic signal plans along all surface arterial street and highway routes in the Region that have traffic signals located at one-half mile or less spacing. This measure also recommends that agencies coordinate their efforts so that motorists do not experience unnecessary stops or delays due to changes in individual traffic signal jurisdiction authority.

VISION 2050 recommends conducting a study to document existing and planned traffic signals and make recommendations for improving and expanding coordinated signal systems.

► **Recommendation 4.5: Improve arterial street and highway traffic flow at intersections**

Intersection improvements increase travel efficiency and improve safety along arterial streets and highways through improvements such as improving the type of traffic control deployed at the intersection (two- or four-way stop control, roundabouts, or signalization); improving signal timing at individual signalized intersections; adding right- and/or left-turn lanes; or improving bicycle and pedestrian accommodation through an intersection (e.g., pavement markings and leading pedestrian intervals at signalized intersections). VISION 2050 recommends that State and local governments aggressively consider and implement individual arterial street and highway intersection improvements. VISION 2050 also recommends that State, county, and local governments each prepare a prioritized short-range (two- to six-year) program of arterial street and highway intersection improvements under their jurisdiction, and review and update the programs every two to five years. VISION 2050 further recommends that Commission staff work with State, county, and local governments, at their request, to prepare such programs for arterial street and highway intersections, which would identify the intersections in need of improvement and recommend improvements.



► **Recommendation 4.6: Expand curb-lane parking restrictions**

Curb-lane parking restrictions improve traffic flow and operation by restricting on-street parking during peak traffic periods and operating the curb parking lanes as through traffic lanes. This measure provides an alternative to the expansion of highway capacity through roadway widenings and new construction. VISION 2050 recommends that State and local governments consider implementation of curb-lane parking restrictions as needed during peak traffic periods in the peak traffic direction along segments of roadway expected by the year 2050 to operate under congested conditions and where there may be the ability to utilize the existing parking lane as a traffic lane. It is recognized that curb-lane parking restrictions may not be feasible in commercial areas where parking is essential to the businesses, such as along Greenfield Avenue in the City of West Allis and North Avenue in the City of Wauwatosa. It may also not be possible to restrict parking for use as a traffic lane along roadway corridors identified for enhanced bicycle accommodations. In such corridors, the level of bicycle accommodation and the ability to



prohibit parking for use as a traffic lane, would be determined as part of the preliminary engineering for the reconstruction of the roadway. In addition, it may not be possible to restrict parking for use as a traffic lane along segments of roadway where rapid transit service is recommended to operate in a dedicated lane. Map 1.13 shows the potential curb-lane parking restrictions that could be considered as needed during peak traffic periods along segments of roadway expected by the year 2050 to operate under congested conditions and where there may be the ability to utilize the existing parking lane as a traffic lane.



► **Recommendation 4.7: Develop and adopt access management standards**

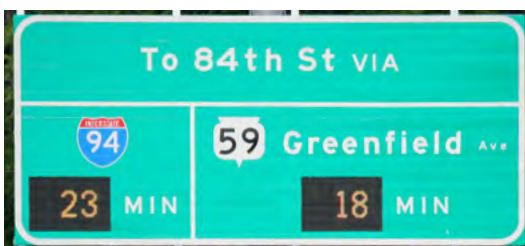
Developing access management standards for the location, spacing, and operation of driveways (residential and commercial), median openings, and street connections improves transportation systems operations by providing full use of the roadway capacity and reducing the number of conflicts that can result in crashes. VISION 2050 recommends that State and local governments continue to adopt and employ access management standards as development takes place along arterials under their jurisdiction and prepare and implement access management plans along arterials that currently are developed and violate these access management standards.



One way to enhance advisory information would be to include surface arterial data on the 511 Wisconsin website in addition to freeway data.

► **Recommendation 4.8: Enhance advisory information for surface arterial streets and highways**

Similar to advisory information measures for the regional freeway system, advisory information measures for surface arterials involve providing real-time information on existing conditions, particularly delays and major incidents, to encourage more informed travel decisions and more efficient use of the transportation system. VISION 2050 recommends improving and expanding advisory information measures, including expanding data provided on the 511 Wisconsin website to include surface arterials in addition to freeways, and implementing VMS, including hybrid variable/static travel time signs (as shown in the photo). Hybrid travel time signs provide motorists with travel times for alternate parallel routes to the same destination, with the times updated in real-time. The availability of travel time information allows motorists to choose the quickest route



A Hybrid Variable/Static Travel Time Sign
Credit: SEWRPC

to their destination. The travel time provided can be based on data collected by traffic detectors installed along the routes. In addition, Bluetooth sensors can be installed that detect any device emitting a Bluetooth signal to estimate travel speeds along the alternative route. Hybrid travel time signs were implemented as part of the Zoo Interchange reconstruction project, with data being provided to the signs by Bluetooth sensors installed along the surface arterial routes. The signs and Bluetooth sensors are installed along portions of Bluemound Road (USH 18), Greenfield Avenue (STH 59), and Mayfair Road/108th Street (STH 100).



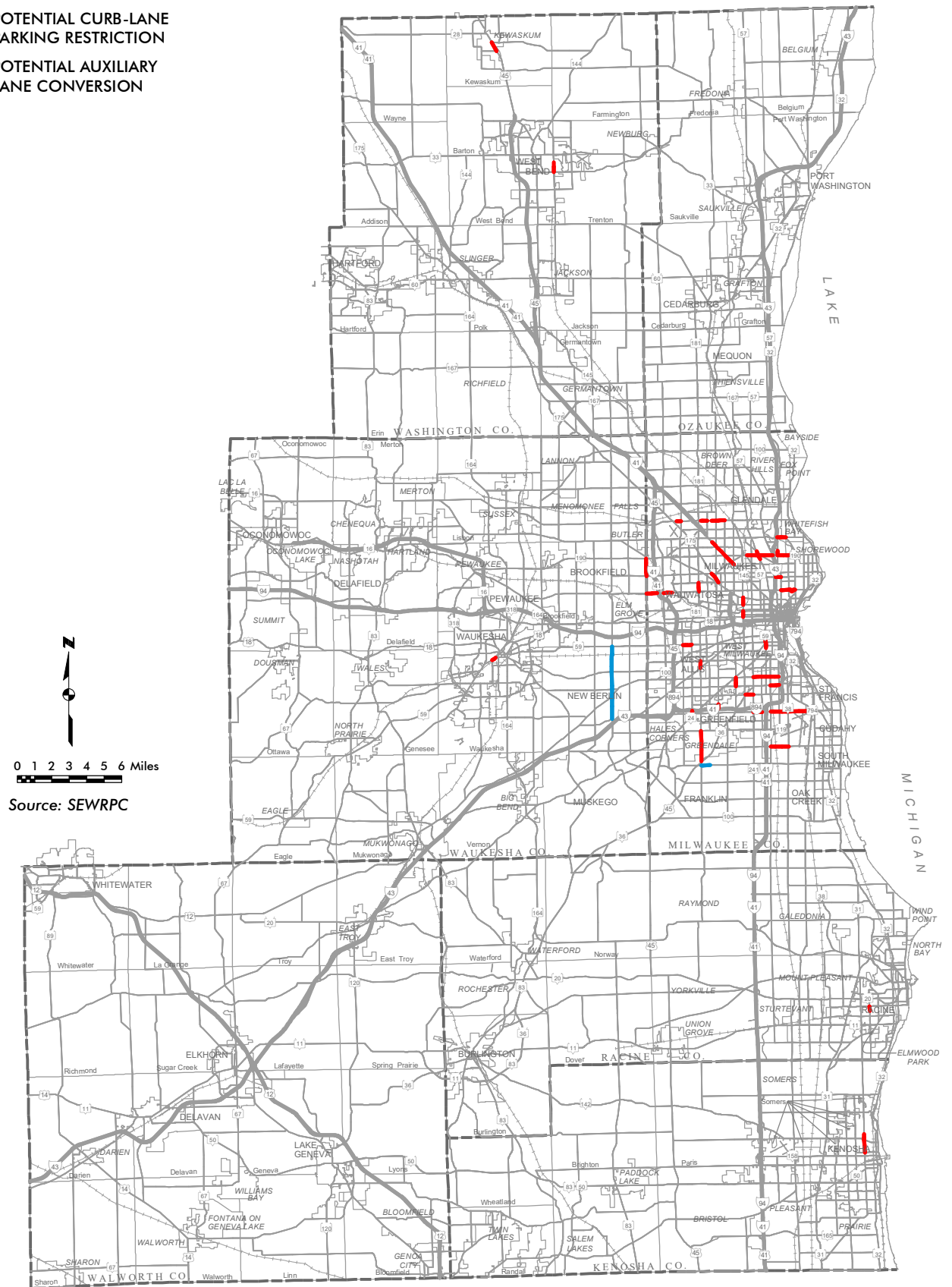
► **Recommendation 4.9: Expand the use of emergency vehicle preemption**

Emergency vehicle preemption allows emergency vehicles to intervene in the normal operation of traffic signals to either change the traffic signal to the green phase or to hold the green phase for the approach from which the emergency vehicle is oriented. Some governmental units in the Region have implemented emergency vehicle preemption on some or all of the traffic signals under their jurisdictional authority. VISION 2050 recommends expanding the use of emergency vehicle preemption at traffic signals in Southeastern Wisconsin.

Map 1.13

Location of Potential Curb-Lane Parking Restrictions and Auxiliary Lane Conversions on Arterial Streets and Highways: VISION 2050

- POTENTIAL CURB-LANE PARKING RESTRICTION
- POTENTIAL AUXILIARY LANE CONVERSION



Major Activity Center Parking

VISION 2050 recommends strategies to improve parking around major activity centers, allowing motorists to find available parking quickly, and reducing traffic volume and congestion and associated air pollutant emissions and fuel consumption. Measures to improve parking around major activity centers include a parking management and guidance system and demand-responsive pricing.



► Recommendation 4.10: Implement parking management and guidance systems in major activity centers

VISION 2050 recommends reducing the traffic circulation of motorists seeking parking in major activity centers through the implementation of parking management and guidance systems. An initiative supporting this recommendation is the City of Milwaukee Advance Parking Guidance System, for which the City completed the first phase in late June 2014. This system provides motorists with real-time parking information around downtown Milwaukee using variable and static message signs located at various locations on major freeway ramps and arterial roadways. The message signs display the address of a participating parking structure, the travel direction of the parking structure, and the number of parking spots that are available in the parking structure. These data could also be made accessible to the public via smartphone by the local municipalities or a third party provider.



A Parking Guidance Sign
Credit: City of Milwaukee



Demand-responsive parking would improve parking availability and reduce traffic congestion in major activity centers by adjusting the price for parking throughout the day based on demand.

► Recommendation 4.11: Implement demand-responsive pricing for parking in major activity centers

Demand-responsive pricing for parking adjusts the price for on-street parking, parking lots, and parking garages in major activity centers. The price for parking can be adjusted throughout the day based on the parking demand in the area so that at least one parking space is available most of the time. Motorists find demand-responsive pricing information online and through smartphone apps that help drivers find parking easier and faster. This strategy can improve parking availability and reduce traffic congestion. VISION 2050 recommends that demand-responsive pricing for parking be considered for future implementation in major activity centers. In October 2018, the City of Milwaukee finalized a plan that would allow demand-responsive parking in the City's central business district, adjusting prices anywhere from \$0.25 to \$5.00 per hour, including special pricing for events; however, demand-responsive pricing has not yet been implemented.

Regional Transportation Operations Plan

The current regional transportation operations plan (RTOP), completed in 2012, is a five-year program identifying candidate corridor and intersection TSM projects prioritized for implementation and funding, particularly with respect to FHWA CMAQ Program funding.



► Recommendation 4.12: Review and update the regional transportation operations plan

VISION 2050 recommends that Commission staff work with State, county, and local governments to review and update the RTOP every four years, with the next update to occur following adoption of VISION 2050. The purpose of the update to the RTOP is to identify additional candidate corridor and intersection TSM projects, and to identify the projects that would have priority for Federal and State funding, such as Federal CMAQ Program funds. During the development of VISION 2050, counties

and local governments identified roadway corridors and intersections potentially having traffic flow issues, as shown in Table 1.11. VISION 2050 recommends that these corridors and intersections be considered as part of the next review and update to the RTOP, programmed to be completed in 2020.

Description of Travel Demand Management Element

Travel demand management (TDM) refers to a series of measures or strategies intended to reduce the total and peak period demand for roadway travel, allowing for more efficient use of the existing capacity of the transportation system. TDM strategies encourage and incentivize people to consider alternatives to single-occupancy vehicle (SOV) trips, such as public transit, ridesharing, walking, biking, and working remotely. The general intent of such measures is to reduce traffic volume and congestion, and the associated air pollutant emissions and fuel consumption. To be effective, TDM measures should be technically and politically feasible; integrated with public transit, bicycle and pedestrian, and arterial street and highway improvements; and combined into coherent packages so that a variety of measures are implemented. VISION 2050 recommends TDM measures, including HOV preferential treatment, park-ride lots, personal vehicle pricing, TDM promotion, and detailed site-specific neighborhood and major activity center land use plans. It should be noted that there is an inherent overlap between the TDM, public transit, and bicycle and pedestrian elements of VISION 2050. The transit and bicycle and pedestrian elements recommend a number of additional measures that would reduce SOV travel beyond those included in the TDM element.

Travel demand management involves executing a series of strategies to encourage the use of alternative methods or times of travel, with the goal of reducing traffic congestion and vehicle emissions.

► Recommendation 5.1: Enhance the preferential treatment for high-occupancy vehicles

VISION 2050 recommends continuing and enhancing the preferential treatment for transit vehicles, vanpools, and carpools on the existing arterial street and highway system. Providing preferential treatment for transit vehicles reduces transit travel times and improves transit travel time reliability, making public transportation more competitive with personal vehicle use. Measures to improve preferential treatment for HOV include the provision of HOV queue bypass lanes at metered freeway on-ramps, and preferential carpool and vanpool parking. Additional measures include transit signal priority systems and reserved bus lanes along congested surface arterial streets and highways, which are discussed further in Recommendation 2.6 of the transit element.



- **HOV Queue Bypass Lanes** – HOV queue bypass lanes allow transit vehicles or vehicles with multiple passengers to bypass single-occupancy vehicle queues at metered freeway on-ramps, providing reduced travel time incentives to carpools, vanpools, and transit vehicles. The provision of HOV queue bypass lanes at metered freeway on-ramps exists at 55 of the 120 metered freeway on-ramp locations on the Region’s freeway system. VISION 2050 recommends providing HOV bypass lanes at metered freeway on-ramps within the Region, particularly at on-ramps near park-ride facilities and at on-ramps that would be used by existing and planned public transit, dependent on right-of-way and on-ramp geometric design constraints.
- **Preferential Carpool and Vanpool Parking** – Preferential carpool and vanpool parking involves employers providing free/subsidized parking or preferential parking for employees who carpool or

Table 1.11**Isolated Intersections and Roadway Corridors Identified as Having Potential Traffic Flow Issues by County and Local Governments: VISION 2050**

County	Location
Milwaukee	E. Layton Avenue (CTH Y) between S. 27th Street (STH 241) and S. Pennsylvania Avenue
Ozaukee	Intersection of STH 57 and CTH A/CTH H Intersection of STH 33 and CTH I Intersection of STH 57 and Jay Road Intersection of CTH W and STH 167 Intersection of N. Port Washington Road (CTH W) and W. Mequon Road (STH 167) Intersection of N. Port Washington Road (CTH W) and Highland Road
Walworth	Intersection of USH 12 and CTH ES Intersection of USH 12 and CTH A Intersection of STH 89 and CTH A Intersection of STH 50 at IH 43 Intersection of South Road and USH 12 ^a
Washington	Intersection of Division Road (CTH G) and Fond du Lac Avenue (STH 145) Intersection of IH 41 southbound off ramp and STH 60 Intersection of IH 41 southbound off ramp and STH 33
Waukesha	Intersection of E. Ottawa Avenue (CTH Z) and Summit Avenue (STH 67) Intersection of Summit Avenue (STH 67) and CTH D Intersection of S. Moorland Road (CTH O) and W. Cleveland Avenue (CTH D) Intersection of S. Moorland Road (CTH O) and W. National Avenue (CTH ES) Intersection of S. Moorland Road (CTH O) and W. Beloit Avenue (CTH I) Intersection of S. Moorland Road (CTH O) and W. Grange Avenue Intersection of Pilgrim Road (CTH YY) and Silver Spring Drive (CTH VV) Intersection of Pilgrim Road (CTH YY) and W. Good Hope Road (CTH W) Intersection of Lynndale Road (CTH JK) and Ryan Road (CTH KF) Intersection of Pewaukee Road (STH 164) and Capitol Drive (STH 190) Intersections of Redford Boulevard (CTH F) with IH 94 ramps Intersection of Redford Boulevard (CTH F) and Watertown Road (CTH M) Intersection of Watertown Road (CTH M) and North Avenue (CTH M) Intersection of Plain View Road and Town Line Road (CTH V) Intersection of Waukesha Avenue (STH 74) and Silver Spring Drive (CTH VV) Intersection of Lisbon Road (CTH K) and Duplainville Road Intersection of Lisbon Road (CTH K) and Redford Boulevard (STH 74)

^a Identified based on a proposed development near the intersection anticipated to generate traffic that would potentially require improvement to the intersection.

Source: SEWRPC

vanpool to their employment site. This measure can reduce vehicle trips by encouraging ridesharing among employees. VISION 2050 encourages employers to provide free/subsidized parking or preferential parking for employees who carpool or vanpool to the employment site.



➤ **Recommendation 5.2: Expand the network of park-ride lots**

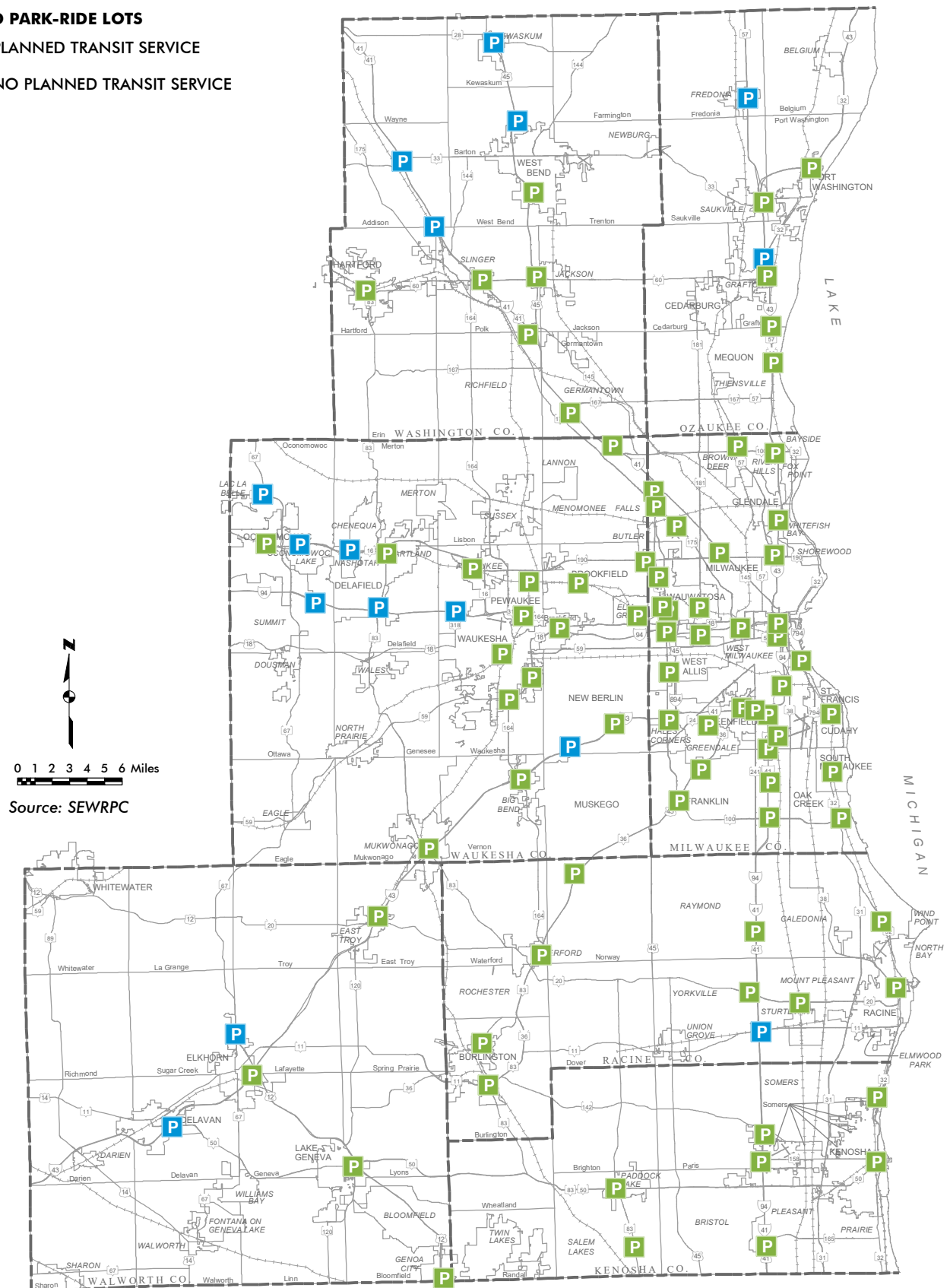
To promote carpooling and the resultant more efficient use of the Region's transportation system, VISION 2050 recommends expanding the network of park-ride lots. Park-ride lots should be located along all major routes at their major intersections and interchanges where sufficient demand may warrant provision of an off-street parking facility. Map 1.14 shows the recommended system of park-ride lots, including existing park-ride lots and those recommended to be served by transit.

