INVENTORY OF TRANSPORTATION FACILITIES AND SERVICES 4

Credit: Eppstein Uhen Architects

4.1 INTRODUCTION

This chapter describes the existing regional transportation system of Southeastern Wisconsin, including streets and highways, public transit, intermodal parking facilities, bicycle and pedestrian facilities, and transportation system operations and management systems. Much of the data presented are for 2011, the plan base year, although more recent data are presented based on availability. The supply and use of the existing regional transportation system is presented, along with trends in transportation system supply and use over the past 50 years, comparing the current plan base year data to that of previous generation plan base years of 2001, 1991, 1972, and 1963.

4.2 STREETS AND HIGHWAYS

Classification of Streets and Highways

The street and highway system must serve several important functions, including providing for the movement of through vehicular traffic; providing for access of vehicular traffic to abutting land uses; providing for the movement of pedestrian and bicycle traffic; and serving as the location for utilities and stormwater drainage facilities. Two of these functions—traffic movement and land access—are basically incompatible. As a result, street and highway system design is based upon a functional grouping or classification of streets and highways, based upon primary function served. Three functional classifications of streets and highways are recognized: 1) arterial streets; 2) collector streets; and 3) land access streets.

Arterial streets and highways are principally intended to provide a high degree of travel mobility, serving the through movement of traffic and providing transportation service between major subareas of an urban area or through the area.

Arterial streets are defined as streets and highways that are principally intended to provide a high degree of travel mobility, serving the through movement of traffic and providing transportation service between major subareas of an urban area or through the area. Together, the arterial streets should form an integrated, areawide system. Access to abutting property may be a secondary function of some types of arterial streets and highways, but it should always be subordinate to the primary function of traffic movement.

Collector streets are defined as streets and highways that are intended to serve primarily as connections between the arterial system and the land access street system. In addition to collecting traffic from, and distributing traffic to, the land access streets, the collector streets usually provide the same principal function as land access streets, that of providing access to abutting property. As a result, collector and land access streets are sometimes combined and referred to as nonarterial, or local, streets.

Land access streets are defined as streets and highways which are intended to serve primarily as a means of access to abutting properties, principally serving the residential areas of a community.

Arterial streets generally account for about 30% of the mileage of the total street and highway system, and carry about 90% of the total average weekday traffic in the Region.

Arterial streets generally account for about 30 percent of the mileage of the total street and highway system, and carry about 90 percent of the total average weekday traffic in the Region. Arterial streets are typically spaced at about one-half mile intervals in high-density areas, one-mile intervals in medium-density areas, two-mile intervals in low-density areas, and intervals of more than two miles in rural areas. To serve travel effectively, and to make efficient use of public resources, the arterial street system should be planned as an integrated system, irrespective of jurisdictional boundaries and jurisdictional responsibilities for streets and highways, with consideration of existing and future traffic volumes, and with traffic capacities fitted to serve those traffic volumes. The Commission's regional transportation planning addresses only the arterial street and highway element of the total street and highway system. Arterial streets and highways are the only element of the total street and highway system for which existing and future traffic volume, and the need for additional traffic lanes or for a new arterial facility to relieve traffic, is a consideration in facility and system design. Working with local governments and the Wisconsin Department of Transportation (WisDOT), the Commission has defined the arterial street system of the Region for over 50 years. The definition of arterials has been determined by an evaluation of four major factors: 1) traffic characteristics—traffic volume and type, operating speeds, and average trip length; 2) physical characteristics—horizontal and vertical alignment, pavement width, and pavement type; 3) system integration—system continuity and facility spacing; and 4) land use service—the areawide significance of the land use activities served.

Collector and land access streets should form a street system within neighborhoods, with the boundaries of those neighborhoods determined by arterial streets, or other built or natural boundaries. Desirably, collector and land access streets should not extend directly through a neighborhood, or from neighborhood to neighborhood. Otherwise, traffic may begin to occur on the collector and land access streets, particularly if the arterial street system is experiencing traffic congestion. Neighborhood residents experience traffic concerns at relatively low levels of traffic volume, specifically, 1,500 to 2,500 vehicles per average weekday, or about one-ninth to one-sixth of the potential traffic-carrying design capacity of a two-lane urban arterial street. The collector and land access street system within a neighborhood should be designed to discourage through traffic from traveling within the neighborhood. It should also be designed to permit reasonably direct travel—by personal vehicle, bicycle, and walking—by residents to all parts of the neighborhood, including parks, schools, and commercial centers, and to each arterial street along the neighborhood boundary.

