# PRELIMINARY RECOMMENDED YEAR 2050 REGIONAL LAND USE AND TRANSPORTATION PLAN

# 4

*Credit: SEWRPC Staff*

## 4.1 INTRODUCTION

This chapter presents a preliminary recommended year 2050 regional land use and transportation plan for Southeastern Wisconsin. The Preliminary Recommended Plan was developed following a thorough evaluation of three detailed regional land use and transportation alternatives, and includes the most effective elements of the alternatives.[1] Public input on the alternatives, as well as input from the Commission's Advisory Committees on Regional Land Use Planning and Regional Transportation Planning, Environmental Justice Task Force, and VISION 2050 Task Forces on key areas of interest, were also considered in determining the recommendations included in the Preliminary Plan.

**The Preliminary Plan was developed following a thorough evaluation of three detailed regional land use and transportation system alternatives and public input.**

The Preliminary Recommended Plan includes a proposed land use development pattern and transportation system, together representing a desired future vision for the Region. Like the alternatives, the Preliminary Plan was thoroughly evaluated based on the objectives and criteria documented in Chapter III of this volume, comparing the Preliminary Plan to existing conditions and the Trend from the alternatives stage. Highlights of this evaluation are incorporated into the descriptions and recommendations of the Preliminary Plan to follow, with the full evaluation detailed in Appendix H to this volume. Appendix H includes condensed versions of the detailed discussions that were part of the alternatives evaluation. The longer versions can be found in the full evaluation of the alternatives presented in Appendix F to this volume.

**The Preliminary Plan represents a desired future vision for the Region.**

Section 4.2 of this chapter describes the preliminary recommendations for land use, including a preliminary recommended land use development pattern.

[1] *An overview of the three detailed alternatives and their evaluation is set forth in Chapter III of this volume.*

Section 4.3 describes the preliminary recommendations for transportation, including a preliminary recommended transportation system. Section 4.4 documents public feedback received on the Preliminary Recommended Plan, which was the focus of the fifth series of VISION 2050 workshops. Section 4.5 summarizes notable changes made to the Preliminary Plan as staff developed the final plan.

## 4.2 PRELIMINARY 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 located in a good position 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 229,000 jobs are forecast for the Region by 2050, which will require an in-migration of workers.**

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 about 369,000 additional residents and about 229,000 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.

**A major focus of the Preliminary Plan is on achieving more compact development.**

The land use component of the Preliminary Recommended Plan 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 proposed under the Preliminary Plan ranges from high-density development such as TOD, to neighborhoods in smaller communities with single-family housing within easy walking distance of neighborhood amenities such as parks, schools and businesses. This range of development is proposed because it has a number of benefits, including:

- Walkable neighborhoods that encourage active lifestyles and a sense of community
- Minimizing impacts on natural and agricultural resources
- Minimizing impacts to water resources and air quality
- Reducing the distance needed to travel between destinations
- Supporting public transit connections between housing and employment
- A variety of housing options near employment

- Positioning the Region to attract potential workers and employers
- Meeting the needs of the Region's aging population
- Minimizing the cost of public services
- Maximizing redevelopment in areas with existing infrastructure

The Preliminary Plan 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 the Preliminary Plan proposes 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 the Preliminary Plan.

Map 4.1 presents the land use development pattern proposed under the Preliminary Plan. Tables 4.1 and 4.2 provide information regarding existing and proposed land use.[2] Actual and planned population, households, and employment by county and sub-area are presented in Table 4.3 (the sub-areas are shown on Map 4.2).

VISION 2050 is intended to provide a guide, or overall framework, for future land use within the Region. Implementation of the following plan 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 land use recommendations are presented in Volume III of this report.

**VISION 2050 is intended to be a guide, or overall framework, for future land use within the Region.**

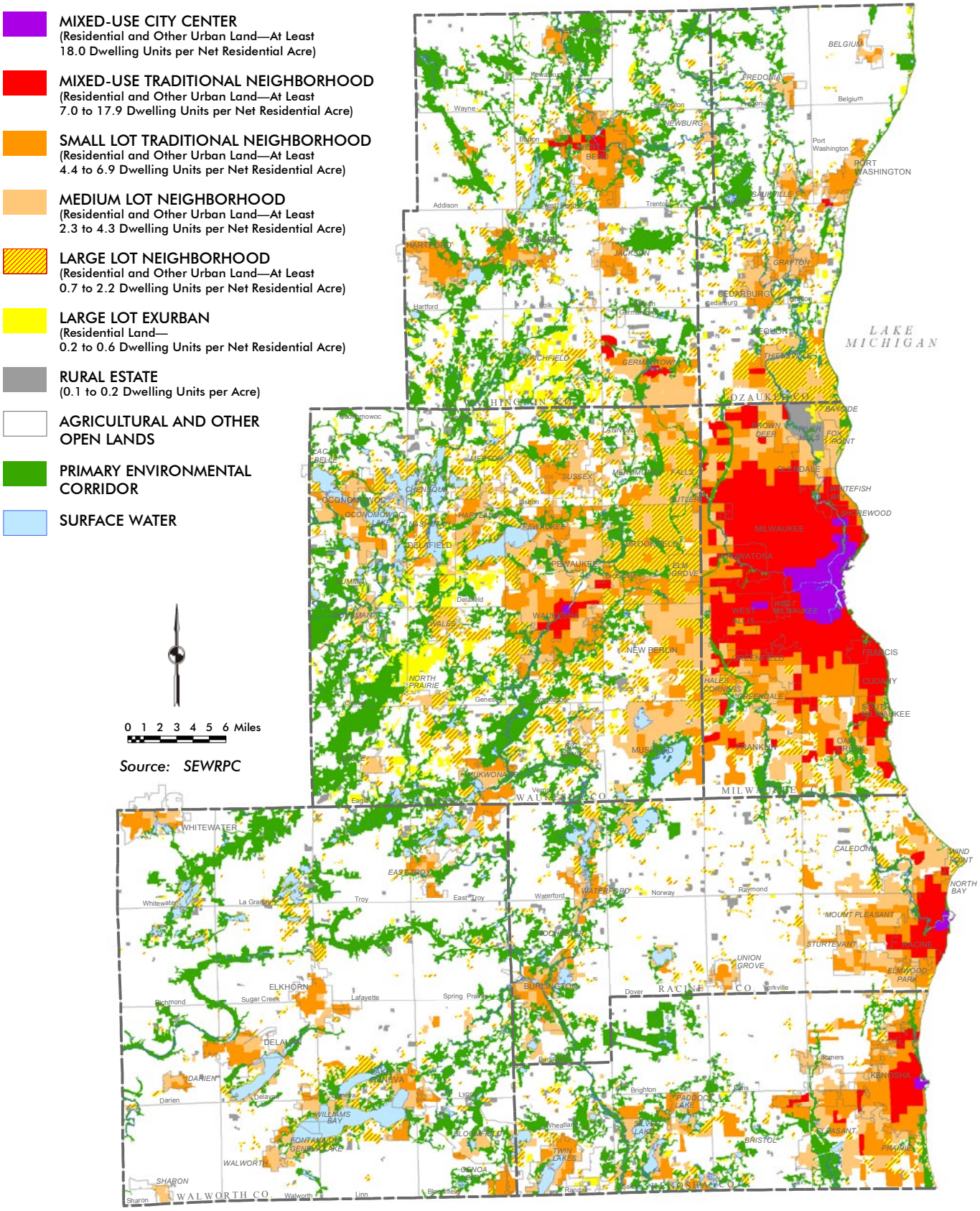
***Population, Household, and Employment Projections***

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 2,020,000 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).

*[2] The Mixed-Use City Center, Mixed-Use Traditional Neighborhood, Small Lot Traditional Neighborhood, Medium Lot Neighborhood, Large Lot Neighborhood, Large Lot Exurban, and Rural Estate land use categories are illustrated in Chapter 3 of Volume II.*

*[3] Projections are discussed in further detail in Chapter 6 of Volume I of the VISION 2050 report.*

## Map 4.1
## Land Use Development Pattern: Preliminary Recommended Plan



## Table 4.1
## Existing and Proposed Land Use in the Region: 2010 and 2050

| Land Use | Existing 2010 | | Planned Increment | | Planned 2050 | |
|---|---|---|---|---|---|---|
| | Square Miles | Percent of Total | Square Miles | Percent of Total | 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 | 3.1 | 6.8 | 48.9 | 1.8 |
| Small Lot Traditional Neighborhood[c] | 41.6 | 1.5 | 34.3 | 82.5 | 75.9 | 2.8 |
| 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 | 59.0 | 14.7 | 459.9 | 17.1 |
| Commercial | 35.6 | 1.3 | 13.6 | 38.1 | 49.2 | 1.8 |
| Industrial | 35.2 | 1.3 | 8.0 | 22.7 | 43.2 | 1.6 |
| Transportation, Communication, and Utilities | 213.8 | 8.0 | 12.4 | 5.8 | 226.2 | 8.4 |
| Governmental and Institutional | 37.0 | 1.4 | 1.7 | 4.6 | 38.7 | 1.4 |
| Recreational[h] | 56.0 | 2.1 | 6.7 | 11.9 | 62.7 | 2.3 |
| Unused Urban | 46.0 | 1.7 | -21.2 | -46.7 | 24.8 | 0.9 |
| Developed Land Subtotal | 824.5 | 30.7 | 80.2 | 9.7 | 904.7 | 33.6 |
| Undeveloped Land | | | | | | |
| Agricultural[i] | 1,155.5 | 43.0 | -58.4 | -5.1 | 1,097.1 | 40.9 |
| 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 | -21.8 | -18.4 | 96.7 | 3.6 |
| Undeveloped Land Subtotal | 1,865.2 | 69.3 | -80.2 | -4.3 | 1,785.0 | 66.4 |
| 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 4.2
## Existing and Proposed 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 | 0.9 | 3.8 | 37.7 | 1.2 | 38.9 | 0.0 | 0.1 | 0.1 | 3.8 | 0.2 | 4.0 |
| Small Lot Traditional Neighborhood[d] | 4.8 | 7.7 | 12.5 | 12.8 | 2.3 | 15.2 | 2.2 | 2.2 | 4.4 | 4.4 | 4.1 | 8.5 |
| 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 | 10.7 | 43.1 | 81.0 | 4.1 | 85.1 | 31.5 | 4.6 | 36.0 | 41.8 | 6.4 | 48.2 |
| Commercial | 2.7 | 1.4 | 4.0 | 12.3 | 1.9 | 14.2 | 1.8 | 1.0 | 2.9 | 3.6 | 1.6 | 5.2 |
| Industrial | 2.9 | 1.5 | 4.5 | 11.2 | 0.6 | 11.9 | 2.0 | 1.2 | 3.1 | 4.3 | 1.4 | 5.7 |
| Transportation, Communication, and Utilities | 19.4 | 2.9 | 22.3 | 53.2 | 0.6 | 53.7 | 15.9 | 0.9 | 16.9 | 22.7 | 1.6 | 24.3 |
| Governmental and Institutional | 3.2 | 0.5 | 3.7 | 13.4 | 0.0 | 13.4 | 2.1 | 0.1 | 2.2 | 3.9 | 0.1 | 4.1 |
| Recreational[i] | 5.9 | 1.4 | 7.3 | 12.3 | 0.2 | 12.5 | 4.1 | 0.4 | 4.5 | 5.3 | 0.9 | 6.2 |
| 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 | 15.2 | 86.3 | 198.1 | 3.0 | 201.1 | 60.4 | 6.6 | 67.0 | 87.4 | 9.3 | 96.7 |
| Undeveloped Land | | | | | | | | | | | | |
| Agricultural[j] | 136.6 | -11.7 | 124.9 | 15.6 | -1.6 | 14.0 | 118.2 | -4.6 | 113.6 | 180.7 | -6.7 | 174.0 |
| 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 | -3.5 | 13.5 | 7.5 | -1.3 | 6.2 | 10.6 | -2.0 | 8.6 | 13.8 | -2.6 | 11.2 |
| Undeveloped Land Subtotal | 207.4 | -15.2 | 192.1 | 44.6 | -3.0 | 41.6 | 175.1 | -6.6 | 168.4 | 253.2 | -9.3 | 243.9 |
| 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 4.2 (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 | 3.1 | 48.9 |
| 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 | 34.3 | 75.9 |
| 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 | 59.0 | 459.9 |
| Commercial | 2.4 | 1.5 | 3.9 | 2.7 | 1.6 | 4.3 | 10.2 | 4.6 | 14.7 | 35.6 | 13.6 | 49.2 |
| Industrial | 2.5 | 0.5 | 3.0 | 2.9 | 1.1 | 4.1 | 9.3 | 1.6 | 11.0 | 35.2 | 8.0 | 43.2 |
| Transportation, Communication, and Utilities | 26.1 | 1.6 | 27.7 | 26.3 | 1.8 | 28.0 | 50.4 | 3.1 | 53.5 | 213.8 | 12.4 | 226.2 |
| Governmental and Institutional | 2.9 | 0.2 | 3.1 | 2.7 | 0.2 | 3.0 | 8.8 | 0.7 | 9.5 | 37.0 | 1.7 | 38.7 |
| Recreational[i] | 7.3 | 1.1 | 8.4 | 6.5 | 0.4 | 6.9 | 14.7 | 2.2 | 16.9 | 56.0 | 6.7 | 62.7 |
| Unused Urban | 3.4 | -1.7 | 1.7 | 3.1 | -1.8 | 1.3 | 11.1 | -5.8 | 5.3 | 46.0 | -21.2 | 24.8 |
| Developed Land Subtotal | 80.9 | 10.7 | 91.6 | 91.2 | 12.9 | 104.1 | 235.4 | 22.5 | 257.9 | 824.5 | 80.2 | 904.7 |
| 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 | -58.4 | 1,097.1 |
| 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 | -21.8 | 96.7 |
| Undeveloped Land Subtotal | 495.5 | -10.7 | 484.9 | 344.3 | -12.9 | 331.4 | 345.1 | -22.5 | 322.6 | 1,865.2 | -80.2 | 1,785.0 |
| 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 4.3
## Existing and Planned 2050 Population, Households, and Employment

| County | Planning Analysis Area (See Map 4.2) | 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 | 85,920 | 34,660 | 39,620 | 44,550 | 49,140 |
| | 16 | 11,230 | 18,690 | 4,940 | 8,190 | 72,980 | 82,510 |
| | 17 | 91,110 | 93,940 | 31,200 | 33,830 | 54,310 | 59,700 |
| | 18 | 118,120 | 116,980 | 47,710 | 49,070 | 53,280 | 57,070 |
| | 19 | 48,360 | 58,050 | 21,340 | 26,130 | 56,910 | 60,980 |
| | 20 | 69,990 | 70,910 | 31,180 | 32,640 | 48,530 | 51,490 |
| | 21 | 59,930 | 62,870 | 26,850 | 28,990 | 28,850 | 30,520 |
| | 22 | 49,070 | 51,530 | 21,760 | 23,580 | 22,420 | 23,870 |
| | 23 | 34,820 | 49,450 | 14,200 | 20,950 | 23,310 | 29,110 |
| | 24 | 36,580 | 47,630 | 14,180 | 19,330 | 19,240 | 23,350 |
| | Subtotal | 947,700 | 1,011,900 | 383,600 | 424,700 | 575,400 | 627,700 |
| **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 | 87,430 | 25,790 | 36,790 | 25,100 | 40,330 |
| | 37 | 39,260 | 45,210 | 14,490 | 17,740 | 15,120 | 19,270 |
| | 38 | 16,970 | 20,170 | 6,750 | 8,550 | 10,570 | 13,180 |
| | Subtotal | 195,400 | 227,700 | 75,700 | 93,800 | 88,300 | 112,300 |
| **Kenosha** | 39 | 97,410 | 108,590 | 36,710 | 43,380 | 45,160 | 51,340 |
| | 40 | 30,520 | 59,940 | 11,420 | 24,050 | 17,950 | 30,090 |
| | 41 | 38,500 | 69,470 | 14,520 | 27,970 | 11,790 | 19,870 |
| | Subtotal | 166,400 | 238,000 | 62,600 | 95,400 | 74,900 | 101,300 |
| **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 | 2,389,200 | 800,100 | 987,500 | 1,176,600 | 1,405,700 |

Note: The existing population, household, and employment data presented by planning analysis area in this table is approximated by quarter section, and may differ slightly from data presented in other chapters of this report.

*Source: SEWRPC*

## Map 4.2
## VISION 2050 Planning Analysis Areas

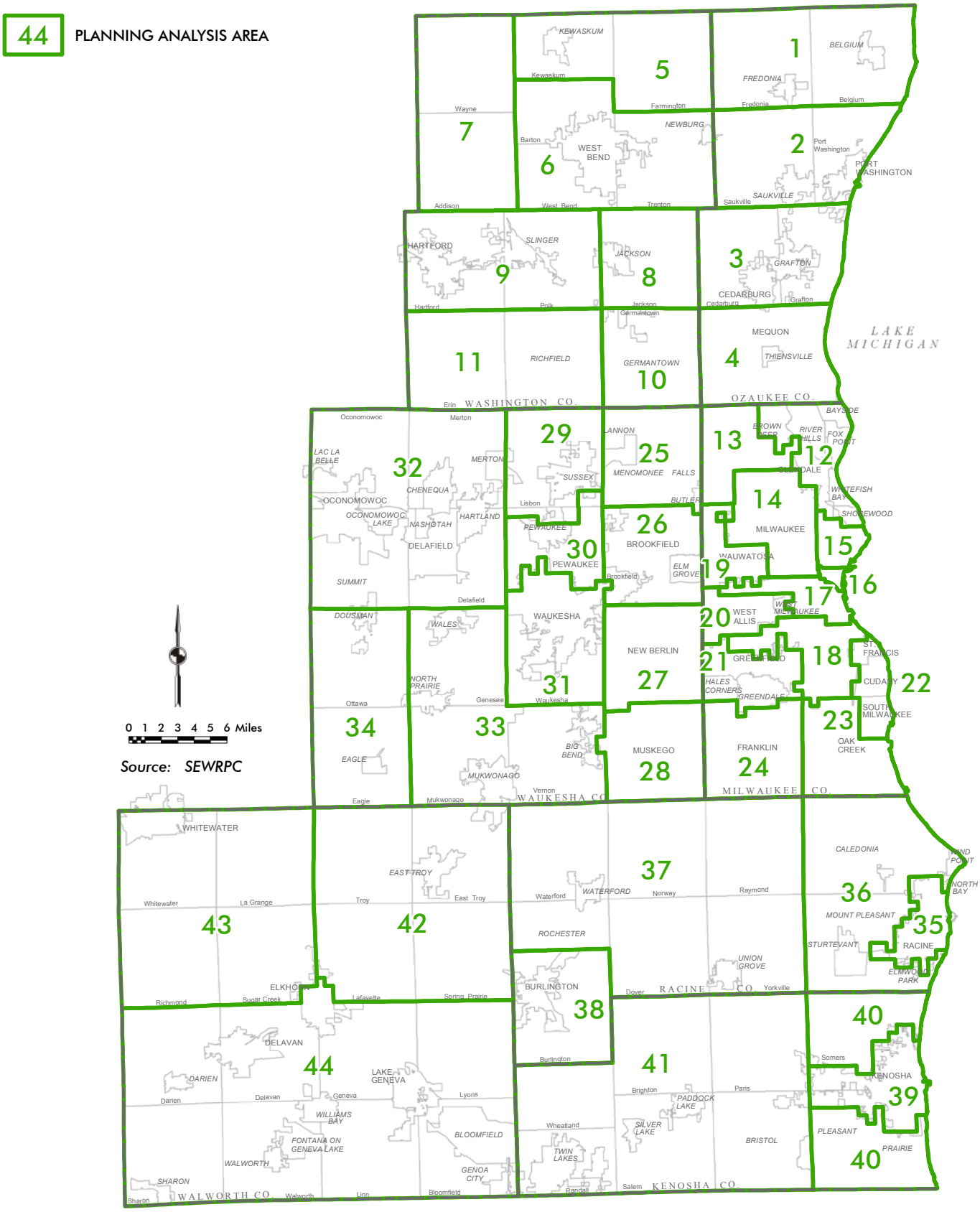


**Table 4.4**
**Forecast Growth in the Region: 2050**

| | County | Existing (2010) | Intermediate Forecast (2050) | Preliminary Recommended Plan (2050) |
|---|---|---|---|---|
| Population | Kenosha | 166,400 | 238,000 | 238,000 |
| | Milwaukee | 947,700 | 976,700 | 1,011,900 |
| | Ozaukee | 86,400 | 109,100 | 109,100 |
| | Racine | 195,400 | 227,700 | 227,700 |
| | 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 | 2,389,200 |
| Households | Kenosha | 62,600 | 95,400 | 95,400 |
| | Milwaukee | 383,600 | 409,600 | 424,700 |
| | Ozaukee | 34,200 | 44,500 | 44,500 |
| | Racine | 75,700 | 93,800 | 93,800 |
| | 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 | 987,500 |
| Employment | Kenosha | 74,900 | 101,300 | 101,300 |
| | Milwaukee | 575,400 | 608,900 | 627,700 |
| | Ozaukee | 52,500 | 69,300 | 69,300 |
| | Racine | 88,300 | 112,300 | 112,300 |
| | 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 | 1,405,700 |

*Source: U.S. Bureau of the Census and SEWRPC*

The Preliminary Recommended Plan includes several of the rapid transit and commuter rail lines that were evaluated under Alternative Plan II during the alternative plans stage of VISION 2050. Consistent with experience nationwide and as envisioned under Alternative Plan II, high-density, transit-oriented development (TOD) would be expected to occur within walking distance of the stations on the rapid transit and commuter rail lines. As a result, total forecast regional population growth from 2010 to 2050 was increased under the Preliminary Plan from 16.5 percent to 18.3 percent, household growth from 21.5 percent to 23.4 percent, and employment growth from 17.9 percent to 19.5 to account for additional anticipated growth in the station areas and to maintain the intermediate-growth forecast for portions of the Region outside those station areas. Table 4.4 presents existing, intermediate forecast, and revised forecast population, household, and employment levels by county.

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

**The Preliminary Plan proposes infill and redevelopment in existing urban service areas.**

***Residential Development Within Urban Service Areas***

The Preliminary Recommended Plan proposes 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 4.1. About 96 percent of new households would be located within urban service areas.

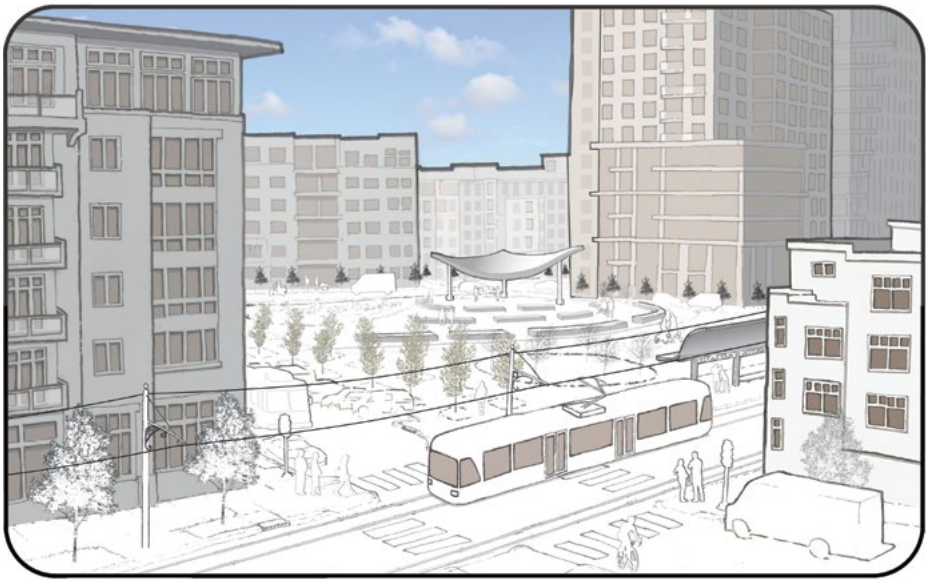
➤ **Recommendation 1.1: Develop urban service areas with a mix of housing types and land uses**

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. The Preliminary Plan

proposes that local governments in urban service areas include these land use categories in their comprehensive plans as shown on Map 4.1. 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.

### ➤ Recommendation 1.2: Focus TOD near rapid transit and commuter rail stations

The Preliminary Plan proposes transit-oriented development (TOD) in areas surrounding rapid transit and commuter rail stations proposed under the transportation component of the Preliminary Plan. 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 a 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 the Preliminary Plan because it supports healthy communities, mobility, and revitalization of urban areas. Despite these benefits, concern regarding the potential for gentrification and displacement of low-income households was expressed during VISION 2050 public outreach activities. Table 4.5 includes strategies for mixed-income housing in TODs. Local governments with proposed rapid transit or commuter rail stations should incorporate these strategies into their land use policies. TOD illustrations and design guidelines are included in Volume III of this report.

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

## Table 4.5
## 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*

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

### ➤ 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 4.3.[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 proposed under Recommendation 1.1 to facilitate efficient and cost-effective provision of services to urban development. It is proposed that local governments consider limiting new development in the Medium Lot Neighborhood[5] and Large Lot Neighborhood[6] 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.

#### *Residential Development Outside Urban Service Areas*

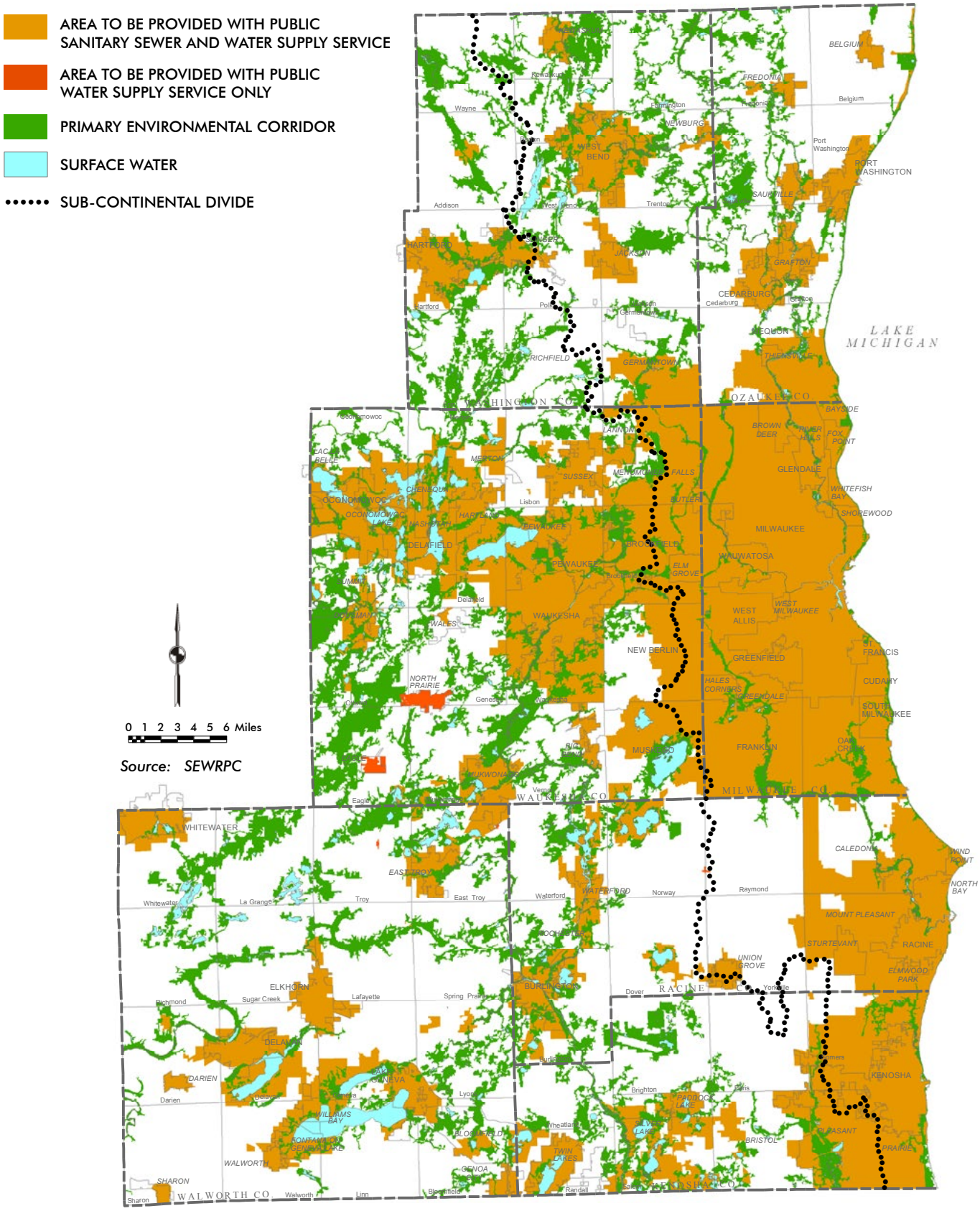
The Preliminary Plan proposes residential development outside urban service areas occur in the Rural Estate land use category using cluster subdivision design. About 4 percent of new households would be located outside urban service areas.