Map 1.14

Park-Ride Lots: VISION 2050

PLANNED PARK-RIDE LOTS

- P PLANNED TRANSIT SERVICE
 - P NO PLANNED TRANSIT SERVICE





Recommendation 5.3 aims to shift more of the costs associated with roadways and parking from property taxpayers to the actual users of these facilities.

► **Recommendation 5.3: Price personal vehicle travel at its true cost**

VISION 2050 recommends that a larger percentage of the full costs of construction, maintenance, and operation of street and highway facilities and services and parking facilities and services be borne by the users of the system, with strategies including cash-out of employer-paid parking, road pricing, and parking pricing. These measures can result in a reduction in total vehicle-miles of travel (VMT).

- **Cash-out of Employee-Paid Parking** – Cash-out employee-paid parking encourages employers currently providing free/subsidized parking to charge their employees the market value of parking. Employers could offset the additional cost of parking through cash payment or salary increases to employees. This measure would potentially reduce vehicle-trips and VMT through the increased use of transit, ridesharing, walking, and bicycling, as some employees may “pocket” the cash payment or salary increase. Employers could also subsidize all, or a portion of, the parking costs for employees who carpool or vanpool to the employment site to further encourage ride-sharing. VISION 2050 supports employers implementing cash-out of employee-paid parking and subsidizing all, or a portion of, the parking costs for employees who carpool or vanpool to the employment site.
- **Road Pricing Strategies** – Road pricing involves charging user fees to pay the costs of construction, maintenance, and operation of street and highway facilities and services. Current user fees primarily include Federal and State motor fuel taxes and vehicle registration fees. Federal and State motor fuel taxes have not been increased within the last decade, and there is substantial opposition at the Federal and State level to increasing the current motor fuel tax rates. Additionally, technological advances, such as increased fuel efficiency and alternative fuels, have the potential to reduce the ability of the current motor fuel tax system to equitably pay for the costs of constructing, maintaining, and operating the arterial street and highway facilities. Currently, the cost of building and maintaining freeways and State highways in Wisconsin is largely paid for through motor fuel taxes and vehicle registration fees. In contrast, the construction and maintenance of county and local arterial streets and highways are generally paid for through local property taxes, with 25 percent or less paid through user fees. There is merit in having the users of the transportation system pay the actual costs of the transportation system, and as travel behavior is affected by the cost of travel, user fees can encourage the use of alternative modes of travel, lessening the number of vehicles, and potentially the amount of congestion, on the arterial street and highway network. VISION 2050 supports the user fee concept, including potential increases in motor fuel taxes and consideration of alternative user fees that either supplement or replace the motor fuel tax system. Alternative user fees that should be considered include a VMT fee, tolling, and/or congestion pricing.
- **Vehicle-Miles of Travel (VMT) Fee** – A VMT fee is a road pricing measure that imposes a fee on a motorist based on the total distance they drive over a specified period of time. A distance-based fee would encourage residents to drive less, potentially reducing total VMT, traffic volumes, and congestion. This strategy also provides a more equitable means of paying

for the costs of the construction, maintenance, and operation of the transportation system as motorists would pay for their actual use of the transportation system, as opposed to paying based on the amount of fuel purchased, which is affected by the fuel efficiency of their vehicle, as a proxy for the amount their vehicle uses the transportation system. Studies and pilot projects across the country suggest that VMT fees could potentially replace or supplement Federal and State motor fuel taxes. Implementing a VMT fee utilizing technologies such as a GPS unit or an in-vehicle device that would collect mileage data has faced obstacles due to technology uncertainty, privacy concerns, and cost implementation issues. However, low-technology options, such as incorporating odometer readings during the annual vehicle registration process, are also possible. In 2019, during the development of the 2019-2021 State budget, further study of VMT fees was discussed by the State Legislature, although the adopted budget did not include a requirement to conduct further study.

- **Tolling** – Tolling requires a motorist to pay a fee to use a particular highway facility. Requiring motorists to pay for the facilities they use would provide additional funds to cover the costs of construction, maintenance, and operation of those facilities, and may result in residents choosing alternative modes of transportation. Federal law currently prohibits the implementation of tolls on Federal-aid highways, with exceptions in specific circumstances. WisDOT conducted a study in 2016 on the feasibility of tolling as a potential user fee model to fund transportation. Similar to VMT fees, further study of tolling was discussed in 2019 by the State Legislature, but the adopted budget did not include a requirement to conduct further study.
- **Congestion Pricing** – Congestion pricing is a user fee for an express lane or highway facility that adjusts based on the time of day and level of congestion. Applying economic supply and demand methodology, the user fee for the express lane or highway facility increases during times of high traffic volume and congestion, and decreases during times of low traffic volume and no congestion. Effective express lane congestion pricing ensures free flowing traffic in the toll lanes, efficiently moving vehicles through a congested corridor as well as providing additional revenue for the construction, maintenance, and operation of the transportation system. Effective highway facility congestion pricing encourages travelers to shift to alternative modes of transportation particularly during peak travel times, or encourages motorists to seek alternative routes or change the time of their travel, potentially reducing congestion on the highway facility.
- **Parking Pricing Strategies** – Parking pricing strategies involve charging user fees for commercial and residential parking facilities. The availability of free parking encourages driving while the cost associated with maintaining parking facilities is paid by everyone, including those who do not drive, through higher prices on merchandise, food, and rent. Imposing a user fee on parking encourages individuals to use alternatives to the automobile to travel to entertainment and retail establishments and also encourages



Congestion Pricing Example

Credit: Minnesota Department of Transportation

residents to reduce the number of vehicles they own. A user fee for parking also places more of the costs associated with maintaining parking facilities onto those who use them. VISION 2050 supports the implementation and expansion of parking pricing strategies.



► **Recommendation 5.4: Promote travel demand management**

VISION 2050 recommends a regionwide program to aggressively promote transit use, bicycle use, ridesharing, pedestrian travel, working remotely, and work-time rescheduling, including compressed work weeks. The program would include education, marketing, and promotion elements aimed at encouraging alternatives to drive-alone personal vehicle travel. VISION 2050 further recommends expanding programs and services that provide residents in Southeastern Wisconsin the opportunity to reduce personal vehicle ownership and vehicular travel, which include car sharing services and a live near your work program.



A Car Sharing Service
Credit: City of Milwaukee

- **Car Sharing Services** – Car sharing services provide an option for travelers who primarily rely on public transit and non-motorized transportation, but at times need a vehicle for special trips such as grocery shopping or trips to rural areas. Typically, a privately owned vehicle entails fixed costs—such as insurance or a car loan—that an owner must pay regardless of the amount they drive, while car sharing services allow drivers to pay per trip. Car sharing services reduce the need for households to own a personal vehicle and reduce a household's VMT because users would only drive when necessary, rather than out of convenience. Local governments can enhance car sharing services by providing dedicated on-street parking spots exclusively for car sharing vehicles at strategic locations. Zipcar, an existing car sharing service in the City of Milwaukee, has several stations located across downtown, the Lower East Side, and the campuses of the University of Wisconsin-Milwaukee and Marquette University. VISION 2050 recommends expanding car sharing services where appropriate in Southeastern Wisconsin.

- **Live Near Your Work Program** – Live near your work programs provide down payment assistance, location efficient mortgages, and rent subsidies for people who buy or rent a home near their employer. Encouraging residents to live near their work reduces VMT and increases transit use. Several Milwaukee area companies participate in an employer-assisted housing program that provides assistance to employees who seek home ownership. These types of programs can be designed to encourage homeownership close to work. VISION 2050 recommends expanding programs similar to the employer-assisted housing program to encourage employees to live near their work.



► **Recommendation 5.5: Facilitate transit, bicycle, and pedestrian movement in local land use plans and zoning**

VISION 2050 recommends that local governments facilitate transit, bicycle, and pedestrian movement as they prepare and implement detailed, site-specific neighborhood and major activity center land use plans. The design and layout of neighborhoods and major activity centers heavily influence residents' transportation choices. Land use strategies recommended under the land use component of VISION 2050 promote transit, bicycle, and pedestrian movement and involve mixed-use and high-density development and changes in parking regulations.

- **Neighborhood Plans** – Mixed-use and higher density neighborhoods can facilitate bicycling and walking by reducing vehicle dependency. Neighborhoods with employment, shopping, parks, and entertainment options nearby provide the opportunity for residents to reach their destinations without a vehicle. Many local governments in Southeastern Wisconsin have recognized, in their planning and land use regulations, the need for improved internal circulation and transit access in addition to the desirability of mixed land uses and higher development densities. Neighborhood plans that incorporate these aspects, which encourage using alternative modes of transportation, can be achieved through zoning, official mapping, subdivision control, site plan review, and site permitting measures. Transit-oriented development (TOD), as described under the land use component of VISION 2050, involves the development of multifamily buildings and buildings with mixed-use development surrounding rapid transit and commuter rail stations. Neighborhood development around transit stations increases the transit accessibility to a number of destinations such as jobs and entertainment, increasing the desirability and attractiveness of transit and reducing vehicle dependency. TOD also provides convenient and safe access for walking and bicycling.
- **Limit Parking Availability** – A strategy that can encourage using alternative modes of transportation in urban areas is to limit the availability of parking in mixed-use and high-density developments. Limiting parking availability while providing the necessary amenities and services that promote transit use, bicycling, and walking would decrease the likelihood that people will drive and increase the likelihood that people will use public transportation, bike, or walk to and from an area. Many local governments have zoning ordinances that require the provision of a minimum number of parking spaces for residential developments (e.g., based on the number of apartment units) and for commercial developments (e.g., based on store square footage), which tends to encourage personal vehicle use. VISION 2050 recommends local governments in urban areas consider removing minimum parking requirements from their zoning ordinances.

► **Recommendation 5.6: Partner with private-sector mobility service providers**

Emerging trends in shared-use transportation are rapidly evolving, with private-sector mobility providers that offer new services such as shared micromobility (e.g., bike and scooter share programs), app-based ride hailing (e.g., Uber and Lyft), on-demand carpooling, and other app-based mobility options. These new services have the potential to have both positive and negative impacts on the Region. For example, shared-use transportation services could reduce personal vehicle ownership and drive-alone personal vehicle travel, particularly when they are used to complement regular public transit use. However, these services also have the potential to pose safety hazards, increase VMT, and reduce public transit use. VISION 2050 recommends that local, county, and State agencies and units of governments develop partnerships with private-sector mobility service providers to advance an equitable, affordable, and efficient transportation system in the Region. When necessary, local and county governments should also adapt plans and ordinances to:

- Prioritize safety for all users of the transportation system
- Accommodate people with disabilities



Partnerships should be developed with private-sector mobility service providers to advance an equitable, affordable, and efficient transportation system in the Region.

- Provide affordable options
- Encourage active and shared-use travel when appropriate
- Develop data-sharing agreements that allow all mobility service providers to better serve transportation needs
- Support the use of public transit as the primary mode of shared mobility by partnering with private-sector mobility services to provide first-mile/last-mile accessibility to transit and to supplement transit service during off-peak service times or in areas with lower-density development patterns

Description of Arterial Streets and Highways Element

Arterial streets and highways are those portions of the total street and highway system principally intended to provide travel mobility, serving the through movement of traffic and providing transportation service between major subareas of a region and also through the region. Though access to abutting property may be a secondary function of some types of arterial streets and highways, the primary function of arterial streets and highways is traffic movement. Together, the arterial streets and highways should form an integrated, areawide system. Arterials are typically spaced about one-half mile apart in Mixed-Use City Center areas and Mixed-Use Traditional Neighborhood areas, one-half mile to one mile apart in Small Lot Traditional Neighborhood areas (depending on area density), one mile apart in Medium Lot Neighborhood areas, two miles apart in Large Lot Neighborhood areas, and more than two miles apart in Large Lot Exurban and Rural Estate areas.

The arterial street and highway system under VISION 2050 totals 3,669.1 route-miles. Approximately 92 percent, or 3,371.2 of these route-miles, are recommended to be resurfaced and reconstructed to their existing traffic carrying capacity. Approximately 233.1 route-miles, or about 6 percent of the year 2050 arterial street and highway system, are recommended to be widened to provide additional through traffic lanes. Approximately 64.8 route-miles, or about 2 percent of the total arterial street mileage, are recommended new arterial facilities to be constructed. Table 1.12 and Maps 1.15 through 1.21 display the arterial streets and highways element of VISION 2050.

VISION 2050 does not make any recommendation with respect to whether the remaining 10.0 route-miles of IH 43 between Howard Avenue and Silver Spring Drive, when reconstructed, should be reconstructed with or without additional traffic lanes. VISION 2050 recommends that preliminary engineering conducted for the reconstruction of this segment of IH 43 should include the consideration of alternatives for rebuilding the freeway with additional lanes and rebuilding it with the existing number of lanes. The decision regarding how this segment of IH 43 would be reconstructed would be made as part of preliminary engineering and an environmental impact study conducted by WisDOT. During preliminary engineering, WisDOT would consider and evaluate a number of alternatives, including rebuilding as is, various options of rebuilding to modern design standards, compromises to rebuilding to modern design standards, rebuilding with additional lanes, and rebuilding with the existing number of lanes. Only at the conclusion of preliminary engineering would a determination be made as to how this segment of IH 43 freeway would be reconstructed. Following the conclusion of the preliminary engineering for the reconstruction, VISION 2050 would be amended to reflect the decision made as to how IH 43 between Howard

Table 1.12
Arterial Street and Highway System Preservation, Improvement, and
Expansion by Arterial Facility Type by County: VISION 2050

County	Arterial Facility Type	System Preservation (miles)	System Improvement (miles)	System Expansion (miles)	Total Miles
Kenosha	Freeway	12.0	--	--	12.0
	Surface Arterial	322.2	27.4	3.9	353.5
	Subtotal	334.2	27.4	3.9	365.5
Milwaukee	Freeway	44.6 ^a	23.4	--	68.0
	Surface Arterial	719.0	9.3	6.5	734.8
	Subtotal	763.6	32.7	6.5	802.8
Ozaukee	Freeway	13.3	14.1	--	27.4
	Surface Arterial	262.4	18.5	3.1	284.0
	Subtotal	275.7	32.6	3.1	311.4
Racine	Freeway	12.0	--	--	12.0
	Surface Arterial	416.1	15.8	8.8	440.7
	Subtotal	428.1	15.8	8.8	452.7
Walworth	Freeway	49.8	4.8 ^b	12.4	67.0 ^b
	Surface Arterial	408.8	4.4	10.3	423.5
	Subtotal	458.6	9.2	22.7	490.5
Washington	Freeway	35.8	6.4	--	42.2
	Surface Arterial	389.8	8.8	15.5	414.0
	Subtotal	425.6	15.2	15.5	456.4
Waukesha	Freeway	34.4	24.4	--	58.8
	Surface Arterial	650.9	75.8	4.3	731.0
	Subtotal	685.3	100.2	4.3	789.8
Region	Freeway	201.9	73.1 ^c	12.4	287.4 ^c
	Surface Arterial	3,169.3	160.0	52.4	3,381.7
	Total	3,371.2	233.1	64.8	3,669.1

^a Includes the 10.0 miles of IH 43 between Howard Avenue and Silver Spring Drive. VISION 2050 does not make a recommendation regarding whether this section should be reconstructed with or without additional traffic lanes.

^b Represents the conversion of approximately 4.8 miles of the USH 12 Whitewater bypass, currently a two-traffic-lane surface arterial, to a four-traffic-lane freeway.

^c Includes the widening of approximately 63.6 miles of the existing regional freeway system, and the conversion of about 4.8 miles of the USH 12 Whitewater bypass, currently a two-traffic-lane surface arterial, to a four-traffic-lane freeway.

Source: SEWRPC

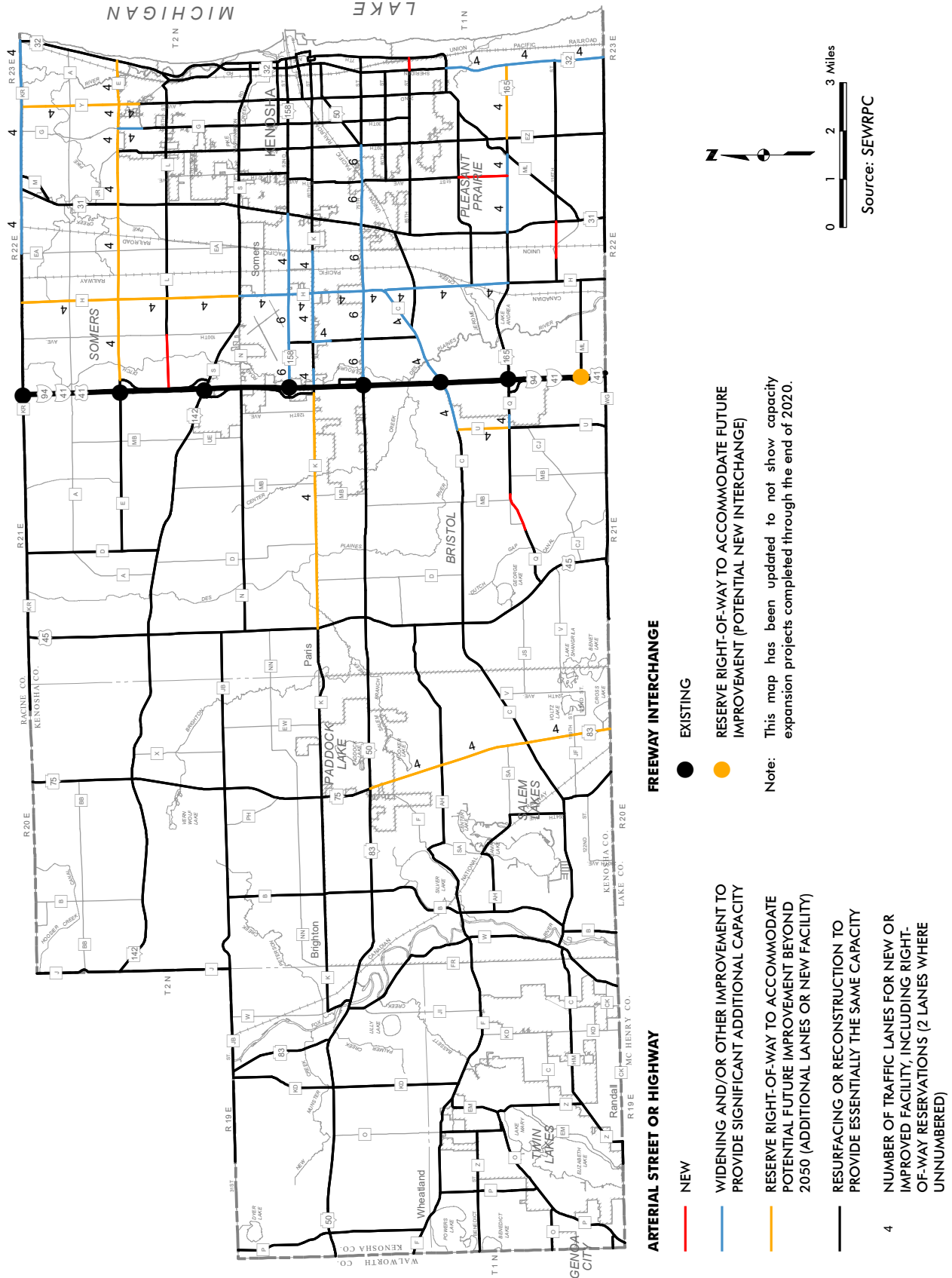
Avenue and Silver Spring Drive would be reconstructed. Any construction along this segment of IH 43 prior to preliminary engineering—such as bridge reconstruction—should fully preserve and accommodate the future option of rebuilding the freeway with additional lanes.