Arterial Street and Highway System

The arterial street and highway system of the Region may be further described and classified in a number of different ways. The arterial street system may be divided into freeway facilities and non-freeway or surface arterial streets and highways. A freeway is a special type of arterial—the highest type of arterial—providing the highest degree of mobility and the most limited degree of access. A freeway is defined as a divided arterial highway with full control of access and grade separations at all interchanges. Surface (or standard) arterial streets and highways are arterials with at-grade intersections and may as well provide direct access to abutting property through driveways. Table 4.1 shows the mileage of arterials in the Region in 2011, and as well for previous regional plan base years of 1963, 1972, 1991, and 2001. The existing and historic mileage of collector and land access streets and of the total street and highway system within the Region are also shown. Over the past nearly 50 years, the mileage of arterials in the Region has increased from 3,188 miles in 1963 to 3,323 miles in 2011, an increase of 135 miles, or 4.2 percent. The lane-miles of arterials have increased over that same period by about 15 percent, while vehicle-miles of travel (VMT) on an average weekday on the arterial street and highway system have increased by over 200 percent.

Over the past 50 years, arterial lane-miles have increased 15%, while VMT on an average weekday has increased by over 200%.

Streets and highways may also be classified according to jurisdiction. Jurisdictional classification establishes which level of government—State, county, or local—has responsibility for the design, construction, maintenance, and operation of each segment of the total street and highway system. The existing jurisdictional highway subsystems are the result of a long evolutionary process influenced by many complex political, administrative, financial, and engineering considerations and constraints. Over the last 45 years, the Commission has recommended changes in the jurisdictional classification of the arterial street and highway system so that the arterial street system is grouped into logical subsystems of jurisdictional responsibility with the appropriate streets and highways under the jurisdiction of each level of government—State, county, and local. The county jurisdictional highway system plans prepared by the Commission are based upon criteria established by the Commission in cooperation with Federal, State, and local units of government and include: 1) trip service—the average trip length on each segment during an average weekday; 2) land use service—the areawide significance of land use activities to be connected and served; and 3) facility operational characteristics and system continuity, including facility spacing, traffic volume, traffic mobility, and land access.

State trunk highways should be those facilities intended to provide the highest level of mobility, to serve trips with the longest length, to provide minimal land access, to serve land uses of regional and statewide significance, and to have interregional continuity. State trunk highways are those arterial facilities which would principally serve travel through a county, and travel between counties.

County trunk highways should be those arterial facilities intended to provide an intermediate level of traffic mobility and land access, to serve land uses of countywide significance, and to have intercommunity continuity. County trunk highways are those arterial facilities which would principally serve travel between the various municipalities of a county. Local or municipal arterial streets are intended to be those facilities that provide the lowest level of arterial traffic mobility and the highest degree of arterial land access, and which have intracommunity continuity and serve principally arterial travel within a municipality. Table 4.2 presents the distribution of existing arterial

Table 4.1
Distribution of Total Street and Highway Mileage in the Region by County: 1963, 1972, 1991, 2001, and 2011[a]

Year	County	Arterial	Collector and Land-Access	Total[b]	Arterial Mileage as a Percent of Total Mileage
1963	Kenosha	281.5	547.1	828.6	34.0
	Milwaukee	791.5	1,642.6	2,434.1	32.5
	Ozaukee	264.9	366.9	631.8	41.9
	Racine	351.3	632.4	983.7	35.7
	Walworth	399.7	824.2	1,223.9	32.7
	Washington	402.3	688.0	1,090.3	36.9
	Waukesha	697.0	1,054.0	1,751.0	39.8
	Region	3,188.2	5,755.2	8,943.4	35.6
1972	Kenosha	287.1	593.4	880.5	32.6
	Milwaukee	795.7	1,851.7	2,647.4	30.1
	Ozaukee	253.5	466.7	720.2	35.2
	Racine	355.4	728.0	1,083.4	32.8
	Walworth	412.0	846.9	1,308.9	31.5
	Washington	344.8	821.1	1,165.9	29.6
	Waukesha	670.2	1,342.5	2,012.7	33.3
	Region	3,118.7	6,700.3	9,819.0	31.8
1991	Kenosha	317.1	660.7	978.3	32.5
	Milwaukee	775.4	2,131.6	2,907.0	26.7
	Ozaukee	250.7	610.3	861.0	29.1
	Racine	349.9	814.4	1,164.3	30.1
	Walworth	429.2	996.4	1,425.6	30.1
	Washington	400.2	922.8	1,323.6	30.3
	Waukesha	735.5	1,805.4	2,540.9	28.9
	Region	3,259.1	7,941.6	11,200.7	29.1
2001	Kenosha	317.6	715.3	1,032.9	30.7
	Milwaukee	781.8	2,187.3	2,969.1	26.3
	Ozaukee	250.7	643.7	894.4	28.0
	Racine	352.6	909.7	1,262.3	27.9
	Walworth	436.6	1,048.5	1,485.1	29.4
	Washington	406.5	1,029.3	1,435.8	28.3
	Waukesha	746.0	2,111.6	2,857.6	26.1
	Region	3,291.8	8,645.4	11,937.2	27.6
2011	Kenosha	320.0	770.3	1,090.3	29.3
	Milwaukee	788.4	2,226.4	3,014.8	26.2
	Ozaukee	250.8	689.8	940.6	26.7
	Racine	358.3	971.3	1,329.6	27.0
	Walworth	445.6	1,080.5	1,526.1	29.2
	Washington	406.5	1,129.4	1,535.9	26.5
	Waukesha	753.3	2,296.7	3,050.0	24.7
	Region	3,322.9	9,164.4	12,487.3	26.6