[4] *Table 4.6 presents area and population served with public sanitary sewer and water in 2010 and proposed 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.*

## Map 4.3
## Proposed Public Sanitary Sewer and Water Supply Service Areas: Preliminary Recommended Plan



## Table 4.6
## Area and Population Served by Public Sanitary Sewer and Public Water: 2010 and 2050

| | | Area | | | | Population | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2010 | | 2050 | | 2010 | | 2050 | |
| | County | Square Miles | Percent | Square Miles | Percent | Population | Percent | Population | Percent |
| Public Sanitary Sewer | Kenosha | 45.8 | 16.5 | 63.2 | 22.7 | 150,200 | 90.3 | 228,200 | 95.9 |
| | Milwaukee | 198.7 | 81.9 | 206.1 | 84.9 | 947,000 | 99.9 | 1,011,900 | 100.0 |
| | Ozaukee | 33.3 | 14.1 | 40.2 | 17.1 | 67,800 | 78.5 | 94,800 | 86.9 |
| | Racine | 57.0 | 16.7 | 67.5 | 19.8 | 176,100 | 90.1 | 210,400 | 92.4 |
| | 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 | 612.3 | 22.8 | 1,797,000 | 89.0 | 2,219,000 | 92.9 |
| Public Water | Kenosha | 34.7 | 12.5 | 52.1 | 18.7 | 125,800 | 75.6 | 189,500 | 79.6 |
| | Milwaukee | 187.3 | 77.2 | 194.7 | 80.2 | 938,400 | 99.0 | 1,011,900 | 100.0 |
| | Ozaukee | 23.4 | 9.9 | 30.3 | 12.9 | 55,800 | 64.6 | 80,400 | 73.7 |
| | Racine | 44.3 | 13.0 | 54.8 | 16.1 | 154,900 | 79.3 | 183,000 | 80.4 |
| | 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 | 126.4 | 21.8 | 261,500 | 67.1 | 376,800 | 78.3 |
| | Region | 443.8 | 16.5 | 531.6 | 19.8 | 1,679,900 | 83.2 | 2,073,800 | 86.8 |

*Source: SEWRPC*


**Illustration of Cluster Subdivision Design**
*Credit: SEWRPC*

### ➤ Recommendation 1.4: Consider cluster subdivision design in residential development outside urban service areas

The Preliminary Plan proposes 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 presented in Volume III of this report.

### ➤ Recommendation 1.5: Limit low-density development outside urban service areas

Large Lot Neighborhood and Large Lot Exurban[7] 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. The Preliminary Plan 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 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. The Preliminary Plan proposes 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 the VISION 2050 planning process. The Preliminary Plan also proposes

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

limiting other development beyond urban service areas to highway-oriented business, utility, and recreational uses.

***Commercial and Industrial Land***

The Preliminary Plan proposes 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-worker mismatches. Local government land use policies should allow a mix of housing types and land uses as proposed under Recommendations 1.1 and 1.2 to promote accessibility between housing and jobs.

**Cities and villages should allow a mix of housing types 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 61 centers have been identified that have either reached major center status or are anticipated to by 2050 based on input from local governments (see Map 4.4). The Preliminary Plan proposes 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***

The Preliminary Plan proposes that new governmental and institutional developments, such as schools and libraries, be provided to meet the needs of the Region's planned population. The Preliminary Plan 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 4.5.

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

The Preliminary Plan proposes 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***

The Preliminary Plan envisions that land devoted to transportation, communication, and utilities will increase due to land needed for streets and highways, airport expansions, and utility facilities such as sewage treatment plants. Major transportation and utility centers envisioned under the Preliminary Plan are shown on Map 4.6.

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[8] *Includes medical centers with 600 or more beds.*

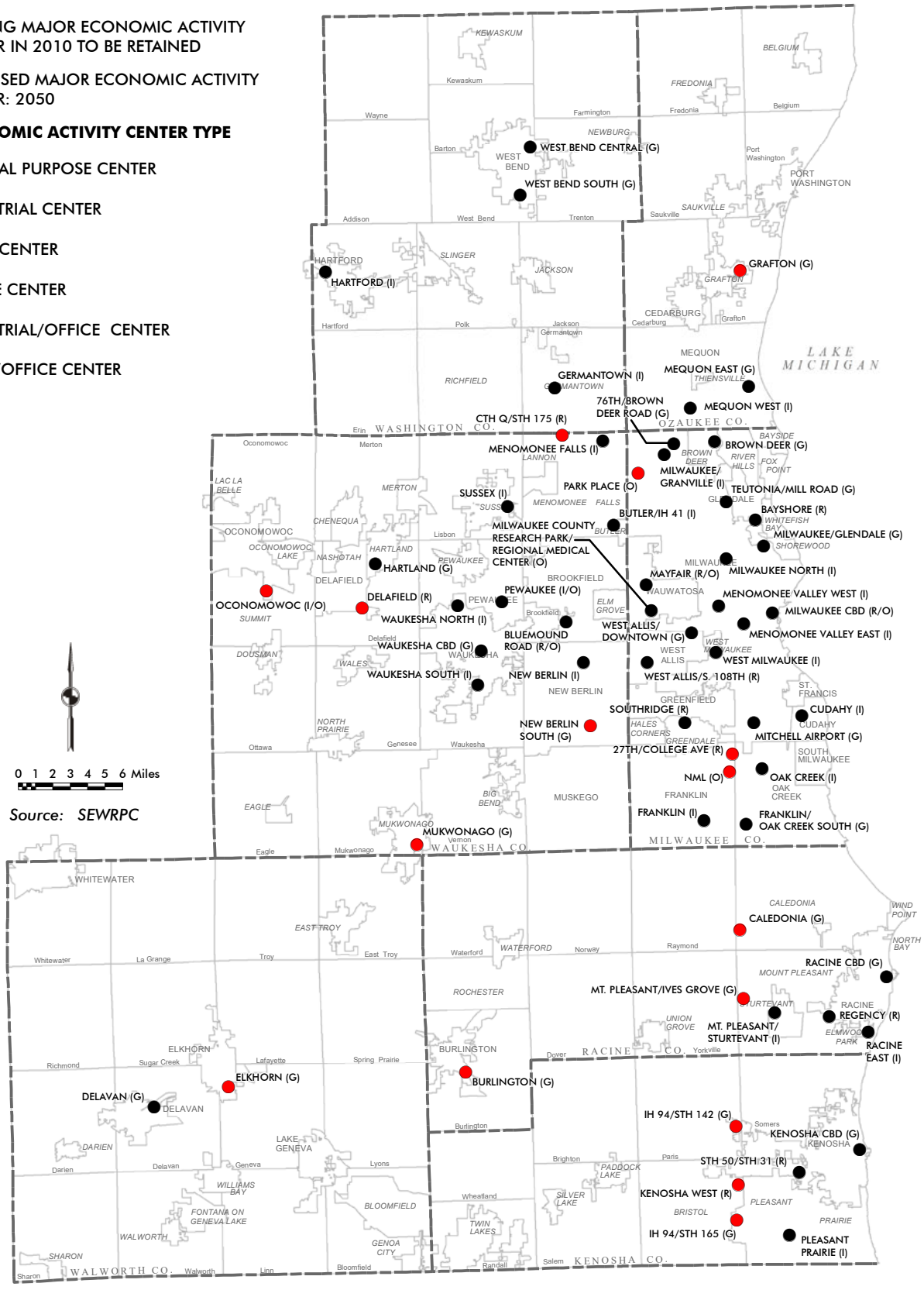
[9] *Includes institutions with accredited bachelor's degree programs that have a total enrollment of 4,500 or more students.*

## Map 4.4
## Major Economic Activity Centers: Preliminary Recommended Plan

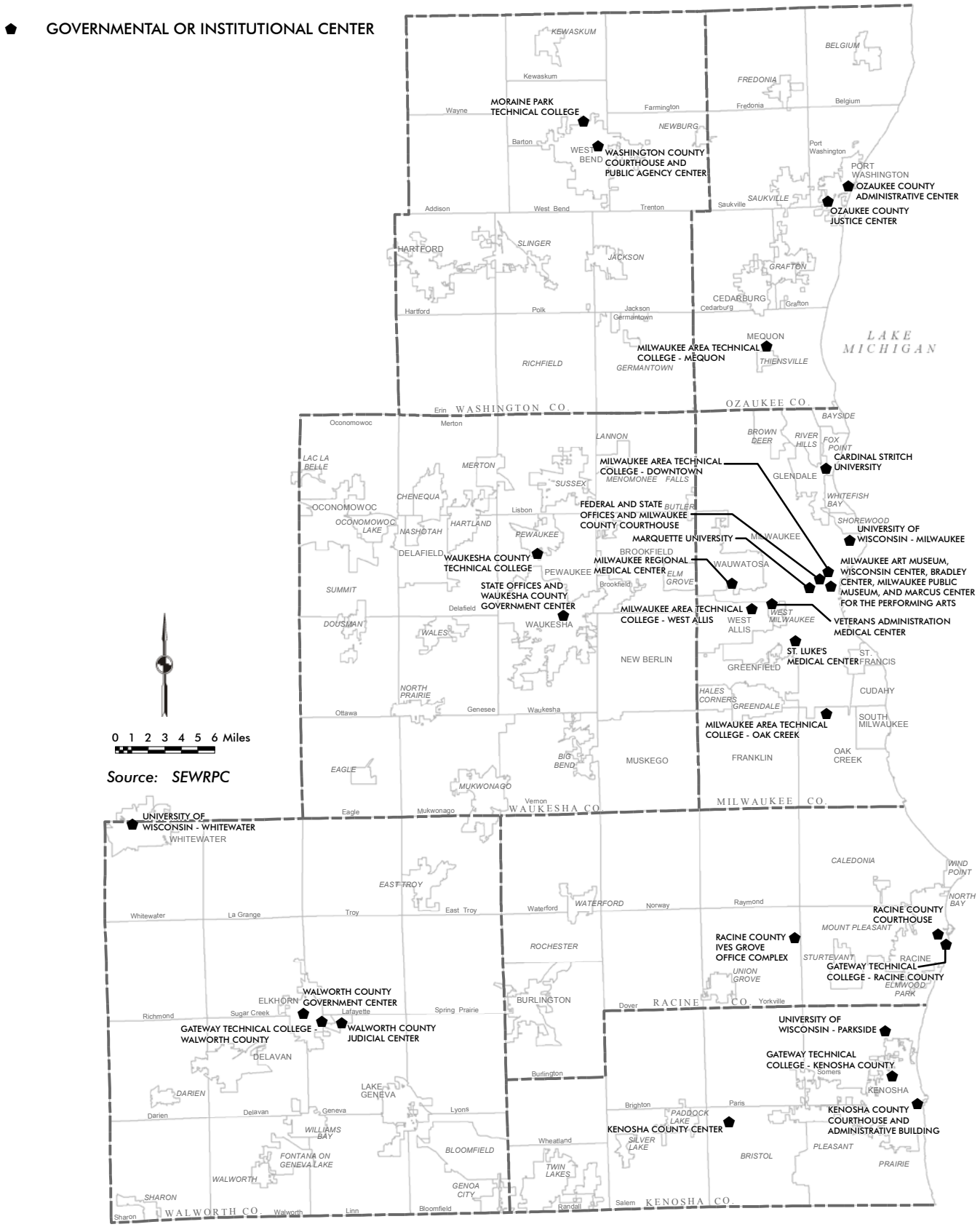
- EXISTING MAJOR ECONOMIC ACTIVITY CENTER IN 2010 TO BE RETAINED
- PROPOSED MAJOR ECONOMIC ACTIVITY CENTER: 2050

**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 |

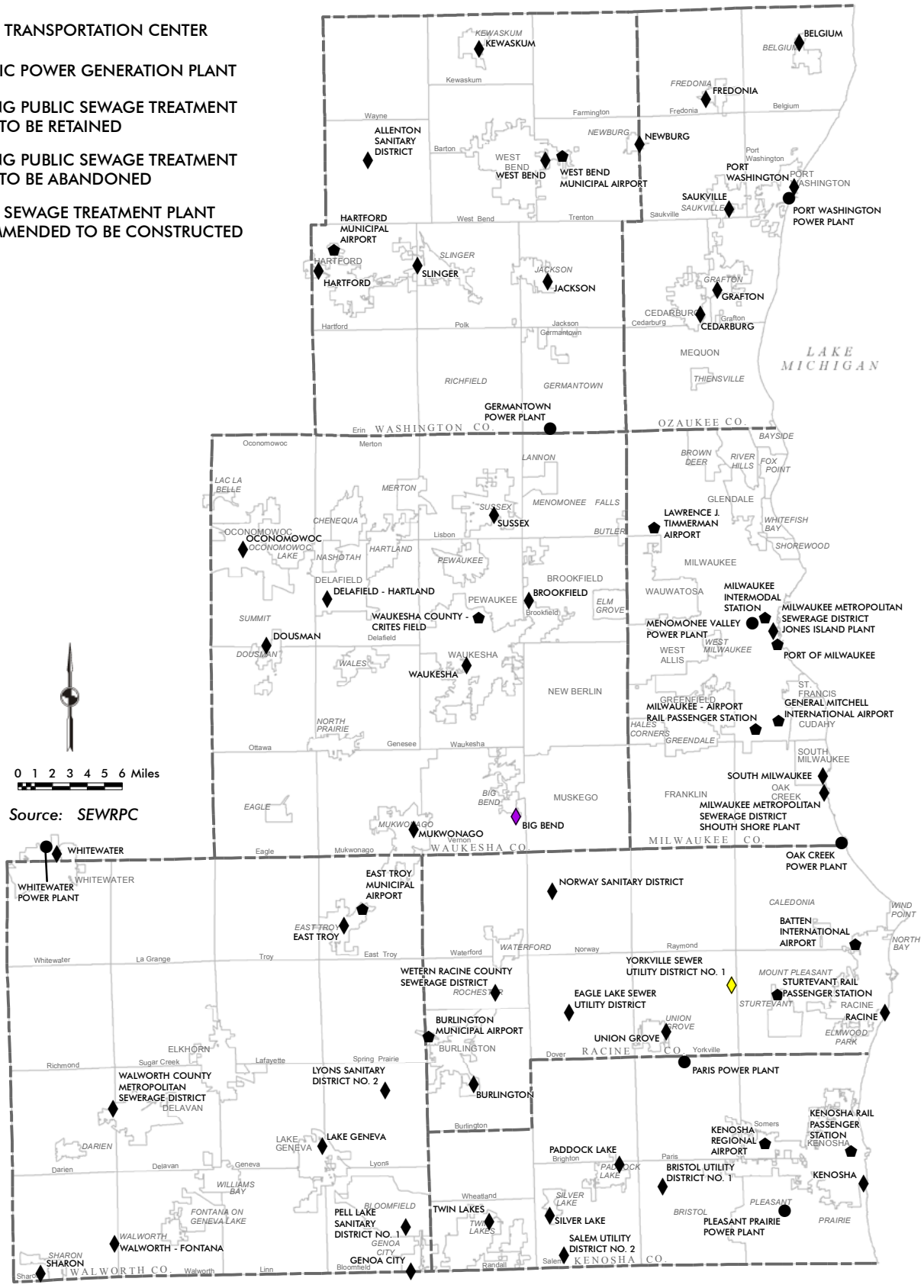


## Map 4.5
## Major Governmental and Institutional Centers: Preliminary Recommended Plan



## Map 4.6
## Major Transportation and Utility Centers: Preliminary Recommended Plan

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




*Source: SEWRPC*

***Recreational Land***

The Preliminary Plan proposes 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. The Preliminary Plan also envisions a system of 32 major parks of regional size and significance as shown on Map 4.7.[10] Major parks have an area of at least 250 acres and provide opportunities for a variety of resource-oriented outdoor recreational activities. Map 4.7 also shows major special-use outdoor recreation and nature study sites.[11]

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

The Preliminary Plan proposes reserving land for parks as new residential neighborhoods are developed within urban service areas (design guidelines are presented in Volume III).

***Environmentally Significant Land***

The Preliminary Plan proposes 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, and 400 acres in size. They are typically located along major stream valleys, along the Lake Michigan shoreline, or around major lakes. The Preliminary Plan proposes limiting development within 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 presented in Volume III). Local and county government land use polices, including comprehensive plans and land use ordinances, should incorporate this recommendation and related design guidelines. Planned primary environmental corridors are shown on Map 4.1 and existing primary environmental corridors are shown on Map 2.22 in Chapter 2 of Volume I. Table 4.7 shows that planned primary environmental corridors

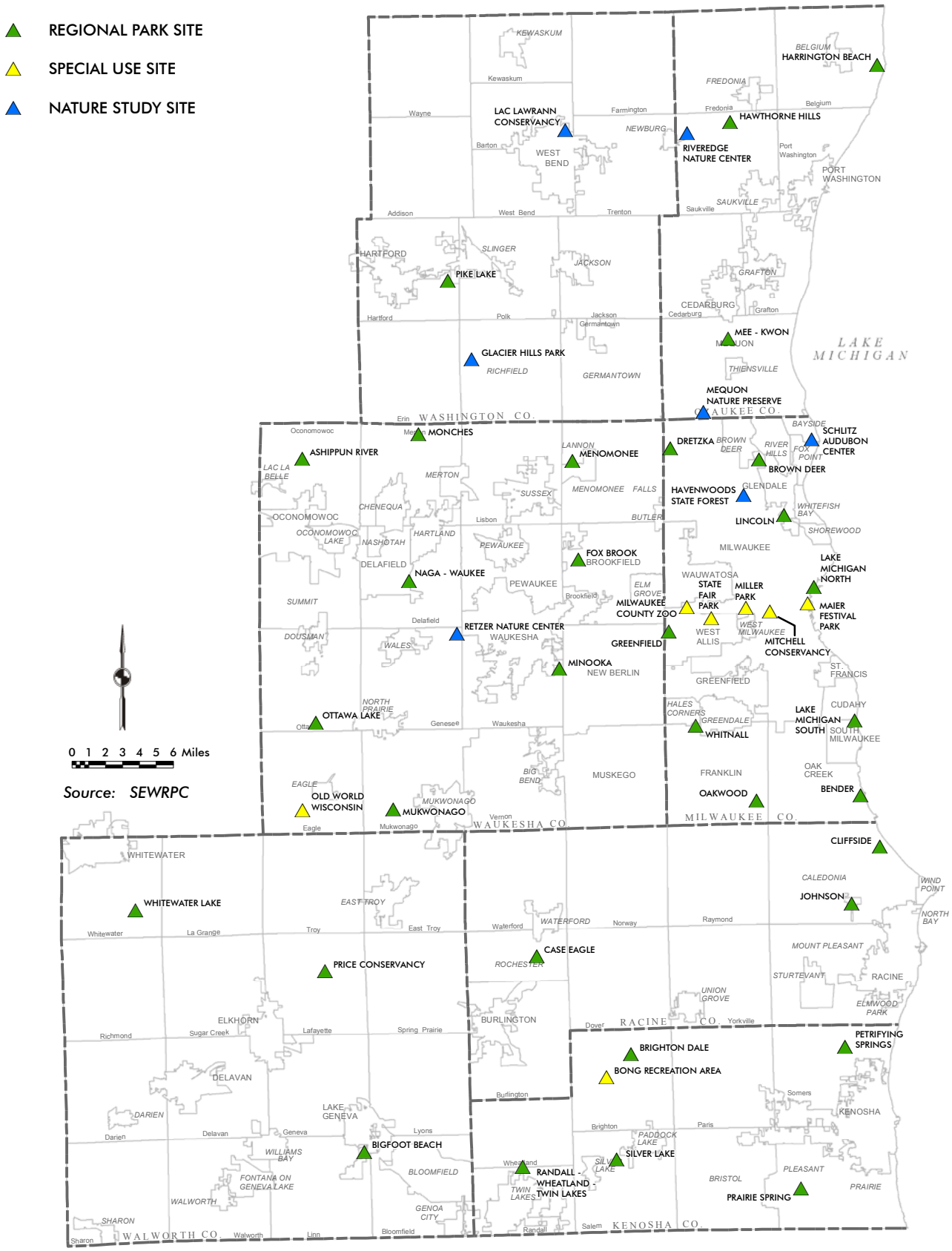
**The Region's most important natural resources occur in environmental corridors.**

*[10] The sites in Milwaukee County identified as "Lake Michigan North" and "Lake Michigan South" on Map 4.7 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 Warnimont 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 Volume III.*

## Map 4.7
## Major Outdoor Recreation Centers: Preliminary Recommended Plan



## Table 4.7
## Existing and Proposed 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*

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 resources 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 proposed that local governments consider preserving secondary environmental corridors as natural, open space; as drainage ways, stormwater detention or retention areas; or as local parks or recreation trails in developing areas. It is also proposed that local governments consider preserving isolated natural resource areas in natural open uses insofar as practicable, including incorporation

[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 4.1 to reflect re-establishment of natural resource features resulting from such restorations. The Preliminary Plan 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.*

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 sites[14] 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. The Preliminary Plan proposes preserving all identified natural areas and critical species habitat sites.

***Agricultural Land***

The Preliminary Plan proposes 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 1,097 square miles would remain in agricultural use in 2050 under the Preliminary Plan, which is 95 percent of the existing area.

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

### ➤ Recommendation 1.13: Preserve productive agricultural land

The Preliminary Plan proposes 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 the Preliminary Plan proposals, which include:

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

[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.*

for nonagricultural development within 15 years after the date the plan is adopted. The Preliminary Plan proposes 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 the Preliminary Plan.

### ➤ 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 proposed by the Preliminary Plan 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] The Preliminary Plan proposes developing a regional food system that connects food producers, distributors, and consumers to ensure access to healthy foods throughout the Region. In addition to encouraging supermarkets and grocery stores near residential areas, local government land use policies should consider allowing urban agriculture, such as community gardens on vacant lots and vertical farming. 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.

**The Preliminary Plan recognizes a need to improve access to healthy foods for low-income residents in the Region's "food deserts."**

***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 Compact. The Commission recognizes the relationship between land use planning and water supply and has prepared and adopted a regional water supply plan in response.

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

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. It should be noted that the forecast population under the year 2035 plan of 2,276,000 residents is about 95 percent of the forecast population under VISION 2050 (2,389,200 residents) and the forecast employment under the year 2035 plan of 1,368,300

[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.*

jobs is about 97 percent of the forecast employment under VISION 2050 (1,405,700 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.

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

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

The Preliminary Plan land use proposals 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 Preliminary Plan development pattern results 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.

**Preliminary Plan proposals embody sustainable land use concepts.**

***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. The Preliminary Plan proposals 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 proposed by the Preliminary Plan 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. The Preliminary Plan proposes 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 sustainable development practices, which are described in the design guidelines presented in Volume III.

➤ **Recommendation 1.18: Target brownfield sites for redevelopment**

The Preliminary Plan proposes 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.

## 4.3 PRELIMINARY RECOMMENDED TRANSPORTATION COMPONENT

The preliminary recommended transportation component 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. A financial analysis of the preliminary recommended transportation component is also described below, including identification of anticipated funding gaps related to implementing plan recommendations and potential revenue sources to achieve the Preliminary Recommended Plan.

**The preliminary recommended transportation component includes six elements:**

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

**Description of Public Transit Element**

The public transit element of the Preliminary Recommended Plan proposes a significant improvement and expansion of public transit in Southeastern Wisconsin, including two commuter rail lines, eight rapid transit lines, and significantly expanded local bus, express bus, commuter bus, and shared-ride taxi services. Map 4.8 displays the routes and areas served by the various components of the proposed transit element. Altogether, service on the regional transit system would be increased from service levels existing in 2014 by about 110 percent measured in terms of revenue transit vehicle-hours of service provided, from about 4,750 vehicle-hours of service on an average weekday in the year 2014 to 9,980 vehicle-hours of service in the year 2050 (see Table 4.8). The proposed service improvements and expansion include expanding service area and hours and significant improvements in the frequency of service. Table 4.9 shows the span of service hours and frequencies under the Preliminary Plan.

**The Preliminary Plan proposes a significant improvement and expansion of public transit—more than doubling existing service levels.**

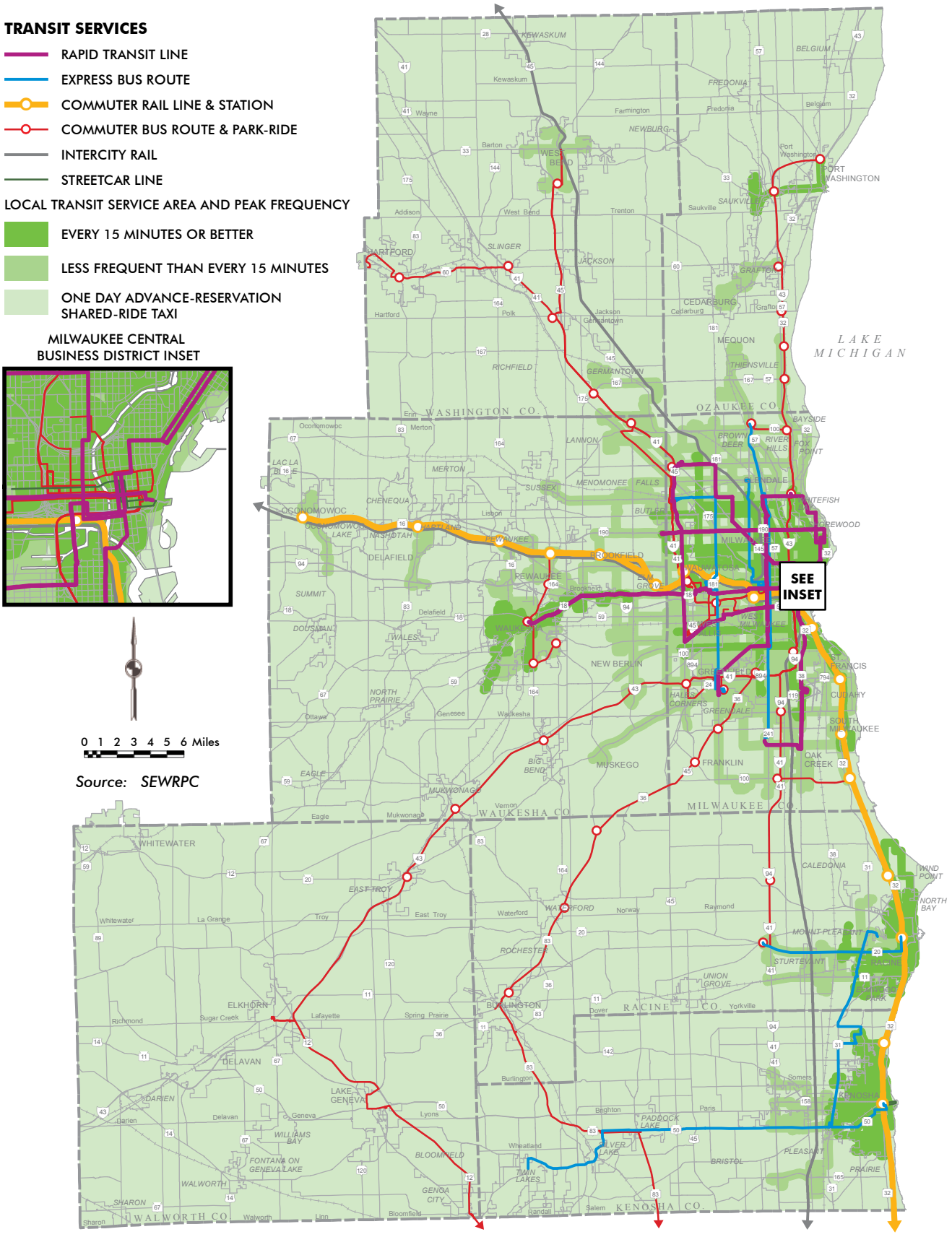
The proposed expansion of public transit discussed in the following pages would have significant costs to the Region's taxpayers, and is not proposed without due consideration of the increased public revenue that would be required to build and operate this investment. However, as the comparison between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

- Public transit expands the 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. If well-coordinated with a transit investment, this leads to more compact, walkable neighborhoods, encouraging active transportation and improving public health.

- The regionwide transit system proposed in the Preliminary Plan (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.

## Map 4.8
## Transit Services: Preliminary Recommended Plan



## Table 4.8
## Fixed-Route Public Transit Service Levels: Preliminary Recommended Plan

| Average Weekday Transit Service Characteristics | Existing (2014) | Preliminary Plan (2050) |
|---|---|---|
| Revenue Vehicle-Hours | | |
| Rapid Transit | -- | 1,180 |
| Commuter Rail | <10 | 140 |
| Commuter Bus | 270 | 1,000 |
| Express Bus | 500 | 740 |
| Local Transit | 3,980 | 6,920 |
| Total | 4,750 | 9,980 |
| Revenue Vehicle-Miles | | |
| Rapid Transit | -- | 23,700 |
| Commuter Rail | 100 | 7,100 |
| Commuter Bus | 5,800 | 24,700 |
| Express Bus | 6,300 | 10,800 |
| Local Transit | 48,200 | 83,200 |
| Total | 60,400 | 149,500 |

*Source: SEWRPC*

## Table 4.9
## Transit Service Hours and Frequency: Preliminary Recommended Plan

| Service Type | Weekdays/ Weekends | Existing (2015) | | Preliminary 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.<br>12 p.m. – 8 p.m.<br>many services peak direction only | 10 – 225 minutes<br>many services peak direction only | 4 a.m. – 11 p.m.<br>both directions | 10 – 60 minutes<br>both directions |
| | Weekends | 8 a.m. – 11 p.m.<br>KRM Bus only | 90 – 240 minutes<br>KRM Bus only | 7 a.m. – 11 p.m.<br>both directions | 30 – 120 minutes<br>both directions |
| Express Bus<br>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<br>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*

- For the 1 in 10 households in the Region without access to a car, transit is vital to providing access to jobs, healthcare, education, and other daily needs. 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 due to excessive travel time. Approximately 279,000 (or 12 percent of the Region's year 2050 population) of the Region's residents would be able to use transit to reach 100,000 jobs or more in less than 30 minutes under the Preliminary Plan, compared to 36,000 residents (or 2 percent) under the Trend.

- 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.

- Other than Milwaukee, only five out of 39 metropolitan areas with more than 1.5 million residents in the United States (Cincinnati, Columbus, Detroit, Indianapolis, and San Antonio) do not 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 goods that have a greater impact on the local economy than expenses associated with a car. By 2050, providing the proposed 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, 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 the Preliminary Plan than the Trend, due to the reduced dependence on cars and the proposed 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 benefit from a regional transit agency to construct, manage, and operate the proposed transit system. This is discussed further in the Financial Analysis section of this chapter.