The arterial system capacity expansion recommended in VISION 2050 represents about an 8 percent expansion in arterial system lane-miles over the next 30 years. The year 2050 arterial street and highway system is designed to serve the expected increase in VMT in the Region of 20 percent by the year 2050 (even with a more than doubling of transit and a more compact development pattern recommended under VISION 2050). The system is designed to address the forecast year 2050 congestion that may be expected, even if all the other elements of VISION 2050 are fully implemented, including land use, public transit, travel demand management, transportation systems management, and bicycle and pedestrian facilities. Implementation of the year 2050 arterial system would be expected to result in overall traffic congestion, travel time delay, and average trip times to be essentially maintained at, or modestly improved from, current levels.

The VISION 2050 arterial street and highway system is designed to serve an expected 20% increase in VMT by the year 2050, with an 8% increase in arterial system lane-miles.

Map 1.15

Functional Improvements to the Arterial Street and Highway System in Kenosha County: VISION 2050

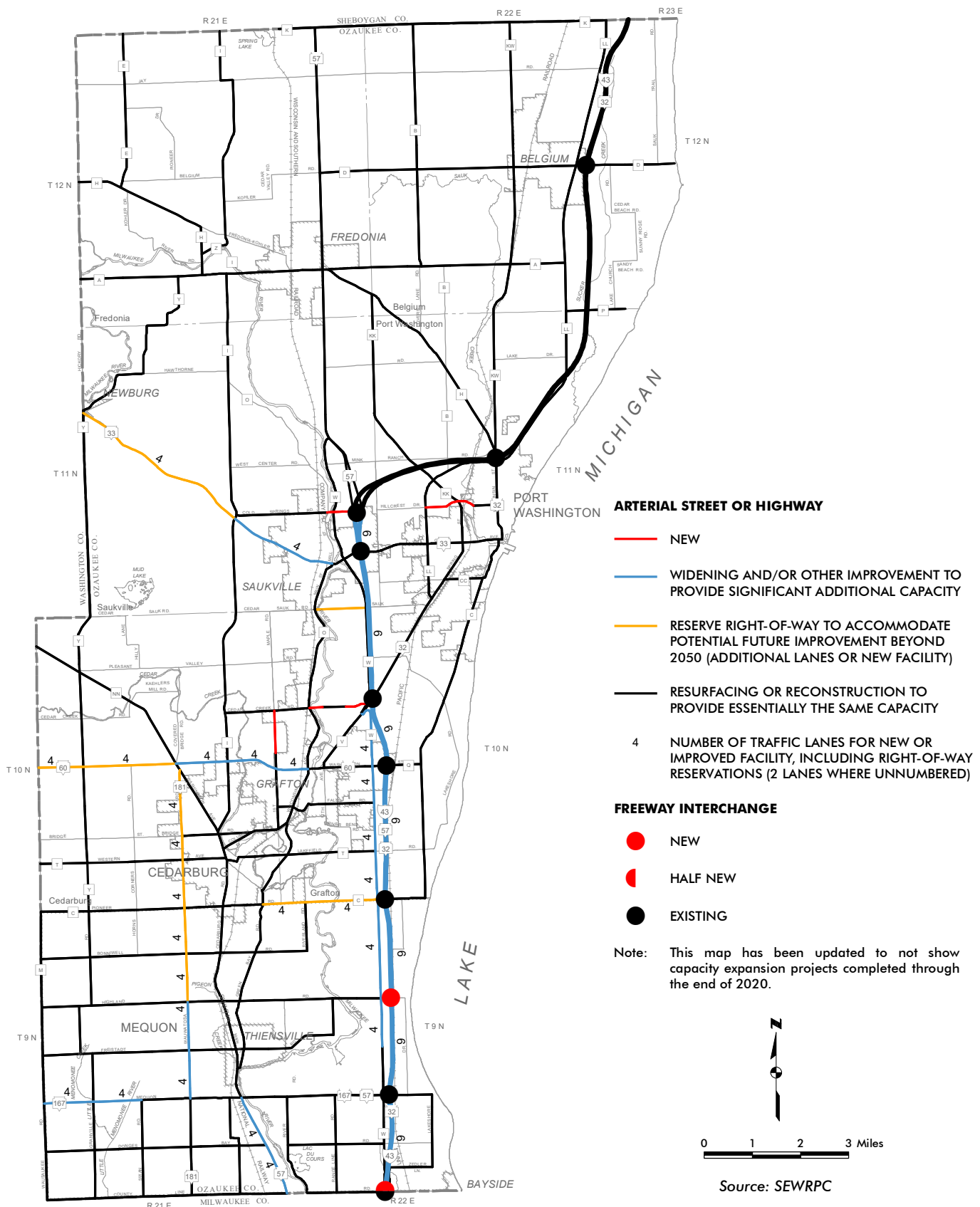


Functional Improvements to the Arterial Street and Highway System in Milwaukee County: VISION 2050

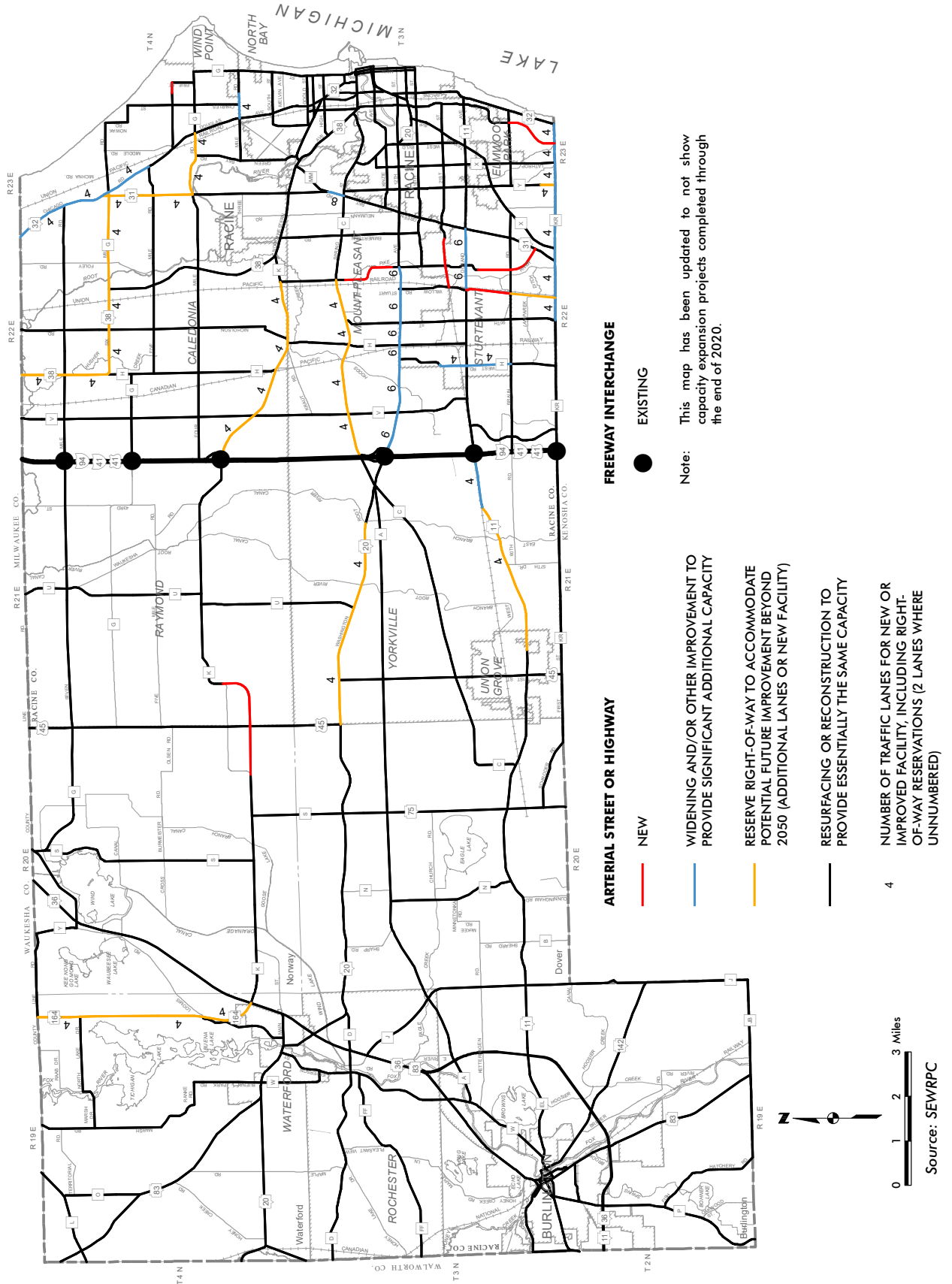


Map 1.17

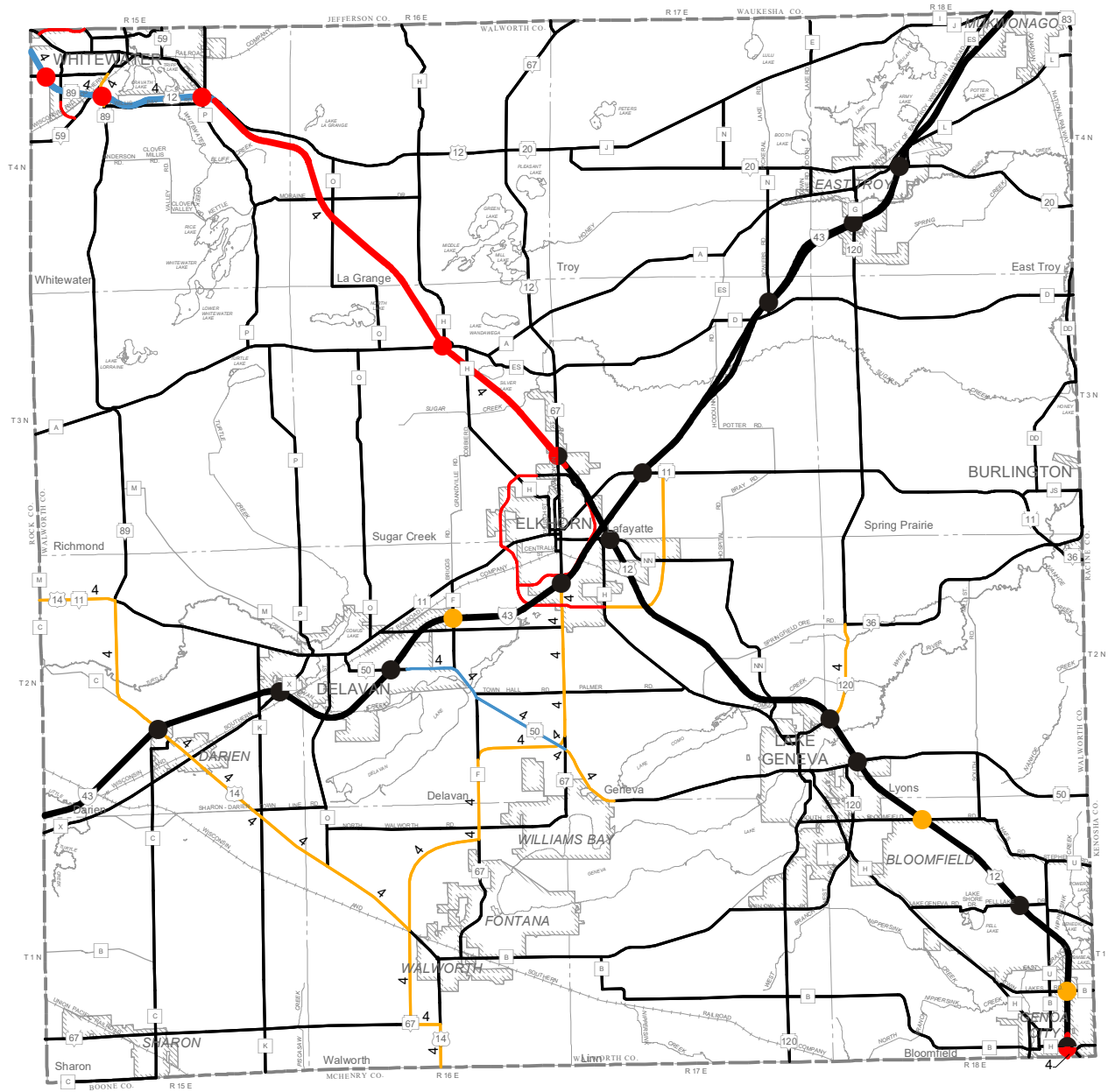
Functional Improvements to the Arterial Street and Highway System in Ozaukee County: VISION 2050



Map 1.18 **Functional Improvements to the Arterial Street and Highway System in Racine County: VISION 2050**



Map 1.19 Functional Improvements to the Arterial Street and Highway System in Walworth: VISION 2050



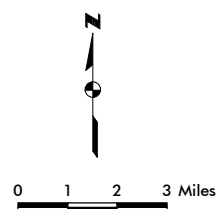
ARTERIAL STREET OR HIGHWAY

- NEW
- WIDENING AND/OR OTHER IMPROVEMENT TO PROVIDE SIGNIFICANT ADDITIONAL CAPACITY
- RESERVE RIGHT-OF-WAY TO ACCOMMODATE POTENTIAL FUTURE IMPROVEMENT BEYOND 2050 (ADDITIONAL LANES OR NEW FACILITY)
- RESURFACING OR RECONSTRUCTION TO PROVIDE ESSENTIALLY THE SAME CAPACITY
- 4 NUMBER OF TRAFFIC LANES FOR NEW OR IMPROVED FACILITY, INCLUDING RIGHT-OF-WAY RESERVATIONS (2 LANES WHERE UNNUMBERED)

FREEWAY INTERCHANGE

- NEW
- ◐ HALF NEW
- EXISTING
- RESERVE RIGHT-OF-WAY TO ACCOMMODATE FUTURE IMPROVEMENT (POTENTIAL NEW INTERCHANGE)

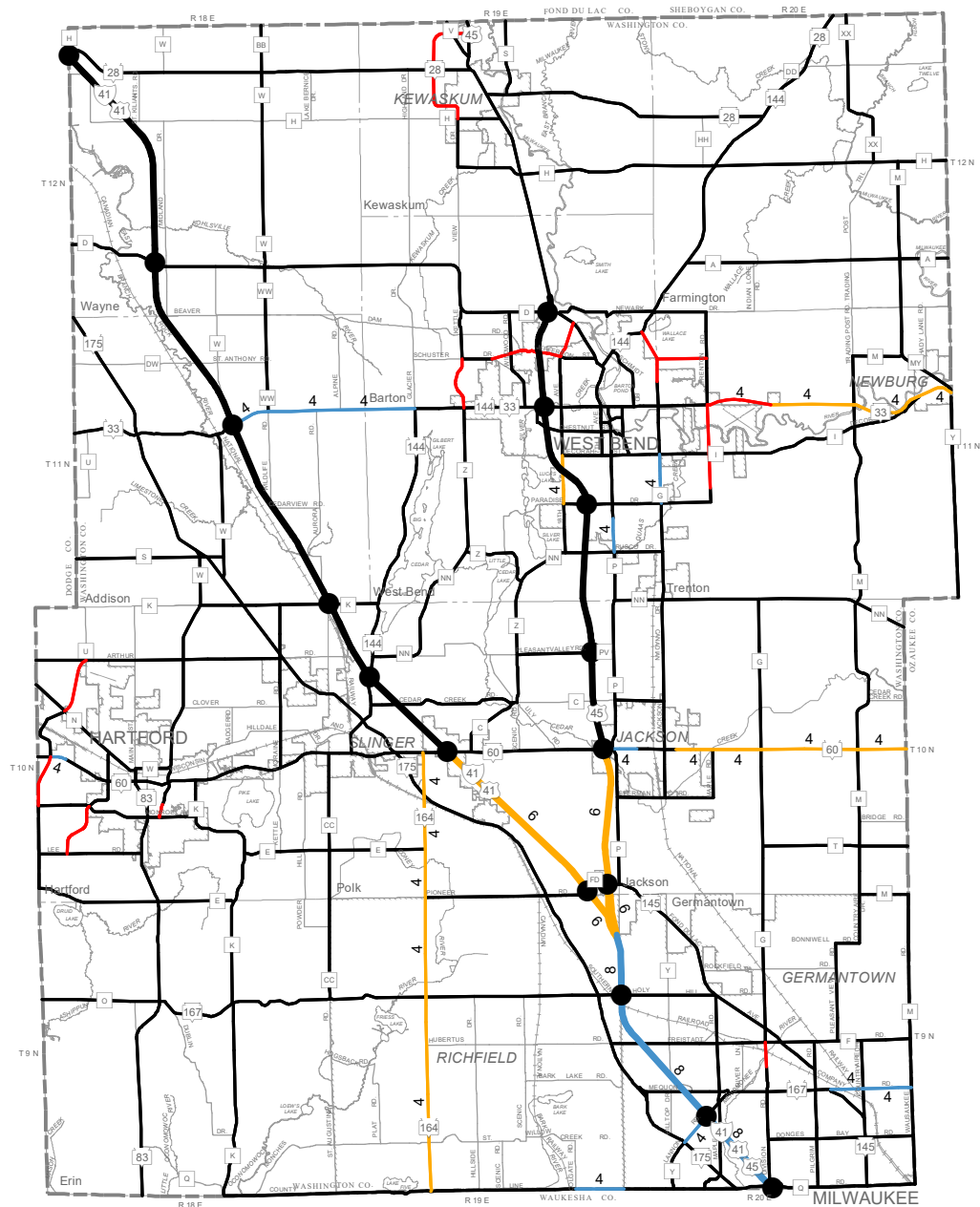
Note: This map has been updated to not show capacity expansion projects completed through the end of 2020.