[a] *The estimated lane-miles of arterials was 7,827 lane-miles in 1963, 7,627 lane-miles in 1972, 8,383 lane-miles in 1991, 8,790 lane-miles in 2001, and 9,004 lane-miles in 2011.*

[b] *Total street and highway mileage does not include private streets and roads or roadways in public parks and on institutional lands.*

Source: SEWRPC

Table 4.2
Distribution of Existing Arterial Street and Highway Mileage in the Region by County and Jurisdictional Classification: 2011

	State		County		Local		Total	
County	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total
Kenosha	115.4	36.1	143.0	44.7	61.5	19.2	320.0	100.0
Milwaukee	251.4	31.9	85.9	10.9	451.2	57.2	788.4	100.0
Ozaukee	77.8	31.0	108.0	43.0	65.1	25.9	250.8	100.0
Racine	163.1	45.5	116.6	32.5	78.6	22.0	358.3	100.0
Walworth	218.9	49.1	178.6	40.1	48.1	10.8	445.6	100.0
Washington	186.3	45.8	145.4	35.8	74.9	18.4	406.5	100.0
Waukesha	234.1	31.1	356.8	47.4	162.4	21.6	753.3	100.0
Region	1,246.8	37.5	1,134.2	34.1	941.9	28.3	3,322.9	100.0

Source: Wisconsin Department of Transportation and SEWRPC

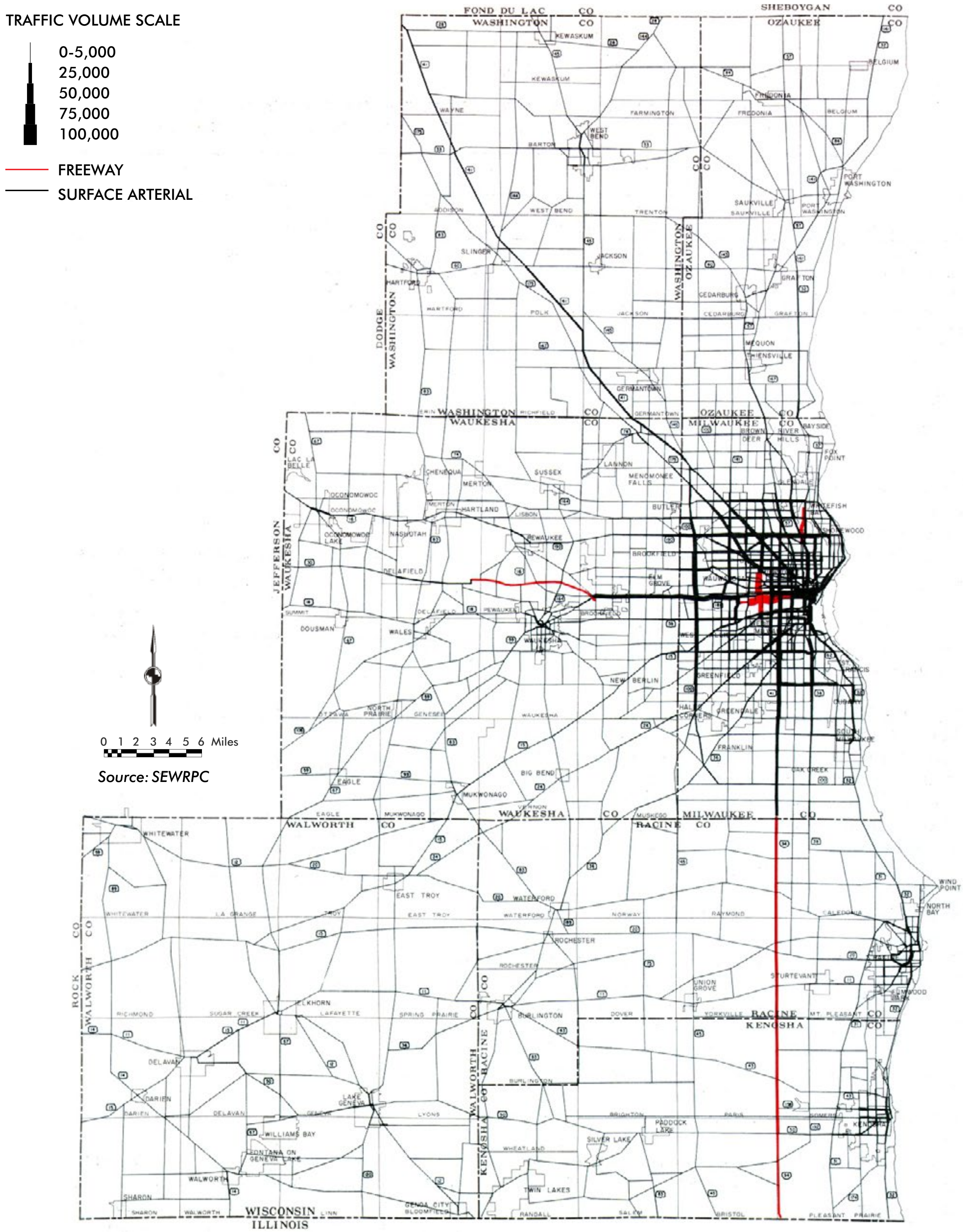
highway mileage within the Region in 2011 by State, county, and local jurisdictional classification.