### ➤ Recommendation 2.1: Develop a rapid transit network

The Preliminary Plan proposes eight rapid transit corridors (either bus rapid transit or streetcar extensions operating as 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 and express bus services. The intent of the proposed 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 proposed are shown in purple on Map 4.8 and would travel:

**The Preliminary Plan proposes eight rapid transit corridors intended to provide travel times competitive with those of an automobile.**

- 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.
- 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 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 Southridge Mall in Greendale, predominately on 27th Street and W. Forest Home Avenue.
- 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 Bus Rapid Transit Vehicle**
*Credit: Greater Cleveland Regional Transit Authority*

**A Light Rail Transit Vehicle**
*Credit: MetroTransit*

**The proposed 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

The Preliminary Plan proposes two commuter rail corridors 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 4.8 shows the proposed commuter bus services in red (with park-ride lots served by commuter bus identified by circles) and commuter rail services in orange (with station locations identified by circles). The proposed 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.

**A Commuter Rail Vehicle**
*Credit: SEWRPC Staff*

- **Commuter Rail Service** – The two commuter rail corridors proposed by the Preliminary Plan would connect Kenosha, Racine, Milwaukee, Wauwatosa, Brookfield, 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 those shown here. In addition to the two corridors included in the Preliminary Plan, 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 the Preliminary Plan because they are forecast to have markedly lower ridership than the two corridors included in the Preliminary Plan, but are shown on Map 4.9 as an acknowledgment that they could be pursued in the future.

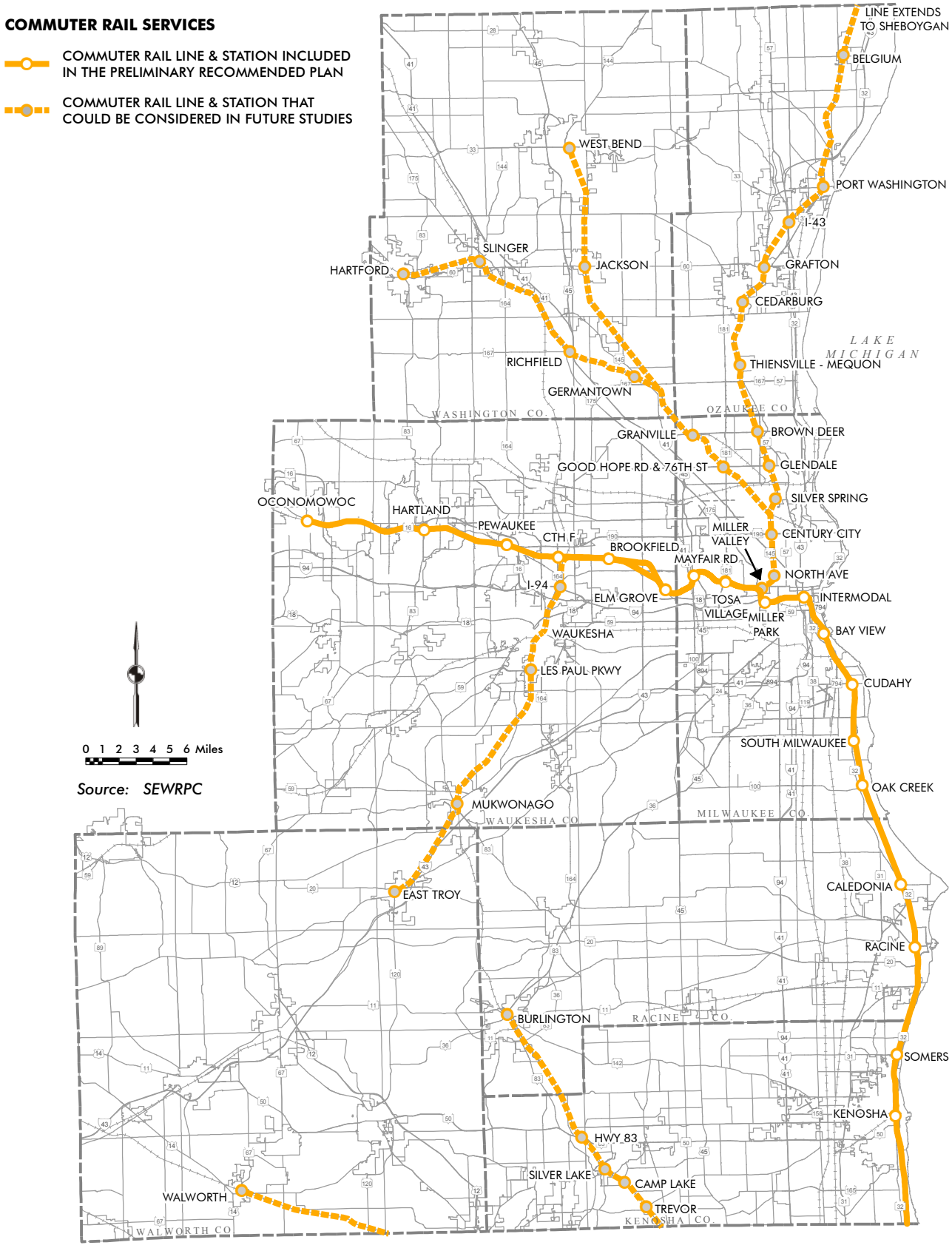
- **Commuter Bus Service** – The commuter bus services proposed by the Preliminary Plan mostly provide radial service connecting communities of the Region with downtown Milwaukee. A few services also provide connections between communities or existing park-ride lots and the proposed commuter rail services, 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).

**The improved and expanded express bus routes would have travel times better than local bus routes due to stops being spaced further apart.**

### ➤ Recommendation 2.3: Improve existing express bus service and add service in new corridors

The Preliminary Plan proposes 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 Northwestern Mutual's Franklin Campus, and both that route and the express route serving Sherman Boulevard would see

## Map 4.9
## Potential Extensions of the Commuter Rail Network: Preliminary Recommended Plan



increased frequency. Additional express routes would be added on 76th Street in Milwaukee County, traveling from the Ives Groves Park-Ride Lot to the Corinne Reid-Owens Transit Center in Racine County, traveling from Twin Lakes 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.

### ➤ Recommendation 2.4: Increase the frequency and expand the service area of local transit

The Preliminary Plan proposes 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 4.8 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 that would not be part of the larger rapid transit network 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.

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

- **Local Bus Service** – The proposed expansion of local bus 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. When compared to the existing transit services provided in the Region, Map 4.8 demonstrates both the expansion of local service and the improved frequency of existing local services. Fares for local bus services are proposed to be identical to those charged for rapid and express services.

- **Streetcar Service** – The proposed expansion of streetcar service within Milwaukee is not fully represented by the lines shown on Map 4.8. When the Preliminary Plan was prepared, the City of Milwaukee was preparing to construct an initial line connecting the Milwaukee Intermodal Station to the Historic Third Ward, East Town, and the Lower East Side, and designing an extension to connect the system to the Lakefront. The transit system proposed in the Preliminary Plan assumes that initial streetcar lines will be modified by the year 2050 to be given their own right-of-way, and that some stops will be eliminated, to allow some of the initial and proposed streetcar services to operate as light rail, becoming the downtown core of the larger rapid transit network. The City of Milwaukee intends to pursue several extensions of the initial streetcar lines and VISION 2050 would be amended to reflect any additional streetcar expansions planned by the City.

- **Shared-Ride Taxi Service** – Accessible shared-ride taxi service is proposed to be expanded across much of the Region, wherever local fixed-route transit service is unavailable. The proposed 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 one end outside the service area of local fixed-route bus or streetcar service. Service is proposed 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 proposed 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.

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

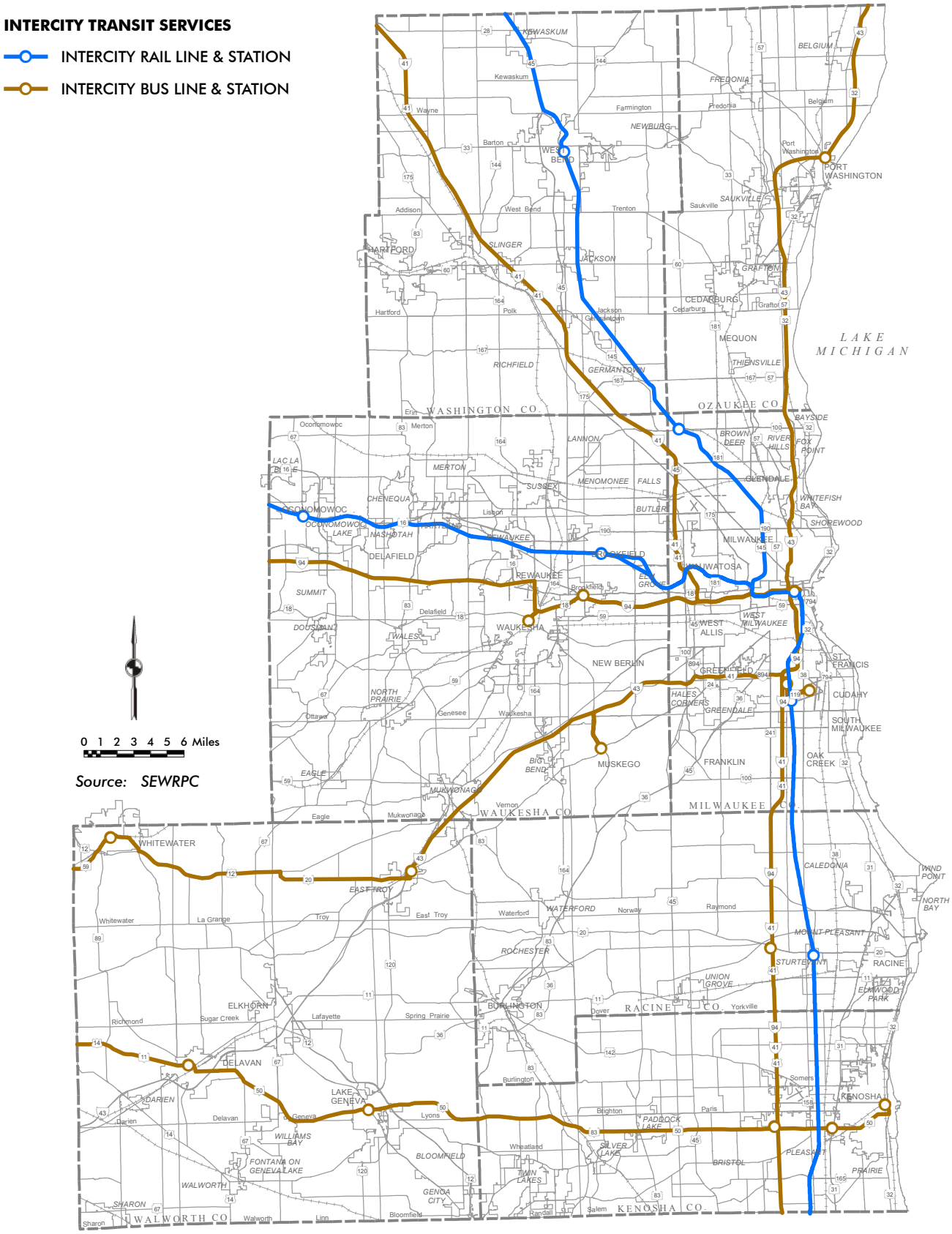
- **Paratransit Service** – The Preliminary Plan proposes that paratransit service be provided consistent with the Federal Americans with Disabilities Act (ADA) of 1990. Under ADA provisions, all transit vehicles that provide conventional fixed-route transit service must be accessible to people with 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 independently to 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 proposed paratransit service would be available during the same hours as the local, express, and rapid fixed-route transit services, and be provided to eligible individuals 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 of 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. The Recommended Plan proposes 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 proposed, one connecting Milwaukee to Minneapolis and St. Paul via Madison, and another connecting Milwaukee to Green Bay via 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 4.10 shows the segments of the proposed intercity services that are within the Region, and the stations served within the Region.

**An Intercity Passenger Rail Trainset**
*Credit: Michael Kolanowski*

## Map 4.10
## Intercity Transit Services: Preliminary Recommended Plan



### ➤ Recommendation 2.6: Implement "transit-first" designs on urban streets

The Preliminary Plan proposes 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. More detail on these recommended improvements will be included as part of design guidelines prepared for the final plan.

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

- **Transit Signal Priority Systems** – Transit signal priority systems allow transit vehicles to modify the normal traffic signal operation as it approaches the intersection to reduce the travel time delay associated with traffic signals. There are several transit signal priority measures, including red truncation, green extension, pre-timed modifications, and real-time strategies that consider overall person delay and overall system performance. The effectiveness of transit priority systems can be enhanced when provided complementary to reserved bus lanes. The Preliminary Plan proposes implementing transit signal priority systems along all rapid, express, and major local transit routes.

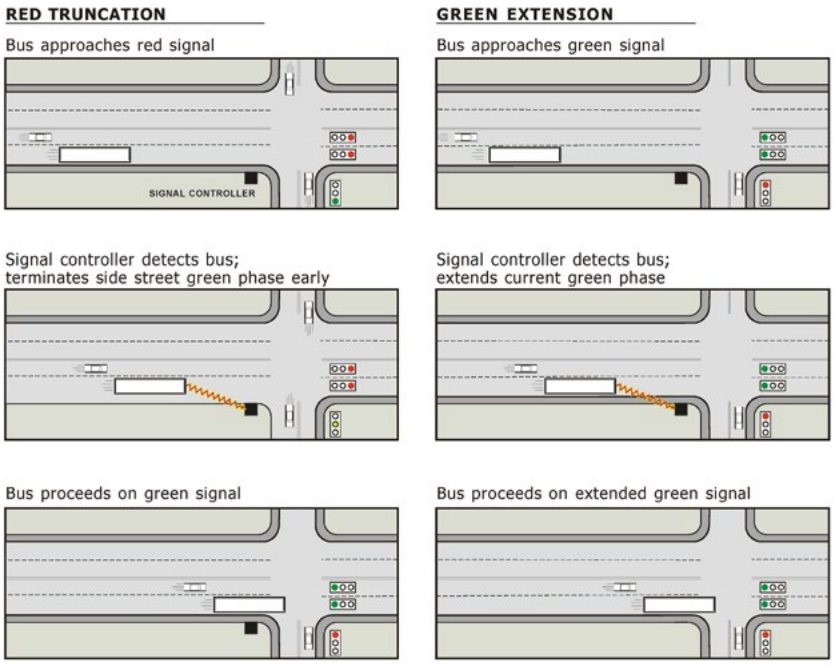



**Illustration of a Transit Signal Priority System**
*Credit: Transit Capacity and Quality of Service Manual, Third Edition*

- **Dedicated Transit Lanes** – Dedicated lanes allow transit vehicles to bypass vehicle queues attendant to 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 Bluemound Road in Waukesha County. Reserved bus lanes may be provided via auxiliary lanes, or where right-of-way is constrained, through peak-period, peak-direction curb-lane parking restrictions. The Preliminary Plan proposes expanding 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).

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

The Preliminary Plan proposes 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. More detail on these recommended improvements will be included as part of design guidelines prepared for the final plan.

### ➤ Recommendation 2.8: Accommodate bicycles on all fixed-route transit vehicles

The Preliminary Plan proposes 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 propose a robust and expansive transit system, one that will take time to develop and construct. In addition, even once the full proposed 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, the Preliminary Plan proposes 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 crosswalks 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. The Preliminary Plan proposes 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 proposed 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, the Preliminary Plan proposes 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.

### ➤ Recommendation 2.10: Provide information to promote transit use

The Preliminary Plan proposes 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.

**Undertaking activities to promote transit use can attract new transit users and encourage 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. MCTS implemented real-time information on all of its routes in 2015, allowing transit riders to track bus locations and bus stop arrival times using the MCTS website and mobile devices. The Preliminary Plan proposes 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 through joint marketing and research efforts. The Preliminary Plan proposes 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).

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

### ➤ 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, the Preliminary Plan proposes 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 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.

### ➤ 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 bus' 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. The Preliminary Plan proposes 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

The Preliminary Plan proposes 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 around the campus area. Reducing the amount of vehicular traffic also improves pedestrian and bicycle safety

around college and university campuses. The Preliminary Plan proposes 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. The Preliminary Plan proposes 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. The Preliminary Plan proposes expanding the guaranteed ride home program to include other transit operators.

**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 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 the Preliminary Recommended Plan proposes 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.

**The Preliminary Plan proposes a well-connected bicycle and pedestrian network that improves access to activity centers, neighborhoods, and other destinations in the Region.**

Bicycle recommendations for the Preliminary Plan include providing on-street bicycle accommodations on the arterial street and highway system, expanding the off-street bicycle path system, implementing enhanced bicycle facilities in key regional corridors, and expanding bike share program implementation. As shown in Table 4.10, the Preliminary Plan proposes approximately 3,031 miles of standard on-street bicycle accommodations, 359 miles of enhanced bicycle facilities, and 713 miles of off-street bicycle paths. Map 4.11 shows the preliminary 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.

### Table 4.10
### Miles of Bicycle Facilities: Preliminary Recommended Plan

| Bicycle Facility | Estimated Mileages | |
|---|---|---|
| | Existing | Preliminary Recommended Plan |
| On-street Accommodations | | |
| Standard | 814.7 | 3,031.2 |
| Enhanced | 69.5 | 358.8 |
| Off-Street Paths | 295.0 | 712.9 |

*Source: SEWRPC*

The Preliminary Plan also includes recommendations for the location, design, and construction of pedestrian facilities. The Preliminary Plan further proposes that local communities develop bicycle and pedestrian plans to supplement the regional plan.

Design guidelines related to the bicycle and pedestrian element, prepared for the final plan, are intended to provide guidance to State, county, and local officials for the location, design, and maintenance of bicycle and pedestrian facilities. Guidance is also provided relating to the design of streets, residential areas, and activity centers that may be expected to enhance opportunities for bicycle travel.

**The Preliminary Plan proposes a 3,300-mile on-street bicycle network, made up of bicycle lanes, paved shoulders, widened outside travel lanes, and enhanced bicycle facilities.**

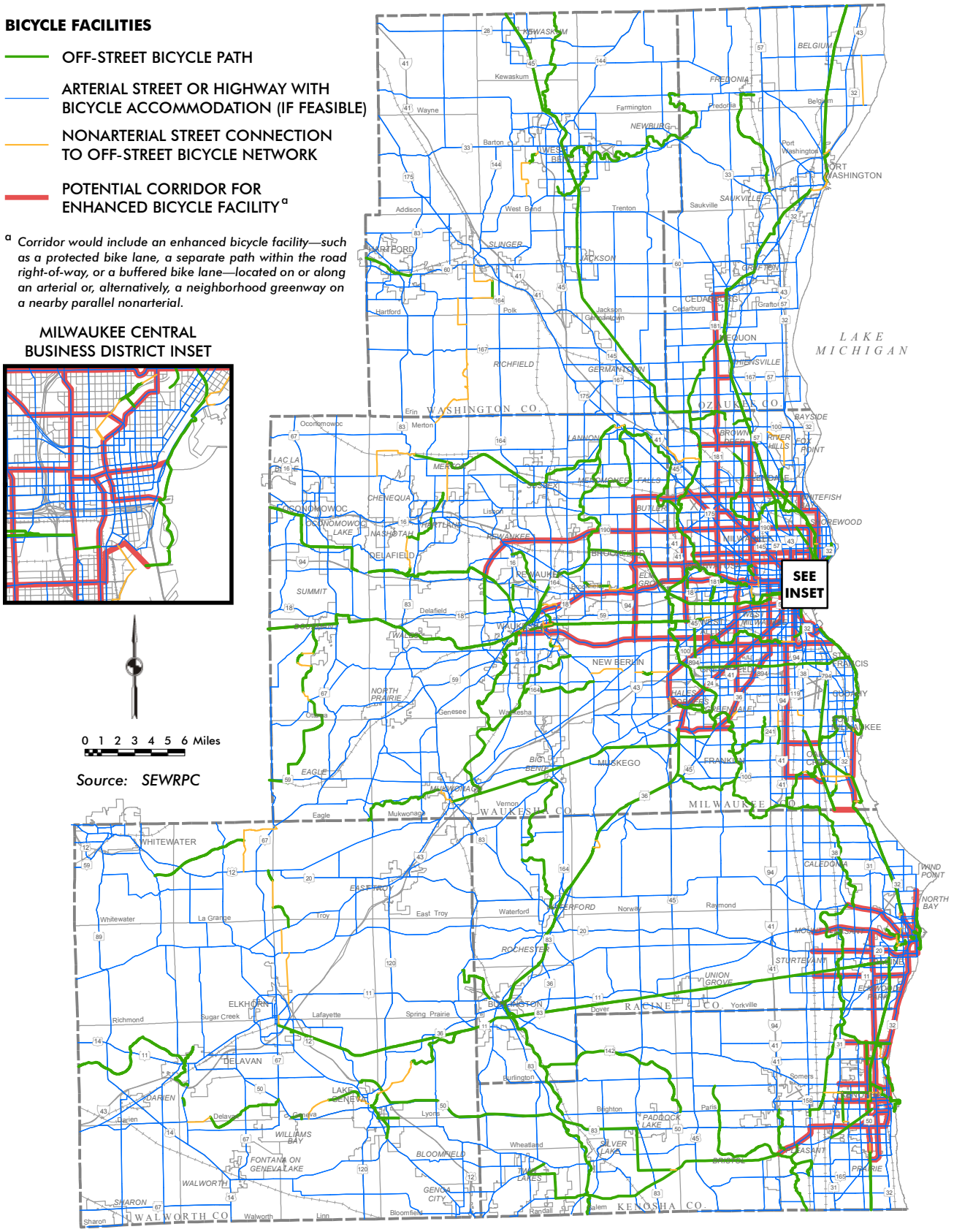
#### ➤ Recommendation 3.1: Expand the on-street bicycle network as the surface arterial system is resurfaced and reconstructed

The Preliminary Plan proposes 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.[16] It also proposes that bicycle accommodation be considered and implemented on newly constructed arterials. Enhanced bicycle facilities are defined as bicycle facilities on or along an arterial that go beyond the standard bicycle lane, paved shoulder, or widened outside travel lane. Enhanced bicycle facility examples include the protected bicycle lane, separate path within the road right-of-way, buffered bicycle lane, and raised bicycle lane.

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 above improvements in order to safely accommodate bicycle travel. The Preliminary Plan 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, are capable of accommodating bicycle travel with no special accommodation for bicycle travel.

[16] *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.*

## Map 4.11
## Bicycle Network: Preliminary Recommended Plan



In addition to accommodating bicycles on arterials, the Preliminary Plan encourages bicycle travel through intersections be appropriately accommodated. Specific guidance on the location, design, and maintenance of on-street bicycle facilities, including treatment of bicycle facilities at intersections, are presented in the design guidelines prepared for the final plan.

**The proposed 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.**

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

The Preliminary Plan proposes that a system of off-street bicycle paths be provided between the Kenosha, Milwaukee, Racine, and West Bend urbanized areas and the cities and villages within the Region with a population of 5,000 or more located outside these four urbanized areas. These off-street bicycle paths would 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 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, would include some type of bicycle accommodation—bicycle lanes, paved shoulders, widened outside travel lanes, or enhanced bicycle facilities. If provided over a nonarterial collector or land access street, they would require no special accommodation.

Bicycle connectivity under the Preliminary Plan 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 4.12 shows the regional off-street bicycle path system, which includes existing and proposed paths as well as surface arterial and nonarterial connections to the path system. The Preliminary Plan envisions expanding the existing 295 miles of off-street paths to approximately 713 miles of off-street paths.

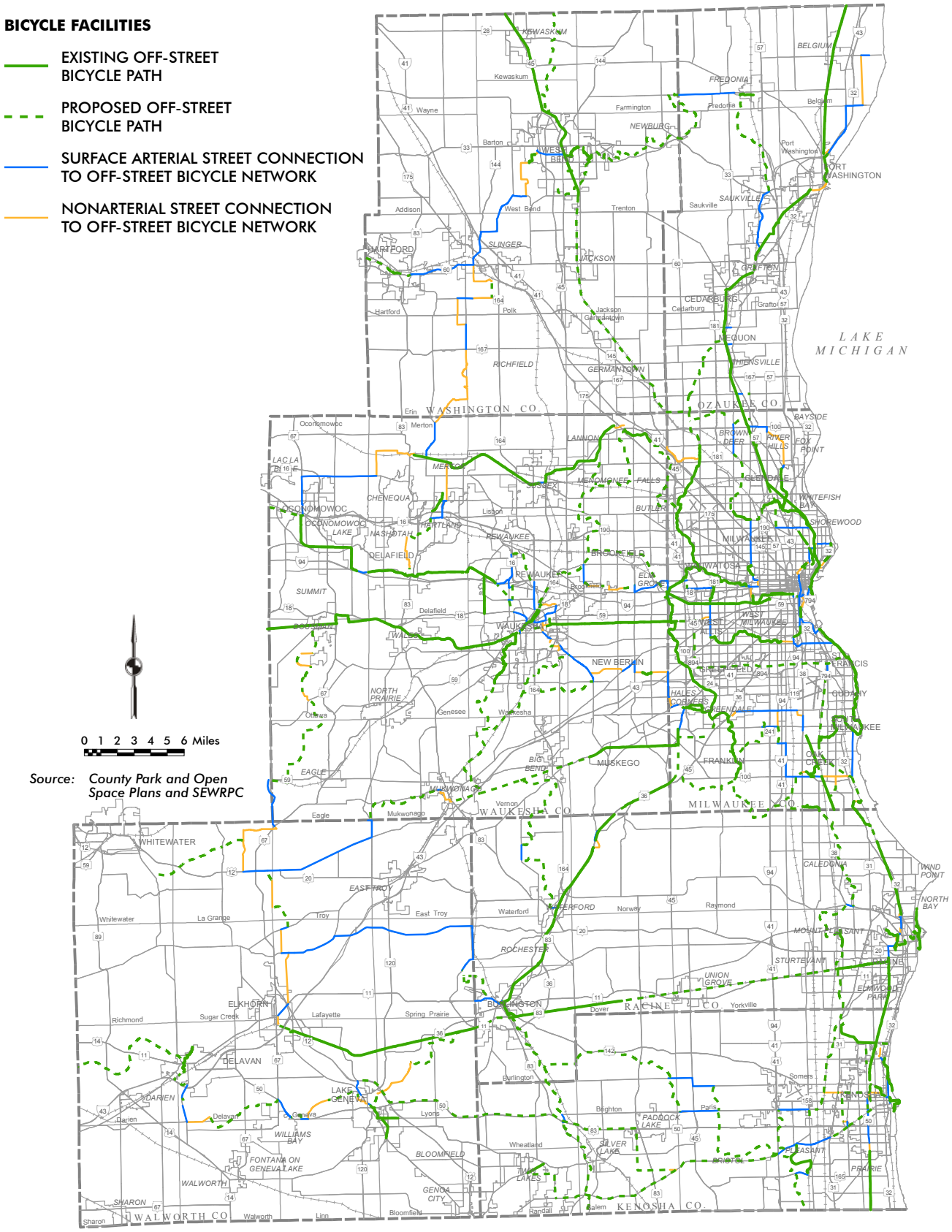
In addition to providing off-street paths and on-street connections to paths, the Preliminary Plan encourages off-street paths be appropriately marked through an intersecting street. Specific guidance on the location, design, and maintenance of off-street bicycle paths, including treatment of off-street paths when intersecting with streets, is presented in the design guidelines prepared for the final plan.

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

### ➤ Recommendation 3.3: Implement enhanced bicycle facilities in key regional corridors

The Preliminary Plan proposes 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

## Map 4.12
## Off-Street Bicycle Path System: Preliminary Recommended Plan



**A Protected Bike Lane**
*Credit: People for Bikes*

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 neighborhood greenway ("bike boulevard") on a parallel nonarterial, which is a low-speed street optimized for bicycle traffic. The Preliminary Plan proposes a network of 359 miles of enhanced bicycle facilities that would link multiple communities throughout Kenosha, Milwaukee, Ozaukee, Racine, and Waukesha Counties. Specific guidance on the design and implementation of enhanced bicycle facilities is presented in the design guidelines prepared for the final plan.

Particular consideration should be given to enhancing the treatment of existing and proposed enhanced bicycle facilities at intersections. Dashed white lines for protected, 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. Further guidance on intersection treatments for enhanced bicycle facilities is presented in the design guidelines prepared for the final plan.

The continued implementation of on-street bicycle accommodations, particularly enhanced bicycle facilities, can improve the level of comfort experienced by bicyclists. Appendix H 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. The existing arterial street network has about 800 miles of arterial streets with high levels of bicycle comfort. Under the Preliminary Plan, 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.

**A Bike Share Station**
*Credit: Bublr Bikes*

### ➤ Recommendation 3.4: Expand bike share program implementation

Bike share programs provide residents and visitors with options to use bicycles for short trips within and between downtown areas and adjacent neighborhoods. They offer opportunities for people to use a bicycle from designated stations for the purpose of traveling to and from home, work, or school, running errands, or for social activities. Bike share users often register for this service and pay an annual or monthly membership fee, although many programs also offer single or multi-day ride options for the service. Bike share has been shown to be effective at providing a travel option for short trips and for reducing trips by automobile. It can also function as a feeder service to transit systems, which often encourages an increase in trips using both of these modes.

The Preliminary Plan proposes the expansion of bike share program implementation to encourage bicycling as a viable mode of travel for short distance trips. Bike share is operated in the City of Milwaukee, and is expanding to additional locations in the City and to other communities. Bike share programs can reduce the number of vehicle trips and are often most effective in serving high-density areas with a mix of residential and commercial uses. Bike share programs can attract people who would not typically consider riding a bicycle—short-distance commuters, people running errands, and tourists—as well as those who prefer to commute via bicycle without maintaining and securing their own bicycle.