Source: SEWRPC

Map 1.20

Functional Improvements to the Arterial Street and Highway System in Washington County: VISION 2050



ARTERIAL STREET OR HIGHWAY

- NEW
- WIDENING AND/OR OTHER IMPROVEMENT TO PROVIDE SIGNIFICANT ADDITIONAL CAPACITY
- RESERVE RIGHT-OF-WAY TO ACCOMMODATE POTENTIAL FUTURE IMPROVEMENT BEYOND 2050 (ADDITIONAL LANES OR NEW FACILITY)
- RESURFACING OR RECONSTRUCTION TO PROVIDE ESSENTIALLY THE SAME CAPACITY
- 4 NUMBER OF TRAFFIC LANES FOR NEW OR IMPROVED FACILITY, INCLUDING RIGHT-OF-WAY RESERVATIONS (2 LANES WHERE UNNUMBERED)

FREEWAY INTERCHANGE

- EXISTING

Note: This map has been updated to not show capacity expansion projects completed through the end of 2020.

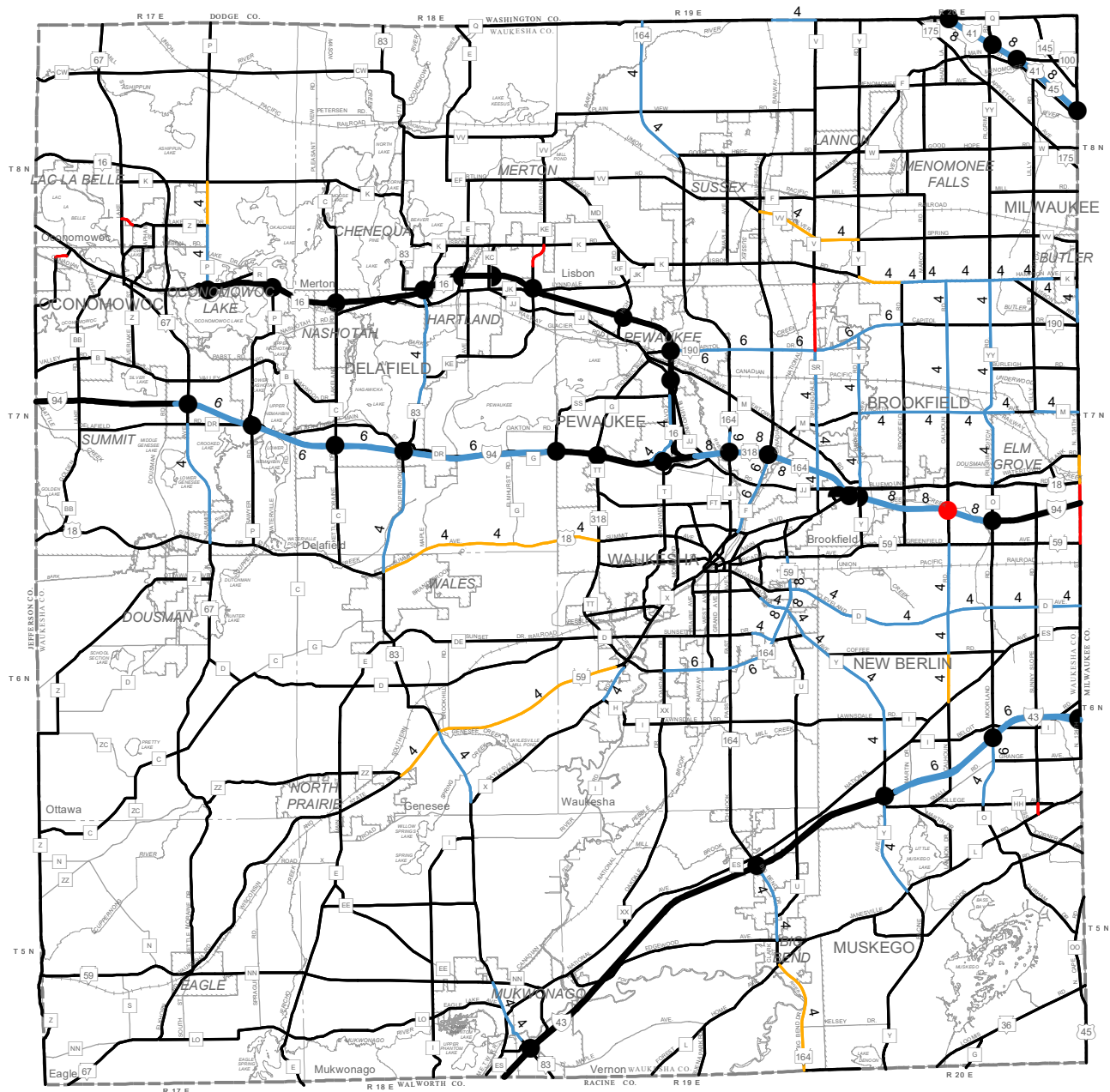


0 1 2 3 Miles

Source: SEWRPC

Map 1.21

Functional Improvements to the Arterial Street and Highway System in Waukesha County: VISION 2050



ARTERIAL STREET OR HIGHWAY

- NEW
- WIDENING AND/OR OTHER IMPROVEMENT TO PROVIDE SIGNIFICANT ADDITIONAL CAPACITY
- RESERVE RIGHT-OF-WAY TO ACCOMMODATE POTENTIAL FUTURE IMPROVEMENT BEYOND 2050 (ADDITIONAL LANES OR NEW FACILITY)
- RESURFACING OR RECONSTRUCTION TO PROVIDE ESSENTIALLY THE SAME CAPACITY
- 4 NUMBER OF TRAFFIC LANES FOR NEW OR IMPROVED FACILITY, INCLUDING RIGHT-OF-WAY RESERVATIONS (2 LANES WHERE UNNUMBERED)

FREEWAY INTERCHANGE

- NEW
- EXISTING

Note: This map has been updated to not show capacity expansion projects completed through the end of 2020.



0 1 2 3 Miles

Source: SEWRPC

In addition, access by automobile to major activity centers (such as retail centers, major parks, universities, and health care providers) and regional destinations (such as Milwaukee Mitchell International Airport and the Milwaukee Regional Medical Center) would be expected to remain about the same by the year 2050 for the Region's population. Implementation of the year 2050 arterial street and highway system would be expected to improve overall safety and maintain the condition of the pavement and bridges along the planned arterial system.

► **Recommendation 6.1: Keep the Region's arterial street and highway system in a state of good repair**

VISION 2050 recommends that the condition of all 3,600 miles of the roadways that are part of the Region's existing arterial street and highway system be preserved to maintain their ability to effectively carry higher levels of people and goods. Preserving the condition of the Region's arterial streets and highways—including pavement, bridges, and all other infrastructure in the roadway right-of-way²⁰—is critical to provide for safe and efficient travel throughout the Region. As they carry a higher level of people and goods each day, preserving the condition of the arterial streets and highways is important for achieving a high standard of living for the Region's residents and giving the Region a competitive edge in terms of retaining and attracting businesses.



Roadways and bridges have a long life before they need to be replaced or reconstructed (typically 50 to 60 years for highways and 50 to 75 years for bridges). However, because of vehicular use (particularly by trucks) and changing weather conditions (freeze/thaw cycle in winters and hot summers), roadways and bridges deteriorate over time. As the comfort and safety of drivers can be affected when these facilities reach a critical point of deterioration, it is necessary to improve the condition of roadways and bridges, along with other highway infrastructure, through routine maintenance, periodic rehabilitation, and reconstruction.²¹ VISION 2050 recommends that the condition of roadway pavements and bridges be maintained at least to its current level through the year 2050. Specifically, it recommends maintaining or increasing the baseline proportion of pavement that is in "good" condition (about 55 percent in 2013), and maintaining or reducing the baseline proportion of pavement in "bad" condition (about 11 percent in 2013), during the life of the plan. Similarly, it recommends maintaining or increasing the baseline proportion of bridges that have a sufficiency rating of 80 or more (about 71 percent in 2013), and maintaining or reducing the baseline proportion of bridges with a sufficiency rating less than 50 (about 5 percent in 2013), during the life of the plan.

- **Asset Management Plans** – As available Federal, State, and local funding is limited, it is important that the timing and choice of rehabilitation and timing of reconstruction/replacement of various roadway features (pavement, bridges, and other roadway infrastructure) be done consistent with their life cycle in order to utilize the available funding effectively. Thus, sound asset

²⁰ Other highway infrastructure within the roadway right-of-way would include traffic signals, lighting, signs, culverts, storm sewers, and tunnels.

²¹ Rehabilitation for highways typically includes resurfacing (removing and overlaying a layer of the pavement) and reconditioning (resurfacing plus spot base repairs). The first rehabilitation typically occurs 20 to 30 years following a roadway's construction or reconstruction, with two subsequent rehabilitations occurring every 8 to 18 years.

management practices are necessary to effectively utilize the limited funding resources. With respect to pavement, this means focusing more on less costly maintenance work and rehabilitations as needed to maximize pavement life, and thus avoiding substantial pavement deterioration and costly premature pavement reconstruction. To assist in managing the condition of their roadways, many states and local governments have developed asset management plans that include strategies for monitoring the condition of the roadway features and for implementing cost-effective maintenance and rehabilitation activities. In 2019, WisDOT developed and implemented an asset management plan for the pavement and bridges for the highways under the State's jurisdiction. VISION 2050 recommends that local governments within the Region also develop and implement asset management plans for the arterial and nonarterial roadways under their jurisdiction. This would be particularly important for local governments that maintain a large system of arterial and nonarterial roadways.



Complete streets involves designing roadways to provide for the safe and convenient travel of all roadway users traveling by various modes.

► **Recommendation 6.2: Incorporate “complete streets” concepts for arterial streets and highways**

Complete streets is a roadway design concept focused on providing for the safe and convenient travel of all roadway users (of all ages and abilities) traveling by various modes (walking, bicycling, transit, or automobile) within the roadway right-of-way. Complete street features can be implemented to encourage walking and bicycling and the use of transit as alternatives to travel by automobile. VISION 2050 recommends that complete street concepts be considered as part of the reconstruction of existing surface arterial roadways and the construction of new surface arterial roadways. In the interim, VISION 2050 recommends that, at the time of resurfacing of suitable existing arterial roadways with sufficient roadway surface width, consideration be given to providing a partial implementation of complete streets, such as adding bicycle lanes or widened travel shoulders. Reducing the number of travel lanes on multi-lane roadways that have existing and future traffic volumes that do not require the current number of travel lanes—called road diets—is an effective means of implementing complete streets. Road diets have been found to improve safety through reducing travel speeds, allowing the implementation of bicycle accommodations, and shortening the in-traffic crossing distances for pedestrians at intersections and mid-block crossings.

While the purpose of complete streets is to provide for the safe and convenient travel for all users on the roadway, the level of complete street features implemented for a particular roadway would be dependent on the types of land use adjacent to the roadway (urban, suburban, or rural), the prevalence of each type of user, and the preferences of the community in which the roadway is located. In urban areas, complete street features can be added to support and enhance adjacent mixed-use developments. Along arterials where transit service is provided, complete street features can include providing safe and accessible transit stops for transit users within the roadway right-of-way, as described under Recommendations 2.6 and 2.7. Accommodations, such as sidewalks and bicycle lanes, can also be implemented to enhance bicycle and pedestrian safety. In addition, complete street elements can be provided within the roadway right-of-way of lower speed arterial roadways that enhance the adjacent mixed-use developments. This can include providing aesthetic features, like plantings and trees, and more practical features, like bike racks, benches, and tables and chairs. Where sidewalk space is limited, such

features can be temporarily provided by utilizing some of the existing parking stalls, or sections of unused or underused roadway. With respect to rural areas, providing a complete street can involve the provision of wide paved shoulders or a separate multi-use path. More details about the provision of bicycle and pedestrian accommodations can be found under Recommendations 3.1, 3.3, and 3.5.

VISION 2050 also recommends that curbside management practices be considered in urban areas to utilize the curbside space to better accommodate all users. Curbside space can be utilized to implement many of the previously indicated complete street measures—such as improved bus stops, bicycle accommodations, and pedestrian crossings. However, in recent years, there has been increased demand for curbside space to accommodate emerging trends and other uses. For example, expansion of ride hailing, carsharing, and online shopping and associated deliveries has increased pick-ups, drop-offs, and idling in some areas of the Region—with such vehicles often blocking travel and bike lanes for periods of time. To address this, communities can utilize curbside space for flex loading zones in high-demand areas that provide designated areas for such uses either all day or during parts of the day, such as during peak usage times. In communities that permit personal mobility services (bikes, e-bikes, and scooters), designated parking areas for these devices can be provided within the curbside space to assist in avoiding interaction with pedestrians. The curbside space can also be utilized to provide designated areas for mobile businesses (such as food trucks), and to provide charging stations for electric vehicles. As well, the curbside area can be utilized in highly developed areas for stormwater treatment and infiltration to improve water quality and reduce the quantity of runoff entering the storm sewer system.

Given all the potential uses of a roadway, VISION 2050 also recommends that local governments develop neighborhood- or corridor-level complete streets plans that provide recommendations on the most beneficial uses of the roadway right-of-way space. Such plans should include a comprehensive evaluation that considers all potential users, adjacent land uses, and the goals of the community. As part of development of the plans, the complete streets/curb use priorities can be established for the entire community or for particular land uses or zoning districts. In addition, the implementation of complete streets and curbside management can be added to local zoning codes and design standards to guide their implementation as part of future roadway projects or land development and redevelopment. As well, curbside regulations can be established or expanded to ensure that the true value of that space is charged for its use, whether it be for parking or other uses.

► **Recommendation 6.3: Expand arterial capacity to address residual congestion**

VISION 2050 recommends approximately 233.1 route-miles be widened to provide additional through traffic lanes, representing about 6 percent of the total VISION 2050 arterial street and highway system mileage, including 68.3 miles of existing freeways. These recommended widenings are shown as blue lines on Maps 1.15 through 1.21. In addition, VISION 2050 recommends 64.8 route-miles of new arterial facilities, representing about 2 percent of the total year 2050 arterial street mileage. These highway improvements are recommended to address the residual congestion that may not be alleviated by recommended land use, systems management, demand management, bicycle and pedestrian facilities,



Highway improvements are recommended to address the residual congestion that may not be alleviated by other measures recommended under VISION 2050.

and public transit measures. In addition, many of the recommended new arterial facilities are recommended to provide a grid of arterial streets and highways at the appropriate spacing as the planned urban areas of the Region develop to the year 2050.

Each arterial street and highway project would need to undergo preliminary engineering and environmental studies by the responsible State, county, or local government prior to implementation. The preliminary engineering and environmental studies will consider alternative alignments and impacts, including a no-build option, and final decisions as to whether and how a planned project will proceed to implementation will be made by the responsible State, county, or local government at the conclusion of preliminary engineering.

- **Freeways** – VISION 2050 recommends the widening of 68.3 miles of existing freeways with an additional lane in each direction at the time of their reconstruction and the conversion of the 4.8-mile USH 12 bypass of Whitewater to a four-lane freeway.

VISION 2050 does not make any recommendation with respect to whether the reconstruction of 10.0 miles of IH 43 between Howard Avenue and Silver Spring Drive should include additional traffic lanes. VISION 2050 recommends that preliminary engineering conducted for the reconstruction of this segment of IH 43 should include the consideration of alternatives for rebuilding the freeway with additional lanes and rebuilding it with the existing number of lanes. The decision regarding how this segment of IH 43 would be reconstructed would be made by WisDOT as part of preliminary engineering and an environmental impact study. Any construction along this segment of IH 43 prior to preliminary engineering—such as bridge reconstruction—should fully preserve and accommodate the future option of rebuilding the freeway with additional lanes.

Currently, the preliminary engineering and environmental impact studies have been completed or nearly completed for 17.2 miles of freeway reconstruction including widening as part of the reconstruction of IH 94 between 70th Street and 16th Street in Milwaukee County and IH 43 between Silver Spring Drive and STH 60. Thus, about 25 percent of the recommended 68.4 miles of freeway capacity expansion that include an additional lane in each direction may be considered as committed projects. The remaining 51.2 miles of recommended freeway widening, as well as the 10.0 miles of IH 43 in Milwaukee County between Howard Avenue and Silver Spring Drive, will undergo preliminary engineering and environmental impact study by WisDOT. During preliminary engineering for the reconstruction of these segments of freeway, alternatives will be considered, including rebuilding as is, various options of rebuilding to modern design standards, compromises to rebuilding to modern design standards, rebuilding with additional lanes, and rebuilding with the existing number of lanes. Only at the conclusion of the preliminary engineering would a determination be made as to how these freeways would be reconstructed.

- **Freeway Interchanges** – On the existing freeway system, VISION 2050 recommends two new freeway interchanges (IH 94 with Calhoun Road and IH 43 with Highland Road). VISION 2050 also recommends the conversion of a half interchange to a full interchange (IH 43 with County Line Road) and the conversion of a

full interchange to a half interchange (IH 94 with Hawley Road). The conversions of these interchanges were part of WisDOT's preferred alternatives for the reconstruction of IH 43 between Silver Spring Drive and STH 60 and IH 94 between 70th Street and 16th Street, respectively. In addition, VISION 2050 identifies four potential new future interchanges for consideration (CTH ML with IH 94, CTH B with USH 12, Bloomfield Road with USH 12, and CTH F with IH 43) and recommends that action be taken by local governments to preserve the potential necessary right-of-way to assure that the future development of these interchanges is not precluded. Should the concerned local governments take the next step of participating with WisDOT in the conduct of a preliminary engineering study of the interchange, and should the preliminary engineering conclude with a recommendation to construct the interchange, the Commission, upon the request of the concerned local governments and WisDOT, would take action to amend VISION 2050 to recommend the construction of the interchange.

► **Recommendation 6.4: Avoid, minimize, or mitigate environmental impacts of arterial capacity expansion**

VISION 2050 recommends that transportation system improvement impacts to natural resource areas (such as primary environmental corridor and wetland) be avoided. Should impacts to these areas be found to be unavoidable through preliminary engineering and environmental impact study, VISION 2050 recommends that impacts to such areas be minimized and, if required, mitigated. Arterial street and highway capacity expansion has been developed through the VISION 2050 planning process to avoid, if possible, impacts to environmentally sensitive resources. The regional transportation planning process first considers land use and transportation alternatives other than arterial street and highway improvements. Arterial street and highway capacity expansion is considered only to address the residual traffic volume and congestion that would not be addressed by these other land use and transportation measures, such as expanded public transit. The Commission has also developed and maintains extensive databases of the location and quality of environmentally sensitive resources in the Region. During the plan development process, efforts were made by the Commission staff to consider arterial improvements and conceptual alignments that avoid, to the extent possible, impacts on environmentally sensitive resources.

- **Avoidance and Minimization of Environmental Impacts** – During the preliminary engineering and environmental studies of arterial street and highway projects with potential impacts to environmentally sensitive resources, it is expected that all feasible efforts will be made to avoid or minimize adverse impacts through consideration of design alternatives. During preliminary engineering and environmental studies, consideration should be given to alternate alignments and cross-sections designed specifically to minimize unavoidable impacts to environmentally sensitive resources. To further minimize impacts, consideration should be given to the use of alternative design features, such as construction of a bridge over wetlands rather than a roadway on fill, even if they significantly increase project costs. Another technique that should be considered to minimize impacts would be to seek exceptions to design standards that would reduce the roadway cross-section through the impacted area, or to include sustainable stormwater management practices such as bioswales and retention systems when possible.



Transportation system improvements should first avoid or minimize any adverse impacts on environmentally sensitive resources, then mitigate only where impacts are unavoidable.

- **Mitigation of Environmental Impacts** – Where environmentally sensitive resources will be unavoidably impacted, and for which compensatory mitigation is required, efforts should focus on the preferred means of mitigation as identified by the appropriate regulatory agencies.²² Types of mitigation typically considered include enhancement of the remaining adjacent environmentally sensitive resources that will not be impacted as part of the arterial street and highway project, re-creation of the impacted environmentally sensitive resources, creation of new environmentally sensitive resources, or the acquisition and utilization of mitigation bank credits. Potential mitigation sites could include areas within or adjacent to primary environmental corridors, secondary environmental corridors, and isolated natural resource areas; mitigation bank sites; and areas identified in SEWRPC Planning Report No. 42, *A Regional Natural Areas and Critical Species Habitat Protection and Management Plan for Southeastern Wisconsin*.