Arterial Street and Highway System Traffic Volume

The average weekday traffic volume on each segment of the arterial street and highway system within the Region in 2011 is graphically displayed on Map 4.1, and compared to arterial street and highway traffic volume patterns of 1963, 1972, 1991, 2001 and 2011. The estimate of average weekday traffic volume is based upon traffic volume counting conducted principally by WisDOT, supplemented by certain county and municipal governments, particularly the City of Milwaukee. The effect of the completion of the freeway system between 1963 and 1972 is apparent in the significant reduction of traffic volume on the surface arterials in Milwaukee County.

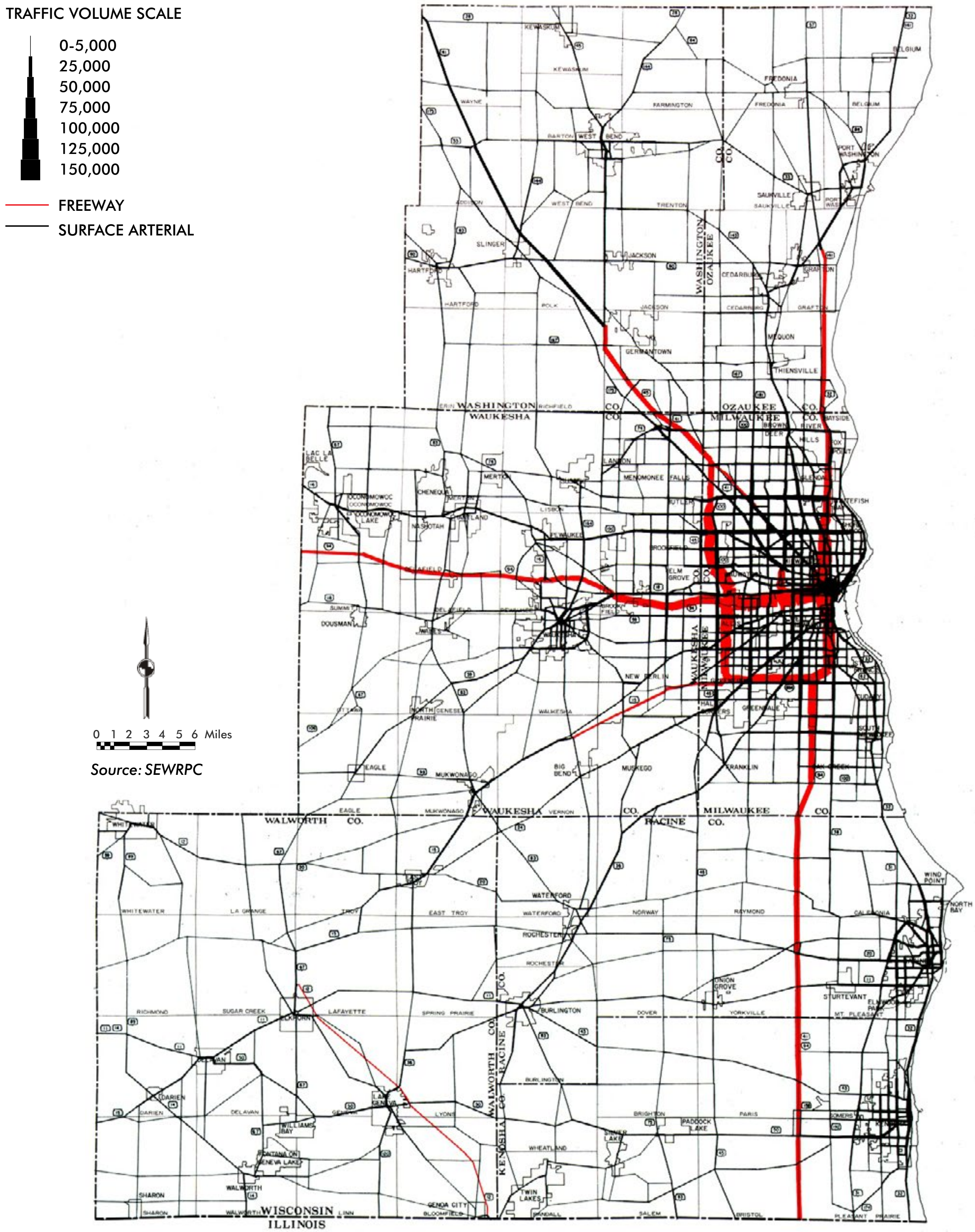
The magnitude of arterial street and highway traffic volume can also be measured in terms of total arterial system average weekday vehicle-miles of travel, or VMT, which is a measure of total travel (estimated by multiplying the average weekday traffic volume on each segment of arterial highway by the length in miles of each segment of arterial highway). As shown in Table 4.3, about 40.9 million VMT occurred on the arterial street and highway system within the Region on an average weekday in 2011. Table 4.3 also compares the arterial VMT within each County and the Region for the years 1963, 1972, 1991, 2001, 2005, and 2011. Between 2005 and 2011, the arterial VMT in the Region on an average weekday decreased from 42.4 million to 40.9 million, a decrease of 3.5 percent, or 0.6 percent annually. Between 2001 and 2005, arterial VMT increased from 39.7 million to 42.4 million, an increase of 7 percent, or 1.7 percent annually. Overall, arterial VMT increased by 3 percent, or 0.3 percent annually, between 2001 and 2011. Between 1991 and 2001, arterial VMT increased from 33.1 million to 39.7 million, an increase of 20 percent, or 1.8 percent annually. Between 1972 and 1991, arterial VMT increased from 20.1 million to 33.1 million, an increase of 64 percent, or 2.6 percent annually. Between 1963 and 1972, arterial VMT increased from 13.1 million to 20.1 million, an increase of 53 percent, or 4.8 percent annually. The annual rate of growth of average weekday VMT for the Region and for each county is shown in Table 4.4.