### ➤ Recommendation 3.5: Provide pedestrian facilities that facilitate safe, efficient, and accessible pedestrian travel

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

The Preliminary Plan proposes 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 prepared for the final plan); 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 between sidewalks and streets for enhancing the pedestrian environment. The Preliminary Plan further encourages making efforts to maximize pedestrian safety at street crossings (specific guidance is presented in the design guidelines prepared for the final plan), including the timing of walk signal phases; the construction of pedestrian median islands in wide, heavily traveled, or otherwise hazardous roadways; and the construction of curb extensions ("bulb-outs") that narrow the crossing distance for pedestrians at intersections. The Preliminary Plan 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, the Preliminary Plan 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. Specific guidance on the location and design of pedestrian facilities, including relevant ADA requirements and appropriate regulations, are presented in the design guidelines prepared for the final plan.

The Preliminary Plan also proposes 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 the Preliminary Plan, 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

The Preliminary Plan proposes 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 units of government should also encourage more compact and walkable development patterns through local land use policies in order to facilitate safe and efficient pedestrian and bicycle travel.

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

**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 proposals for the Preliminary Recommended Plan 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 proposed to be expanded and enhanced. Several newer technologies also provide potential opportunities, and certain measures not currently used in the Region are proposed to be considered for future implementation. Essential to implementing freeway traffic management measures is the State Traffic Operations Center (STOC) 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 proposals related to specific measures.

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

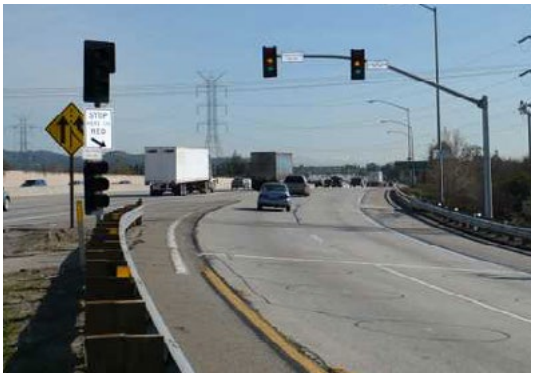
➤ **Recommendation 4.1: Implement freeway operational control measures**

The Preliminary Plan proposes 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 as well 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 STOC 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

detectors could instantaneously identify the presence of a freeway incident. The Preliminary Plan proposes 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 51 of the 121 on-ramp-meter locations. The Preliminary Plan proposes 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.

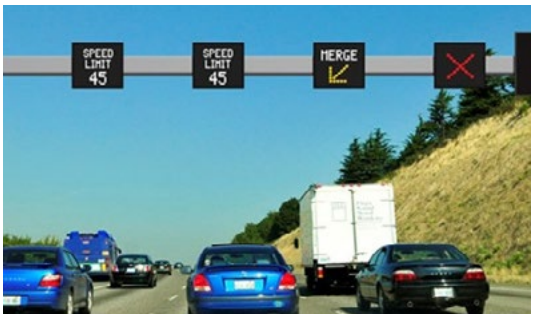


**A Ramp Meter**
*Credit: Caltrans*

- **Active Traffic Management** – In addition to the freeway operation and control measures widely utilized within the Region's freeway system, the Preliminary Plan proposes 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.




**Lane Use Control Signals**
*Credit: WSP/Parsons Brinckerhoff*

- **Lane Use Control** – Lane use control strategies utilize overhead variable message signs—such as the intelligent lane control signals (ILCS) shown in the adjacent photograph—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 shoulder.

- **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.


**Bus-on-shoulder**
*Credit: Minnesota Department of Transportation*

- **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 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.

- **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 Message Signs Show Junction Control Activated (bottom) and Not Activated (top)**
*Credit: Caltrans*

- **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

The Preliminary Plan proposes 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 STOC to display dynamic messages providing real-


**A Variable Message Sign**
*Credit: WisDOT*

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

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 31 locations along the freeway system, and at 19 locations on surface arterials that connect with the freeway system. The Preliminary Plan proposes 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.

- **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 application, 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 is deploying a statewide 511 traveler information system that 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. The Preliminary Plan proposes that WisDOT continue to improve its website and 511 system for providing advisory information to motorists. Some of these improvements could include crowd-sourcing of road and travel conditions; development of a hands-free mobile phone application; and addition of roundabout, park-ride, rest area, and more truck information, such as inclusion of a truck parking information system.

- **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. The Preliminary Plan proposes 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. Based on

this information, the traffic information provider can dynamically make route suggestions to motorists. The Preliminary Plan proposes that WisDOT and local governments consider future partnerships, particularly the Connected Citizens Program with Waze, to enable the exchange of traffic information and data. WisDOT and local governments can benefit from such a partnership by receiving real-time traffic condition information, such as traffic incidents, congestion, road conditions, and hazards. In turn, traffic information providers can use information shared openly by WisDOT and local governments, such as scheduled road closures and current construction projects, to better inform motorists of current traffic conditions. Currently, the traffic data provided by WisDOT and third-party providers is typically accessed through smart phones and GPS units. It is expected that over the next few years automobile manufacturers will expand the capability of accessing traffic information through direct connections to the internet in the automobiles that they produce.

### ➤ Recommendation 4.3: Implement incident management measures for the freeway system

The Preliminary Plan proposes 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 STOC 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 are currently being deployed as part of the Zoo Interchange reconstruction project.

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

- **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 159 CCTV cameras on most of the Region's heavily traveled freeways, along with 46 CCTV cameras on surface arterials parallel and connecting with the freeway system primarily located in Milwaukee County. The Preliminary Plan proposes 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. The Preliminary Plan proposes 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.


**A Freeway Service Patrol Vehicle**
*Credit: WisDOT*

- **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. The Preliminary Plan proposes expanding freeway service patrol to serve the entire regional freeway system, and providing greater coverage, including all-day weekday and weekend service and increased vehicle coverage of 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 Ramp Closure Device**
*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. The Preliminary Plan proposes that WisDOT expand implementation of ramp closure devices throughout Southeastern Wisconsin.

- **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 32 crash investigation sites on the Region's freeway system with 24 of the 32 sites in Milwaukee County. The Preliminary Plan proposes 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. The Preliminary Plan proposes 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 of freeway. The Preliminary Plan proposes 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 proposed to be expanded and enhanced. Surface arterial street and highway traffic management measures are described below, along with proposals 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 systems 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.

**The Preliminary Plan proposes a future study to document existing and planned traffic signals and make recommendations for improving and expanding coordinated signal systems.**

The Preliminary Plan proposes 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 a high priority for Federal and State funding, such as Federal Highway Administration (FHWA) Congestion Mitigation and Air Quality Improvement (CMAQ) Program funds. The Preliminary Plan also proposes preparing and implementing 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 proposed 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.

### ➤ 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). The Preliminary Plan proposes that State and local governments aggressively consider and implement individual arterial street and highway intersection improvements. The Preliminary Plan also proposes 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. The Preliminary Plan further proposes that Commission staff work with State, county, and local governments, at their request, to prepare such programs for arterial street and highway intersections, identifying the need for improvement, and recommended 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. The Preliminary Plan proposes that State and local governments consider implementing curb-lane parking restrictions as needed during peak traffic periods in the peak traffic direction along segments of roadway expected to operate under congested conditions by the year 2050, 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 BRT service is proposed to operate in a dedicated lane. Map 4.13 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. The Preliminary Plan proposes 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. A set of recommended access standards are presented in the design guidelines for the final plan.

### ➤ 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 involves providing real-time information of existing conditions, particularly delays and major incidents, to encourage more informed travel decisions and more efficient use of the transportation system. The Preliminary Plan proposes 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 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 have been 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 were installed along portions of Bluemound Road (USH 18), Greenfield Avenue (STH 59), and Mayfair Road/108th Street (STH 100).

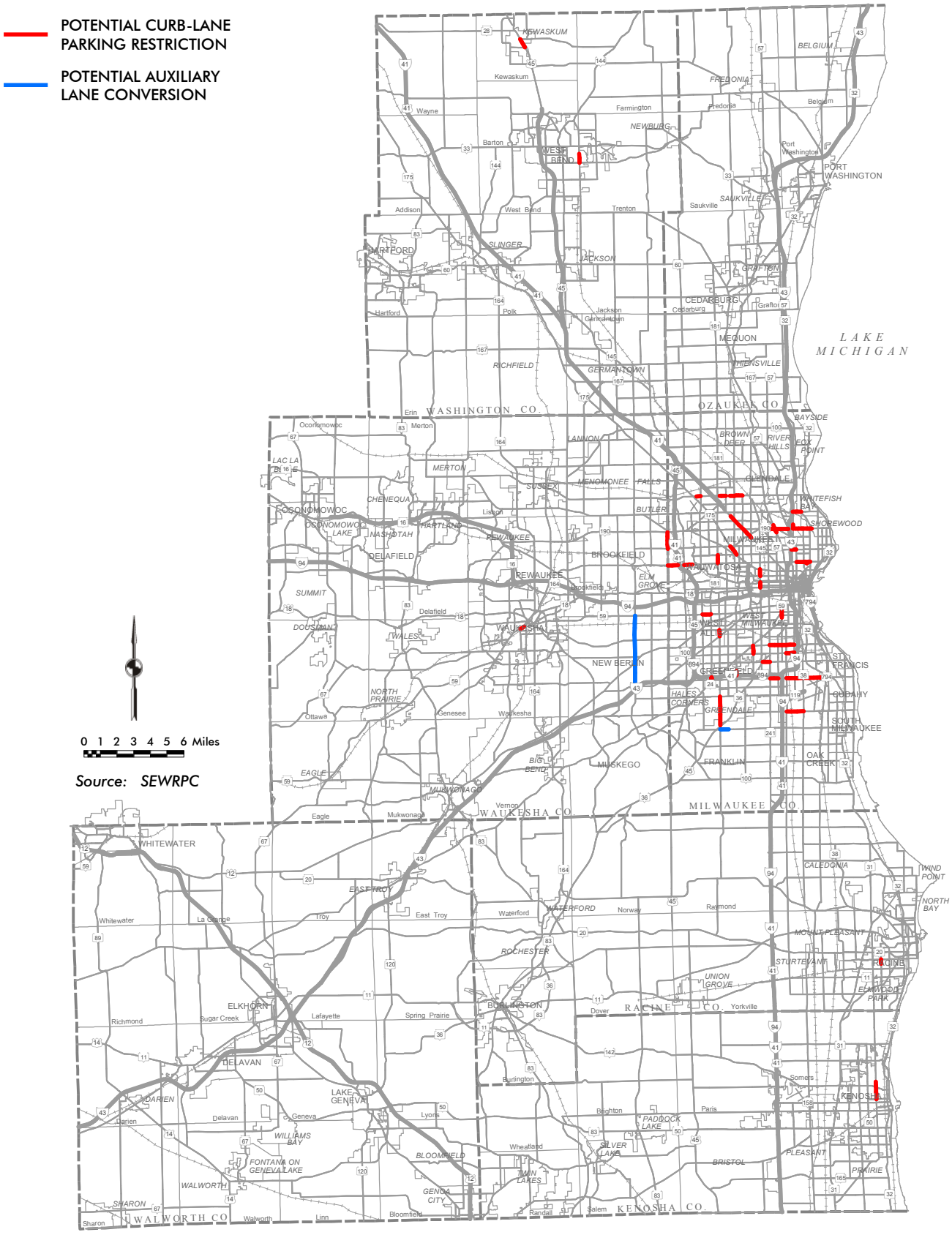
**One way to enhance advisory information would be to include surface arterial data on the 511 Wisconsin website in addition to freeway data.**


**A Hybrid Variable/Static Travel Time Sign**
*Credit: SEWRPC*

### ➤ 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. The Preliminary Plan proposes expanding the use of emergency vehicle preemption at traffic signals in Southeastern Wisconsin.

## Map 4.13
## Location of Potential Curb-Lane Parking Restrictions and Auxiliary Lane Conversions on Arterial Streets and Highways: Preliminary Recommended Plan



### *Major Activity Center Parking*

The Preliminary Plan proposes strategies to improve parking around major activity centers that allow motorists to find available parking quickly, reducing traffic volume and congestion, and attendant 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

The Preliminary Plan proposes 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 proposal 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. This 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*

#### ➤ 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. The Preliminary Plan proposes that demand-responsive pricing for parking be considered for future implementation in major activity centers.

**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.**

### *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 Federal CMAQ Program funding.

#### ➤ Recommendation 4.12: Review and update regional transportation operations plan

The Preliminary Plan proposes that Commission staff work with State, county, and municipal 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 4.11. The Preliminary Plan proposes that these corridors and intersections be considered as part of the next review and update to the RTOP.

## Table 4.11
## Isolated Intersections and Roadway Corridors Identified as Having Potential Traffic Flow Issues by County and Local Governments: Preliminary Recommended Plan

| 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 |
| **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*

**Travel demand management involves using 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.**

### Description of Travel Demand Management Element

Travel demand management (TDM) refers to a series of measures or strategies intended to reduce personal and vehicular travel or to shift such travel to alternative times and routes, allowing for more efficient use of the existing capacity of the transportation system. The general intent of such measures is to reduce traffic volume and congestion, and attendant air pollutant emissions and fuel consumption. To be effective, these 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. The Preliminary Recommended Plan proposes 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 and public transit elements of the Preliminary Plan, and the transit element proposes a number of additional measures that would reduce personal and vehicular travel beyond those included in the TDM element.

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

The Preliminary Plan proposes to continue and enhance 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 HOVs 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 public 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 51 of the 121 metered freeway on-ramp locations on the Region's freeway system. The Preliminary Plan proposes 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 vanpool to their employment site. This measure can reduce vehicle trips by encouraging ridesharing among employees. The Preliminary Plan 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, the Preliminary Plan proposes 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 4.14 shows the proposed system of park-ride lots, including existing park-ride lots and those proposed to be served by transit.

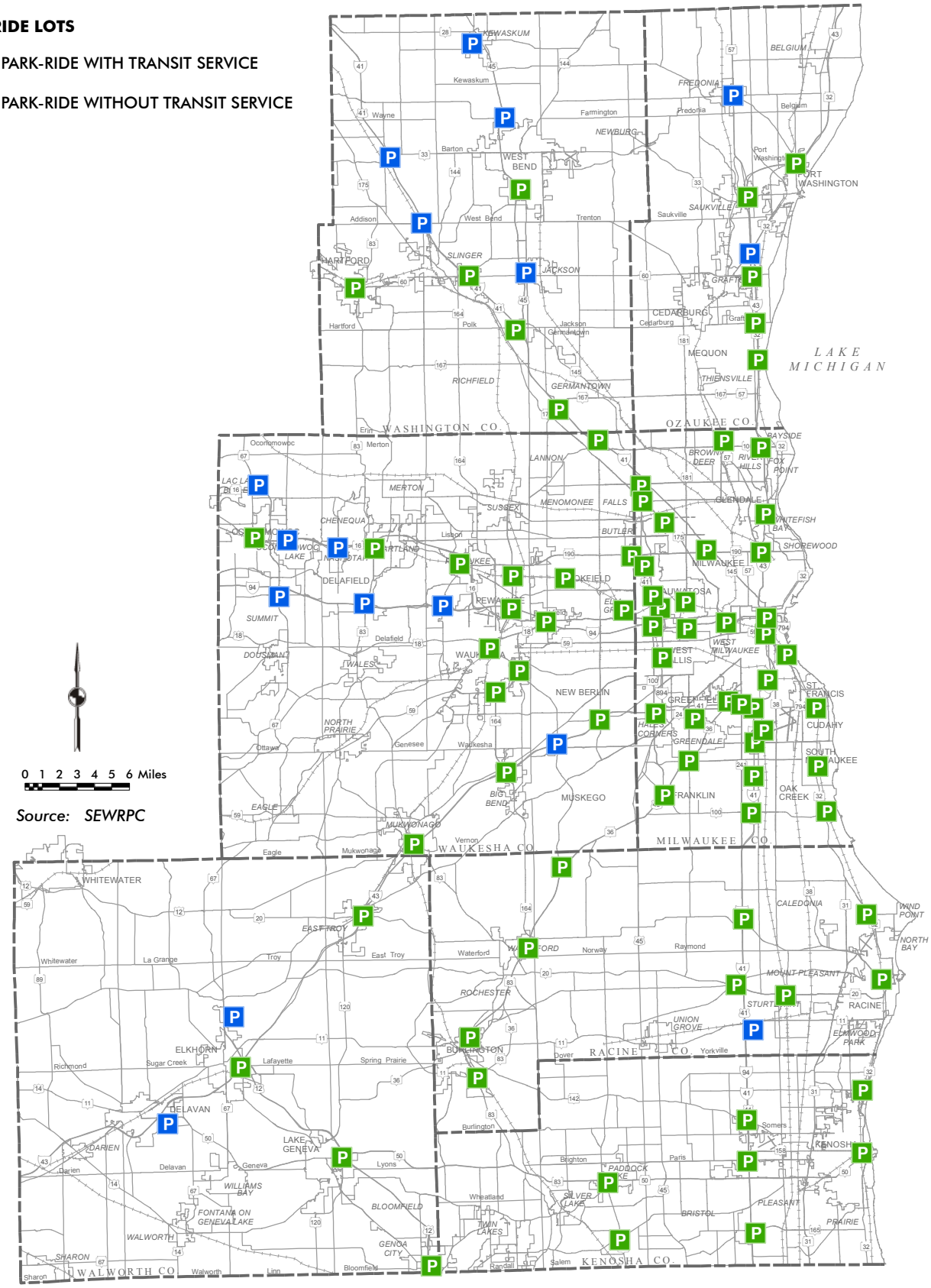
### ➤ Recommendation 5.3: Implement personal vehicle pricing

The Preliminary Plan proposes 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).

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

- **Cash-out of Employee-Paid Parking** – Cash-out of 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

## Map 4.14
## Park-Ride Lots: Preliminary Recommended Plan



ride-sharing. The Preliminary Plan 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 increase 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. The Preliminary Plan 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 have faced obstacles due to technology uncertainty, privacy concerns, and cost implementation issues. However, low technological options, such as incorporating odometer readings during the annual vehicle registration process, are also possible. In 2013, the Wisconsin Transportation Finance and Policy Commission, a State task force appointed by the Governor, recommended incorporating a VMT fee with the annual registration fee, but the proposal was not considered by the State Legislature.

- **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.


**Congestion Pricing Example**
*Credit: Minnesota Department of Transportation*

- **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 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. The Preliminary Plan supports the implementation and expansion of parking pricing strategies.

### ➤ Recommendation 5.4: Promote travel demand management

The Preliminary Plan proposes a regionwide program to aggressively promote transit use, bicycle use, ridesharing, pedestrian travel, telecommuting, 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. The Preliminary Plan further proposes 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.

- **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. The Preliminary Plan proposes expanding the car sharing services where appropriate in Southeastern Wisconsin.


**A Car Sharing Service**
*Credit: City of Milwaukee*

- **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. The Preliminary Plan proposes 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

The Preliminary Plan proposes 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 proposed under the land use component of the Preliminary Plan 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 other 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 the Preliminary Plan, 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. The Preliminary Plan proposes local governments in urban areas consider removing minimum parking requirements from their zoning ordinances.

**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 the Preliminary Recommended Plan totals 3,666.5 route-miles. Approximately 90 percent, or 3,309.0 of these route-miles, are proposed to be resurfaced and reconstructed to their existing traffic carrying capacity. Approximately 283.9 route-miles, or about 8 percent of the year 2050 arterial street and highway system are recommended for capacity expansion through widening to provide additional through traffic lanes. The remaining 73.6 route-miles, or about 2 percent of the total arterial street mileage, propose arterial system capacity expansion through the construction of new arterial facilities. Of the total of about 357.5 route-miles of planned arterial capacity expansion, about 79.9 route-miles, or 22 percent, is part of a committed project (i.e., one that is currently underway or recommended as part of a completed or nearly completed preliminary engineering study). Table 4.12 and Maps 4.15 through 4.21 display the arterial street and highway element of the Preliminary Plan.

**The preliminary year 2050 arterial street and highway system is designed to serve an expected increase in vehicle-miles of travel of 23% by the year 2050, with an 8% increase in arterial system lane-miles.**

The arterial system capacity expansion proposed in the Preliminary Plan represents about an 8 percent expansion in arterial system lane-miles over the next 35 years. The year 2050 arterial street and highway system is designed to serve the expected increase in VMT in the Region of 23 percent by the year 2050 (even with a near doubling of transit and a more compact development pattern proposed under the Preliminary Plan). The year 2050 arterial street and highway system is designed to address the forecast year 2050 congestion that may be expected, even if all the other elements of the Preliminary Plan are fully implemented, including land use, public transit, transportation systems management, travel demand 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. In addition, access by automobile to major

## Table 4.12
## Arterial Street and Highway System Preservation, Improvement, and Expansion by Arterial Facility Type by County: Preliminary Recommended Plan

| County | Arterial Facility Type | System Preservation (miles) | System Improvement (miles) | System Expansion (miles) | Total Miles |
|---|---|---|---|---|---|
| **Kenosha** | Freeway | 8.6 | 3.4 | 0.0 | 12.0 |
| | Surface Arterial | 318.4 | 31.2 | 4.4 | 354.0 |
| | Subtotal | 327.0 | 34.6 | 4.4 | 366.0 |
| **Milwaukee** | Freeway | 19.2 | 48.4 | 0.0 | 67.6 |
| | Surface Arterial | 719.3 | 11.3 | 7.0 | 737.6 |
| | Subtotal | 738.5 | 59.7 | 7.0 | 805.2 |
| **Ozaukee** | Freeway | 13.3 | 14.1 | 0.0 | 27.4 |
| | Surface Arterial | 262.4 | 18.5 | 2.9 | 283.8 |
| | Subtotal | 275.7 | 32.6 | 2.9 | 311.2 |
| **Racine** | Freeway | 0.0 | 12.0 | 0.0 | 12.0 |
| | Surface Arterial | 410.1 | 11.1 | 13.9 | 435.1 |
| | Subtotal | 410.1 | 23.1 | 13.9 | 447.1 |
| **Walworth** | Freeway | 49.8 | 4.8[a] | 12.5 | 67.1[a] |
| | Surface Arterial | 408.5 | 4.3 | 10.3 | 423.1 |
| | Subtotal | 458.3 | 9.1 | 22.8 | 490.2 |
| **Washington** | Freeway | 35.8 | 6.6 | 0.0 | 42.4 |
| | Surface Arterial | 388.8 | 8.8 | 16.9 | 414.5 |
| | Subtotal | 424.6 | 15.4 | 16.9 | 456.9 |
| **Waukesha** | Freeway | 32.5 | 26.4 | 0.0 | 58.9 |
| | Surface Arterial | 642.3 | 83.1 | 5.7 | 731.1 |
| | Subtotal | 674.8 | 109.5 | 5.7 | 790.0 |
| **Region** | Freeway | 159.2 | 115.7[b] | 12.5 | 287.4[b] |
| | Surface Arterial | 3,149.8 | 168.2 | 61.1 | 3,379.1 |
| | Total | 3,309.0 | 283.9 | 73.6 | 3,666.5 |

[a] *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.*

[b] *Includes the widening of approximately 110.9 miles of the existing 2015 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*

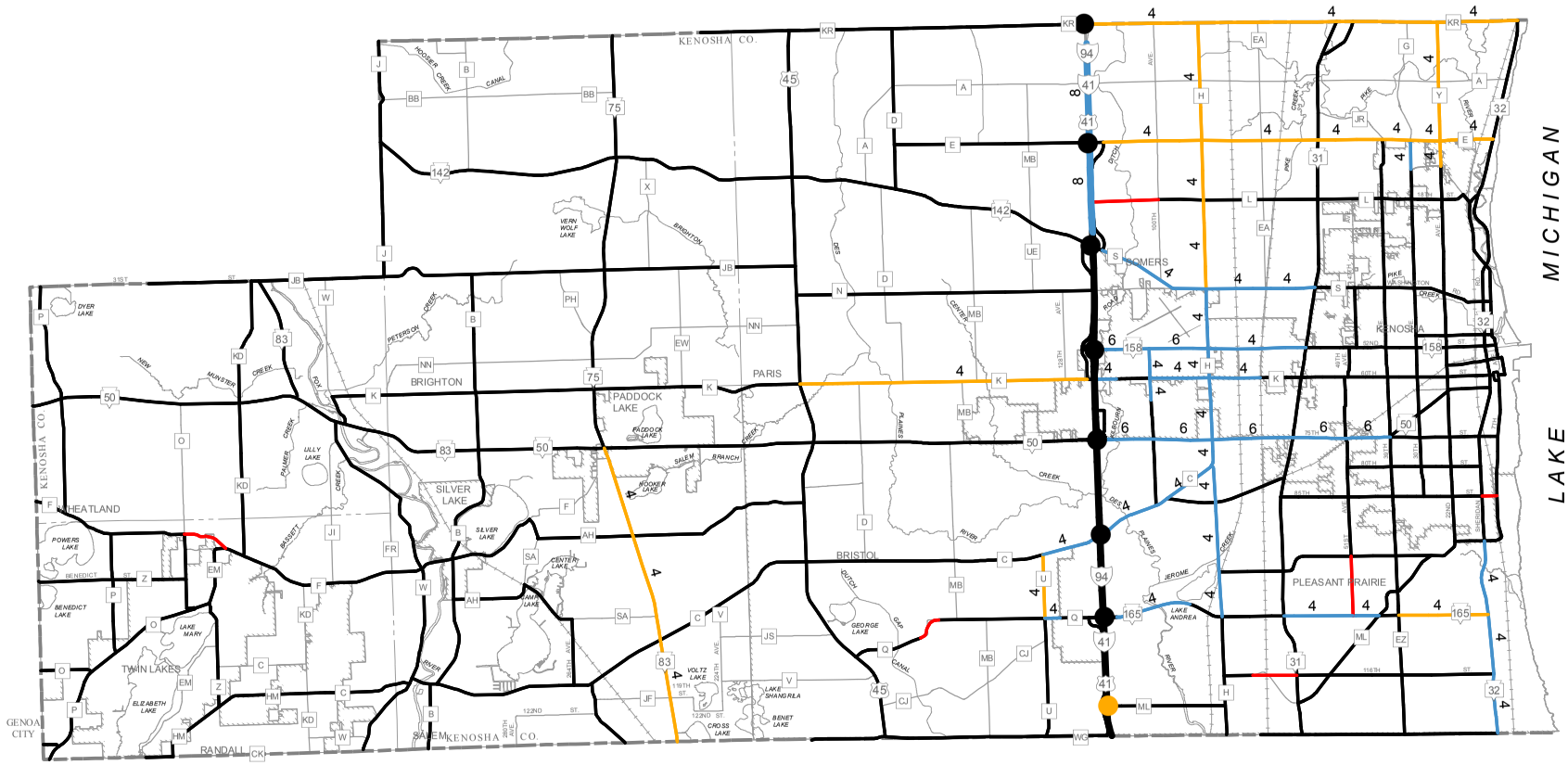
activity centers (such as retail centers, major parks, universities, and health care providers) and regional destinations (such as General Mitchell International Airport and the Milwaukee Regional Medical Center) would be expected to remain about the same by the year 2050 for the Region's population. 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: Preserve the Region's arterial street and highway system

The Preliminary Plan proposes 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-way[17]—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

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

## Map 4.15
## Functional Improvements to the Arterial Street and Highway System in Kenosha County: Preliminary Recommended Plan




**ARTERIAL STREET OR HIGHWAY**

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

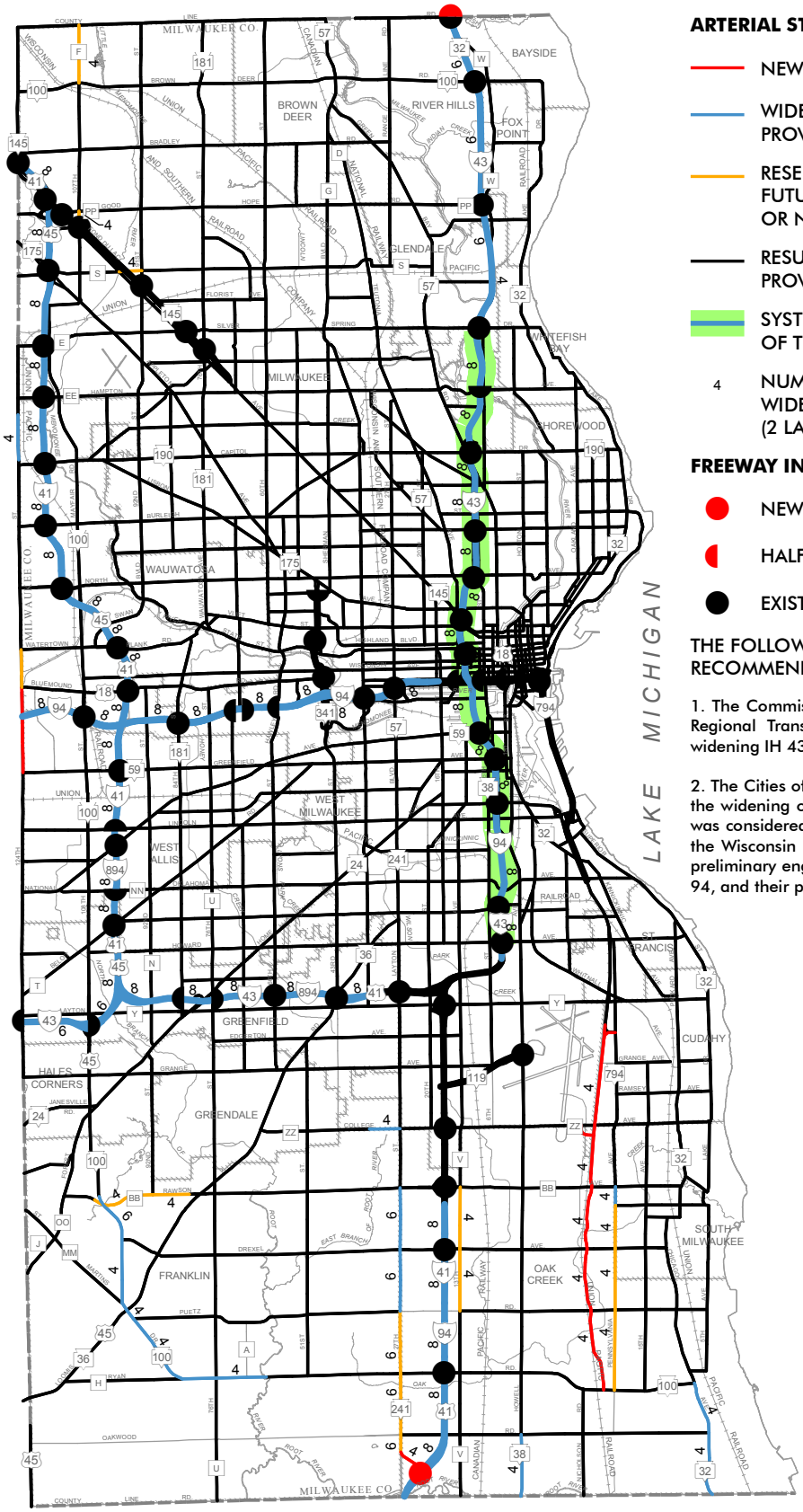
**FREEWAY INTERCHANGE**

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

0 1 2 3 Miles

*Source: Wisconsin Department of Transportation and SEWRPC*

## Map 4.16
## Functional Improvements to the Arterial Street and Highway System in Milwaukee County: Preliminary Recommended Plan