Vehicular crashes take a heavy toll in life, property damage, and human suffering, and should be minimized through a variety of measures.

► **Recommendation 6.5: Address safety needs on the arterial street and highway network**

The occurrence of crashes can have a negative effect on the Region as they contribute to overall transportation costs; increase public costs for police, emergency medical, and other social services; and cause nonrecurring congestion on the highway system. In addition, vehicular crashes take a heavy toll in life, property damage, and human suffering. Vehicular crashes occur due to one or a combination of the following factors: human error, vehicle failure, and roadway/environmental conditions. VISION 2050 recommends that Federal, State, and local governments, and the Commission, work to:

- **Minimize total traffic crashes on the arterial street and highway system** – Implementing each element of VISION 2050 should minimize the number of total traffic crashes on the arterial street and highway system. For example, the recommended improvement and expansion of public transit and bicycle and pedestrian facilities and implementation of the recommended TDM measures should reduce the growth in vehicle travel, conflicts, and crashes and encourage increased travel on safer facilities and services. Also, the recommended reconstruction of the freeway system with additional traffic lanes should reduce traffic congestion and related traffic crashes. While VMT may be expected to increase by 20 percent by the year 2050, total vehicular crashes are estimated to increase by only 16 to 22 percent with full implementation of all elements of VISION 2050.

²² Established Federal and/or State policy and guidelines exist with respect to compensatory mitigation of certain environmentally sensitive resources. With respect to wetlands, all wetland compensatory mitigation efforts must meet the requirements of Section 404 of the Clean Water Act including the U.S. Environmental Protection Agency 404(b)(1) Guidelines (40 CFR Part 230) and the Federal Mitigation Rule (33 CFR Part 332), Section 10 of the Rivers and Harbors Act, Section 281.36 of the Wisconsin Statutes, Chapter NR 350 of the Wisconsin Administrative Code, 2011 State of Wisconsin Act 118, and, for Wisconsin Department of Transportation projects, compensatory mitigation efforts must meet the requirements of the cooperative agreement between the Wisconsin Departments of Natural Resources and Transportation. The Wisconsin Department of Natural Resources, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service have jointly developed specific guidelines for required compensatory mitigation for permitted wetland loss in Wisconsin. The document, dated August 2013, is entitled, *Guidelines for Wetland Compensatory Mitigation in Wisconsin*.

With respect to highways, strategies that can reduce the number of crashes should be considered for roadways identified as having excessive crashes as part of a safety assessment or during preliminary engineering for their reconstruction or rehabilitation. These strategies can include modifying roadway and roadside elements (such as increasing lane width, adding/widening paved shoulders, installing side barricades, and removing fixed objects along the roadside), improving horizontal and vertical grades, modifying intersections (such as improving signal timing and adding turn lanes), adding/modifying signage and pavement markings, and controlling access. In some cases, the rate of crashes may be reduced by adding capacity along a surface arterial, such as reconstructing an urban two-lane arterial that exceeds its design capacity as a divided roadway. With respect to freeways, strategies to reduce the number of crashes could also include removing ramp entrances and exits on the left side of the freeway, increasing the distance between ramp terminals, and increasing entrance ramp length. Adding capacity on heavily congested freeways can also be expected to reduce crash rates.

- **Minimize total traffic crashes, along with crashes involving fatalities and serious injuries, on the arterial street and highway system** – There are many factors that can affect the severity of a crash, including human factors (age and vulnerability of drivers/passengers, seat belt/helmet use, speed of vehicle, sobriety of driver), vehicle factors (safety features), and roadway/environmental factors (weather conditions, pavement condition, grade, presence of roadside features). Implementing the recommendations of the State’s Strategic Highway Safety Plan (SHSP) by the State and local governments would assist in the reduction of crashes involving fatalities and serious injuries.²³ While implementing the SHSP would be expected to reduce overall crashes, addressing the types of crashes emphasized in the SHSP would also be expected to reduce fatalities and serious injuries, which occur at a higher proportion for such crashes. The types of crashes prioritized in the SHSP include intersection crashes, speed-related crashes, head-on and roadway departure crashes, crashes involving pedestrians and bicyclists, alcohol/drug-related crashes, and crashes involving the driver or passengers not wearing a seatbelt.
- **Minimize crashes due to reckless driving** – Reckless driving typically involves operating vehicles with disregard for traffic laws and the safety of others, including driving at excessive speeds. Driving recklessly can greatly increase the opportunity for crashes and the severity of those crashes. For example, nearly 40 percent of vehicular-related fatalities that occurred in the Region in 2018 could be attributed, among other factors, to drivers travelling at excessive speed or too fast for conditions. As such, VISION 2050 recommends that measures effective in addressing reckless driving should be considered, including infrastructure improvements, public education, and increased accountability and enforcement.
 - **Infrastructure Improvements** – Narrowing travel lanes, providing protected or separated bicycle accommodations,

²³ At the time VISION 2050 was updated, the most recent SHSP was completed in November 2017 for the years 2017-2020 and can be found at wisconsindot.gov/Pages/safety/education/frms-pubs.

reducing unnecessary travel lanes (road diets), providing pedestrian curb bump-outs, visually narrowing the roadway using streetscaping (such as street trees), ensuring speed limits are appropriate for surrounding land uses, and incorporating other complete street concepts have all been found to lower travel speeds and assist in reducing reckless driving.

- **Public Education** – Campaigns that provide information about the consequences of reckless driving and excessive speeding can be implemented through traditional drivers' education courses, web-based media campaigns, youth programs and activities, community outreach events, and traditional public service announcements.
- **Enforcement and Accountability** – Increased enforcement in known problem areas, mandated safe-driving classes for offenders, and increased data sharing among all agencies are strategies that have been found to reduce reckless driving. While currently not permitted in Wisconsin, automated traffic enforcement (red-light and speed cameras) have also been found to be effective in increasing the obedience of traffic laws and in reducing reckless driving and crashes. Since 2017, members of the State Legislature have been working on legislation to permit a pilot automated traffic enforcement program in the City of Milwaukee.

VISION 2050 further recommends that these measures and others should be reviewed and implemented in a coordinated effort through State and local transportation departments, law enforcement agencies, and local stakeholders. In some cases, action by the State Legislature may be required.

- **Minimize bicycle and pedestrian-related crashes** – While the number of reported vehicular crashes involving either a bicycle or a pedestrian accounted for only 2 percent of all vehicular crashes in the Region, they were involved in about 18 percent of vehicular crashes resulting in a fatality or serious injury. VISION 2050 promotes the improvement of bicycle and pedestrian safety by recommending implementation of safe and convenient accommodations for bicycle and pedestrian traffic. Specifically, VISION 2050 recommends that as arterial roadways in the Region are reconstructed and resurfaced, bicycle accommodation be considered and implemented, as described in Recommendation 3.1. In addition, VISION 2050 recommends, under Recommendation 3.2, expanding a system of off-street bicycle paths largely constructed in natural resource and utility corridors. VISION 2050 also recommends a network of enhanced bicycle facility corridors through the Kenosha, Milwaukee, and Racine urbanized areas, as described under Recommendation 3.3. These corridors, in particular, would be expected to reduce bicycle-related crashes on higher-speed, higher-volume arterial streets and highways within the three urbanized areas by separating bicyclists from automobiles (either through accommodations along the roadway or through bike boulevards on parallel nonarterials). With respect to pedestrian safety, VISION 2050 recommends providing sidewalks in areas of existing or planned urban development, and encourages making efforts to maximize pedestrian safety at street crossings in these locations, as described in Recommendation 3.5.

- **Reduce conflicts between automobiles and public transit vehicles** – VISION 2050 recommends expanding the use of dedicated transit lanes along rapid, express, and major local transit routes, as described in Recommendation 2.6. The dedicated transit lanes could be provided via auxiliary lanes, or where right-of-way is constrained through peak-period, peak-direction curb-lane parking restrictions. These lanes are intended to reduce travel times and improve transit travel time reliability during times of congestion, but can also reduce the conflicts between automobiles and public transit vehicles by allowing transit vehicles to stop without interrupting the flow of traffic.
- **Reduce vehicle traffic conflicts** – VISION 2050 recommends that traffic engineering measures and access management standards be considered to reduce vehicle traffic conflicts, including freeway modernization, congestion mitigation, and implementation of alternative intersection types.
 - **Freeway Modernization** – It is anticipated that the segment-by-segment reconstruction of the regional freeway system would continue during the time period of VISION 2050. The regional freeway system was originally built in the 1950s, 1960s, and 1970s, and is approaching the end of its useful life. Over the last few decades, there have been significant advances in freeway design, as a result of research and experience in freeway operations. The existing freeway system has many deficiencies in design—left-hand exits and entrances, lack of shoulders, service interchanges spaced too close to freeway-to-freeway interchanges, and multi-point exits. VISION 2050 recommends reconstructing the freeway system to modern design standards, addressing the design deficiencies of the existing freeway system and improving travel safety.
 - **Congestion Mitigation** – Portions of the freeway system in the Region, particularly in Milwaukee and Waukesha Counties, currently experience severe congestion and are projected to experience substantially increased congestion for periods of the day, even if all the VISION 2050 recommendations that do not involve highway capacity expansion are implemented, including improved land use, travel demand and systems management, and improved and expanded public transit. The rate of overall crashes is greater on the segments of congested freeway (typically 2 to 7 times higher). In particular, rear-end crash rates (which make up about 40 percent of total freeway crashes) are 5 to 20 times higher on congested freeway segments, with the highest rates on the most severely congested freeway segments. While it would be expected that freeway modernization would reduce sideswipe crashes, it would not be expected to significantly reduce the number of rear-end crashes, which appear to be more of a result of freeway congestion. Thus, the freeway widenings recommended under Recommendation 6.3 would be expected to improve travel safety by reducing congestion and associated rear-end crashes.
 - **Alternative Intersections** – VISION 2050 recommends that alternative intersection types that reduce the number of vehicle-to-vehicle conflicts be considered, particularly for high-volume intersections. While VISION 2050 does not identify the specific treatment that should be implemented at each

intersection, it recommends that alternative intersection types be considered during the preliminary engineering conducted for the reconstruction of the intersection. Roundabouts are one example of an alternative intersection type increasingly being implemented throughout the Region. While a roundabout is not ideal for every intersection location, when properly designed and located, roundabouts have been found to be effective in reducing the number of crashes, and particularly the severity of crashes. Other intersection types utilized around the country that could be considered on the Region's arterial system include displaced left-turns, median U-turns, restricted crossing U-turns (including J-turn intersections), and quadrant roadways.

- **Access Management** – Developing and implementing access management standards, as recommended in Recommendation 4.7, along arterial streets and highways would be expected to reduce the number of conflicts that can result in vehicular crashes.
- **Regional Safety Implementation Plan** – VISION 2050 recommends that the Commission, working with WisDOT and local governments, develop a Regional Safety Implementation Plan (RSIP) that will identify a list of intersections and corridors along the Region's arterial streets and highways with the most severe crash rates in each county. These intersections and corridors would be prioritized based on the nature of the crashes and frequency of the crashes resulting in fatalities and serious injuries. This prioritization could be used by the State and local governments to identify intersections and corridors for further, more detailed safety studies and identifying and prioritizing projects for Federal and State Highway Safety Improvement (HSIP) funds. The study would also identify a list of corrective measures to reduce the number and severity of crashes.



Security planning involves preventing and responding to attacks affecting the arterial street and highway system.

► **Recommendation 6.6: Address security needs related to the arterial street and highway system**

Ongoing efforts to prevent and respond to attacks affecting the arterial street and highway system encompass a wide range of Federal, State, and local programs, measures, and initiatives. It is expected that Federal and State agencies will continue to refine transportation security measures over the upcoming years, and work toward closer cooperation, coordination, and integration of tasks at all levels of government in an effort to provide secure transportation networks and facilities throughout the United States. Although the Commission does not currently have a direct role in Federal and State Transportation Security policy decisions and implementation, in the future, the Commission will continue to maintain a supportive regional role for transportation security planning. As the Region's metropolitan planning organization, the Commission will work to coordinate activities with local, State, and Federal agencies and officials to provide a regional forum on security issues, and will continue to provide a high level of support for existing and ongoing transportation security measures.

The Commission will also monitor and assist WisDOT in implementing the security recommendations in its long-range transportation plan entitled *Connections 2030*.²⁴ The action items in that plan that involve Commission efforts include coordinating border county evacuation plans with Illinois,

²⁴ The Wisconsin Department of Transportation, *Connections 2030 Long-Range Multimodal Transportation Plan*, October 2009.

supporting the development of the transportation element of the National Response Framework, coordinating evacuation plans for Wisconsin's 12 largest communities, studying the needs of essential freight movement, developing the Wisconsin Airport Security Plan, offering security planning assistance to local transit agencies, and developing local plans that can be integrated into statewide emergency relief and disaster preparedness plans, strategies, and policies.

VISION 2050 recommends that the State and local governments in the Region continue to work with the Federal government and the Commission to address the security needs related to the arterial street and highway system:

- **Conduct periodic vulnerability assessments and monitor and strengthen vulnerable infrastructure** – The State has completed a vulnerability assessment of critical transportation infrastructure in Wisconsin, with guidance from the Federal government. The assessment, included in *Connections 2030*, identified transportation facilities in Wisconsin that have the potential to significantly disrupt the State's transportation system, should they lose functionality. Regularly updating this assessment, strengthening identified vulnerable transportation facilities, and regularly monitoring identified facilities would reduce the risk of disruptions to the Region's arterial street and highway system.
- **Develop and maintain county and local government all hazards mitigation plans** – The counties and local governments in the Region have prepared, or are in the process of preparing, all hazards mitigation plans. These plans fulfill requirements set forth by the Wisconsin Division of Emergency Management (WEM) and the Federal Emergency Management Agency (FEMA). The plans use an "All Hazards Approach" recommended by WEM and FEMA, giving appropriate consideration to such hazards as flooding; lakeshore bluff and dam failure episodes; severe weather conditions, including wind storms, tornadoes, periods of extreme heat or cold, and winter storms; terrorism; civil disorder; urban fire or mass casualty; and hazardous material situations. The Commission has prepared, and periodically updates, hazard mitigation plans for Kenosha County, Ozaukee County, Racine County, Washington County, and the City of Milwaukee. Milwaukee, Walworth, and Waukesha Counties have also prepared hazard mitigation plans. Including all of Southeastern Wisconsin in an up-to-date all hazards mitigation plan will help reduce the risk of disruptions to the Region's arterial street and highway system.
- **Maintain a resilient regional arterial street and highway network** – Implementing the capacity expansion improvements recommended in the arterial streets and highways element of VISION 2050 would result in a more resilient regional arterial street and highway network that would more effectively move people and goods on alternative routes should a portion of the network be disrupted.
- **Increase transportation system resiliency to flooding** – Identifying streets, highways, and other transportation facilities (e.g., bus stops and park-ride lots) that are susceptible to flooding, and identifying adjacent roadway facilities that could serve as alternative routes when flooding occurs, would help the Region's transportation

VISION 2050
recommends a study to
identify improvements
that would make the
regional transportation
system more resilient to
flooding.

system become more resilient with respect to the projected increase in frequency of large storm events. VISION 2050 recommends that the Commission staff conduct a study to identify transportation facilities in low-lying areas (e.g., within 100-year and 500-year floodplains) and identify potential improvements that would help the regional transportation system become more resilient to flooding.

- **Plan evacuation routes** – The Commission recognizes WisDOT security-related transportation policies and planning efforts in Southeastern Wisconsin, including the Emergency Transportation Operations Plan, downtown Milwaukee evacuation routes, and emergency alternate routes to IH 94 in Waukesha County. The Commission will work with WisDOT to ensure that these policies are adhered to and continually updated to achieve proper implementation in the Region.



► **Recommendation 6.7: Monitor growth and development of automated vehicles**

In recent years, automated features have been introduced to the mainstream automobile market. Although several regulatory and technological hurdles remain before fully autonomous vehicles become common place, automated vehicle technology continues to advance. VISION 2050 recommends that Commission staff work with Federal, State, and local governments to monitor the growth and development of automated vehicles to determine their effect on VISION 2050. Specifically, Commission staff will monitor changes in policies and infrastructure under the following topics as automated vehicle technology advances: (1) vehicle ownership; (2) operator requirements and liability laws; (3) land use implications; (4) interaction with other users of the roadway, particularly pedestrians and bicyclists; (5) connected vehicle infrastructure; and (6) implications for public transit and freight movement. Staff will review such changes in the context of potential changes to VISION 2050 as part of future updates to the plan.

VISION 2050 recommends improvements to achieve a safe, efficient, and multimodal freight transportation system.

Description of Freight Transportation Element

The movement of freight is essential for maintaining and growing Southeastern Wisconsin's economy. Truck, rail, water, and air modes of transportation bring raw materials to the Region's manufacturers, and they carry finished goods to domestic and international markets. The Region's freight transportation system is used by the U.S. Postal Service and express parcel service providers, and it supports commerce in the Region by providing for the movement of goods that stock the Region's retail stores. The Region's freight transportation system also supports the movement of building materials needed to construct and maintain the Region's homes and businesses as well as the transportation system itself. In 2018, approximately 144 million tons of domestic and international cargo valued at about \$202 billion were shipped to, from, and within the Milwaukee-Racine-Waukesha Combined Statistical Area (CSA).²⁵ This cargo was transported using a variety of modes, including: truck (83 percent of all shipments by weight and 79 percent by value); rail (12 percent by weight and 3 percent by value); water (2 percent by weight and 1 percent by value); air (less than 1 percent by weight and 2 percent by value); multiple modes and mail (2 percent by weight and 15 percent by value); pipeline

²⁵ Office of Freight Management and Operations, Federal Highway Administration, Freight Analysis Framework (FAF) Version 4.5.1. The Milwaukee-Racine-Waukesha Combined Statistical Area consists of Dodge, Jefferson, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha Counties.

(1 percent by weight and less than 1 percent by value); and other/unknown (less than 1 percent by weight and less than 1 percent by value).²⁶

VISION 2050 recommends a multimodal freight transportation system designed to provide for the efficient and safe movement of raw materials and finished products to, from, and within Southeastern Wisconsin. To achieve this goal, VISION 2050 recommends improvements to the Region's transportation infrastructure as well as intergovernmental cooperation and other actions to preserve key transportation corridors, address regulatory inefficiencies, meet trucking industry workforce needs, and increase transportation safety and security. Many of these recommendations serve to implement or support the State's Freight Plan completed in 2018.²⁷

► **Recommendation 7.1: Accommodate truck traffic on the regional highway freight network**

Freight shipments in Southeastern Wisconsin—including shipments involving ships, airplanes, and trains—rely heavily on trucks using the Region's arterial street and highway system. In particular, the movement of freight depends in large part on trucks using the regional highway freight network—arterial streets and highways in the Region intended to carry a higher percentage of truck traffic. The regional highway freight network is based on the National Highway System, the State's designated routes for long trucks, and Critical Urban Freight Corridors (CUFCs) and Critical Rural Freight Corridors (CRFCs) designated by the Commission and WisDOT (see Map 1.22).²⁸ Higher levels of congestion and the presence of bottlenecks on the regional highway freight network can result in increased shipping delays and higher shipping costs, negatively impacting businesses and manufacturers in the Region. VISION 2050 recommends implementing the capacity expansion improvements recommended in the arterial streets and highways element, which would address existing and forecast future traffic congestion on the regional highway freight network.