Map 4.1a
Arterial Street and Highway Utilization in the Region: 1963



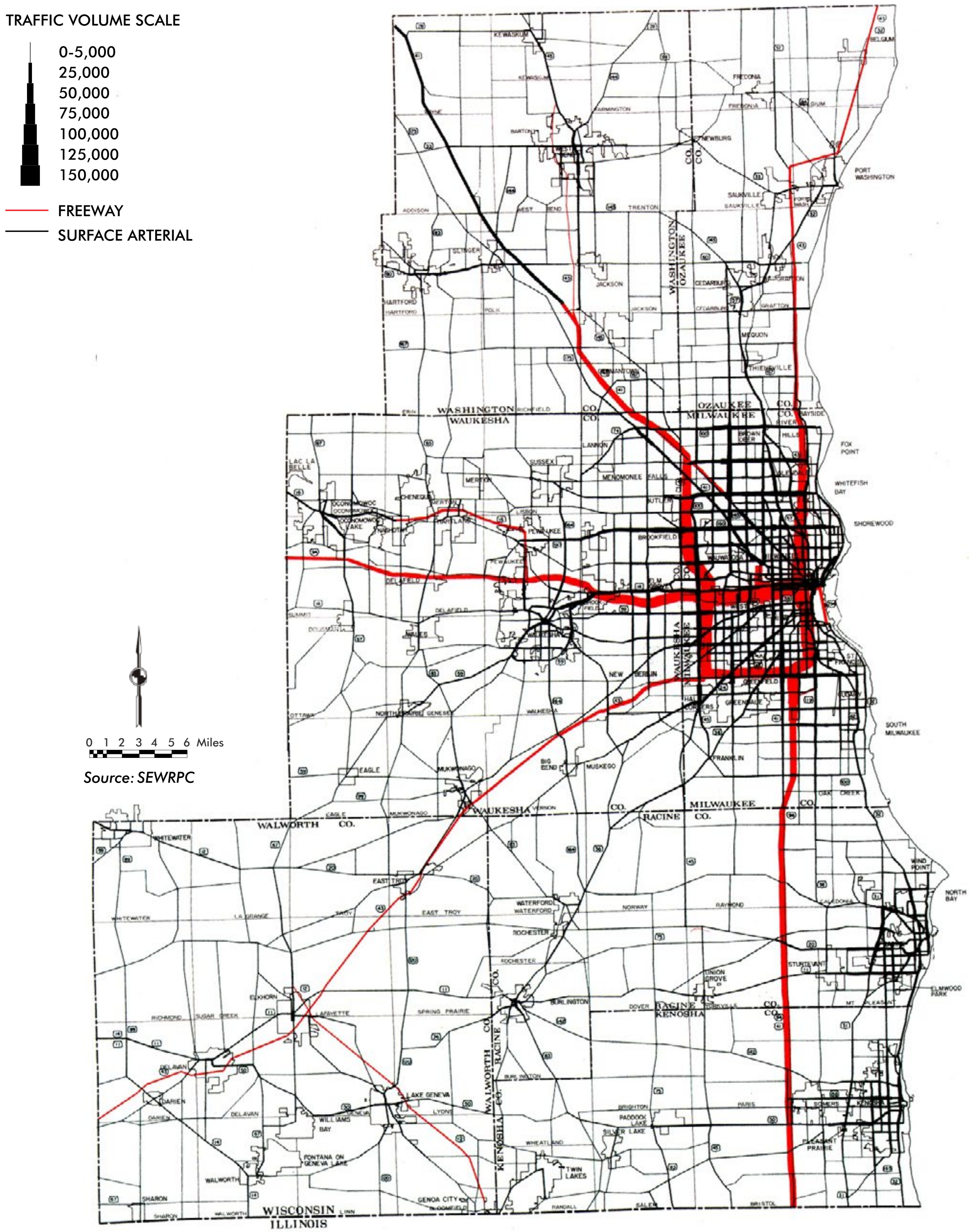
Source: SEWRPC

Map 4.1b
Arterial Street and Highway Utilization in the Region: 1972