**ARTERIAL STREET OR HIGHWAY**

- NEW
- WIDENING AND/OR OTHER IMPROVEMENT TO PROVIDE SIGNIFICANT ADDITIONAL CAPACITY
- RESERVE RIGHT-OF-WAY TO ACCOMMODATE FUTURE IMPROVEMENT (ADDITIONAL LANES OR NEW FACILITY)
- RESURFACING OR RECONSTRUCTION TO PROVIDE ESSENTIALLY THE SAME CAPACITY
- SYSTEM WAS EVALUATED WITHOUT WIDENING OF THIS SEGMENT OF IH 43 (SEE NOTE 1 BELOW)
- 4 NUMBER OF TRAFFIC LANES FOR NEW OR WIDENED AND/OR IMPROVED FACILITY (2 LANES WHERE UNNUMBERED)

**FREEWAY INTERCHANGE**

- NEW
- HALF NEW
- EXISTING

THE FOLLOWING NOTES SUPPLEMENT THE RECOMMENDATIONS PORTRAYED ON THIS MAP:

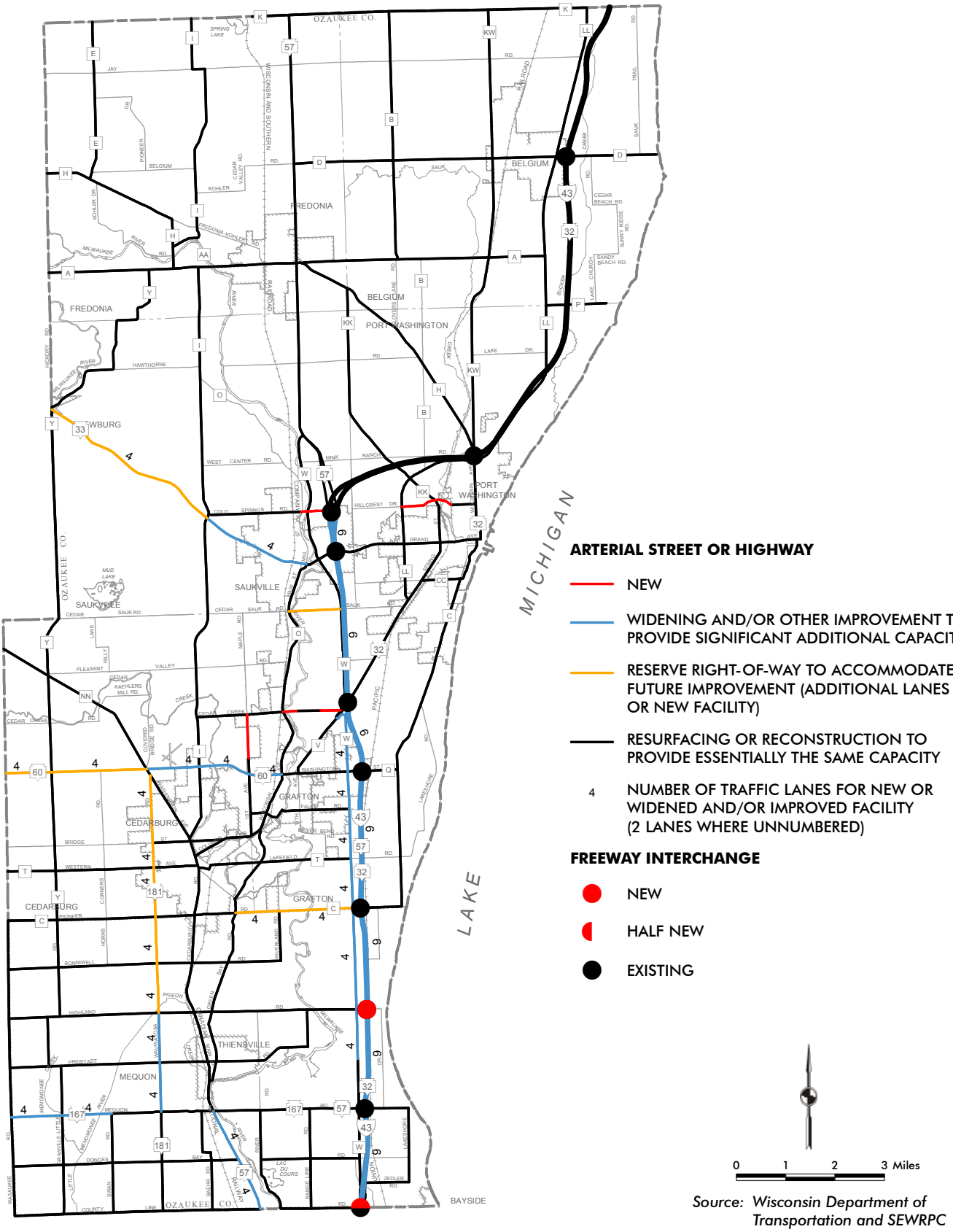
1. The Commission staff was asked by the Advisory Committee on Regional Transportation Planning to evaluate the effect of not widening IH 43 between Howard Avenue and Silver Spring Drive.

2. The Cities of Milwaukee and Wauwatosa expressed opposition to the widening of IH 94 between 70th Street and 16th Street, which was considered a committed project under the Preliminary Plan, as the Wisconsin Department of Transportation had nearly completed preliminary engineering for the reconstruction of this segment of IH 94, and their preferred alternative includes its widening.

0 1 2 3 Miles

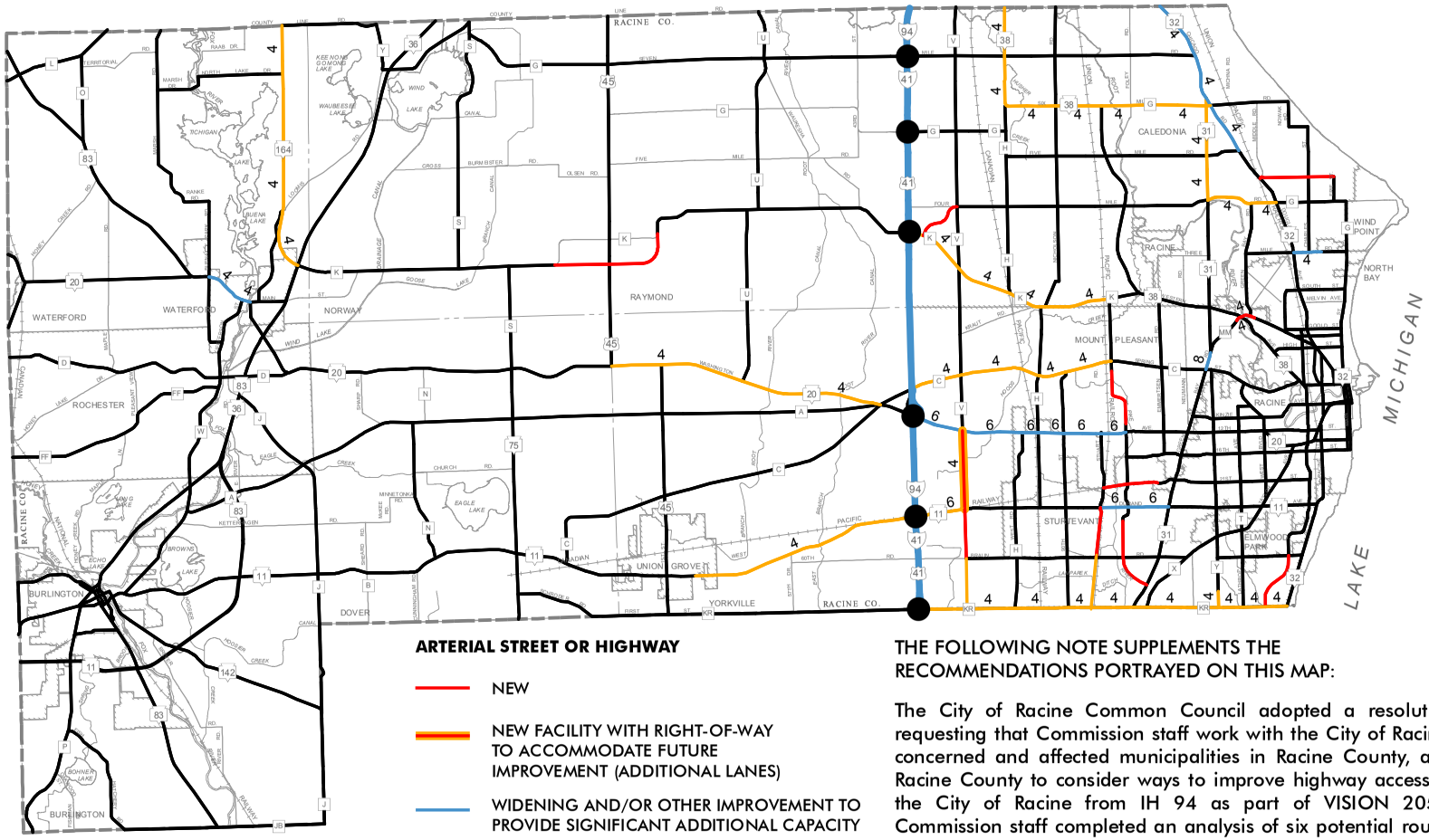
*Source: Wisconsin Department of Transportation and SEWRPC*

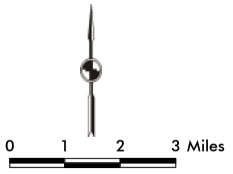
## Map 4.17
## Functional Improvements to the Arterial Street and Highway System in Ozaukee County: Preliminary Recommended Plan




*Source: Wisconsin Department of Transportation and SEWRPC*

## Map 4.18
## Functional Improvements to the Arterial Street and Highway System in Racine County: Preliminary Recommended Plan




*Source: Wisconsin Department of Transportation and SEWRPC*

**ARTERIAL STREET OR HIGHWAY**

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

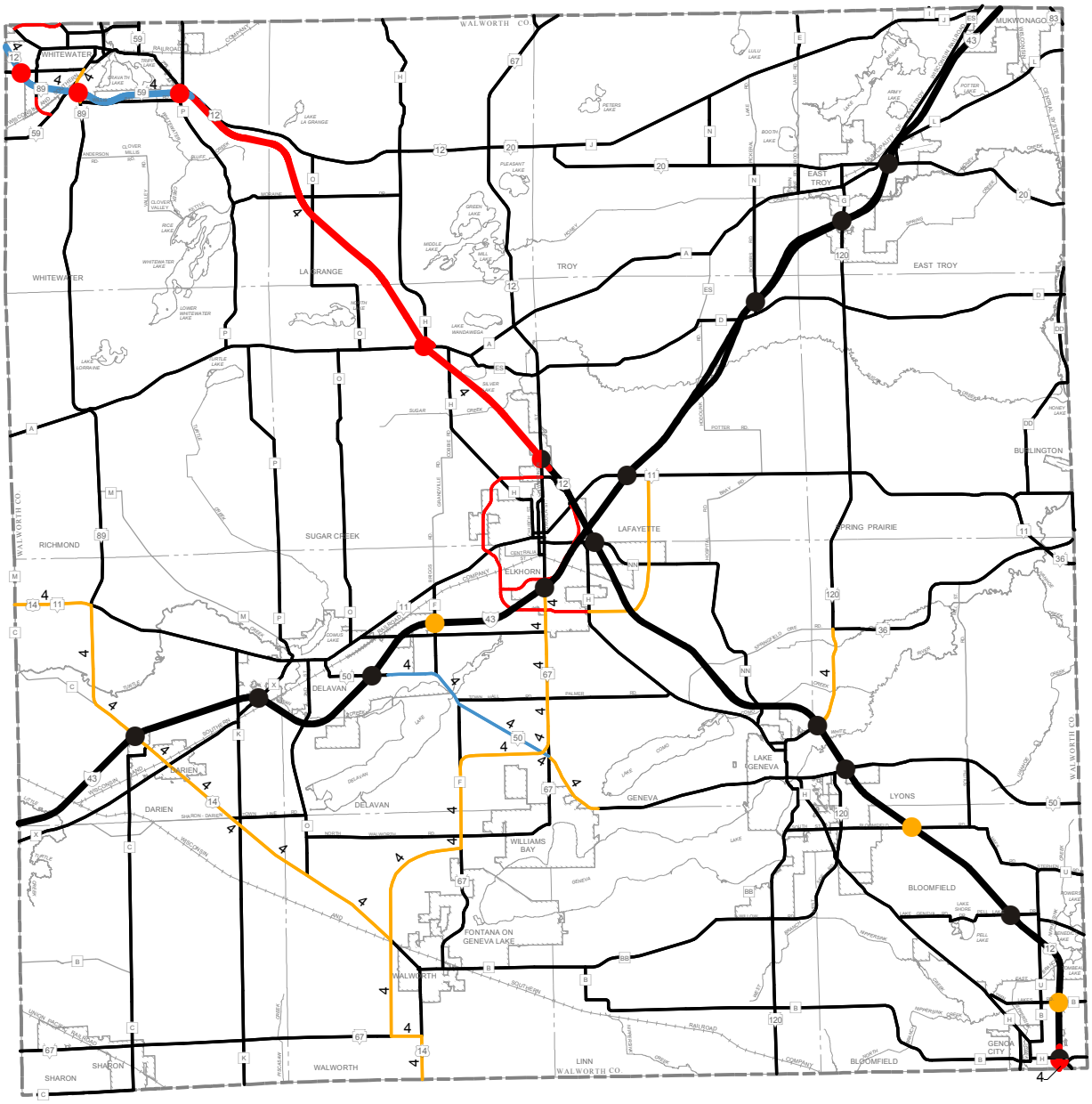
**FREEWAY INTERCHANGE**

- EXISTING

THE FOLLOWING NOTE SUPPLEMENTS THE RECOMMENDATIONS PORTRAYED ON THIS MAP:

The City of Racine Common Council adopted a resolution requesting that Commission staff work with the City of Racine, concerned and affected municipalities in Racine County, and Racine County to consider ways to improve highway access to the City of Racine from IH 94 as part of VISION 2050. Commission staff completed an analysis of six potential routes between IH 94 and the City of Racine downtown area (defined as Main Street between State Street and 7th Street): STH 11/STH 32, STH 20/STH 32, CTH K/STH 38, Four Mile Road/STH 32, CTH C/STH 38, and CTH KR/STH 32. Based on the results of the analysis, Commission staff has identified three routes for further study: STH 20/STH 32, CTH K/STH 38, and CTH KR/STH 32. Commission staff will work with affected local units of government and the Wisconsin Department of Transportation to identify potential recommended improvements along these three routes. Any additional functional improvements identified would be included in the final recommended plan or amended into the plan.

## Map 4.19
## Functional Improvements to the Arterial Street and Highway System in Walworth County: Preliminary Recommended Plan




**ARTERIAL STREET OR HIGHWAY**

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

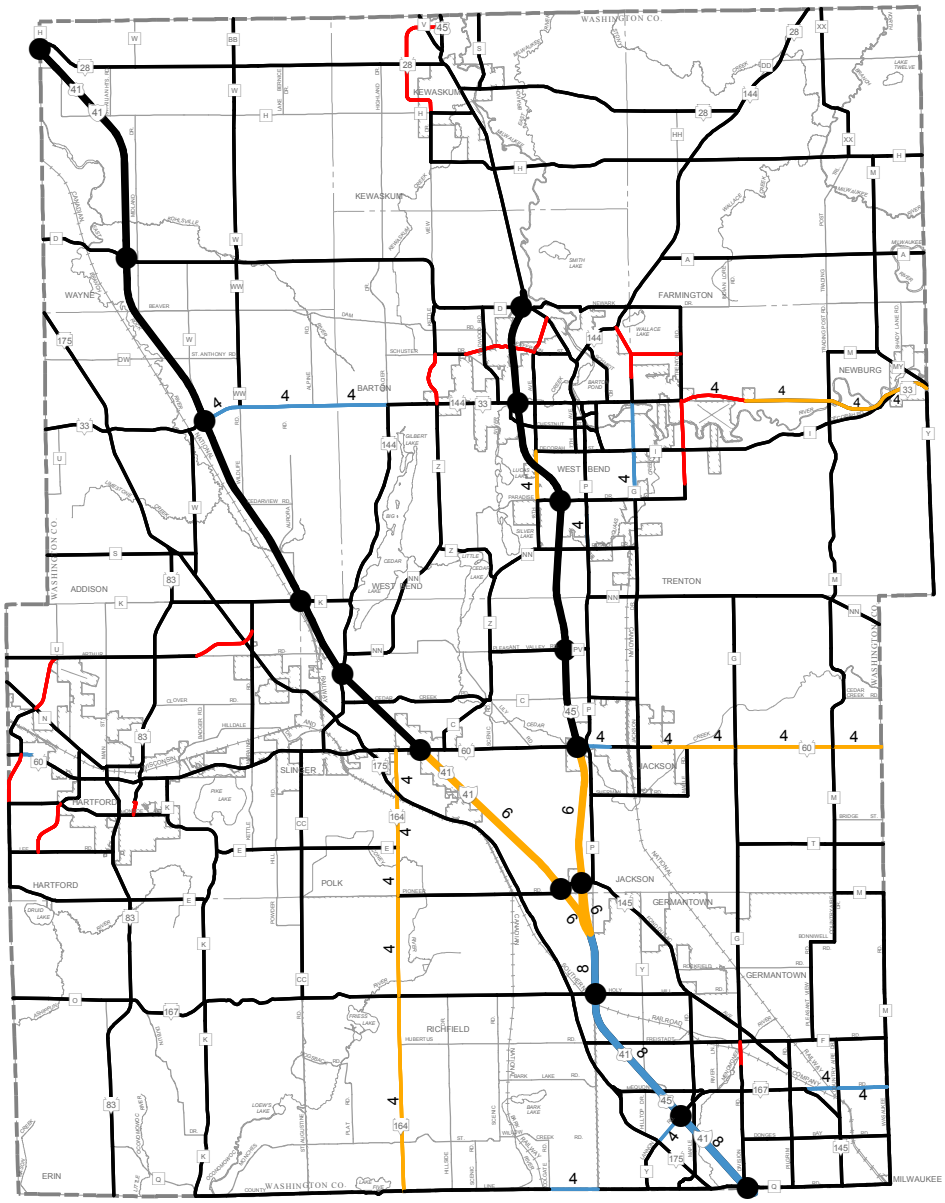
**FREEWAY INTERCHANGE**

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

0 1 2 3 Miles

*Source: Wisconsin Department of Transportation and SEWRPC*

## Map 4.20
## Functional Improvements to the Arterial Street and Highway System in Washington County: Preliminary Recommended Plan




**ARTERIAL STREET OR HIGHWAY**

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

**FREEWAY INTERCHANGE**

- EXISTING

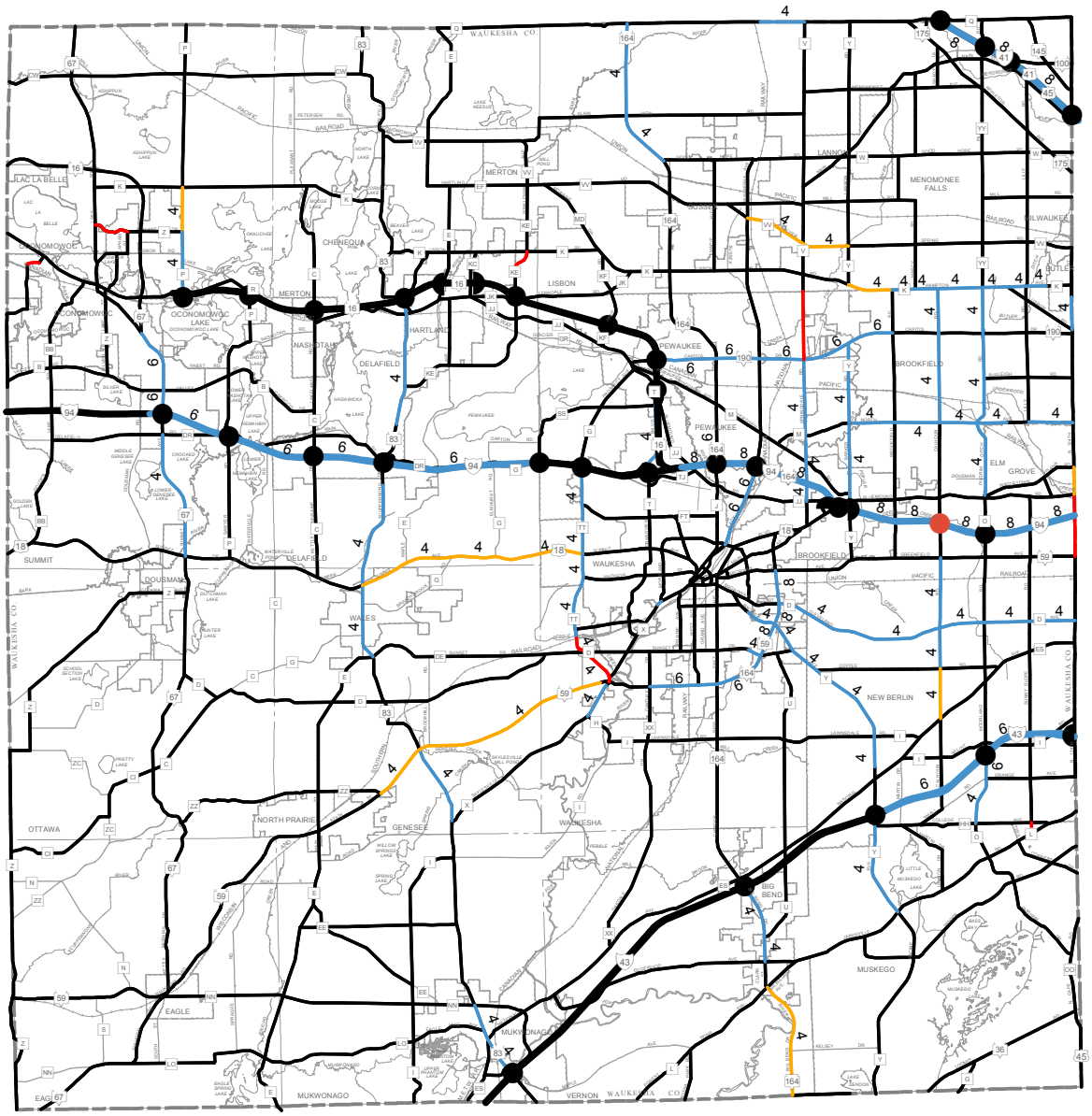
THE FOLLOWING NOTE SUPPLEMENTS THE RECOMMENDATIONS PORTRAYED ON THIS MAP:

Commission staff was asked by Washington County to evaluate alternative east-west arterial bypass routes north of the City of Hartford and Village of Slinger, and potential improvements to STH 60 between the west county line and IH 41. The study is expected to be completed beyond the completion of VISION 2050. Should the results of this study differ from the final plan, it will be amended to reflect the results of the study.

0 1 2 3 Miles

Source: *Wisconsin Department of Transportation and SEWRPC*

## Map 4.21
## Functional Improvements to the Arterial Street and Highway System in Waukesha County: Preliminary Recommended Plan




**ARTERIAL STREET OR HIGHWAY**

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

**FREEWAY INTERCHANGE**

- NEW
- HALF NEW
- EXISTING

0 1 2 3 Miles

*Source: Wisconsin Department of Transportation and SEWRPC*

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.[18] The Preliminary Plan proposes that the condition of roadway pavements and bridges be maintained at least to its current level through the year 2050. Specifically, it proposes maintaining or increasing the current proportion of pavement that is in "good" condition (about 55 percent), and maintaining or reducing the current proportion of pavement in "bad" condition (about 11 percent), during the life of the plan. Similarly, it proposes maintaining or increasing the current proportion of bridges that have a sufficiency rating of 80 or more (about 71 percent), and maintaining or reducing the current proportion of bridges with a sufficiency rating less than 50 (about 5 percent), 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 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. Since the Moving Ahead for Progress in the 21st Century Act (MAP-21) was enacted in 2012, WisDOT has been required to develop and implement an asset management plan for the pavement and bridges of the roadways on the National Highway System (NHS) within the State. At the time the Preliminary Plan was prepared, FHWA had not yet finalized the requirements for States in developing these asset management plans. WisDOT has one year following completion of the Federal requirements to complete their asset management plan. The Preliminary Plan proposes that WisDOT's Federally required asset management plan also include the state trunk highways that are not on the NHS. The Preliminary Plan also proposes that local governments within the Region develop and implement asset management plans for the arterial and nonarterial roadways under their jurisdiction. This

[18] *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.*

would be particularly important for local governments that maintain a large system of arterial and nonarterial roadways.

- **Performance Monitoring of Pavement and Bridge Condition** – As part of the performance management reporting and targeting setting requirements initiated under MAP-21, the Commission will be responsible to report the condition of the pavement and bridges for the roadways on the NHS. At the time the Preliminary Plan was prepared, FHWA was finalizing the methodology that will be used to determine the level of condition for pavement and bridges for the NHS roadways. The collection of these data will be primarily the responsibility of WisDOT, which is responsible for reporting the condition of the pavement and bridges for the NHS roadways statewide. In addition, WisDOT is responsible for setting performance targets for the condition of pavement and bridges on the NHS, and has one year from the time the methodology is finalized to establish the performance targets for pavement and bridges statewide. The Commission will be responsible to establish and report regionwide targets for the condition of pavement and bridges. When established, these performance targets will be reported in VISION 2050 updates.

**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. The Preliminary Plan proposes 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, the Preliminary Plan proposes that suitable existing arterial roadways with sufficient roadway surface width be considered at the time of their resurfacing for providing a partial implementation of complete streets, such as adding bicycle lanes or widened travel shoulders. Details on complete street improvements are included as part of design guidelines developed for the final plan.

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 desire 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. In such areas where pedestrian and bicycle activity is expected to be higher, accommodations to enhance the safety of such users can be implemented, such as sidewalks and bicycle lanes. 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, temporary features can be provided by utilizing some of the existing

parking stalls, or sections of unused or underused pavement. 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.

### ➤ Recommendation 6.3: Expand arterial capacity to address residual congestion

The Preliminary Plan proposes approximately 283.9 route-miles be widened to provide additional through traffic lanes, representing about 8 percent of the total preliminary year 2050 arterial street and highway system mileage, including 110.9 miles of existing freeways. These proposed widenings are shown as blue lines on Maps 4.15 through 4.21. In addition, the Preliminary Plan proposes 73.6 route-miles of new arterial facilities, representing about 2 percent of the total year 2050 arterial street mileage. These proposed new facilities are shown in red on Maps 4.15 through 4.21. Of the total of about 357.5 route-miles of planned arterial capacity expansion, about 79.9 route-miles, or 22 percent, is part of a committed project (i.e., one that is currently underway or recommended as part of a completed or nearly completed preliminary engineering study). These highway improvements are proposed to address the residual congestion that may not be expected to be alleviated by proposed land use, systems management, demand management, bicycle and pedestrian facilities, and public transit measures proposed in the Preliminary Plan. In addition, many of the proposed new arterial facilities would 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.

**Highway improvements are proposed to address the residual congestion that may not be alleviated by other measures proposed under the Preliminary Plan.**

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** – The Preliminary Plan proposes the widening of 110.9 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. Currently, 29.5 miles of freeway widening are being constructed as part of the project to reconstruct the Zoo Interchange and IH 94 between the Mitchell Interchange and STH 142. In addition, 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, of the Plan's proposed 115.7 miles of freeway capacity expansion that include an additional lane in each direction, 46.7 miles (or 42 percent) may be considered as committed projects. The remaining 64.2 miles of proposed freeway widening, including the 10.2 miles of the proposed widening in the City of Milwaukee of IH 43 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 rebuild-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 the freeway would be reconstructed.

Given opposition by the City of Milwaukee to the widening of freeways within the City, an analysis was done of the implications of not including the widening of IH 43 between Howard Avenue and Silver Spring Drive. This analysis is presented in Appendix I to this volume.

- **Freeway Interchanges** – On the existing freeway system, the Preliminary Plan proposes two new freeway interchanges (IH 94 with Calhoun Road and IH 43 with Highland Road). The Preliminary Plan also proposes the conversion of two half interchanges to full interchanges (IH 94 with S. 27th Street and 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 94 between the Wisconsin-Illinois State line and the Mitchell Interchange, IH 94 between 70th Street and 16th Street, and IH 43 between Silver Spring Drive and STH 60. In addition, the Preliminary Plan 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 proposes 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 the preliminary engineering conclude with a recommendation to construct the interchange, the Commission, upon the request of the concerned local governments and the WisDOT, would take action to amend the regional plan to recommend the construction of the interchange.