► **Recommendation 7.2: Accommodate oversized/overweight shipments to, from, and within Southeastern Wisconsin**

Unusually large or heavy goods shipped within or through the Region require that specific oversized/overweight (OSOW) truck routes be used. These routes may consist of streets and highways under State, county, or local jurisdiction. In some cases the movement of OSOW shipments may require temporarily changing infrastructure along the shipment's route—such as raising utility wires or moving traffic signals—or following a circuitous route to avoid physical restrictions such as low bridges. While OSOW shipments constitute only a small percentage of all truck shipments in the Region, they include high-value goods—including exports of locally manufactured products to other countries—that are important to the Region's economy. VISION 2050 recommends that State and local governments work with the Commission and local manufacturers, shippers, and utilities to improve the accommodation of OSOW shipments on the Region's arterial street







While oversized/overweight shipments constitute a small percentage of truck shipments, they include high-value goods important to the Region's economy.

²⁶ *Ibid.*

²⁷ *The Wisconsin Department of Transportation, Wisconsin State Freight Plan, April 2018.*

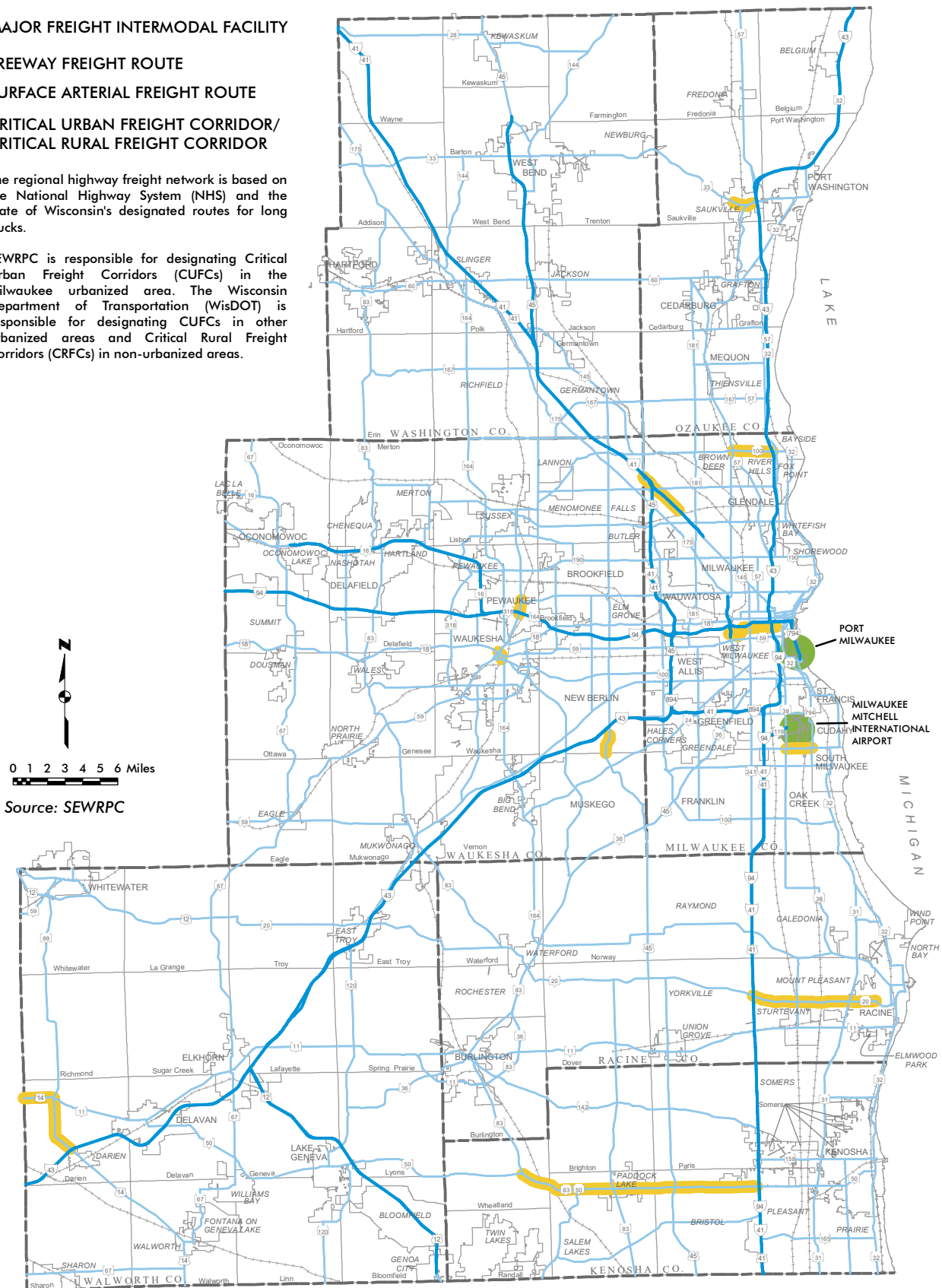
²⁸ *In accordance with the Fixing America's Surface Transportation (FAST) Act, the Commission, in consultation with WisDOT, is responsible for designating CUFCs for the Milwaukee urbanized area. Similarly, WisDOT, in consultation with the Commission, is responsible for designating CUFCs and CRFCs in the Region's other urbanized and non-urbanized areas.*

Map 1.22 Regional Highway Freight Network: 2020

-  MAJOR FREIGHT INTERMODAL FACILITY
-  FREEWAY FREIGHT ROUTE
-  SURFACE ARTERIAL FREIGHT ROUTE
-  CRITICAL URBAN FREIGHT CORRIDOR/
CRITICAL RURAL FREIGHT CORRIDOR

Note: The regional highway freight network is based on the National Highway System (NHS) and the State of Wisconsin's designated routes for long trucks.

SEWRPC is responsible for designating Critical Urban Freight Corridors (CUFCs) in the Milwaukee urbanized area. The Wisconsin Department of Transportation (WisDOT) is responsible for designating CUFCs in other urbanized areas and Critical Rural Freight Corridors (CRFCs) in non-urbanized areas.



Source: SEWRPC

and highway network. The following are specific actions recommended to improve the accommodation of OSOW shipments:

- **Analyze OSOW truck shipments in the Region** – Document and analyze the types of goods that are shipped, the origins and destinations of the shipments, the dimensions (height, width, and length) and weights of the shipments, the OSOW routes used, and the geometric envelopes (height and width) of the OSOW routes.
- **Maintain a regional OSOW truck route network** – Monitor and refine, as needed, the State's network of designated OSOW truck routes—including routes serving Port Milwaukee and routes serving origins and destinations outside the Region—to ensure their associated geometric envelopes and weight restrictions meet the needs of manufacturers and shippers in the Region.
- **Identify OSOW truck route infrastructure needs** – Document existing physical impediments to OSOW shipments on the delineated regional OSOW truck route network (e.g., low bridge clearances, low-hanging utility wires, or median barriers) and identify the infrastructure improvements to address the impediments. As an example, WisDOT has established a goal of providing a minimum 20-foot clearance for new and replacement bridges and sign structures along designated OSOW high-clearance routes.
- **Preserve OSOW truck routes** – Identify potential intergovernmental agreements or changes to *Wisconsin Statutes*, *Wisconsin Administrative Code*, or municipal ordinances that would aid in the preservation of the geometric envelopes and weight restrictions on the delineated OSOW truck route network.



An Oversize/Overweight Shipment
Credit: Port of Milwaukee

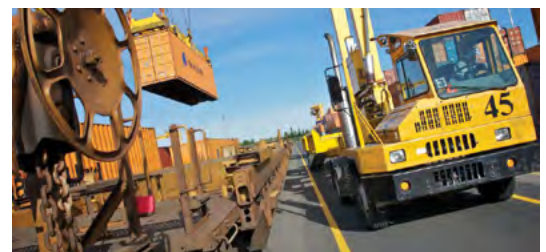
► **Recommendation 7.3: Pursue development of a new truck-rail intermodal facility in or near Southeastern Wisconsin**

In many cases freight shipments between Southeastern Wisconsin and other states or countries are most effectively transported using more than one mode of transportation. These intermodal shipments often use trucks for the shorter portion of the trip and rail for the longer portion of the trip. Currently, the truck-rail intermodal facilities—where containerized shipments are interchanged between trucks and freight trains—closest to Southeastern Wisconsin are located in the Chicago area, where intermodal shipments sometimes experience significant congestion-related delays. Locating such a facility in or near Southeastern Wisconsin could provide transportation benefits to the Region's manufacturers and shippers, including lower shipping costs. VISION 2050 recommends that local governments, the Commission, local manufacturers and shippers, freight railroads, and the State work together to pursue development of a new truck-rail intermodal facility in or near Southeastern Wisconsin.

- **Assess the feasibility of developing a new truck-rail intermodal facility** – Conduct a study on the feasibility of developing a new truck-rail intermodal facility in or near Southeastern Wisconsin. Such a study could include identifying potential locations for developing a new facility, surveying local manufacturers and shippers



The Region's intermodal shipments can experience significant congestion-related delays as they need to travel to truck-rail intermodal facilities in the Chicago area.



A Truck-Rail Intermodal Facility
Credit: Canadian Pacific Railway

regarding their interest in using a new facility, and working with the freight railroads to determine their interest and needs related to developing an intermodal facility.

- **Support private sector efforts to develop a new truck-rail intermodal facility** – Work with businesses seeking to develop a new truck-rail intermodal facility in or near Southeastern Wisconsin. Support could include identifying and implementing functional improvements to the Region’s arterial street and highway system to provide adequate access to the facility.



► **Recommendation 7.4: Develop truck size and weight regulations in Wisconsin consistent with neighboring states**

Inefficient movement of goods by truck between the Region and neighboring states can result from differences in truck size and weight regulations between Wisconsin and neighboring states (e.g., a truck may not be able to be fully loaded due to a neighboring state’s lower weight restrictions). VISION 2050 recommends that the State work with neighboring states and FHWA to develop truck size and weight regulations that are consistent across state lines.



► **Recommendation 7.5: Construct the Muskego Yard bypass**

Canadian Pacific Railway (CP) freight trains traveling through downtown Milwaukee currently pass through the Milwaukee Intermodal Station (MIS). The station is a stop for Amtrak’s Hiawatha Service and Empire Builder intercity passenger trains. It would also be a stop for commuter rail service under VISION 2050 and for expanded intercity passenger rail service under the State’s long-range state rail plan.²⁹ Upgrading track and signaling through CP’s Muskego Yard, which passes through the Menomonee Valley south of MIS, would allow freight trains traveling through downtown Milwaukee to bypass the station. This would benefit the station’s ability to accommodate additional commuter rail and intercity passenger rail service, and it would improve safety and reduce delays to both freight and passenger trains traveling through Milwaukee. As such, VISION 2050 recommends that the City and County of Milwaukee, the Commission, and the State work with CP to construct the Muskego Yard bypass. Map 1.23 shows the general location of the Muskego Yard bypass.



► **Recommendation 7.6: Address the potential need for truck drivers in Southeastern Wisconsin**

The trucking industry expects to experience a nationwide, significant shortage of qualified truck drivers in the near future, primarily due to increasing demand for shipping goods by truck in conjunction with the impending retirement of a large number of current truck drivers. VISION 2050 recommends that workforce development agencies and technical colleges in Southeastern Wisconsin monitor the trucking industry’s need for qualified drivers in the Region and work with the trucking industry to help address potential driver shortages. This could be done through raising the awareness of truck driving as a career opportunity and through the development of truck driver training opportunities.

²⁹ The Wisconsin Department of Transportation, Wisconsin Rail Plan 2030, March 2014.

Map 1.23
Location of Proposed Muskego Yard Bypass



► **Recommendation 7.7: Address safety needs related to freight transportation**

Crashes involving freight transportation negatively impact the wellbeing of Southeastern Wisconsin's residents as well as its economy. VISION 2050 recommends that Federal, State and local governments, the Commission, and private freight carriers continue to work to:

- **Minimize total traffic crashes on the regional highway freight network** – Implementing the capacity expansion improvements recommended in the arterial streets and highways element would address existing and forecast future traffic congestion and reduce total crashes on the regional highway freight network.
- **Implement Positive Train Control (PTC) systems** – Completing installation of PTC systems on major rail lines in the Region, as required by Federal law, would reduce the risk of train derailments and train-to-train collisions.
- **Reduce conflicts involving trucks** – Implementing the recommendations in the public transit element of VISION 2050 has the potential to reduce conflicts between trucks and automobiles by reducing the number of trips made by automobiles and by providing exclusive right-of-way for certain rapid transit routes. Implementing the recommendations in the bicycle and pedestrian element has the potential to reduce conflicts between trucks and bicycles and



pedestrians by providing additional off-street bicycle and pedestrian facilities (including bicycle/pedestrian paths and sidewalks) and expanded and enhanced on-street bicycle facilities.

- **Reduce conflicts involving freight trains** – Improving rail crossing infrastructure in the Region would reduce the risk of collisions between freight trains and motor vehicles, bicycles, and pedestrians. Improvements could include upgrading rail crossings to include visual and audible warning devices and/or gates, installing separate visual and audible warning devices and/or gates for bicyclists and pedestrians, reconstructing roads to improve crossing geometrics (e.g., to improve sight lines), or closing rail crossings and consolidating traffic on adjacent roads. Implementing the recommendations in the public transit element of VISION 2050 has the potential to reduce conflicts between freight trains and automobiles by reducing the number of trips made by automobiles. This would include implementing infrastructure improvements necessary for commuter trains to operate on existing freight rail lines without negatively affecting freight train operations.



► **Recommendation 7.8: Address security needs related to freight transportation**

Ongoing efforts to prevent and respond to attacks affecting freight shipped by truck, train, ship, and airplane encompass a wide range of Federal, State, and local programs, measures, or initiatives. VISION 2050 recommends that the State and local governments continue to work with the Federal government, the Commission, and private freight carriers and businesses to address security needs related to freight transportation, including:

- **Conduct periodic vulnerability assessments and monitor and strengthen vulnerable infrastructure** – The State has completed a vulnerability assessment of critical transportation infrastructure in Wisconsin, with guidance from the Federal government. The assessment identified transportation facilities in Wisconsin that have the potential to significantly disrupt the State’s transportation system, should they lose functionality.³⁰ Regularly updating this assessment, strengthening identified vulnerable transportation facilities, and regularly monitoring identified facilities would reduce the risk of disruptions to the Region’s freight transportation system.
- **Develop and maintain county and/or local government all hazards mitigation plans** – Several counties and local governments in the Region have prepared, or are in the process of preparing, all hazards mitigation plans. These plans identify potential hazards—which can include terrorism and civil disorder—and strategies for preventing and responding to incidents. Ensuring that all of Southeastern Wisconsin is included in an up-to-date all hazards mitigation plan would help reduce the risk of disruptions to the Region’s freight transportation system.
- **Maintain a resilient regional highway freight network** – Implementing the capacity expansion improvements recommended in the arterial streets and highways element would result in a more resilient regional highway freight network that would more

³⁰ The Wisconsin Department of Transportation, Connections 2030 Long-Range Multimodal Transportation Plan, October 2009.

effectively accommodate truck movements on alternative routes should a portion of the network be disrupted.

- **Study the needs of essential freight movement** – Studying and recommending strategies for ensuring that shipments of essential freight—such as food and fuel—can travel to, from, and within the Region during prolonged security incidents, as recommended by the State’s long-range transportation plan,³¹ would help the Region recover from incidents as well as support efforts to respond to incidents in other parts of the country.

► **Recommendation 7.9: Support efforts in areas outside the Region that improve freight movement to and from the Region**

Freight transportation issues in neighboring metro areas and states—such as highway and rail congestion in the Chicago area—can negatively impact the Region’s manufacturers and shippers. In some cases neighboring metro areas, states, the Federal government, and/or private sector freight transportation providers have initiated efforts to address these issues. For example, a partnership between the U.S. Department of Transportation (U.S. DOT), the State of Illinois, the City of Chicago, freight railroads, Metra, and Amtrak developed the Chicago Region Environmental and Transportation Efficiency Program (CREATE). CREATE has identified specific infrastructure improvements that would reduce freight rail congestion and truck and automobile delays at grade crossings in the Chicago area. VISION 2050 recommends that the State, the Commission, and local manufacturers and shippers participate in and support efforts outside Southeastern Wisconsin that address issues affecting freight movement to and from the Region.



Targets Established for the National Performance Measures

The Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, created a national performance management framework that established uniform performance measures and target setting to, in part, create a consistent nationwide process for monitoring the effectiveness of Federal transportation investments. As part of implementing the national performance management framework, metropolitan planning organizations (MPOs), like the Commission, are to establish transit and highway targets for performance measures under the following categories:

- Transit Asset Management (TAM)
- Transit Safety
- Highway Safety
- National Highway System (NHS) Bridge and Pavement Condition
- NHS and Freight Reliability
- Congestion Mitigation and Air Quality Improvement (CMAQ)

The Commission has established a series of transit and highway targets for performance measures that help to monitor the effectiveness of Federal transportation investments.

In implementing the national performance management framework in Southeastern Wisconsin, the Commission has established performance

³¹ *Ibid.*

targets for all but the transit safety performance measures.³² In developing the targets, it was determined that, since the required short-range targets were to be incorporated into VISION 2050, a long-range plan, long-term regional targets should be established, as appropriate, for the TAM, highway safety, NHS, freight, and CMAQ performance measures. As such, the short-term targets that were established for either the Metropolitan Planning Area or the Milwaukee urbanized area, as required as part of the national performance measure framework,³³ are based on these long-term regional targets. Highway safety-related targets were formally amended into VISION 2050 in June 2018, and the TAM, NHS, freight, and CMAQ-related targets were formally amended into VISION 2050 in June 2019.

Appendix P summarizes the established short-term and year 2050 regional targets, along with the process for developing the targets, for the TAM, highway safety, NHS, freight, and CMAQ performance measures. Appendix P also includes a summary of the progress in achieving the targets in the brief period of time since they were established.

The financial analysis for the VISION 2050 transportation system is guided by Federal requirements that the system only include projects that can be funded with reasonably expected revenues.

Financial Analysis for VISION 2050 Transportation System

Implementing the transportation system recommended in VISION 2050 will require adequate funding for the public transit system, bicycle and pedestrian network, and arterial street and highway system. The financial analysis in this section examines the expected costs of the transportation system recommended in VISION 2050 and compares those costs to reasonably expected revenues that would be available to fund the transportation system. Comparing cost and revenue forecasts illustrates potential funding gaps that would need to be addressed to fully implement VISION 2050. To address the funding gaps, VISION 2050 identifies additional revenue sources that should be explored. The transportation component of VISION 2050 is required by the Federal government to be funded with reasonably expected revenues. If funding gaps exist for the desired improvements of a particular element, those improvements would not meet Federal requirements for fiscal constraint, necessitating identification of a “Fiscally Constrained Transportation System” for Southeastern Wisconsin, which is presented in Chapter 2 of this volume.³⁴

The financial analysis prepared for VISION 2050 indicates existing funding sources are not adequate to construct, operate, and maintain the entire VISION 2050 transportation system.

When VISION 2050 was initially prepared, the financial analysis identified a gap between the funds needed to construct, operate, and maintain the recommended regional transportation system and the available revenues, with expected funds being insufficient to support a large portion of the recommended expansion of the Region’s transit element. In December 2018, an updated financial analysis included in the second amendment to the plan showed that the funding gap remained for public transit and also that

³² The transit safety targets are to be set within 180 days following the development of safety plans and transit safety target setting by all of the transit operators in Southeastern Wisconsin, which is due to be completed in late 2020.

³³ Under the national performance management framework, the Commission is required to establish performance targets for the Region’s Metropolitan Planning Area for all but two of the performance measures, and the Milwaukee urbanized area for two of the CMAQ-related measures. In addition, the TAM and highway safety targets are to be established annually, and the NHS, freight, and CMAQ targets are to be established every four years.