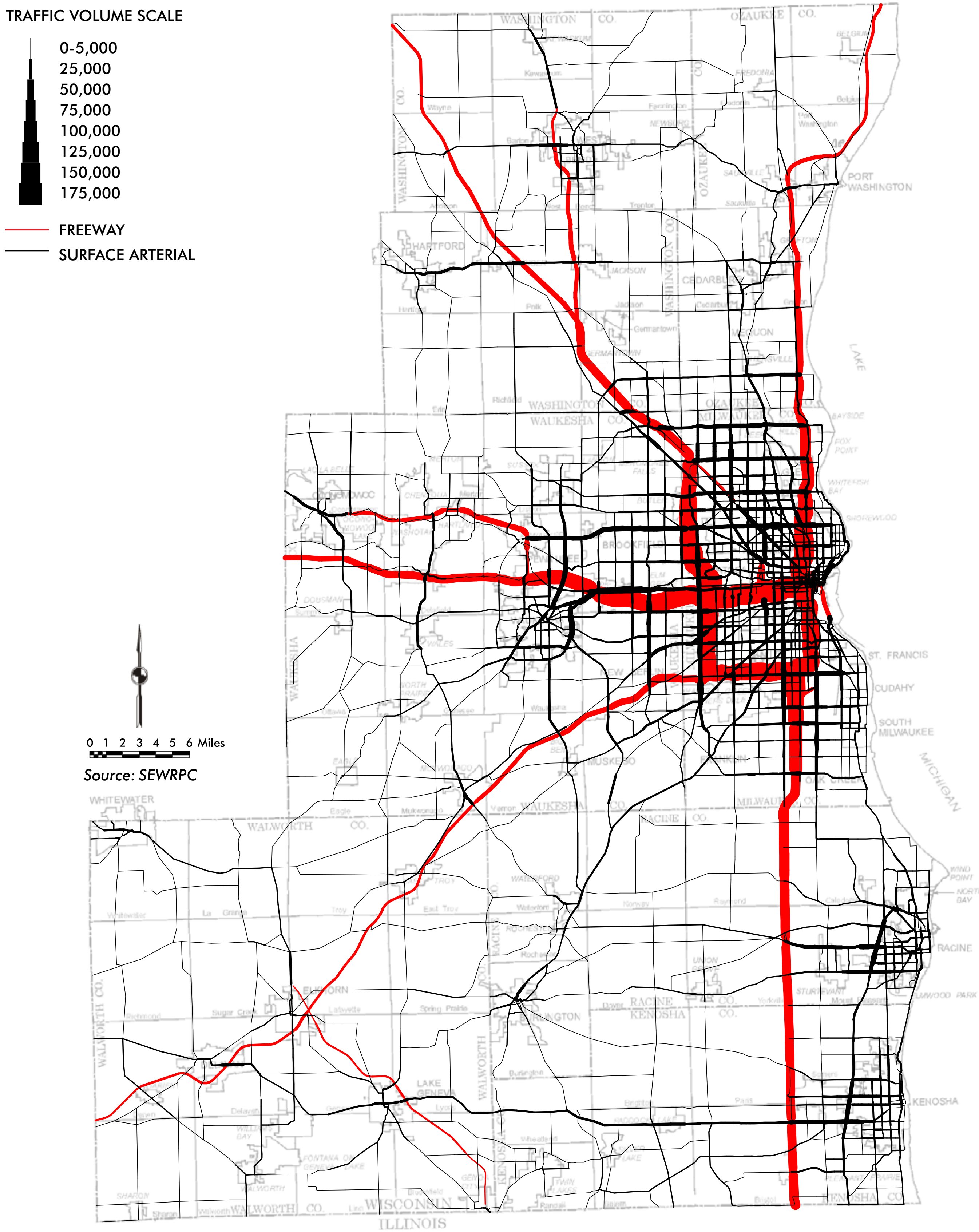
Source: SEWRPC

Map 4.1c
Arterial Street and Highway Utilization in the Region: 1991



Source: SEWRPC

Map 4.1d
Arterial Street and Highway Utilization in the Region: 2001



Map 4.1e