**Transportation system improvements should first avoid or minimize any adverse impacts on environmentally sensitive resources, only mitigating where impacts will be unavoidable.**

### ➤ Recommendation 6.4: Avoid, minimize, or mitigate environmental impacts of arterial capacity expansion

The Preliminary Plan proposes 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, the Preliminary Plan proposes 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 at all 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 any 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.

- **Mitigation of Environmental Impacts** – Where environmentally sensitive resources will be unavoidably impacted, and for which mitigation is compensatory, efforts should focus on the preferred means of mitigation as identified by the regulatory agencies.[19] 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*.

### ➤ Recommendation 6.5: Address safety needs on the arterial street and highway network

The occurrence of crashes can have negative effects 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:

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

[19] *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 State 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.

human error, vehicle failure, and roadway/environmental conditions. The Preliminary Plan proposes 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 the Preliminary Plan should minimize the number of total traffic crashes on the arterial street and highway system. For example, the proposed improvement and expansion of public transit and bicycle and pedestrian facilities and implementation of the proposed TDM measures should reduce the growth in vehicle travel, conflicts, and crashes, and encourage increased travel on safer facilities and services. Also, the proposed 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 23 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 the Preliminary Plan.

  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.[20] 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

[20] *At the time VISION 2050 was completed, the most recent SHSP was completed in September 2014 for the years 2014-2016 and can be found at http://wisconsindot.gov/Pages/safety/education/frms-pubs.*

pedestrians and bicyclists, alcohol/drug-related crashes, and crashes involving a driver or passengers not wearing their seatbelt.

- **Minimize bicycle and pedestrian-related crashes** – While the number of reported vehicular crashes involving either a bicycle or a pedestrian accounted for only 3 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. The Preliminary Plan promotes the improvement of bicycle and pedestrian safety by proposing implementation of safe and convenient accommodations for bicycle and pedestrian traffic. Specifically, the Preliminary Plan proposes 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, the Preliminary Plan proposes, under Recommendation 3.2, expanding a system of off-street bicycle paths largely constructed in natural resource and utility corridors. The Preliminary Plan also proposes 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 by use of parallel nonarterials). With respect to pedestrian safety, the Preliminary Plan proposes sidewalks be provided 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** – The Preliminary Plan proposes 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** – The Preliminary Plan proposes 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. The

Preliminary Plan proposes that the freeway system be reconstructed 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 of the Preliminary Plan 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 a result of freeway congestion. Thus, the freeway widenings proposed under Recommendation 6.3 of the Preliminary Plan would be expected to result in improved travel safety by reducing congestion, and associated rear-end crashes.

- **Alternative Intersections** – The Preliminary Plan proposes that alternative intersection types that reduce the number of vehicle-to-vehicle conflicts be considered, particularly for high-volume intersections. While the Preliminary Plan does not identify the specific treatment that should be implemented at each intersection, it proposes 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, and quadrant roadways (currently proposed by WisDOT for the intersection STH 50 and STH 31 in Kenosha County).

- **Access Management** – Developing and implementing access management standards, as proposed in Recommendation 4.7, along arterial streets and highways would be expected to reduce the number of conflicts that can result in vehicular crashes. A set of recommended access management standards is presented in design guidelines for the final plan.

- **Regional Safety Implementation** – The Preliminary Plan proposes 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.

### ➤ Recommendation 6.6: Address security needs related to the arterial street and highway system

**Security planning involves preventing and responding to attacks affecting 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 regional Metropolitan Planning Organization, the Commission will work to coordinate activities with local, State, and Federal agencies and officials in order 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.[21] The action items in that plan that involve Commission efforts include coordinating border county evacuation plans with Illinois, 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.

The Preliminary Plan proposes 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.

[21] *Wisconsin Department of Transportation,* Connections 2030 Long-Range Multimodal Transportation Plan, October 2009.

- **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. At the request of Kenosha County, Racine County, Washington County, and the City of Milwaukee, the Commission has prepared, and periodically updates, their hazard mitigation plans. Milwaukee, Ozaukee, Walworth, and Waukesha Counties have also prepared hazard mitigation plans. Ensuring that all of Southeastern Wisconsin is included 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 proposed in the arterial streets and highways element of the Preliminary Plan 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.

- **Increasing 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 system become more resilient with respect to the projected increase in frequency of large storm events. The Preliminary Plan proposes that the Commission staff initiate a study to identify transportation facilities in low-lying areas (e.g., within 100-year flood plains) and identify potential improvements that would help the regional transportation system become more resilient to flooding.

- **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.

**The Preliminary Plan proposes 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 2015, approximately

138 million tons of domestic and international cargo valued at about $206 billion were shipped to, from, and within the Milwaukee-Racine-Waukesha Combined Statistical Area (CSA).[22] This cargo was transported using a variety of modes, including: truck (82 percent of all shipments by weight and 78 percent by value); rail (11 percent by weight and 2 percent by value); water (4 percent by weight and 2 percent by value); air (0.1 percent by weight and 3 percent by value); multiple modes and mail (2 percent by weight and 14 percent by value); pipeline (1 percent by weight and 0.3 percent by value); and other/unknown (less than 0.1 percent by weight and less than 0.1 percent by value).[23]

The Preliminary Plan proposes 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, the Preliminary Plan proposes 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.

### ➤ 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 as well as the State's designated routes for long trucks (see Map 4.22). 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. The Preliminary Plan proposes implementing the capacity expansion improvements proposed in the arterial streets and highways element of the preliminary recommended plan, which would address existing and forecast future traffic congestion on the regional highway freight network.

### ➤ Recommendation 7.2: Accommodate oversize/overweight shipments to, from, and within Southeastern Wisconsin

Unusually large or heavy goods shipped within or through the Region require that specific oversize/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 following a circuitous route to avoid physical restrictions such as low bridges or temporarily changing infrastructure along the shipment's route—such as raising utility wires or moving traffic signals. 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. The Preliminary Plan proposes that

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

[22] *Office of Freight Management and Operations, Federal Highway Administration, Freight Analysis Framework (FAF) Version 4.1. The Milwaukee-Racine-Waukesha Combined Statistical Area consists of Dodge, Jefferson, Milwaukee, Ozaukee, Racine, Walworth, and Waukesha Counties.*

[23] *Ibid.*

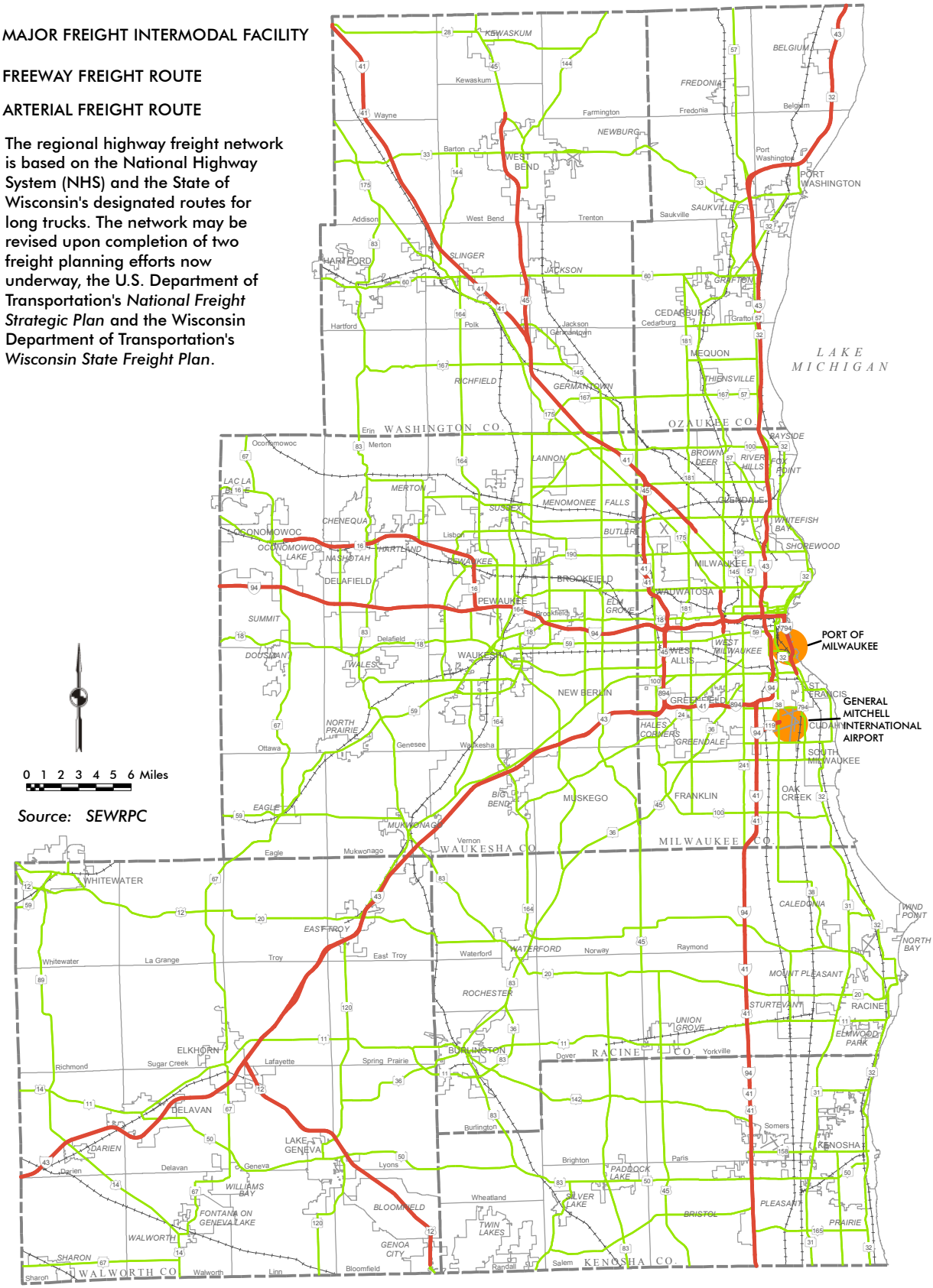
## Map 4.22
## Regional Highway Freight Network: 2015

MAJOR FREIGHT INTERMODAL FACILITY

FREEWAY FREIGHT ROUTE

ARTERIAL FREIGHT ROUTE

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. The network may be revised upon completion of two freight planning efforts now underway, the U.S. Department of Transportation's *National Freight Strategic Plan* and the Wisconsin Department of Transportation's *Wisconsin State Freight Plan*.




*Source: SEWRPC*

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

**An Oversize/Overweight Shipment**
*Credit: Port of Milwaukee*

- **Study past OSOW truck shipments in the Region** – Document and analyze the types of goods that were 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.

- **Delineate a regional OSOW truck route network** – Identify OSOW truck routes—including routes serving the Port of Milwaukee and routes serving origins and destinations outside the Region—and their associated geometric envelopes and weight restrictions that would 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, a potential need that has been identified involves meeting a minimum height standard of 23 feet for utility wires on all established OSOW routes accommodating high and wide shipments.

- **Preserve OSOW truck routes** – Identify potential intergovernmental agreements or changes to State statutes, State 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.

### ➤ 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 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. The Preliminary Plan proposes that the State, in cooperation with local governments, the Commission, local manufacturers and shippers, and freight railroads, pursue development of a new truck-rail intermodal facility in or near Southeastern Wisconsin.

**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*

- **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 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). The Preliminary Plan proposes that the State work with neighboring states and the Federal Highway Administration 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 the Preliminary Plan and for expanded intercity passenger rail service under the State's long-range state rail plan.[24] 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, the Preliminary Plan proposes the State work with CP to construct 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. The Preliminary Plan proposes 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.

### ➤ Recommendation 7.7: Address safety needs related to freight transportation

Crashes involving freight transportation negatively impact the well-being of Southeastern Wisconsin's residents as well as its economy. The

[24] *The Wisconsin Department of Transportation,* Wisconsin Rail Plan 2030, *March 2014.*

Preliminary Plan proposes 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 proposed in the arterial streets and highways element of the Preliminary Plan 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 the Preliminary Plan 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 of the Preliminary Plan 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 the Preliminary Plan 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. The Preliminary Plan proposes 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.[25] 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 proposed in the arterial streets and highways element of the Preliminary Plan would result in a more resilient regional highway freight network that would more 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,[26] 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), which has identified specific infrastructure improvements that would reduce freight rail congestion and truck and automobile delays at grade crossings in the Chicago area. The Preliminary Plan proposes 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.

**The financial analysis for the Preliminary Plan's transportation system is guided by Federal requirements that the system only include projects that can be funded with reasonably expected revenues.**

### Financial Analysis of Expected Plan Costs and Revenues

The implementation of the transportation component of the Preliminary Recommended Plan will require adequate funding for the proposed improvements to the public transit system, bicycle and pedestrian network, and arterial street and highway system. The financial analysis in this section

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

[26] *Ibid*.

examines the expected costs of the Preliminary Plan and compares those costs to reasonably expected revenues that would be available to fund the transportation component of the Preliminary Plan. Comparing cost and revenue forecasts illustrates potential funding gaps that would need to be addressed in order to fully implement the Preliminary Plan. To address the funding gaps, the Preliminary Plan 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.

***Expected Costs and Revenues***

Tables 4.13 and 4.14 compare estimated transportation system costs of the Preliminary Plan to reasonably expected future revenues. Table 4.13 provides this comparison based on year 2015 constant dollars, and Table 4.14 based on year of expenditure (YOE) dollars. Federal, State, and local capital and operating revenues for highways are based on estimated Federal, State, and local expenditures over the last several years. Federal capital and operating revenues for transit are based on historical expenditures over the last several years, and an assessment of available Federal formula and program funds. Tables 4.15 and 4.16 present the estimates of revenue and the basis for those estimates.

With respect to reasonably expected revenues, estimates need to take into account existing and reasonably expected limitations on funding. For example, existing limitations may dictate that funding can be used only for capital projects as opposed to covering operating costs. As another example, funds may be restricted to a specific travel mode, program, or geographic area. It should also be noted that there are inherent difficulties in predicting future costs and revenues, including uncertainties related to the economy, local and State budgets, and Federal transportation bills.

***Funding Gap Identification***

A comparison of estimated costs to expected revenues for the Preliminary Plan, shown in Tables 4.13 and 4.14, indicates there may be enough revenue to fund the proposed arterial system improvements during the plan period. A principal element of the arterial street and highway system cost is the construction, or capital, cost associated with major projects (shown on Maps 4.15 through 4.21). Major projects are defined as projects of higher cost and include those segments of the freeway system shown in Table 4.17 and new surface arterial construction and existing surface arterial reconstruction of four or more miles in length, as shown in Table 4.18.

**The financial analysis prepared for the Preliminary Plan indicates existing funding sources are not adequate to construct, operate, and maintain the entire proposed transportation system.**

The conclusion that the arterial street and highway system can be funded within reasonably expected revenues is based on an expectation that the State will continue to provide the necessary level of funding for arterial improvements. In recent State budgets, the State has chosen to provide this level of funding through bonding and the long-term sustainability of this approach has been questioned. Other issues have also been raised regarding the ability to sustainably fund the arterial street and highway system at the regional, State, and Federal levels in the future. The Federal motor fuel tax has not changed since 1993, and the State motor fuel tax—the principal source of State transportation funding—is no longer indexed to inflation (the ability to index was repealed in 2006). Combined with improvements in

## Table 4.13
## Average Annual Costs and Revenues Associated with the Preliminary Recommended Transportation System in 2015 Constant Dollars: 2016-2050

| Cost or Revenue Item | | 2015 Constant Dollars |
|---|---|---|
| Transportation System Cost (average annual 2016-2050 expressed as millions of dollars)[a] | | |
| Arterial Street and Highway System | | |
| Capital | | |
| Freeway Reconstruction | | $281 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing[b] | | 381 |
| | Subtotal | $662 |
| Operating | | 84 |
| | Subtotal | $746 |
| Transit System | | |
| Capital | | $125 |
| Operating[c] | | $198 |
| | Subtotal | $323 |
| | Total | $1,069 |
| Transportation System Revenues (average annual 2016-2050 expressed as millions of dollars)[a] | | |
| Highway Capital | | |
| Freeway Reconstruction (Federal/State) | | $275 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing | | |
| Federal/State | | 338 |
| Local | | 67 |
| | Subtotal | $680 |
| Highway Operating | | |
| State | | $41 |
| Local | | 38 |
| | Subtotal | $759 |
| Transit Capital | | |
| Federal | | $98 |
| Local | | 3 |
| | Subtotal | $101 |
| Transit Operating | | |
| Federal | | $5 |
| State | | 76 |
| Local | | 21 |
| | Subtotal | $102 |
| | Subtotal | $203 |
| | Total | $962 |

[a] *The estimated arterial street and highway system and transit system costs include all capital costs and operating and maintenance costs. The estimated costs include the necessary costs to preserve the existing transportation system, such as arterial street resurfacing and reconstruction and transit system bus replacement, and the estimated costs of the transportation system improvement and expansion proposed under the Preliminary Plan. The freeway system capital costs include the cost to resurface the existing freeway system, as needed, estimated at $1.1 billion or $32 million per year; the cost to rebuild those segments of the existing freeway system that have not yet been rebuilt to modern design standards, estimated at $8.4 billion or $240 million per year; the incremental cost to rebuild 116 miles of the freeway system with additional lanes, estimated at $961 million or $27 million per year; the cost of two new freeway interchanges, estimated at $73 million; and the cost of the extension of the USH 12 freeway from Elkhorn to Whitewater, estimated at $438 million. These freeway capital costs include the cost to reconstruct IH 43 between Howard Avenue and Silver Spring Drive to modern design standards. Should it be determined that this segment of IH 43 be widened, the project cost would incrementally increase by $168 million. With respect to freeway resurfacing, it was assumed that segments of freeway that were reconstructed before 2016 would be resurfaced on average two times by 2050 and segments of freeway that are recommended to be reconstructed in 2016 and beyond would be resurfaced on average one time by 2050. Surface arterial capital costs include the estimated costs of the necessary resurfacing and reconstruction of the 3,137 miles of surface arterials that will require preservation of capacity over the plan design period, the estimated costs of reconstruction and widening with additional traffic lanes of about 176 miles of surface arterials, and the estimated costs of new construction of 65 miles of surface arterials. The estimated costs of resurfacing and reconstruction are based on the estimated lifecycle of existing surface arterials, and include reconstruction of about 50 percent of surface arterials with approximately 40 percent resurfaced once, and two resurfacings on about 50 percent of surface arterials. Unit costs for surface arterial resurfacing, reconstruction, widening, and new construction vary by cross-section from $0.4 to $13.4 million per mile (rural or urban, divided or undivided, and number of traffic lanes) and are based upon actual project costs over the past several years. The estimated capital cost of surface arterials is $348 million per year, including $296 million for preservation (resurfacing and reconstruction) and $52 million for new arterials and arterials reconstructed with additional traffic lanes. Transit system capital costs include preservation of the existing transit system, including bus replacement on a 12-year schedule and replacement of fixed facilities, and costs of system improvement and expansion, including needed additional buses and facility expansion.*

*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 proposed increase in the Preliminary Plan in arterial highway system lane-miles. Transit system operating (and maintenance) costs are based on existing estimated actual costs and unit costs based on service vehicle-miles and vehicle-hours.*

*Federal, State, and local highway capital and operating revenues are based on historical expenditures over the last several years and are documented in Table 4.15. Federal, State, and local transit capital and operating revenues are based on historical expenditures over the last several years and assessment of available Federal formula and program funds and are documented in Table 4.16.*

[b] *Also includes the costs associated with the bicycle and pedestrian, TSM, and TDM elements of the Preliminary Plan.*

[c] *Net operating cost (total operating costs less fare-box revenue). Like all amounts in this table, transit system operating costs represent the average annual costs for the transit system during the plan design period (2015-2050). Because the transit system changes in size (and therefore cost) significantly over the life of the plan, the amounts in this table do not represent the operating costs of the full transit system in the year 2050.*

*Source: SEWRPC*

## Table 4.14
## Average Annual Costs and Revenues Associated with the Preliminary Recommended Transportation System Based on Year of Expenditure: 2016-2050

| Cost or Revenue Item | YOE Dollars |
|---|---|
| Transportation System Cost (average annual 2016-2050 expressed as millions of dollars)[a] | |
| Arterial Street and Highway System | |
| Capital | |
| Freeway Reconstruction | $428 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing[b] | 590 |
| Subtotal | $1,018 |
| Operating | 130 |
| Subtotal | $1,148 |
| Transit System | |
| Capital | $197 |
| Operating[c] | $273 |
| Subtotal | $470 |
| Total | $1,618 |
| Transportation System Revenues (average annual 2016-2050 expressed as millions of dollars)[a] | |
| Highway Capital | |
| Freeway Reconstruction (Federal/State) | $417 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing | |
| Federal/State | 520 |
| Local | 92 |
| Subtotal | $1,029 |
| Highway Operating | |
| State | $60 |
| Local | 55 |
| Subtotal | $1,144 |
| Transit Capital | |
| Federal | $137 |
| Local | 5 |
| Subtotal | $142 |
| Transit Operating | |
| Federal | $5 |
| State | 107 |
| Local | 28 |
| Subtotal | $140 |
| Subtotal | $282 |
| Total | $1,462 |

[a] *The estimated arterial street and highway system and transit system costs include all capital costs and operating and maintenance costs. The estimated costs include the necessary costs to preserve the existing transportation system, such as arterial street resurfacing and reconstruction and transit system bus replacement, and the estimated costs of the transportation system improvement and expansion proposed under the Preliminary Plan. The freeway system capital costs include the estimated cost to rebuild those segments of the existing freeway system that have not yet been rebuilt to modern design standards, the estimated incremental cost to rebuild 116 miles of the freeway system with additional lanes, the estimated cost of two new freeway interchanges, and the estimated cost of the extension of the USH 12 freeway from Elkhorn to Whitewater. Surface arterial capital costs include the costs of the necessary resurfacing and reconstruction of the 3,137 miles of surface arterials that will require preservation of capacity over the plan design period, the estimated costs of reconstruction and widening with additional traffic lanes of about 176 miles of surface arterials, and the estimated costs of new construction of 65 miles of surface arterials.*

*The conversion of year 2015 constant dollar cost to year of expenditure cost utilizes inflation rates based upon historical trends. The rate of inflation used for highway costs and transit construction costs of 2.3 percent was provided by WisDOT. The inflation rate of 2.5 percent used for transit vehicle costs is based on the historical increase in the purchase price of transit vehicles as experienced by the transit operators of the Region. With regard to transit operating costs, the inflation rate of 2.0 percent is based on the historical inflation from the Consumer Price Index for the Milwaukee area and discussions with Milwaukee County Transit System staff. The average annual capital and operating costs were calculated by evenly distributing the total year of expenditure costs over 35 years.*

*Federal, State, and local highway capital and operating revenues are based on historical expenditures over the last several years and are documented in Table 1.15. Federal, State, and local transit capital and operating revenues are based on historical expenditures over the last several years and assessment of available Federal formula and program funds and are documented in Table 1.16.*

[b] *Also includes the costs associated with the bicycle and pedestrian, TSM, and TDM elements of the Preliminary Plan.*

[c] *Net operating cost (total operating costs less fare-box revenue). Like all amounts in this table, transit system operating costs represent the average annual costs for the transit system during the plan design period (2015-2050). Because the transit system changes in size (and therefore cost) significantly over the life of the plan, the amounts in this table do not represent the operating costs of the full transit system in the year 2050.*

*Source: SEWRPC*

## Table 4.15
## Estimate of Year 2050 Plan Arterial Street and Highway Revenues

### Federal and State Capital Funding

**Assessment of Historical Statewide Funding**

Major Highway Development
- 2015 – $368 million
- 2011-2015 – 0.6 percent annual increase
- 2006-2015 – 4.7 percent annual increase

State Highway Rehabilitation
- 2015 – $806 million
- 2011-2015 – 3.0 percent annual increase
- 2006-2015 – 3.5 percent annual increase

Local Roads and Bridges
- 2015 – $181 million
- 2011-2015 – 0.6 percent annual increase
- 2006-2015 – 0.5 percent annual increase

Southeastern Wisconsin Freeway Megaproject
- 2015-2017 State budget provides an annual $208 million
- 2013-2015 State budget provided an annual $275 million
- 2011-2015 – $276 million annual average (2015 constant dollars)
- 2006-2015 – $291 million average annual funding (2015 constant dollars)

The 2011 Wisconsin Act 32 eliminated the Southeastern Wisconsin freeway rehabilitation program and initiated the Southeast Wisconsin Freeway Megaproject program.

**Conclusion**

| | 2015 Constant Dollar Funding (millions) | Year of Expenditure Average Annual Increase (Percent) |
|---|---|---|
| Major Highway Development | $365 | 2.5 |
| State Highway Rehabilitation | 805 | 2.5 |
| Local Roads and Bridges | 180 | 0.5 |
| Southeastern Wisconsin Freeway Megaproject | 275 | 2.0 |
| Total | $1,625 | |

The average annual increase is based on Wisconsin Department of Transportation assumptions of future transportation revenues.

### Southeastern Wisconsin Share of State Revenues

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 all State highway system revenues. 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
- $275 + 0.25($1,350) = $613 million

Option 2
- $1,625 x 0.30 = $488 million

Conclusion
- $613 million Federal and State annual highway revenue in 2015 constant dollars (2.0 percent annual increase year of expenditure)

### Local Capital

Estimate of annual revenue based upon local arterial highway annual expenditure – $52 million (2.0 percent annual increase year of expenditure)

### Local Transportation Aids (Capital)

Estimate of annual general transportation aids attendant to estimated local highway capital expenditure – $15 million (0.5 percent annual increase year of expenditure)

### Operating and Maintenance Funding

**State**

Assessment of Historical Funding
- $41 million annually

Conclusion – 2050 Plan
- $41 million annually (2.0 percent annual increase year of expenditure)

**Local**

Assessment of Historical Funding
- $38 million annually

Conclusion – 2050 Plan
- $38 million annually (2.0 percent annual increase year of expenditure)

*Source: Transportation Budget Trends – 2014-2015 (Wisconsin Department of Transportation) and SEWRPC*

## Table 4.16
## Estimate of Year 2050 Plan Transit Revenues (Fixed-Route Systems)

**Estimate of Year 2015 Constant Dollar Annual Funding**

**Federal**

Assessment of Historical Funding
- Operating – $32 million (2004-2016)
- Capital – $7.1 million (2013-2016)

Assessment of Funding Sources
- Milwaukee Urbanized Area Section 5307 formula funds – $21.9 million (2004-2016)
- Racine, Kenosha, and West Bend Urbanized Ares 5307 operating funds – $5.8 million (2004-2016)
- Other:
  - FTA 5311 – $0.3 million (2013-2016)
  - FTA 5337 – $0.4 million (2013-2016)
  - FTA 5339 – $3.2 million (2013-2016)
  - FTA 5339b – $2.5 million (2016)
  - FHWA CMAQ – $5 million
  - FHWA STP-M – $1.7 million
- City of Milwaukee Streetcar
  - Capital
    - $55 million Federal Interstate Cost Estimate funding ($2.6 million average annual)
    - $14.1 million TIGER grant ($402,900 average annual)
    - FTA 5337 – $178,600 beginning in 2025 ($132,700 average annual)
  - Operating
    - CMAQ – $3.2 million ($152,000 average annual)
    - FTA 5307 – $370,500 beginning in 2020 ($328,200 average annual)
- Milwaukee County Bus Rapid Transit
  - Capital
    - FTA 5309 Small Starts – $30 million ($857,000 average annual)
    - FTA 5337 – $860,000 beginning in 2026 ($614,300 average annual)
  - Operating
    - FTA 5307 – $1 million beginning in 2021 ($828,600 average annual)

Conclusion
- $33.3 million operating
- $13.4 million capital
- Transit service levels envisioned in the Preliminary Recommended Plan would be expected to generate an additional $63.3 million in Federal capital and operating funding annually

**State**

Assessment of Historical Operating Funding
- 43.7 percent of operating cost – $76.3 million (2014)
- 41.4 percent of total operating cost (average 2004-2014) – $83.2 million

Conclusion
- $76 million operating annually

**Local**

Assessment of Operating Funding
- $20.7 million (2014)
- $26.8 million (average 2004-2014)
- $1.3 million average annual parking revenue – City of Milwaukee Streetcar

Conclusion
- $26 million operating

Assessment of Capital Funding
- $3.2 million (2014)
- $3.4 million (average 2004-2015)
- $12.1 million (2016) for Milwaukee County Transit System, which represents approximately 90 percent of the transit service in the Region
- $10 million tax incremental finance funds ($437,000 average annual) – City of Milwaukee Streetcar

Conclusion
- $12 million capital

**Table continued on next page.**

**Table 4.16 (Continued)**

| Estimate of Annual Increase in Funding for Year of Expenditure Revenues |
|---|
| **Federal** |
| Assessment of Historical Funding and Conclusion |
| FTA Section 5307 Milwaukee Area |
| 0.4 percent annual increase (2004-2014) |
| FTA Section 5307 Kenosha, Racine, and West Bend |
| 3.3 percent annual increase (2004-2014) |
| FTA 5311 |
| -3.1 percent annually (2013-2016) |
| FTA 5337 |
| 5.1 percent annually (2013-2016) |
| FTA 5339 |
| -2.0 percent annually (2013-2016) |
| FTA 5339b |
| Approximately $2.5 million (2016) |
| FHWA CMAQ |
| Assume no growth |
| FHWA STP-M |
| Assume no growth |
| **State** |
| Assessment of Historical Operating Funding |
| 1.7 percent annual increase (average 2004-2014) |
| Conclusion |
| 1.7 percent annual increase |
| **Local** |
| Assessment of Historical Funding |
| 1.2 percent annual decrease (2004-2014 operating) in recent years due primarily to reductions in operating costs attributable to contract restructuring. |
| 10 percent annual increase (2015-2016) for the Milwaukee County Transit System, which represents approximately 90 percent of the transit service in the Region. |
| Conclusion |
| 1.5 percent annual increase |
| Average Fares |
| 2.4 percent annual increase (2004-2014) |
| Conclusion |
| 2.4 percent increase |

Source: SEWRPC

motor vehicle fuel economy and increasing alternative fuel use, State and Federal motor fuel tax revenues have been declining.[27]

For the 2015-2017 State budget, the Secretary of WisDOT proposed several potential solutions to address these State transportation funding issues. The Governor and State Legislature determined not to implement any of these solutions in the 2015-2017 State budget, opting to instead bond to fill the funding gap. However, it is reasonable to expect the State will address the long-term funding issues during the plan period. The solutions proposed by the WisDOT Secretary included:

- Modify the State's motor fuel tax to include a variable component based upon the wholesale price of fuel sold in Wisconsin.
- Establish a higher tax rate on diesel fuel so that heavy vehicles pay in relation to the damage they cause to roads and bridges.