³⁴ Federal regulations regarding fiscal constraint of a regional transportation plan can be found in 23 CFR 450.324(f)(11), most recently published in the Federal Register on May 27, 2016. Additional information on fiscal constraint can be found at: www.fhwa.dot.gov/planning/guidfinconstr_qa.cfm and www.transit.dot.gov/regulations-and-guidance/transportation-planning/financial-planning-fiscal-constraint.

Table 1.13
Estimated Gap Between VISION 2050 Costs and
Existing and Reasonably Expected Revenues

Constant Year 2019 Dollars (Average Annual Through Year 2050)	
Highway	
Capital	\$367 million
Operating	\$19 million
Public Transit	
Capital	\$113 million
Operating	\$140 million
Year of Expenditure Dollars (Average Annual Through Year 2050)	
Highway	
Capital	\$683 million
Operating	\$49 million
Public Transit	
Capital	\$144 million
Operating	\$194 million

Source: SEWRPC

expected funding levels would be insufficient to support the recommended reconstruction of several portions of the Region's arterial street and highway system. The Commission staff subsequently prepared another updated financial analysis as part of the 2020 Review and Update of VISION 2050. This updated financial analysis is presented in this section.

Funding Gap Identification

Though the 2019-2021 State budget increased transportation funding over previous years, increases in vehicle fuel efficiency are expected to continue to limit growth in State funding. As such, State revenues are expected to be constant in nominal dollars through the year 2050, resulting in continuing declines in purchasing power due to inflationary pressures on construction and operating costs. This dynamic, combined with State-imposed limitations on the ability of local governments to generate revenue, results in the funding gaps shown in Table 1.13. These funding gaps mean that without additional revenue the Region will still be unable to achieve the public transit system recommended in VISION 2050 or complete the recommended reconstruction of several portions of the Region's arterial street and highway system by 2050. No funding gap was identified for other transportation elements as a part of this financial analysis.

Without additional funding, the Region will be unable to achieve the recommended public transit system or complete the recommended reconstruction of several portions of the arterial street and highway system.

Expected Costs and Revenues

The financial analysis relies on a detailed analysis of existing and reasonably expected revenues for the Region's transportation system, which is shown in Figure 1.5 for the arterial streets and highways element and Table 1.14 for the public transit element. A comparison of the estimated costs to implement the VISION 2050 transportation system and the available revenues, which illustrates how the funding gaps were identified, is presented in 2019 constant dollars in Table 1.15 and year of expenditure dollars in Table 1.16.

A significant portion of the arterial street and highway system expenses is related to the construction and reconstruction of significant arterial segments. Table 1.17 shows the estimated cost and potential schedule of significant arterial construction and reconstruction projects through 2050. This table is provided to give more insight into the costs associated with specific projects contained within the arterial streets and highways element.

Figure 1.5
Estimate of Existing and Reasonably Expected Arterial Street and Highway Revenues

Federal and State Capital and Operating Funding Assessment of Historical Statewide Funding (millions of nominal dollars)							
Program	Averaging Timeframe	Bonds		Federal	State	Total	Annual Growth (Percent)
		Transportation Revenue	General Obligation				
Major Highway Development	2020-2021 Budget	\$71	\$--	\$169	\$26	\$266	
	20-Year	132	13	91	55	291	1.55
	10-Year	115	21	109	74	319	-1.92
	5-Year	65	6	128	58	257	-4.08
State Highway Rehabilitation	2020-2021 Budget	\$--	\$--	\$448	\$520	\$968	
	20-Year	--	70	383	261	714	1.98
	10-Year	--	61	417	335	813	-0.75
	5-Year	--	30	438	357	825	0.05
Southeastern Wisconsin Freeway Megaproject	2020-2021 Budget	\$--	\$43	\$34	\$32	\$109	
	18-Year	--	91	86	33	210	-1.37
	10-Year	--	126	79	29	235	-14.85
	5-Year	--	150	48	13	211	-32.26
Operations and Maintenance	2020-2021 Budget	\$--	\$--	\$1	\$299	\$300	
	20-Year	--	--	3	218	221	-0.50
	10-Year	--	--	3	254	257	0.04
	5-Year	--	--	2	283	285	0.00
Local Roads and Bridges	2020-2021 Budget	\$--	\$--	\$--	\$203	\$203	
	20-Year	--	--	--	195	195	0.62
	10-Year	--	--	--	190	190	1.17
	5-Year	--	--	--	199	199	2.36
General Transportation Assistance	2020-2021 Budget	\$--	\$--		\$495	\$495	
	20-Year	--	--	--	395	395	1.56
	10-Year	--	--	--	422	422	1.01
	5-Year	--	--	--	429	429	2.28
Total	2020-2021 Budget	\$71	\$43	\$652	\$1,575	\$2,341	
	20-Year	132	174	563	1,158	2,027	
	10-Year	115	208	609	1,304	2,235	
	5-Year	65	187	615	1,339	2,205	

Reasonably Available/Expected Federal and State Annual Funding Levels: Statewide				
Program	Bonding	Federal	State	Total
Major Highway Development	\$71	\$169	\$26	\$266
State Highway Rehabilitation	--	448	520	968
Southeastern Wisconsin Freeway Megaproject	43	34	32	109
Operations and Maintenance	--	1	299	300
Local Roads and Bridges	--	--	203	203
General Transportation Aids	--	--	495	495
Total	\$114	\$652	\$1,575	\$2,341

Though the 2019-2021 State budget increased transportation funding over previous years, increases in vehicle fuel efficiency are expected to continue to limit growth in State funding. As such, State funding levels are expected to be constant in nominal dollars through the year 2050.

Based on the FAST Act, Federal funding levels are expected to increase by 2.0 percent annually.

Capital Funding Assumptions

Southeastern Wisconsin represents approximately 35 percent of the State in population, employment, income, and assessed value, and about 30 percent of vehicle-miles of travel. In the years after freeway system construction, and before freeway system reconstruction, Southeastern Wisconsin received about 25 to 30 percent of State highway system revenues.

State Highway System

To estimate Southeastern Wisconsin's share of State revenues, Option 1 allocates all Southeast Freeway Rehabilitation funds to Southeast Wisconsin and 25 percent of all other funds to Southeastern Wisconsin. Option 2 allocates 30 percent of all funds to Southeastern Wisconsin.

Option 1

$$\$109 + 0.25(\$1,234) = \$418 \text{ million}$$

Option 2

$$\$1,343 \times 0.30 = \$403 \text{ million}$$

Conclusion

\$418 million Federal and State annual highway revenue in nominal dollars

Figure continued on next page.

Figure 1.5 (Continued)

Local and County Trunk Highway System					
<u>Local Roads and Bridges</u>					
\$203 x 0.30 = \$61 million					
<u>General Transportation Aids (Capital)</u>					
Southeastern Wisconsin has historically received approximately 20 percent of Statewide General Transportation Aids. Capital expenses have typically represented approximately 40 percent of all General Transportation Aids expenditures, with approximately 25 percent of those expenditures being on arterial streets and highways.					
\$495 x 0.20 x 0.40 x 0.25 = \$10 million					
<u>Local Capital Transportation Funding</u>					
Assessment of Historical Funding					
\$48 million annually					
Conclusion – 2050 Plan					
\$48 million					
Operating and Maintenance Funding Assumptions					
State Highway System					
State highway operations and maintenance expenditures have historically represented approximately 20 percent of statewide operations and maintenance expenditures					
\$300 x 0.20 = \$60 million					
Local and County Trunk Highway System					
<u>General Transportation Aids (O&M)</u>					
Southeastern Wisconsin has historically received approximately 20 percent of Statewide General Transportation Aids. Operating expenses have typically represented approximately 30 percent of all General Transportation Aids expenditures attributed to highway operations and maintenance, with approximately 25 percent of those expenditures being on local arterial streets and highways.					
\$495 x 0.20 x 0.30 x 0.25 = \$7 million					
<u>Local Transportation Funding</u>					
Assessment of Historical Funding					
\$34 million annually					
Conclusion – 2050 Plan					
\$34 million					
Reasonably Available/Expected Annual Funding Levels: Southeastern Wisconsin					
Program	Bonding	Federal	State	Local	Total
State					
Capital	\$61	\$188	\$169	\$--	\$418
Operating & Maintenance	--	--	60	--	60
Subtotal	\$61	\$188	\$229	\$--	\$478
County & Local Municipalities					
Capital	\$--	\$--	\$71	\$48	\$119
Operating & Maintenance	--	--	7	34	41
Subtotal	\$--	\$--	\$78	\$82	\$160
Total	\$61	\$188	\$307	\$82	\$638

Source: 2018-2019 Transportation Budget Trends (Wisconsin Department of Transportation) and SEWRPC

The amount of transit service varies significantly by county and is directly related to the number of jobs and residents that are located within a specific area. Due to these variations, the costs of constructing, operating, and maintaining the public transit element also vary significantly by county. Table 1.18 shows these costs and is provided to further inform the discussion of determining the most appropriate method of funding the public transit element (see the next section of this chapter).

Potential Revenue Sources to Fund the Recommended Transportation System

VISION 2050 makes recommendations for significantly improving and expanding the Region's transportation system, but implementing this system will require adequate funding. State legislation to create local dedicated transit funding would likely be necessary to achieve the transit

VISION 2050 identifies a number of potential ways to address the funding gap and achieve the recommended transportation system, most of which would require State action.

Table 1.14
Estimate of Existing and Reasonably Expected Transit Revenues

Regional Capital and Operating Funding Assessment (millions of nominal dollars)						
Program	Averaging Timeframe (1998-2017)	Federal	State	Local	Total	Annual Growth (Percent)
Operating	20-Year	\$26	\$74	\$24	\$124	2.23
	10-Year	31	81	26	138	0.91
	5-Year	29	80	27	136	3.17
Capital	20-Year	\$15	\$--	\$4	\$19	1.98
	10-Year	17	--	5	22	-0.75
	5-Year	14	--	6	20	0.05

Additional Federal Revenue (From Committed Projects)

City of Milwaukee Streetcar
 Capital
 FTA 5337 – \$263,800 beginning in 2025, 2026, and 2027 (\$191,100 average annual)
 Operating
 FTA 5307 – \$547,300 beginning in 2020, 2021, and 2022 (\$474,600 average annual)
 \$2.9 million average annual parking revenue
 Milwaukee County Bus Rapid Transit
 Capital
 FTA 5337 – \$860,000 beginning in 2026 (\$623,000 average annual)
 Operating
 FTA 5307 – \$1 million beginning in 2021 (\$857,100 average annual)

Reasonably Available/Expected Funding Levels

Program	Federal	State	Local	Total
Operating	\$31	\$80	\$30	\$141
Capital	15	--	8	23
Total	\$46	\$80	\$38	\$164

Though the 2019-2021 State budget increased transportation funding over previous years, increases in vehicle fuel efficiency are expected to continue to limit growth in State funding. As such, State funding levels are expected to be constant in nominal dollars through the year 2050.

Transit service levels envisioned in VISION 2050 would be expected to generate an additional \$54 million in Federal capital and operating funding annually on average.

Based on the FAST Act, Federal funding levels are expected to increase by 2.0 percent annually.

Source: SEWRPC

system improvement and expansion recommended under VISION 2050, although this funding could also be provided through additional State financial assistance to transit. Providing sufficient funding to complete the recommended reconstruction of the Region's arterial street and highway system would also require State action.

The 2019-2021 State budget provided increased revenues for transportation through an increase in annual vehicle registration fees, an increase in the vehicle title fee, and a structure for implementing a previously approved surcharge on hybrid electric vehicles, resulting in an estimated total statewide increase of approximately \$188 million annually. This revenue increase added funding to the State's Transportation Fund, which supports the arterial street and highway system and public transit operations statewide. The State budget also provided a 2 percent increase in mass transit operating assistance in calendar year 2020, and funded a one-time, \$75-million competitive grant program available to local governments for local transportation system projects, including roads, bridges, transit capital and facilities, bicycle and pedestrian accommodations, railroads, and harbors.

While these increases represent progress toward achieving the recommended plan, a more substantial revenue increase that provides sustainable, long-term

Table 1.15
Average Annual Costs and Revenues Associated with the VISION 2050
Transportation System in 2019 Constant Dollars: 2021-2050

Cost or Revenue Item	2019 Dollars (millions)
Transportation System Cost ^a	
Arterial Street and Highway System	
Capital	
Freeway	
Reconstruction, Modernization, and Committed Capacity Improvements	\$284
Increment Associated with Recommended Capacity Improvements	38
Resurfacing and Rehabilitation	80
Surface Arterial Reconstruction/Resurfacing ^b	458
Operating & Maintenance	98
Highway Subtotal	\$958
Transit System	
Capital	\$201
Operating ^c	285
Transit Subtotal	\$486
Total	\$1,444
Transportation System Revenues ^a	
Highway Capital	
Federal/State	\$425
Local	68
Subtotal	\$493
Highway Operating & Maintenance	
State	\$47
Local	32
Subtotal	\$79
Highway Subtotal	\$572
Transit Capital	
Federal	\$82
Local	6
Subtotal	\$88
Transit Operating	
Federal	\$54
State	63
Local	28
Subtotal	\$145
Transit Subtotal	\$233
Total	\$805

^a The estimated arterial street and highway system and transit system costs include all capital, operating, and maintenance costs. The estimated costs include the necessary costs to preserve the existing transportation system, such as arterial street and highway resurfacing and reconstruction and transit system bus replacement, and the estimated costs of the transportation system improvement and expansion recommended under VISION 2050. Costs for freeway and surface arterial resurfacing, reconstruction, widening, and new construction are based upon actual project costs over the past several years. Transit system capital costs include preservation, improvement, and expansion of the existing transit system, including bus replacement on a 12-year schedule.

Highway system operating and maintenance costs are based on estimated actual State and local highway system operating costs and verified by application of estimated unit lane-mile costs. Planned highway system operating costs are increased from estimated existing costs based on the recommended increase in arterial highway system lane-miles under VISION 2050. Transit system operating and maintenance costs are based on existing estimated actual costs and unit costs based on service vehicle-miles and vehicle-hours.

Highway Federal, State, and local capital and operating revenues are based on estimated Federal, State, and local expenditures over the last several years. Transit Federal capital and operating revenues are based on historical expenditures over the last several years, and assessment of available Federal formula and program funds. State transit revenues are based on the State maintaining estimated average year 2020-2021 funding levels through the year 2050.

^b Includes the costs associated with the bicycle and pedestrian, TSM, and TDM elements of VISION 2050.

^c Net operating cost (total operating costs less fare-box revenue).

Source: SFWRPC.

Table 1.16
Average Annual Costs and Revenues Associated with the VISION 2050
Transportation System Based on Year of Expenditure: 2021-2050

Cost or Revenue Item	YOE Dollars (millions)
Transportation System Cost ^a	
Arterial Street and Highway System	
Capital	
Freeway	
Reconstruction, Modernization, and Committed Capacity Improvements	\$430
Increment Associated with Recommended Capacity Improvements	59
Resurfacing and Rehabilitation	122
Surface Arterial Reconstruction/Resurfacing ^b	705
Operating & Maintenance	150
Highway Subtotal	\$1,466
Transit System	
Capital	\$257
Operating ^c	381
Transit Subtotal	\$638
Total	\$2,104
Transportation System Revenues ^a	
Highway Capital	
Federal/State	\$545
Local	88
Subtotal	\$633
Highway Operating & Maintenance	
State	\$60
Local	41
Subtotal	\$101
Highway Subtotal	\$734
Transit Capital	
Federal	\$105
Local	8
Subtotal	\$113
Transit Operating	
Federal	\$72
State	80
Local	35
Subtotal	\$187
Transit Subtotal	\$300
Total	\$1,034

^a The estimated arterial street and highway system and transit system costs include all capital, operating, and maintenance costs. The estimated costs include the necessary costs to preserve the existing transportation system, such as arterial street and highway resurfacing and reconstruction and transit system bus replacement, and the estimated costs of the transportation system improvement and expansion recommended under VISION 2050. Costs for freeway and surface arterial resurfacing, reconstruction, widening, and new construction are based upon actual project costs over the past several years. Transit system capital costs include preservation, improvement, and expansion of the existing transit system, including bus replacement on a 12-year schedule.

Highway system operating and maintenance costs are based on estimated actual State and local highway system operating costs and verified by application of estimated unit lane-mile costs. Planned highway system operating costs are increased from estimated existing costs based on the recommended increase in arterial highway system lane-miles under VISION 2050. Transit system operating and maintenance costs are based on existing estimated actual costs and unit costs based on service vehicle-miles and vehicle-hours.

Highway Federal, State, and local capital and operating revenues are based on estimated Federal, State, and local expenditures over the last several years. Transit Federal capital and operating revenues are based on historical expenditures over the last several years, and assessment of available Federal formula and program funds. State transit revenues are based on the State maintaining estimated average year 2020-2021 funding levels through the year 2050.

^b Includes the costs associated with the bicycle and pedestrian, TSM, and TDM elements of VISION 2050.

^c Net operating cost (total operating costs less fare-box revenue).

Source: SFWRPC

Table 1.17
Estimated Cost and Potential Schedule of Significant Arterial
Construction and Reconstruction Projects: 2021-2050^{a,b}

Period Completed and Open to Traffic	County	Facility	Limits of Project	Cost (Millions 2019 Dollars) ^c	Cost (Millions YOY Dollars)	Mileage
2021 to 2025	Kenosha	CTH S (part)	E. Frontage Road to CTH H	\$8.5	\$9.3	1.9
	Kenosha	STH 50	IH 94 to 39th Avenue	68.6	75.2	4.8
	Milwaukee	Zoo Interchange	Completion of North Leg	188.6	211.3	1.7
	Racine	CTH KR	IH 94 to Old Green Bay Road	77.8	85.3	4.4
	Waukesha	CTH M (part)	CTH Y to CTH YY	25.1	27.5	2.9
	Subtotal			\$368.6	\$408.6	15.7
2026 to 2030	Kenosha	CTH H (Part)	CTH S to STH 50	\$19.7	\$24.2	2.6
	Milwaukee	IH 94	70th Street to 16th Street (Including Stadium Interchange)	871.0	1,069.4	3.5
	Milwaukee and Ozaukee	IH 43	Silver Spring Dr. to STH 60	551.6	639.5	12.6
	Milwaukee and Racine	STH 32	STH 100 to Five Mile Road	33.2	40.8	5.1
	Ozaukee	CTH W (part)	Highland Road to W. Glen Oaks Lane	7.6	9.3	1.0
	Racine	CTH KR	Old Green Bay Road to STH 32	21.7	26.6	2.8
	Walworth	STH 50	IH 43 to STH 67	26.2	32.2	4.3
	Waukesha	STH 83	USH 18 to Phylis Parkway	35.4	43.5	2.4
	Waukesha	STH 83	Mariner Drive to STH 16	35.4	43.5	3.6
	Waukesha	CTH D (part)	Milwaukee County line to Calhoun Road	13.4	16.5	3.0
	Waukesha	CTH Y (part)	Hickory Trail to Downing Drive	17.7	21.7	4.0
		Subtotal			\$1,632.9	\$1,967.2
2031 to 2035	Kenosha	CTH H (Part)	STH 50 to STH 165	\$14.6	\$20.1	3.0
	Racine	STH 20	IH 94 to Oaks Road	46.1	63.4	4.5
	Milwaukee	IH 794 Lake Interchange	Milwaukee River to Hoan Bridge	200.0	257.3	0.7
	Milwaukee	USH 45/STH 100	Rawson Avenue to 60th Street	24.7	34.0	4.8
	Waukesha	Pilgrim Road	USH 18 to Lisbon Road	36.4	50.1	4.8
	Waukesha	CTH SR/Town Line	CTH JJ to STH 190	24.2	33.3	3.2
		Road extension (part)				
	Waukesha	CTH Y (part)	CTH L to College Avenue	12.8	17.6	2.1
	Subtotal			\$358.8	\$475.8	23.1
2036 to 2040	Ozaukee	CTH W (part)	CTH V to Lakeland Road	\$23.5	\$36.2	3.1
	Waukesha	STH 67 (part)	CTH DR to USH 18	14.9	23.0	2.9
	Waukesha	STH 190	STH 16 to Brookfield Road	55.1	84.9	5.4
	Waukesha	CTH D (part)	Calhoun Road to STH 59/164	17.1	26.4	3.8
		Subtotal			\$110.6	\$170.5
2041 to 2045	Ozaukee	CTH W (part)	Lakeland Road to Highland Road	\$23.3	\$40.2	3.1
	Waukesha	STH 59/164	CTH XX to Arcadian Avenue	58.1	100.3	4.8
	Waukesha	CTH SR/Town Line	STH 190 to Weyer Road	8.2	14.2	1.5
		Road extension (part)				
	Subtotal			\$89.6	\$154.7	9.4
Total				\$2,560.5	\$3,176.8	108.3

^a Significant projects include those projects involving new construction or widening with a cumulative length of four or more miles.