Arterial Street and Highway Utilization in the Region: 2011

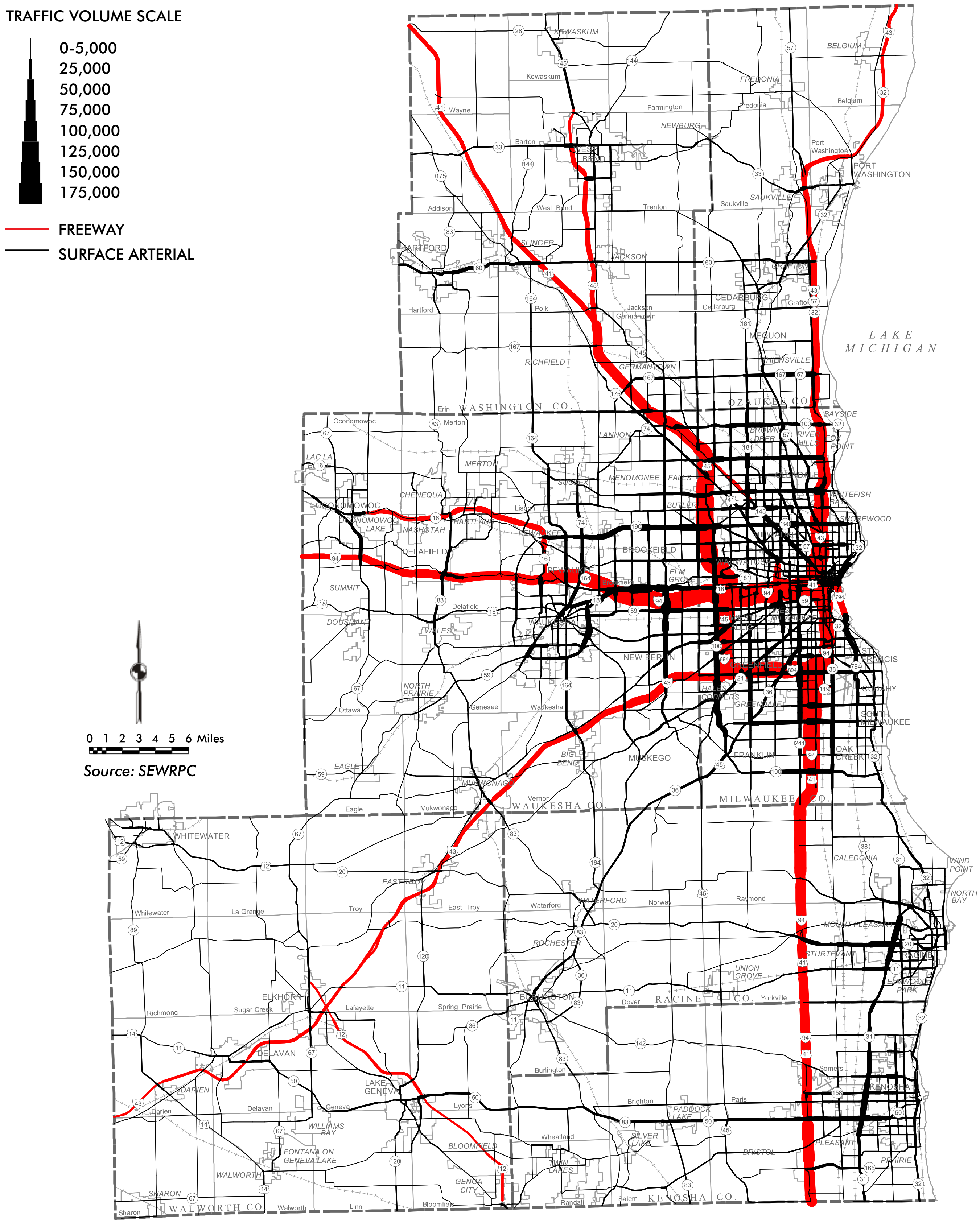


Table 4.3
Arterial Vehicle-Miles of Travel in the Region on an Average Weekday by County: 1963, 1972, 1991, 2001, 2005, and 2011