[27] *Wisconsin Transportation Finance and Policy Commission,* Keep Wisconsin Moving—Smart Investments, Measurable Results, *January 2013.*

## Table 4.17
## Estimated Cost and Potential Schedule of Freeway Reconstruction: 2016-2050[a]

| Period Completed and Open to Traffic | Facility | Limits of Project | Estimated Cost | | Estimated Funding-Year of Expenditure Dollars (millions) |
|---|---|---|---|---|---|
| | | | Year 2015 Constant Dollars (millions)[b] | Year of Expenditure Dollars (millions)[b] | |
| **2016 to 2020** | IH 794[c] | Lake Interchange to Carferry Drive (including Lakefront Gateway) | 45.3 | 46.4 | |
| | Zoo IC[c] | Zoo Interchange | 660.9 | 707.9 | |
| | | Subtotal | 706.2 | 754.2 | 1,518.7 |
| **2021 to 2025** | IH 94[c] | Illinois to Mitchell Interchange | 560.4 | 635.5 | |
| | IH 94 | 70th Street to 16th Street (including Stadium Interchange) | 848.2 | 1,018.0 | |
| | IH 43 | Silver Spring Drive to STH 60 | 471.6 | 559.4 | |
| | | Subtotal | 1,880.2 | 2,212.9 | 1,676.8 |
| **2026 to 2030** | IH 43, IH 43/894, & IH 894 | Lincoln Avenue to 27th Street (STH 241), Moorland Road to Hale Interchange (including Hale Interchange) | 954.8 | 1,255.0 | |
| | | Subtotal | 954.8 | 1,255.0 | 1,851.3 |
| **2031 to 2035** | IH 94 | Jefferson County to 124th Street | 954.5 | 1,358.9 | |
| | IH 43 | Howard Avenue to Silver Spring Drive (including Marquette Interchange modifications) | 985.4 | 1,484.6 | |
| | IH 43 | STH 83 to Moorland Road | 305.4 | 471.2 | |
| | | Subtotal | 2,245.3 | 3,314.7 | 2,044.0 |
| **2036 to 2040** | IH 41 | Burleigh Street to Richfield Interchange | 817.3 | 1,274.3 | |
| | STH 175 | Stadium Interchange to Lisbon Avenue | 140.5 | 235.1 | |
| | USH 41 | Richfield Interchange to Dodge County | 394.3 | 672.8 | |
| | | Subtotal | 1,352.0 | 2,182.2 | 2,256.7 |
| **2041 to 2045** | IH 43 | IH 43 and USH 12 Interchange | 68.7 | 131.9 | |
| | IH 43 | STH 60 to Sheboygan County | 391.3 | 758.0 | |
| | USH 12 | Illinois to Rock County | 729.6 | 1,411.1 | |
| | | Subtotal | 1,189.6 | 2,300.9 | 2,491.6 |
| **2046 to 2050** | IH 43 | Rock County to STH 83 | 585.5 | 1,130.5 | |
| | STH 16 | STH 67 to IH 94 | 418.5 | 887.9 | |
| | STH 145 | Hampton Avenue to Good Hope Road | 185.7 | 381.3 | |
| | USH 45 | Richfield Interchange to CTH D | 309.3 | 671.2 | |
| | | Subtotal | 1,498.9 | 3,070.8 | 2,750.9 |
| | | Total | 9,826.9 | 15,090.8 | 14,590.0 |

[a] *Project prioritization beyond the year 2021 are subject to change.*

[b] *Constant dollar and year of expenditure cost estimates for projects are reported in the period that the project is expected to be completed and open to traffic. Actual project expenditures will occur over multiple years and could extend over multiple periods dependent on the scope and complexity attendant to each project.*

[c] *Project is currently underway. Only those construction costs programmed for years 2016 through 2050 are included.*

*Source: Wisconsin Department of Transportation and SEWRPC*

- Create a highway use fee based on a percentage of the manufacturer's suggested price for new vehicles in Wisconsin.
- Increase the annual registration fee for hybrid and electric powered vehicles to ensure owners pay their fair share of the construction and operating costs of infrastructure.
- Increase the use of General Fund revenues to reflect the fact that not all users of our system pay transportation user fees.
- Decrease the WisDOT's use of debt by $186 million compared to the 2013-2015 biennium.

## Table 4.18
## Estimated Cost and Potential Schedule of Major Surface Arterial Construction and Reconstruction Projects[a, b]

| Period Completed and Open to Traffic | County | Facility | Limits of Project | Cost (Millions 2015 Dollars)[c] | Cost (Millions Year of Expenditure Dollars) | Mileage |
|---|---|---|---|---|---|---|
| **2015 to 2020** | Kenosha | CTH S (part) | CTH H to STH 31 | 6.3 | | 1.9 |
| | Milwaukee | USH 45/STH 100 | Rawson Avenue to 60th Street | 22.0 | | 4.8 |
| | Waukesha | CTH M (part) | CTH YY to Highland Drive and Lilly Road to 124th Street | 13.1 | | 1.7 |
| | Waukesha | STH 67 (part) | Summit Avenue to IH 94 | 23.2 | | 1.9 |
| | Waukesha | Waukesha West Bypass | IH 94 to STH 59 | 43.1 | | 5.1 |
| | | | **Subtotal** | 107.7 | 115.4 | 15.4 |
| **2021 to 2025** | Kenosha | CTH S (part) | E. Frontage Road to CTH H | 7.5 | | 1.9 |
| | Kenosha | STH 50 | IH 94 to 39th Avenue | 61.0 | | 4.8 |
| | Waukesha | STH 83 | Mariner Drive to STH 16 | 31.5 | | 3.6 |
| | Waukesha | STH 190 | STH 16 to Brookfield Road | 49.0 | | 5.4 |
| | Waukesha | CTH M (part) | CTH Y to CTH YY | 22.3 | | 2.9 |
| | | | **Subtotal** | 171.4 | 205.7 | 18.6 |
| **2026 to 2030** | Kenosha | CTH H (Part) | CTH S to STH 50 | 17.5 | | 2.6 |
| | Ozaukee | CTH W (part) | Highland Road to W. Glen Oaks Lane | 6.7 | | 1.0 |
| | Milwaukee and Racine | STH 32 | STH 100 to Five Mile Road | 29.5 | | 5.1 |
| | Walworth | STH 50 | IH 43 to STH 67 | 23.3 | | 4.3 |
| | Waukesha | STH 83 | USH 18 to Phylis Parkway | 31.5 | | 2.4 |
| | Waukesha | CTH D (part) | Milwaukee County line to Calhoun Road | 11.9 | | 3.0 |
| | Waukesha | CTH Y (part) | Hickory Trail to Downing Drive | 15.8 | | 4.0 |
| | | | **Subtotal** | 136.2 | 183.2 | 22.4 |
| **2031 to 2035** | Kenosha | CTH H (Part) | STH 50 to STH 165 | 13.0 | | 3.0 |
| | Racine | STH 20 | IH 94 to Oaks Road | 41.0 | | 4.5 |
| | Waukesha | Pilgrim Road | USH 18 to Lisbon Road | 32.4 | | 4.8 |
| | Waukesha | CTH SR/Town Line Road extension (part) | CTH JJ to STH 190 | 21.6 | | 3.2 |
| | Waukesha | CTH Y (part) | CTH L to College Avenue | 11.4 | | 2.1 |
| | | | **Subtotal** | 119.3 | 143.8 | 17.6 |
| **2036 to 2040** | Ozaukee | CTH W (part) | CTH V to Lakeland Road | 20.9 | | 3.1 |
| | Waukesha | STH 67 (part) | CTH DR to USH 18 | 13.2 | | 2.9 |
| | Waukesha | CTH D (part) | Calhoun Road to STH 59/164 | 15.2 | | 3.8 |
| | | | **Subtotal** | 49.3 | 83.3 | 9.8 |
| **2041 to 2045** | Ozaukee | CTH W (part) | Lakeland Road to Highland Road | 20.8 | | 3.1 |
| | Waukesha | STH 59/164 | CTH XX to Arcadian Avenue | 51.6 | | 4.8 |
| | Waukesha | CTH SR/Town Line Road extension (part) | STH 190 to Weyer Road | 7.3 | | 1.5 |
| | | | **Subtotal** | 79.7 | 150.8 | 9.4 |
| **2046 to 2050** | Milwaukee | Lake Pkwy Extension | E. Edgerton Avenue to STH 100 | 219.7 | | 6.0 |
| | | | **Subtotal** | 219.7 | 465.5 | 6.0 |
| | | | **Total** | 883.4 | 1,347.6 | 99.2 |

[a] *Major 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 4.19**
**Estimated Gap Between Preliminary Recommended Plan Costs and Existing and Reasonably Expected Revenues**

| Constant Year 2015 Dollars (Average Annual Through Year 2050) | |
|---|---|
| Public Transit | |
| Capital | $24 million |
| Operating | $96 million |
| **Year of Expenditure Dollars (Average Annual Through Year 2050)** | |
| Public Transit | |
| Capital | $55 million |
| Operating | $133 million |

*Source: SEWRPC*

Given that TSM, TDM, and bicycle and pedestrian facility costs are primarily included in the costs for arterial streets and highways, and typically represent a fraction of the cost to reconstruct an arterial facility, there would also likely be enough revenue to fund the TSM, TDM, and bicycle and pedestrian elements as proposed under the Preliminary Plan. As discussed in Chapter 3 of Volume I, the TSM and bicycle and pedestrian elements of the year 2035 regional transportation plan have also been substantially implemented since that plan was adopted, further supporting this conclusion.

Although a funding gap was not identified for the arterial, TDM, TSM, or bicycle and pedestrian elements, a significant funding shortfall was identified for the proposed public transit system (see Table 4.19). The overall funding gap between the forecast capital and operating costs for the proposed transit system and the forecast revenues for transit is about $120 million annually in year 2015 constant dollars and about $188 million annually in YOE dollars. The identified funding gap is a result of significantly constrained funding for public transit. Public transit in Southeastern Wisconsin is funded in a unique way, heavily dependent on Federal and State funding. The local share of funding for public transit in the Region is provided through county or municipal budgets, largely provided by property taxes, with public transit competing annually with mandated services and projects. Increasingly, due to the constraints in property tax-based funding, counties and municipalities have found it difficult to provide funding to address transit needs, and to respond to any shortfalls in Federal and State funding.

**The financial analysis identified a significant funding gap for the proposed public transit system.**

***Fiscally Constrained Transportation Plan***

Federal regulations require the Region's transportation plan to only include projects that can be funded with existing and reasonably expected revenues. Therefore, only the funded portion of the Preliminary Plan would be considered the regional transportation plan by the Federal Government and is titled the Fiscally Constrained Transportation Plan (FCTP) for VISION 2050. The FCTP has been determined to include essentially all transportation elements of the Preliminary Plan except for the public transit element, which cannot be implemented within expected funds due to a gap in funding. Therefore, transit service under the FCTP would be expected to decline rather than significantly improve as proposed under the Preliminary Plan, with the exception of the East West BRT project being studied by Milwaukee County and the initial Milwaukee Streetcar lines, which have secured funding or have identified reasonably expected sources of funding. The FCTP transit system (described below) is consistent with the trends of declining transit service levels over the last 15 years, which were a result of transit funding levels during that period of time. Because the Federal regulations guiding this analysis of the

projected costs and expected revenues require that the financial analysis of the Preliminary Plan assume that expected revenues maintain the restrictions placed on them by current laws, the analysis cannot assume that funding for the arterial streets and highways element can be flexed to transit projects, as that is not permitted at this time by the State Legislature.

***Consequences of Not Addressing Transit Funding Gap***

If the transit funding gap identified above is not addressed, the transit element of the Preliminary Plan cannot be expected to be achieved. The effect on the transit system is not only an inability to implement and operate the proposed transit improvements and expansion, but also reductions in current transit service. The following identifies the specific transit service reductions that would be likely given the anticipated funding gap, as well as the specific transit improvements and expansion that would not be achieved. The resulting transit system is considered the transit system of the FCTP and is shown on Map 4.23.

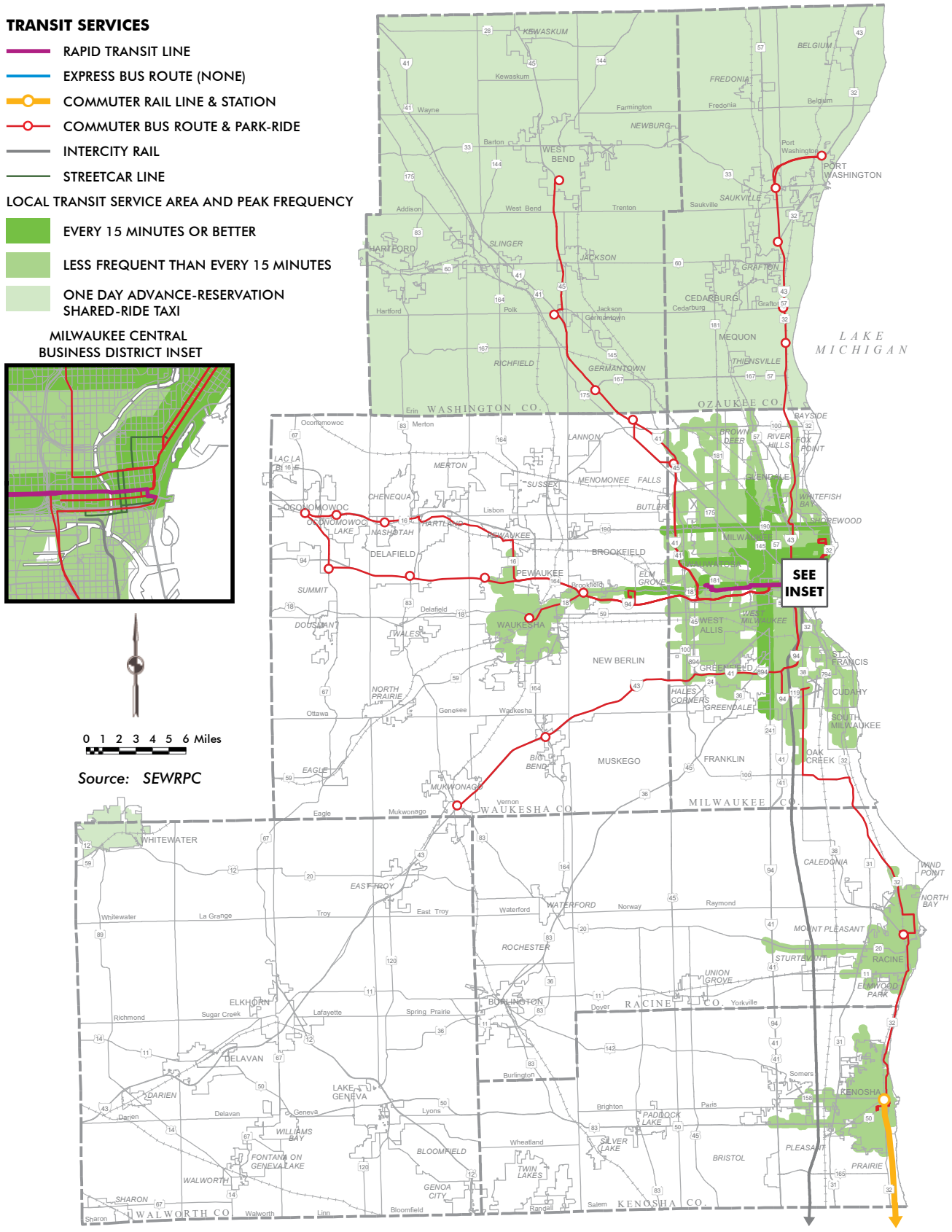
- Reductions in frequency and service areas for local transit services, rather than increases in frequency and expanded service areas
- Fewer commuter bus routes, rather than expansion of commuter bus services
- Buses not replaced on the recommended schedule and remaining in operation beyond their normal service life
- No rapid transit lines (except for the BRT line between downtown Milwaukee and the Milwaukee Regional Medical Center)
- No commuter rail lines
- No regionwide shared-ride taxi service
- No streetcar expansion beyond the initial phases of the Milwaukee Streetcar
- No expansion of intercity passenger rail services
- Limited fixed-guideway transit stations to support transit-oriented development

Given the transit funding gap, it is necessary to estimate the costs and revenues that would be associated with the FCTP. Table 4.20 provides this comparison based on year 2015 constant dollars, and Table 4.21 based on YOE dollars. The estimates of revenue and the basis for those estimates are presented in Tables 4.15 and 4.16.

The evaluation of the Preliminary Plan, and of the alternatives during the previous stage of VISION 2050, illustrated numerous benefits of improving and expanding transit service. The transit funding gap would result in the Region not realizing these benefits, and not implementing the proposed transit system would have the following negative consequences:

- Reduction in traffic carrying capacity in the Region's heavily traveled corridors and densely developed activity centers as less transit service would result in more people using automobiles.

## Map 4.23
## Public Transit Element of the Fiscally Constrained Transportation Plan



## Table 4.20
## Average Annual Costs and Revenues Associated with the Fiscally Constrained Transportation Plan in 2015 Constant Dollars: 2016-2050

| Cost or Revenue Item | | 2015 Constant Dollars |
|---|---|---|
| Transportation System Cost (average annual 2016-2050 expressed as millions of dollars)[a] | | |
| Arterial Street and Highway System | | |
| Capital | | |
| Freeway Reconstruction | | $281 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing[b] | | 381 |
| | Subtotal | $662 |
| Operating | | 84 |
| | Subtotal | $746 |
| Transit System | | |
| Capital | | $26 |
| Operating[c] | | $129 |
| | Subtotal | $155 |
| | Total | $901 |
| Transportation System Revenues (average annual 2016-2050 expressed as millions of dollars)[a] | | |
| Highway Capital | | |
| Freeway Reconstruction (Federal/State) | | $275 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing | | |
| Federal/State | | 338 |
| Local | | 67 |
| | Subtotal | $680 |
| Highway Operating | | |
| State | | $41 |
| Local | | 38 |
| | Subtotal | $759 |
| Transit Capital | | |
| Federal | | $16 |
| Local | | 9 |
| | Subtotal | $25 |
| Transit Operating | | |
| Federal | | $24 |
| State | | 76 |
| Local | | 29 |
| | Subtotal | $129 |
| | Subtotal | $154 |
| | Total | $913 |

[a] *The estimated arterial street and highway system and transit system costs include all capital costs and operating and maintenance costs. The estimated costs include the necessary costs to preserve the existing transportation system, such as arterial street resurfacing and reconstruction and transit system bus replacement, and the estimated costs of the transportation system improvement and expansion under the Fiscally Constrained Transportation Plan. The freeway system capital costs include the cost to resurface the existing freeway system, as needed, estimated at $1.1 billion or $32 million per year; the cost to rebuild those segments of the existing freeway system that have not yet been rebuilt to modern design standards, estimated at $8.4 billion or $240 million per year; the incremental cost to rebuild 116 miles of the freeway system with additional lanes, estimated at $961 million or $27 million per year; the cost of two new freeway interchanges, estimated at $73 million; and the cost of the extension of the USH 12 freeway from Elkhorn to Whitewater, estimated at $438 million. These freeway capital costs include the cost to reconstruct IH 43 between Howard Avenue and Silver Spring Drive to modern design standards. Should it be determined that this segment of IH 43 be widened, the project cost would incrementally increase by $168 million. With respect to freeway resurfacing, it was assumed that segments of freeway that were reconstructed before 2016 would be resurfaced on average two times by 2050 and segments of freeway that are recommended to be reconstructed in 2016 and beyond would be resurfaced on average one time by 2050. Surface arterial capital costs include the estimated costs of the necessary resurfacing and reconstruction of the 3,137 miles of surface arterials that will require preservation of capacity over the plan design period, the estimated costs of reconstruction and widening with additional traffic lanes of about 176 miles of surface arterials, and the estimated costs of new construction of 65 miles of surface arterials. The estimated costs of resurfacing and reconstruction are based on the estimated lifecycle of existing surface arterials, and includes reconstruction of about 50 percent of surface arterials with approximately 40 percent resurfaced once, and two resurfacings on about 50 percent of surface arterials. Unit costs for surface arterial resurfacing, reconstruction, widening, and new construction vary by cross-section from $0.4 to $13.4 million per mile (rural or urban, divided or undivided, and number of traffic lanes) and are based upon actual project costs over the past several years. The estimated capital cost of surface arterials is $348 million per year, including $296 million for preservation (resurfacing and reconstruction) and $52 million for new arterials and arterials reconstructed with additional traffic lanes. Transit system capital costs include preservation of the existing transit system, including bus replacement on a 15-year schedule and replacement of fixed facilities, and costs associated with the initial phases of the Milwaukee Streetcar and Milwaukee County's BRT line between downtown Milwaukee and the Milwaukee Regional Medical Center, including needed additional vehicles and facilities.*

*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 proposed increase in the Fiscally Constrained Transportation Plan in arterial highway system lane-miles. Transit system operating (and maintenance) costs are based on existing estimated actual costs and unit costs based on service vehicle-miles and vehicle-hours. Planned transit system operating costs have been decreased from existing system operating costs based on the requisite decrease in transit service vehicle-miles and vehicle-hours to match reasonably expected revenues available.*

*Federal, State, and local highway capital and operating revenues are based on historical expenditures over the last several years and are documented in Table 4.15. Federal, State, and local transit capital and operating revenues are based on historical expenditures over the last several years and assessment of available Federal formula and program funds and are documented in Table 4.16.*

[b] *Also includes the costs associated with the bicycle and pedestrian, TSM, and TDM elements of the Fiscally Constrained Transportation Plan.*

[c] *Net operating cost (total operating costs less fare-box revenue). Like all amounts in this table, transit system operating costs represent the average annual costs for the transit system during the plan design period (2015-2050). Because the transit system changes in size (and therefore cost) over the life of the plan, the amounts in this table do not represent the operating costs of the full transit system in the year 2050.*

*Source: SEWRPC*

## Table 4.21
## Average Annual Costs and Revenues Associated with the Fiscally Constrained Transportation Plan Based on Year of Expenditure: 2016-2050

| Cost or Revenue Item | | YOE Dollars |
|---|---|---|
| Transportation System Cost (average annual 2016-2050 expressed as millions of dollars)[a] | | |
| Arterial Street and Highway System | | |
| Capital | | |
| Freeway Reconstruction | | $428 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing[b] | | 590 |
| | Subtotal | $1,018 |
| Operating | | 130 |
| | Subtotal | $1,148 |
| Transit System | | |
| Capital | | $37 |
| Operating[c] | | $167 |
| | Subtotal | $204 |
| | Total | $1,352 |
| Transportation System Revenues (average annual 2016-2050 expressed as millions of dollars)[a] | | |
| Highway Capital | | |
| Freeway Reconstruction (Federal/State) | | $417 |
| Surface Arterial Reconstruction/Resurfacing and Freeway Resurfacing | | |
| Federal/State | | 520 |
| Local | | 92 |
| | Subtotal | $1,029 |
| Highway Operating | | |
| State | | $60 |
| Local | | 55 |
| | Subtotal | $1,144 |
| Transit Capital | | |
| Federal | | $18 |
| Local | | 19 |
| | Subtotal | $37 |
| Transit Operating | | |
| Federal | | $29 |
| State | | 107 |
| Local | | 31 |
| | Subtotal | $167 |
| | Subtotal | $204 |
| | Total | $1,348 |

[a] *The estimated arterial street and highway system and transit system costs include all capital costs and operating and maintenance costs. The estimated costs include the necessary costs to preserve the existing transportation system, such as arterial street resurfacing and reconstruction and transit system bus replacement, and the estimated costs of the transportation system improvement and expansion under the Fiscally Constrained Transportation Plan. The freeway system capital costs include the estimated cost to rebuild those segments of the existing freeway system that have not yet been rebuilt to modern design standards, the estimated incremental cost to rebuild 116 miles of the freeway system with additional lanes, the estimated cost of two new freeway interchanges, and the estimated cost of the extension of the USH 12 freeway from Elkhorn to Whitewater. Surface arterial capital costs include the costs of the estimated necessary resurfacing and reconstruction of the 3,137 miles of surface arterials that will require preservation of capacity over the plan design period, the estimated costs of reconstruction and widening with additional traffic lanes of about 176 miles of surface arterials, and the estimated costs of new construction of 65 miles of surface arterials.*

*The conversion of year 2015 constant dollar cost to year of expenditure cost utilizes inflation rates based upon historical trends. The rate of inflation used for highway costs and transit construction costs of 2.3 percent was provided by WisDOT. The inflation rate of 2.5 percent used for transit vehicle costs is based on the historical increase in the purchase price of transit vehicles as experienced by the transit operators of the Region. With regard to transit operating costs, the inflation rate of 2.0 percent is based on the historical inflation from the Consumer Price Index for the Milwaukee area and discussions with Milwaukee County Transit System staff. The average annual capital and operating costs were calculated by evenly distributing the total year of expenditure costs over 35 years.*

*Federal, State, and local highway capital and operating revenues are based on historical expenditures over the last several years and are documented in Table 4.15. Federal, State, and local transit capital and operating revenues are based on historical expenditures over the last several years and assessment of available Federal formula and program funds and are documented in Table 4.16.*

[b] *Also includes the costs associated with the bicycle and pedestrian, TSM, and TDM elements of the Fiscally Constrained Transportation Plan.*

[c] *Net operating cost (total operating costs less fare-box revenue). Like all amounts in this table, transit system operating costs represent the average annual costs for the transit system during the plan design period (2015-2050). Because the transit system changes in size (and therefore cost) over the life of the plan, the amounts in this table do not represent the operating costs of the full transit system in the year 2050.*

*Source: SEWRPC*

- Carbon emissions from transportation would be slightly higher as travelers would be more dependent on their cars.

- Access to jobs, healthcare, education, and other daily needs would decrease, particularly for the 1 in 10 households in the Region without access to a car. In addition, for those that would maintain access to transit, a large number of the Region's jobs would be inaccessible due to excessive travel time. This particularly impacts minority populations and low-income populations, which use public transit at a rate proportionally higher than other population groups.

- Reduced ability to develop compact, walkable neighborhoods, which encourage active transportation and improve public health.

- Costs of public infrastructure and services, and the taxes necessary to support them, may be higher as improved and expanded public transit would not be available to support and promote more efficient, higher-density development.

- Reduced ability for the Region's residents to age in place as their ability to drive declines.

- Reduced labor force availability for employers.

- Lack of transit as a regional amenity has the potential to reduce the economic competitiveness of the Region, given that only five out of the other 39 metropolitan areas with more than 1.5 million residents in the United States (Cincinnati, Columbus, Detroit, Indianapolis, and San Antonio) do not have light rail, bus rapid transit, or commuter rail.

- Increased costs for some of the Region's households due to an inability to replace one or more of the household's cars with an annual transit pass. As a result, these households would have less money to save or spend on goods that have a greater impact on the local economy than expenses associated with a car.

- Reduced ability for communities to reduce or eliminate parking requirements, developers to build fewer spaces, and commercial and residential tenants to pay less for goods and rent.

- Reduced 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.

All of these consequences may negatively impact economic growth in Southeastern Wisconsin and the quality of life of its residents. Future projections indicate that soon the Region will no longer be able to support economic growth with internal growth of the Region's labor force. If the Region is to experience even a modest growth in jobs, the Region will need to in-migrate population and labor force. An inability to sustain and expand public transit service presents an obstacle to attracting labor force and business growth to Southeastern Wisconsin.

***Potential Revenue Sources to Address Transit Funding Gap***

As long recommended in previous regional transportation plans, transit system improvement and expansion, as proposed under the Preliminary Plan, would require State legislation to create local dedicated transit funding and a renewal of adequate annual State financial assistance to transit. In terms of State financial assistance to transit, the State should consider restoring the cut in transit funding from the 2011-2013 State budget, raising funding back to historical levels, and increasing future funding at the rate of inflation. The Wisconsin Transportation Finance and Policy Commission recommended an annual increase in statewide transit funding of $36.3 million along with recommended revenue sources to support the additional funding (including restoring the cut in transit funding from the 2011-2013 budget, raising funding back to historical levels, and creating a transit capital program). In the 2015-2017 State budget, the WisDOT Secretary proposed an additional $60.7 million in statewide transit funding during the biennium, including a new capital program and increases to State transit operating assistance. Implementing these modest measures would have the potential to partially address the transit funding gap.

**The Preliminary Plan identifies a number of potential ways to address the transit funding gap and fund the proposed transit system.**

A sales tax is the most common dedicated local transit funding source in other areas of the country and has previously been proposed for the Region.[28] A sales tax has the potential to generate the needed revenue to implement the transit improvements proposed under the Preliminary Plan. Milwaukee has by far the largest transit system of its peers not supported by dedicated funding. When comparing the Milwaukee metro area to 26 peer metro areas from the Midwest and across the nation, two-thirds of the peers have a local dedicated source of funding—typically a sales tax—which provides the bulk of their funding. The other peer metro area transit systems without dedicated funding provide one-half to one-fifth the transit service per capita provided in Milwaukee. In addition, the Milwaukee area is the most dependent on State funding compared to its 26 peers. The transit systems nationwide supported by sales tax revenue typically have a sales tax of 0.25 to 1.0 percent. In some of these areas, the sales tax rate varies by jurisdiction depending on the amount of transit service received by each jurisdiction.