^b The schedule shown in this table represents an estimate of the timing of construction and reconstruction for the purposes of comparison of costs and revenues, and is not a recommendation for the schedule of construction and reconstruction. Such a schedule can only be developed by the responsible implementing agency and will necessarily entail frequent updating, for example, due to pavement and structure condition.

^c Cost of Construction does not include the cost of right-of-way required for the project.

Source: SEWRPC

Table 1.18
Average Annual Costs by County Associated with the VISION 2050
Public Transit Element in 2019 Constant Dollars: 2021-2050

County	Operating Cost ^a (millions)	Capital Cost (millions)	Total (millions)
Kenosha	\$28.7	\$13.9	\$42.6
Milwaukee	166.7	139.3	306.0
Ozaukee	6.5	1.6	8.1
Racine	30.1	14.4	44.5
Walworth	3.2	0.3	3.5
Washington	6.3	1.5	7.8
Waukesha	43.5	30.0	73.5
Region	\$285.0	\$201.0	\$486.0

^a Net operating cost (total operating costs less fare-box revenue).

Source: SEWRPC

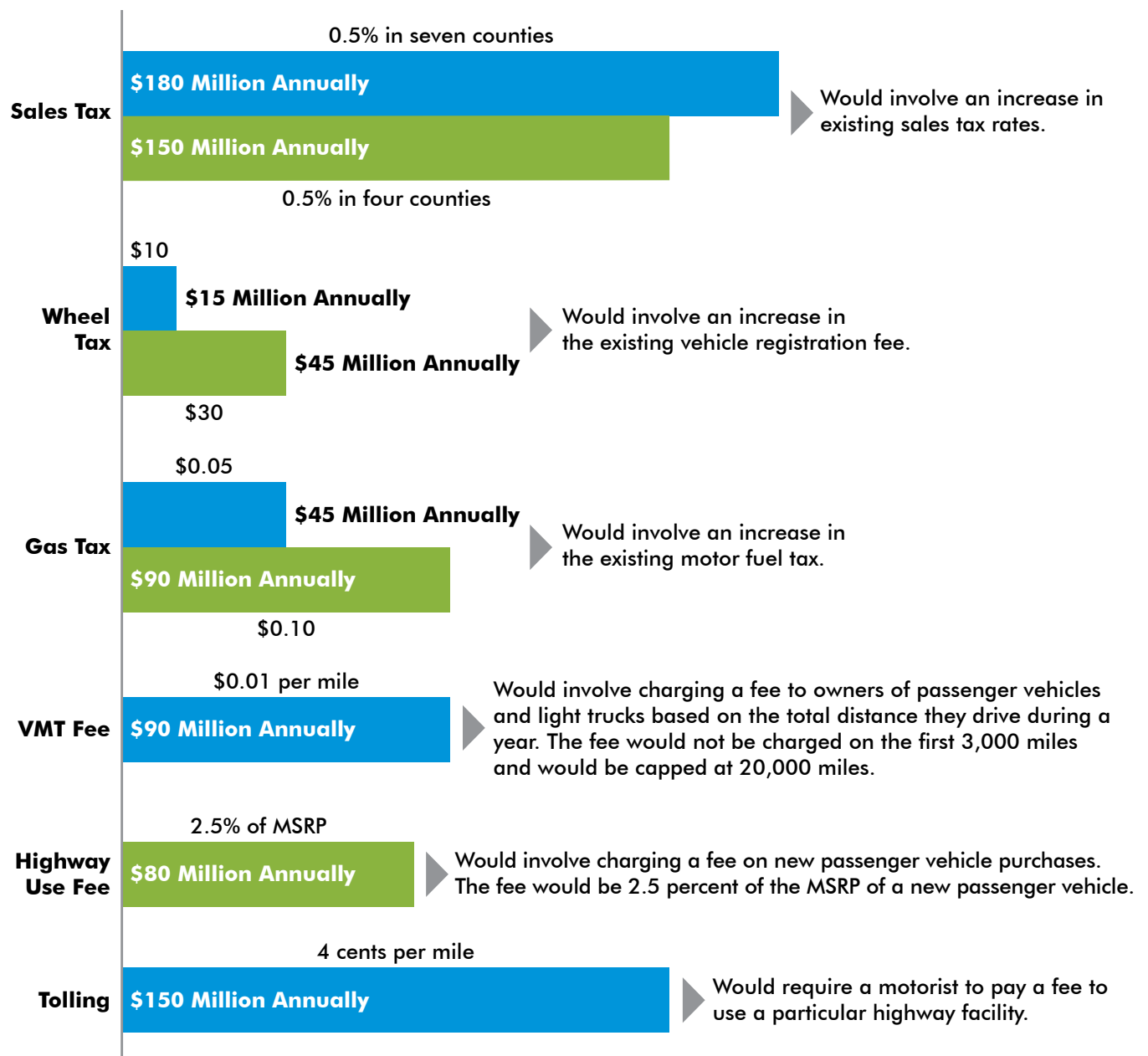
funding would be necessary to achieve VISION 2050. Numerous potential revenue sources that would allow improved and expanded transit services and provide stable funding for arterial street and highway reconstruction have been identified and proposed in recent years. These include an advisory referendum in 2008 in Milwaukee County that approved a 1.0 percent sales tax supporting public transit, county parks, and emergency medical services, and subsequent unsuccessful attempts at the State level to allow a sales tax for transit. In January 2013, the Wisconsin Transportation Finance and Policy Commission made recommendations to the Governor and State Legislature on “options to achieve a stable balance between transportation expenditures, revenues and debt service over the next decade.” The WisDOT Secretary proposed including a number of the revenue sources recommended by that Commission in the subsequent 2015-2017 State budget, but the Governor did not include them in his proposed budget. In December 2016, WisDOT completed a report to the Legislature on the solvency of the State’s Transportation Fund, including a review of current and projected transportation revenues and a Tolling Feasibility Study. In 2017, the Legislative Fiscal Bureau prepared a paper for the Joint Finance Committee that provided information on “possible revenue increases that could be enacted to improve the sustainability of the transportation fund.” These efforts provide the basis for the revenue sources and estimates presented in this section.

This section focuses on six primary revenue sources likely to generate enough revenue to implement the recommended transit improvements and highway reconstruction.

This section presents potential revenue sources that could be considered to provide sufficient transportation funding, along with estimates of the revenue each source could potentially generate on an annual basis. It is important to note that staff prepared generalized revenue estimates to demonstrate each individual source’s potential for providing the funding necessary to achieve the recommended transportation system. More detailed estimates would need to be prepared as decision makers determine whether to pursue a particular revenue source. It is also important that potential equity concerns be considered related to whether lower-income residents would pay a higher proportion of their incomes than higher-income residents if a particular revenue source were implemented.

While there are certainly more sources that could help address insufficient funding levels, this section focuses on a series of primary revenue sources that have been seriously considered and are likely to generate revenues on a scale sufficient to implement all or most of the transit improvements and highway reconstruction recommended under VISION 2050. Six primary revenue sources are discussed below and a generalized comparison of annual revenue estimates is presented in Figure 1.6.

Figure 1.6
Estimates for Potential Revenue Sources to Fund the
Recommended Transportation System (2019 Dollars)



Note: All revenue estimates assume the source is levied regionwide, except the four-county sales tax (only in Kenosha, Milwaukee, Racine, and Waukesha Counties) and tolling (estimate is based on tolling these interstate facilities: IH 43 between Beloit and Muskego, IH 41/IH 43/IH 94/IH 794/IH 894 in metropolitan Milwaukee, and IH 94 between Seven Mile Road and the Illinois State Line).

Dedicated funding for transit could be levied only in certain parts of the Region, or the level of a particular tax/fee could vary by county or community, based on the recommended level of transit service.

- **Sales Tax** – Involves an increase in existing sales tax rates. A 0.5 percent sales tax could generate about \$180 million annually in the Region. Transportation revenues from a sales tax could be obtained in two ways. The first way would involve the State increasing the statewide sales tax rate, with the revenues added to the State's Transportation Fund. These revenues could be used to increase State funding towards sufficiently funding both the highway and transit elements of VISION 2050. The second way, which has been more frequently discussed in Southeastern Wisconsin, would involve the State allowing municipalities or counties to enact a sales tax at their discretion. A sales tax is the most common dedicated local transit funding source in other areas of the country and has the potential to generate the needed revenue to implement the transit improvements recommended under VISION 2050. A 0.5 percent sales tax enacted in each county would likely generate significantly more revenue in some counties than the level of transit service recommended in those counties. In addition, the amount of transit funding envisioned under VISION 2050 in some counties may not require dedicated funding, particularly if State funding for transit is sufficiently increased. Alternatively, a sales tax could be levied only in the more urban areas of the Region that would be served by a majority of the recommended transit improvements and expansion. Enactment of a dedicated sales tax for transit would also permit counties and municipalities to eliminate or partially eliminate the use of property tax revenues to fund transit. In addition, a portion of sales tax revenues also comes from out-of-state visitors. It should be noted that sales tax revenues also tend to be impacted by downturns in the economy. Some alternative dedicated sources used by peer metro areas, although not as common as the sales tax, include the payroll tax, income tax, and dedicated property tax.
- **Vehicle Registration Fee ("Wheel Tax")** – Involves an increase in the existing vehicle registration fee. A \$10 vehicle registration fee enacted in all counties in the Region could generate about \$15 million annually. The vehicle registration fee is unaffected by, and unrelated to, how much the vehicle's owner actually uses the transportation system. The vehicle registration fee is essentially the only revenue source available to municipal and county governments to increase transportation funding without a change in State law. Milwaukee County (\$30) and the City of Milwaukee (\$20) currently levy a vehicle registration fee in addition to the statewide annual registration fee collected by WisDOT. A number of other municipalities and counties across the State also levy a vehicle registration fee, with fees ranging from \$10 to \$30. Alternatively, the State could further increase the statewide registration fee (now \$85 for most automobiles, and ranging from \$100 to \$106 for light trucks and from \$173 to \$2,578 for heavy trucks), with the revenues being added to the State's Transportation Fund. In addition to the increased vehicle registration fees that went into effect in 2019, the State also began assessing a \$75 surcharge on hybrid electric vehicles, which is collected with the regular annual registration fee. A \$100 surcharge on electric vehicles went into effect in 2017. Additional revenue from the registration fee could be generated by indexing the fee based on inflation, charging an additional variable fee based on a vehicle's value or weight, or increasing the fees for heavy trucks.

- **Motor Fuel Tax (“Gas Tax”)** – Involves an increase in the existing motor fuel tax rate levied by the State. A five cent increase could generate about \$45 million annually in the Region, assuming current fuel consumption levels. However, unlike the other revenue sources discussed in this section, those revenues would likely decline long term as vehicles become more fuel efficient on average. In addition, the motor fuel tax is impacted by the level of use of alternative fuels. The State currently levies a 30.9 cents per gallon motor fuel tax, which has not increased since 2006 when the State eliminated automatic annual indexing of the motor fuel tax based on inflation. Additional revenue from this source could be generated by reinstating annual indexing based on inflation, adjusting the tax rate to reflect lost indexing, eliminating the exemption for farming, or charging a higher rate for diesel fuel. Another related revenue source would involve eliminating the existing sales tax exemption for motor fuel sales.
- **VMT/Mileage-Based Registration Fee (“VMT Fee”)** – Involves charging a fee to owners of passenger vehicles and light trucks based on the total distance they are driven during a year. The fee would not be charged on the first 3,000 miles and would be capped at 20,000 miles. As an example, such a fee on a vehicle driven 13,000 miles during a year would be \$100. Based on current travel levels, a one cent per mile fee could generate about \$90 million annually in the Region. Unlike the motor fuel tax and vehicle registration fee, a distance-based fee provides a more equitable means of paying for the costs of the construction, maintenance, and operation of the transportation system as motorists would pay for their actual use of the transportation system. A VMT fee is unaffected by vehicle fuel efficiency or alternative fuels and can encourage residents to drive less, potentially reducing total VMT, traffic volumes, and congestion. Implementing a VMT fee utilizing technologies, such as a GPS unit or an in-vehicle device that would collect mileage data, has faced obstacles due to technology uncertainty, privacy concerns, and cost implementation issues. Low-technology options, such as incorporating odometer readings during the annual vehicle registration process, are also possible. Additional revenue from this source could be generated by indexing the fee to inflation.
- **Highway Use Fee** – Involves charging a fee on new passenger vehicle purchases. A fee of 2.5 percent of the manufacturer’s suggested retail price (MSRP) of a new passenger vehicle could generate about \$80 million annually in the Region. Given that the fee would only be collected at the time of a vehicle’s initial purchase, it would not directly impact those selling or purchasing used vehicles. New vehicle purchasers could also incorporate the fee into the financing of the vehicle, spreading out payment of the fee over time. Revenue from this type of fee has the potential to naturally increase over time with increases in new vehicle values, although it would decline during economic downturns when new vehicle sales volumes are lower. Critiques of the fee include that it is essentially an extra sales tax on new vehicle purchases and that it targets only one subset of the users of the transportation system. Similar to the highway use fee, the vehicle title fee, which the State increased as part of the 2019-2021 State budget, involves charging a fee on passenger vehicle purchases. However, the title fee is charged whenever an owner applies for a Certificate of Title, regardless of whether the vehicle is new or used.

- **Tolling** – Would require a motorist to pay a fee to use a particular highway facility. Federal law has traditionally prohibited implementing tolls on highways that have received Federal funds. However, a number of exceptions have been added to Federal transportation law over the years. The State could also apply under the Federal Interstate System Reconstruction and Rehabilitation Pilot Program (ISRRPP) to collect tolls on one interstate facility for which funding reconstruction or rehabilitation would not otherwise be possible. In 2016, WisDOT completed a preliminary study of the feasibility of tolling Wisconsin's interstate highways, at the direction of the State Legislature. This Tolling Feasibility Study identified issues and challenges related to tolling in Wisconsin and included traffic and revenue estimates for all interstate corridors in the State. Based on the study's revenue estimates, a four cents per mile toll on interstate facilities could generate about \$150 million annually in net revenues (accounting for operating and maintenance costs) in the Region.³⁵ Tolling would also involve upfront capital costs, which are not accounted for in the annual revenue estimate. Like a VMT fee, tolling involves paying for the costs of the construction, maintenance, and operation of the transportation system based on actual use and it is unaffected by vehicle fuel efficiency or alternative fuels. It also ensures that out-of-state motorists pay for their use of the interstate system. Tolling revenues would likely need to be used for improvements within the interstate corridor in which they are generated, although that could potentially free up revenues for improvements elsewhere in the Region. One challenge associated with tolling would be the potential for traffic to divert from tolled facilities to parallel non-tolled facilities. Related to tolling, congestion pricing can be employed on an express lane or highway facility, with the fee adjusted based on the time of day and level of congestion. Effective express lane congestion pricing ensures free flowing traffic in the toll lanes and provides additional revenue for the construction, maintenance, and operation of the transportation system.

Transit system improvement and expansion, as recommended under VISION 2050, would require State legislation to create local dedicated transit funding (as recommended in previous regional transportation plans) and a renewal of adequate annual State financial assistance to transit.

The recommended increases in transit service under VISION 2050 have the potential to increase the amount of Federal funding the Region receives.

In addition to the revenue generated by a dedicated local transit funding source, the recommended increases in transit service under VISION 2050 have the potential to increase the amount of Federal funding the Region receives. FTA Section 5307 Urbanized Area Formula Grant funding is partially allocated to urbanized areas based on transit service and ridership. If additional routes are implemented and services are provided, more FTA 5307 funding would be allocated to the Region's urbanized areas. In addition to FTA Section 5307, the Region could obtain additional funding from a number of other FTA funding programs due to the additional transit service recommended under VISION 2050. Based on the amount of additional transit service recommended in VISION 2050, the Region could expect to receive up

³⁵ The annual revenue estimate is based on tolling these interstate facilities: IH 43 between Beloit and Muskego, IH 41/IH 43/IH 94/IH 794/IH 894 in metropolitan Milwaukee, and IH 94 between Seven Mile Road and the Illinois State Line. The annual revenue estimate may be somewhat low because it does not include these interstate facilities: IH 43 north of STH 57 in Ozaukee County, IH 41 north of CTH Q in Washington County, and IH 94 west of STH 67 in Waukesha County.

to \$54 million (average annual in 2019 constant dollars) in additional FTA funding if VISION 2050 is implemented.

To implement the public transit element, VISION 2050 recommends that the Governor and State Legislature consider granting local jurisdictions the authority to hold binding referendums approving dedicated funding for public transit because:

- The State already provides substantial transit funding, at a higher rate than nearly all other states, and the potential for a significant increase is extremely unlikely. In addition, while significant State funding has been provided, it has not increased reliably in the past 20 years.
- Currently, transit systems in Southeastern Wisconsin and throughout the State have been using Federal funds, which are intended for capital projects, to fill gaps in operating funding. Long-term, using Federal funding in this way is not viable.
- In addition, significant increases in local property taxes to fund transit are unlikely, whether or not caps on property tax levies continue.

For a number of local governments that want to expand or even continue to provide their current level of transit service, the option to pursue a referendum for dedicated funding for transit service is needed.

In addition to providing adequate funding, implementation of the significant improvements and expansion of transit service would be bolstered through the creation of a regional transit authority (RTA) with the ability to collect dedicated funding, and construct, manage, and operate the recommended transit system. A number of the recommended transit services extend across city and county boundaries and a regional agency could assist in the implementation of these recommended services. Legislative efforts to create an RTA have not progressed since 2010.

Consequences of Not Sufficiently Funding the Transportation System

There are numerous benefits associated with significantly improving and expanding public transit and it is critical that the Region's arterial streets and highways be reconstructed in a timely manner. Not fully implementing the transportation system recommended under VISION 2050 due to the limitations of current and expected transportation revenues would result in significant negative consequences for Southeastern Wisconsin.

Not improving and expanding transit service will likely result in the following negative impacts:

- Limited transit-oriented development and redevelopment
- Reduced traffic carrying capacity in the Region's heavily traveled corridors
- Reduced access to jobs, healthcare, education, and other daily needs, particularly for the 1 in 10 households in the Region without access to a car, which is more likely to affect people of color and low-income residents

VISION 2050 recommends that the Governor and State Legislature consider granting local jurisdictions the authority to hold binding referendums approving dedicated funding for public transit.

Improving public transit and reconstructing streets and highways in a timely manner will have numerous benefits, which will not be achieved without address the transportation funding gap.

- Smaller labor force available to employers
- Reduced ability to develop compact, walkable neighborhoods

Postponing reconstruction of freeways beyond their service life and not adding capacity on highly congested segments will have the following negative impacts:

- Costly emergency repairs and inefficient pavement maintenance due to unnecessary, and increasingly ineffective, repaving projects
- Increased traffic congestion and travel delays, along with decreased travel reliability
- Increased crashes due to traffic congestion, antiquated roadway design, and deteriorating roadway condition