**Enacting dedicated local transit funding, like a sales tax, would require State legislation.**

As noted above, a sales tax could address the transit funding gap for the Preliminary Plan, and was previously approved as part of an advisory referendum in Milwaukee County and proposed in State legislation. It should be noted that a one-half percent dedicated sales tax would likely generate significantly more revenue in some counties than the level of transit service proposed in those counties. 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 proposed transit improvements and expansion. Lastly, if a dedicated sales tax is enacted for transit, counties and municipalities may be able to eliminate or partially eliminate the use of property tax revenues to fund transit.

**Dedicated funding 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 proposed level of transit service.**

[28] *In November 2008, an advisory referendum passed in Milwaukee County approving a 1 percent sales tax, including a one-half percent sales tax for public transit. In the 2009-2011 State budget, then-Governor Doyle proposed a regional transit authority (RTA) with a one-half percent sales tax local dedicated funding, but the State Legislature rejected his proposal, and it was not included in the adopted budget. The State Legislature did include one-half percent sales tax dedicated funding for MCTS, but then-Governor Doyle vetoed this dedicated funding. The budget also created a Kenosha-Racine-Milwaukee (KRM) commuter rail authority with vehicle rental fee dedicated funding. Another attempt was made to pass RTA legislation in April of 2010 during the regular session of the State biennial Legislature. The legislation came very close to passing, but was not adopted into State law.*

## Table 4.22
## Potential Revenue Sources to Address Funding Gap for Transit Under the Preliminary Recommended Plan

| Revenue Source | Description with Approximate Revenues (2015 Constant Dollars) |
|---|---|
| Sales tax | Would involve an increase in existing sales tax rates, with the revenues dedicated to public transit. If enacted in each county, a 0.1% increase could generate about $25-30 million annually in the Region. |
| Vehicle registration fee ("wheel tax") | Would involve an increase in the existing vehicle registration fee, with the revenues dedicated to public transit. Each $1 increase could generate about $1.5 to 1.8 million annually in the Region. |
| Motor fuel tax ("gas tax") | Would involve an increase in the existing motor fuel tax levied by the State, with the revenues dedicated to public transit. Each $0.01 increase could generate about $9 million annually in the Region (assuming today's fuel consumption levels), declining to about $7 million (assuming year 2050 fuel consumption levels). |
| VMT/mileage-based registration fee ("VMT fee") | Would involve charging a fee to owners of passenger vehicles and light trucks based on the total distance they drive during a year. Assuming the fee would not be charged on the first 3,000 miles and would be capped at 20,000 miles, each $0.01 per mile fee could generate about $70 to 85 million annually in the Region. |
| Property tax increase | Would involve an increase in the existing property tax rate, with the revenues dedicated to public transit. Each $0.01 increase per $1,000 of valuation would generate about $1.7 million annually in the Region. |
| Vehicle rental fee | Would involve charging an additional fee for vehicles rented in the Region. State legislation previously allowed a vehicle rental fee of up to $18 per rental for KRM commuter rail costs, but it was repealed. In the KRM corridor, each $1 could generate about $400,000 to 500,000 annually. |
| Hotel room tax | Would involve increases to existing tax rates on short-term lodging (hotels, motels, etc.), with the revenues dedicated to public transit. A 1.0% increase could generate about $1.5 to 2 million annually in the Region. |
| Flex Federal highway funding to transit | Would involve flexing to public transit a portion of existing Federal highway funding that is allocated to the State, including Surface Transportation Program (STP), National Highway Performance Program (NHPP), and/or Congestion Mitigation and Air Quality Improvement Program (CMAQ) funding. In the past, about $14 million in STP-Milwaukee Urbanized Area (STP-M) funding has been utilized for transit projects. It should be noted there are Federal limitations on the use of Federal highway funds. For example, STP and NHPP funding can only be used for capital costs. |
| State transit capital assistance program | Would involve creating a program to grant funding for major transit capital improvement projects. A transit capital program previously created by the State would have provided up to $100 million in grant funding for Southeastern Wisconsin, but the program was repealed. The Wisconsin Transportation Finance and Policy Commission and the WisDOT Secretary also both proposed a transit capital program, which would have provided $15 million annually. |
| Capital cost value-capture | Would attempt to recover some or all of the value that a fixed-guideway station or other related infrastructure would generate for the private landowners in the station area. Examples include property tax TIF, sales tax TIF, development fees, and real estate transfer fee. Revenues would be generated on a project-specific basis and could be used for station and associated infrastructure costs. |

*Source: Wisconsin Transportation Finance and Policy Commission, Wisconsin Legislative Fiscal Bureau, Wisconsin Department of Revenue, Wisconsin Counties Association, Wisconsin Department of Transportation, and SEWRPC*

There are a number of other potential revenue sources that could provide additional transit funding in the Region (see Table 4.22). In order to help address the transit funding gap identified for the Preliminary Plan, these sources could be considered. Like the sales tax, the ability to implement most of the identified funding sources would require State legislation. Also like the sales tax, some revenue sources could be levied only in the more urban areas of the Region that would be served by a majority of the proposed transit improvements and expansion, and counties and municipalities may be able to partially eliminate the use of property tax revenues to fund transit.

**The proposed increases in transit service under the Preliminary Plan 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 proposed increases in transit service under the Preliminary Plan 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 proposed under the Preliminary Plan. Based on the amount of additional transit service proposed in the Preliminary Plan, the Region could expect to receive up to $63 million (average annual in 2015 constant dollars) in additional FTA funding if the Preliminary Plan is implemented.

In addition to providing adequate funding, implementation of the significant improvements and expansion of transit 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 proposed transit system. A number of the proposed transit services extend across city and county boundaries and a regional agency could assist in the implementation of these proposed services. Legislative efforts to create an RTA have not progressed since 2010.[29]

## 4.4 PUBLIC FEEDBACK ON PRELIMINARY RECOMMENDED PLAN

**The fifth and final round of visioning workshops, held in spring 2016, focused on reviewing the Preliminary Recommended Plan and the funding and benefits associated with the Preliminary Plan.**

A fifth round of interactive workshops, open to the general public and held throughout the Region, was conducted between April 25 and May 4, 2016. The workshops were the final round of public workshops held across the Region during the VISION 2050 process. The five rounds of workshops were used to provide information on, and obtain input into, the development of the year 2050 regional land use and transportation plan. As was done in the first four rounds, the Commission hosted one workshop in each county, with the Commission's eight partner community organizations holding individual workshops for their constituents between April 19 and May 3, 2016. A summary report of the eight partner workshops held in the spring of 2016 can be found in Appendix J-1 to this volume. As in the previous four rounds of workshops, the Commission staff offered to hold individual workshops by request, and held one such requested workshop in the spring of 2016.[30]

The focus of the fifth round of workshops was reviewing the Preliminary Recommended Plan and the funding and benefits associated with the Preliminary Plan. The funding and benefits information included a summary of the financial analysis of the Preliminary Plan, the identification of a funding gap for the public transit element, and the Fiscally Constrained Transportation Plan (FCTP), which included a reduction in transit service rather than the significant improvement and expansion proposed in the Preliminary Plan.[31] Attendees were also made aware of a demonstration of air quality conformity of the FCTP and the 2015-2018 regional transportation improvement program.

**Each workshop was held in an interactive open house format, allowing residents to attend at any time during the two-hour timeframe of a workshop.**

Each workshop was held in an interactive open house format, allowing residents to attend at any time during the two-hour timeframe of a

[29] *Ibid.*

[30] *The Commission staff held an individual workshop in May 2016 for City of Wauwatosa elected officials and staff.*

[31] *During consideration of the Preliminary Plan, the term Federally Recognized Transportation Plan (FRTP) was changed to Fiscally Constrained Transportation Plan (FCTP). Any public comment referring to the FRTP is related to the FCTP presented in this chapter.*

workshop. Attendees were greeted by staff and provided a brief orientation presentation to familiarize them with the Preliminary Plan and the open house format of the workshop. Staff also distributed a 20-page booklet summarizing the Preliminary Recommended Plan and its funding and benefits. Each workshop was arranged in six stations: 1) VISION 2050 Overview, 2) Land Use, 3) Public Transit, 4) Bicycle and Pedestrian, 5) Arterial Streets and Highways (including TSM, TDM, and Freight), and 6) Funding and Benefits of the Preliminary Plan. Staff was available at each station to answer attendee questions and comment cards (color-coded to coincide with each station) were available to allow attendees to comment on each element of the Preliminary Plan. The comment cards included questions specific to their respective elements in an attempt to obtain feedback that could be considered in preparing a final recommended plan, which is presented in Volume III of this report. Attendees could also provide oral comment on the Preliminary Plan to a court reporter at each of the seven public workshops.

Nearly 360 residents attended one of the above workshops held in the spring of 2016—about 160 people participated in the public or requested workshops and about 200 people participated in the eight partner workshops.

The Commission staff made available an interactive website dedicated to exploring the Preliminary Plan and its evaluation through May 6, 2016 (the end of the public comment period), particularly for those who were unable to attend one of the spring 2016 workshops. The website replicated the information and activities at the workshops. The site had an initial page with four tabs, which described land use, bicycle and pedestrian facilities, public transit, and arterial streets and highways under the Preliminary Plan compared to the Trend from the alternatives stage and existing conditions. Within each tab was a navigable map with GIS layers that could be turned on and off and the ability to flip between existing conditions, the Trend, and the Preliminary Plan, allowing users to quickly compare what was included. Each tab also provided key recommendations from each element; a space to provide feedback on each element and respond to the questions included on the comment cards from the workshops; and links to the 20-page summary booklet, the preliminary VISION 2050 plan report chapter on the Preliminary Plan, the preliminary VISION 2050 plan report appendix on the Preliminary Plan evaluation, and a summary brochure.

Following the initial page describing the Preliminary Plan, there was a page discussing funding for the Preliminary Plan and a page describing the potential benefits of the Preliminary Plan. These pages included interactive graphics, maps, and charts, along with the ability to provide comments on the transit funding gap and the FCTP. The final page of the site allowed users to provide any general feedback on the Preliminary Plan, encouraging comment on the FCTP as well as a demonstration of air quality conformity of the FCTP and the 2015-2018 regional transportation improvement program.

A total of about 510 residents participated in reviewing the Preliminary Plan, either at a workshop or online, providing a total of about 500 comments related to the plan (includes comments provided at a workshop or via mail, email, and online). The results are discussed below (a more detailed summary of the results can be found in Appendix J-2 to this volume, including Commission staff responses to comments, as appropriate), followed by a summary of the notable changes made to the Preliminary Plan as staff developed the final recommended plan.

**Public Comment on the Preliminary Recommended Plan**

Overall, as was the case with the feedback received on the alternative plans, most participants at the workshops and through the online tool did not want to follow current trends in land use and transportation system development. There was significant support of the compact, walkable development and the improved and expanded public transit services envisioned under the Preliminary Plan. The detailed evaluation of the Preliminary Plan and information regarding the FCTP allowed participants to more fully consider the potential benefits and consequences of the Preliminary Plan, particularly as it relates to public transit service. Although specific questions were asked regarding each plan component and element, the public provided a wide range of feedback, which is briefly summarized below and is summarized in more detail in Appendix J-2.

**There was significant support for more compact, walkable development and the improved and expanded public transit services envisioned under the Preliminary Plan.**

***Land Use***

There were almost 110 total comments received on the land use component of the Preliminary Plan, with 64 comments in support, six comments in opposition, and 38 comments requiring a clarifying response.

**There were 64 comments in support of the land use component of the Preliminary Plan, and six comments in opposition.**

Comments in support of the land use component covered a wide range of topic areas, including the environment, housing, and compact development. The most frequent reasons for supporting the land use component were preserving farmland (7 comments), protecting environmental corridors (6), supporting walkable neighborhoods (6), supporting a variety of housing options throughout the Region (5), a land use development pattern that supports transit (5), limiting urban sprawl (4), and supporting TOD (4).

Comments in opposition centered on the population projections used as a basis for preparing the Preliminary Plan and property rights. Two commenters expressed concern that the population projections show an unrealistic amount of growth for the Region and two commenters expressed concern about government policy influencing the preservation of farmland and infringing on individual property rights.

***Public Transit***

There were over 130 total comments received on the public transit element of the Preliminary Plan, with the overwhelming majority in support. There were 111 comments in support, 18 comments suggesting a change or addition to the public transit element, six comments requiring a clarifying response, and no comments in opposition.

**There were 111 comments in support of the public transit element of the Preliminary Plan, and no comments in opposition.**

Numerous commenters expressed support for all of the recommendations included in the public transit element (38). Other commenters cited specific recommendations they supported or specific reasons for their support, such as: expanding and enhancing intercity and commuter rail services that connect the Region to other areas (14); implementing commuter rail in the Region (13); expanding transit service to compete with other Regions and attract new, especially younger, residents (11); and expanding public transit to enable residents to access more jobs (7). Providing more transit service to rural areas of the Region was the most frequent suggestion for changes or additions to the public transit element (3).

***Bicycle and Pedestrian***

Almost 80 comments were received on the bicycle and pedestrian element, again with most in support. There were 58 comments in support, one comment in opposition, three comments suggesting changes or additions, and 14 comments requiring a clarifying response. Numerous commenters expressed general support for the bicycle and pedestrian element (25), citing

**There were 58 comments in support of the bicycle and pedestrian element of the Preliminary Plan, and one comment in opposition.**

a wide range of benefits. Some of the benefits cited in the comments included improved public health and reduced healthcare costs, reduced air pollution, and improved safety. The other most frequently cited reasons for support included expanding the off-street bicycle path network (11) and enhanced bicycle facilities (8).

Comments suggesting changes or additions to the bicycle and pedestrian element include two suggestions to encourage Safe Routes to School programs and one suggestion to reinstate the State's Complete Streets law. The comment in opposition suggested addressing bicycle facility planning locally rather than regionally.

**There were 39 comments in support of the arterial streets and highways element of the Preliminary Plan, and 29 comments in opposition.**

***Arterial Streets and Highways (including TSM, TDM, and Freight Transportation)***

Over 90 comments were received on the arterial streets and highways, TSM, TDM, and freight transportation elements. There were 39 comments in support, 29 comments in opposition, and 24 comments suggesting changes or making other observations.

Five commenters expressed support for constructing the USH 12 freeway between the Cities of Elkhorn and Whitewater, five commenters expressed support for adding a lane in each direction on IH 43 between Howard Avenue and Silver Spring Drive, four commenters expressed general support in relation to widening or adding highways, and three commenters expressed support for the Lake Parkway extension to STH 100. Several other projects received a single comment in support.

Adding a lane in each direction on IH 43 between Howard Avenue and Silver Spring Drive received the most comments in opposition (16). In addition, 11 commenters expressed general opposition to widening or adding freeways and highways to address traffic congestion in the Region. Those commenters cited a number of reasons, including focusing on improving and expanding alternative modes of travel and doubt that widenings will reduce traffic congestion.

The most frequent suggestions for changes or additions included improving the IH 94 interchange at Moorland Road rather than constructing an interchange at Calhoun Road (4) and moving the alignment for the proposed arterial near Lenwood Lake from N. River Road to STH 144 in Washington County (3).

**There were 29 comments in support of generating additional public revenue to fund the public transit element of the Preliminary Plan, and two comments in opposition.**

***Funding and Benefits of the Preliminary Recommended Plan***

There were over 40 comments regarding funding and benefits of the Preliminary Plan. There were 29 comments in support of generating additional public revenue to fund the public transit element, two comments in opposition, and five comments required a clarifying response. Eight commenters indicated they believed the public transit element included in the FCTP was inadequate. Several of the commenters indicated their preferences for which funding sources should be pursued so the Region could achieve the public transit element included in the Preliminary Plan. The most frequently cited sources included increasing fuel tax rates (7), implementing a VMT fee (7), and increasing sales tax rates (6).

***Additional Comments***

There were 32 additional comments received on the Preliminary Plan. There were 19 additional comments in support of the Preliminary Plan. They included 12 commenters that complimented the VISION 2050 planning process and seven commenters that generally supported the plan and its

implementation. There were four comments in opposition to the plan. Two commenters expressed concern that many residents who might generally object to the plan did not comment due to a lack of interest in the planning process. Two commenters expressed concern about the robust transportation infrastructure proposed under the Preliminary Plan and stated that low taxes are more important to attracting businesses than infrastructure investment.

There were also three comments requesting changes or additions. The commenters stated that not enough emphasis was placed in the public outreach materials on the benefits of the Preliminary Plan related to improving public health and improving opportunities for minority residents and low-income residents.

## 4.5 NOTABLE CHANGES TO PRELIMINARY RECOMMENDED PLAN FOR FINAL RECOMMENDED PLAN

**Based on feedback received on the Preliminary Plan, staff made revisions to the public transit, bicycle and pedestrian, and arterial streets and highways elements as they prepared the final plan.**

The input received on the Preliminary Recommended Plan was considered during the next step of the VISION 2050 process, as Commission staff prepared a final recommended year 2050 land use and transportation plan for Southeastern Wisconsin. The final recommended plan is presented in Volume III of this report. Below is a summary of the notable changes made to the Preliminary Plan as staff developed the final plan.

**Changes to the Land Use Component**
Based on the extensive public outreach and feedback received throughout the VISION 2050 process, including the final round of public involvement on the Preliminary Plan, no changes to the land use component of the Preliminary Plan were made in the final plan.

**Changes to the Public Transit Element**
Based on the feedback received on the public transit element of the Preliminary Plan, the following changes were made in the final plan (map changes are shown on Maps 4.24 and 4.25):

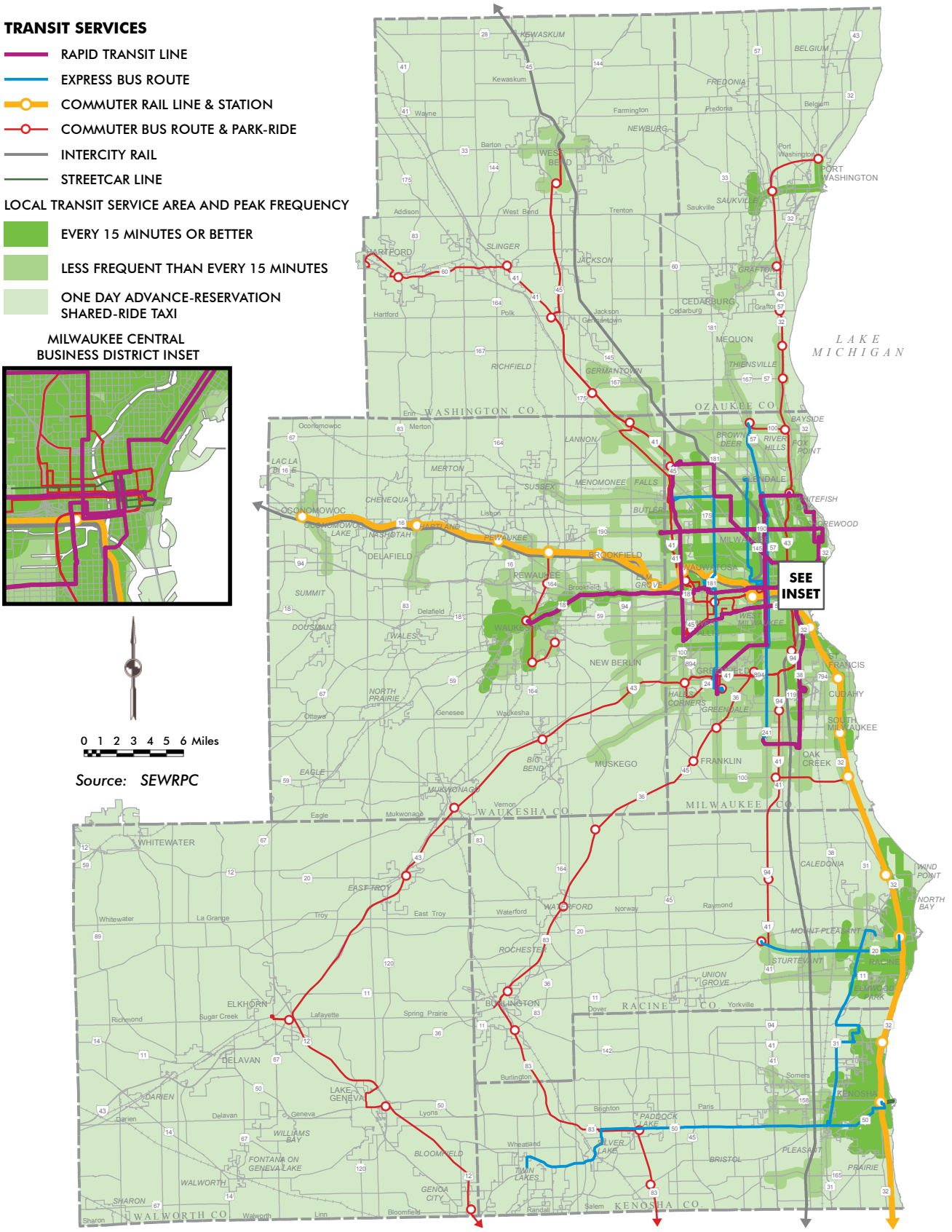
- As requested by the City of Milwaukee, the recommendation for a rapid transit network was revised to remove references to the potential extension of Milwaukee streetcar service as rapid transit light rail service. Instead, streetcar service would be provided as a Milwaukee downtown circulator and local transit service connecting to nearby neighborhoods. As part of this revision, the currently planned extent of the City of Milwaukee streetcar network is included as local transit service in the final plan. The Milwaukee Central Business District Inset on Maps 4.24 and 4.25 display this change.

- As requested by the City of Milwaukee, a commuter rail extension was included along the 30th Street Industrial Corridor between downtown Milwaukee and Century City.

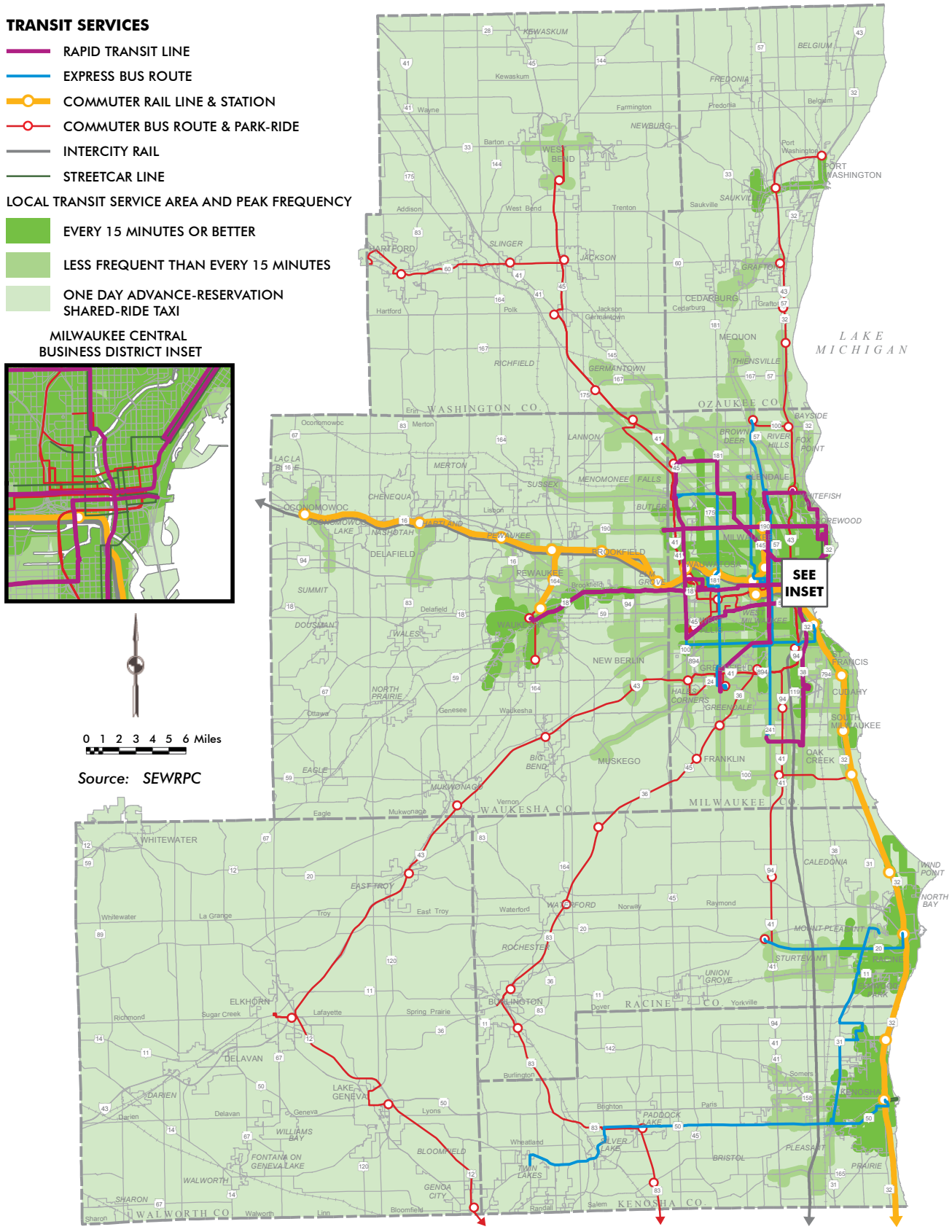
- As requested by the City of Waukesha, a commuter rail extension was included along Canadian National's existing freight line from Pewaukee to downtown Waukesha, connecting downtown Waukesha to downtown Milwaukee via commuter rail.

- As requested by members of the public, elected officials, and members of the VISION 2050 Public Transit Task Force, a few minor revisions were made to commuter and express bus routes.

## Map 4.24
## Transit Services: Preliminary Recommended Plan



## Map 4.25
## Transit Services: Final Recommended Plan



**Changes to the Bicycle and Pedestrian Element**
Based on the feedback received on the bicycle and pedestrian element of the Preliminary Plan, the following changes were made in the final plan:

- As requested by members of the public, elected officials, and members of the VISION 2050 Non-Motorized Transportation Task Force, a few minor revisions were made to off-street bicycle paths and enhanced bicycle facility corridors.

- As requested by members of the public and members of the VISION 2050 Non-Motorized Transportation Task Force, language was added recommending local governments work to implement Safe Routes to School programs as appropriate to Recommendation 3.6, which recommends that local governments prepare community bicycle and pedestrian plans to supplement the regional plan.

**Changes to the Transportation Systems Management Element**
Based on the feedback received on the transportation systems management element of the Preliminary Plan, no changes were made in the final plan.

**Changes to the Travel Demand Management Element**
Based on the feedback received on the travel demand management element of the Preliminary Plan, no changes were made in the final plan.

**Changes to the Arterial Streets and Highways Element**
Based on the feedback received on the arterial streets and highways element of the Preliminary Plan, the following changes were made in the final plan:

- As requested by members of the public and members of the Commission's jurisdictional highway planning committees for various counties, a few minor revisions were made to the locations of proposed new arterial streets and highways in the Region.

***The Widening of IH 43 between Howard Avenue and Silver Spring Drive in Milwaukee County***
The Commission staff was requested by the Commission's Advisory Committees on Regional Transportation Planning and Regional Land Use Planning to analyze the benefits and impacts of adding a lane to this segment of IH 43 at the time of its reconstruction (see Appendix I of this volume). The potential benefits and impacts were presented to the public during the fifth round of VISION 2050 workshops. Appendix J includes a summary of the public feedback received on this corridor.

Staff proposed three options for the Advisory Committees to consider with respect to addressing this segment of IH 43 in the final plan:

- **Option 1** – Include the widening of IH 43 between Howard Avenue and Silver Spring Drive in the final plan. Under this option, the final plan would recommend that the preliminary engineering conducted for the reconstruction of this segment of IH 43 include the consideration of alternatives for rebuilding the freeway with additional lanes and also rebuilding it with the existing number of lanes. Should, at the conclusion of preliminary engineering, a determination be made that IH 43 between Howard Avenue and Silver Spring Drive be reconstructed with the existing number of traffic lanes, then VISION 2050 would be amended accordingly.

- **Option 2** – Not make any recommendation with respect to how IH 43 between Howard Avenue and Silver Spring Drive would be reconstructed in the final plan, similar to the Commission staff's suggested compromise during the development of the regional freeway reconstruction plan completed in 2003. Under this option, VISION 2050 would recommend that the preliminary engineering conducted for the reconstruction of this segment of IH 43 include the consideration of alternatives for rebuilding the freeway with additional lanes and rebuilding it with the existing number of lanes. Following the conclusion of preliminary engineering, VISION 2050 would be amended to reflect the decision made as to how IH 43 between Howard Avenue and Silver Spring Drive would be reconstructed. This option would further recommend that 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.

- **Option 3** – Recommend maintaining IH 43 between Howard Avenue and Silver Spring Drive with the same number of traffic lanes that exist today in the final plan. Under this option, VISION 2050 would recommend that the preliminary engineering conducted for the reconstruction of this segment of IH 43 include the consideration of alternatives for rebuilding the freeway with additional lanes and rebuilding it with the existing number of lanes. Should, at the conclusion of preliminary engineering, a determination be made that IH 43 between Howard Avenue and Silver Spring Drive be reconstructed with additional traffic lanes, then VISION 2050 would be amended accordingly.

The Advisory Committees unanimously recommended including Option 2 in the final plan.

**Changes to the Freight Transportation Element**
Based on the feedback received on the freight transportation element of the Preliminary Plan, no changes were made in the final plan.