		Freeway		Surface Arterial		
	County	Vehicle-Miles of Travel (Thousands)	Percent of Total	Vehicle-Miles of Travel (Thousands)	Percent of Total	**Total Vehicle-Miles of Travel (Thousands)**
1963	Kenosha	204	21.7	734	78.3	938
	Milwaukee	531	7.2	6,817	92.8	7,348
	Ozaukee	20	4.1	464	95.9	484
	Racine	203	18.0	922	82.0	1,125
	Walworth	--	--	685	100.0	685
	Washington	345	49.6	351	50.4	696
	Waukesha	159	8.9	1,637	91.1	1,796
	Region	1,462	11.2	11,610	88.8	13,072
1972	Kenosha	382	26.8	1,046	73.2	1,428
	Milwaukee	3,977	37.2	6,718	62.8	10,695
	Ozaukee	223	26.2	627	73.8	850
	Racine	415	22.9	1,398	77.1	1,813
	Walworth	56	6.4	817	93.6	873
	Washington	190	16.5	961	83.5	1,151
	Waukesha	970	29.3	2,344	70.7	3,314
	Region	6,213	30.9	13,911	69.1	20,124
1991	Kenosha	675	27.0	1,825	73.0	2,500
	Milwaukee	5,945	41.3	8,446	58.7	14,391
	Ozaukee	762	39.2	1,180	60.8	1,942
	Racine	708	23.9	2,258	76.1	2,966
	Walworth	540	28.2	1,373	71.8	1,913
	Washington	546	23.0	1,833	77.0	2,379
	Waukesha	2,421	34.7	4,560	65.3	6,981
	Region	11,597	35.1	21,475	64.9	33,072
2001	Kenosha	805	25.8	2,321	74.2	3,126
	Milwaukee	6,878	42.0	9,499	58.0	16,377
	Ozaukee	951	42.1	1,308	57.9	2,259
	Racine	864	25.5	2,519	74.5	3,383
	Walworth	766	32.8	1,569	67.2	2,335
	Washington	1,370	44.3	1,725	55.7	3,095
	Waukesha	3,239	35.6	5,868	64.4	9,107
	Region	14,873	37.5	24,809	62.5	39,682
2005	Kenosha	913	26.6	2,523	73.4	3,436
	Milwaukee	7,162	41.4	10,131	58.6	17,293
	Ozaukee	1,008	42.9	1,344	57.1	2,352
	Racine	948	25.7	2,744	74.3	3,692
	Walworth	882	34.7	1,657	65.3	2,539
	Washington	1,550	44.3	1,949	55.7	3,499
	Waukesha	3,585	37.2	6,047	62.8	9,632
	Region	16,048	37.8	26,395	62.2	42,443
2011	Kenosha	906	25.9	2,590	74.1	3,497
	Milwaukee	6,770	41.8	9,440	58.2	16,210
	Ozaukee	974	40.9	1,405	59.1	2,378
	Racine	930	26.8	2,537	73.2	3,468
	Walworth	877	35.8	1,576	64.2	2,452
	Washington	1,541	44.8	1,901	55.2	3,442
	Waukesha	3,362	35.7	6,053	64.3	9,415
	Region	15,361	37.6	25,502	62.4	40,862

Source: SEWRPC

Table 4.4
Average Annual Growth Rate of Average Weekday Vehicle-Miles of Travel in the Region by County

County	Average Annual Growth Rate of Average Weekday Vehicle-Miles of Travel						
	1960s	1970s	1980s	1990s	2001 to 2005	2005 to 2011	2001 to 2011
Kenosha	4.8	3.4	2.7	2.2	2.5	0.3	1.2
Milwaukee	4.3	1.5	1.6	1.3	1.4	-1.0	-0.1
Ozaukee	6.5	4.1	4.6	1.5	1.0	0.2	0.5
Racine	5.4	2.7	2.5	1.3	2.3	-1.0	0.3
Walworth	2.7	5.3	3.3	2.0	2.2	-0.6	0.5
Washington	5.7	3.6	4.0	2.7	3.3	-0.3	1.1
Waukesha	7.0	4.2	3.7	2.7	1.4	-0.4	0.3
Region	4.9	2.7	2.6	1.9	1.0	-0.6	0.3

Source: SEWRPC

Figure 4.1 compares the growth in VMT in the Region from 1963 to 2011 to changes in travel characteristics over the same period and to changes in the Region's population and economy. Contributing to the growth in VMT was a growth in person-trip making due to increases in households and jobs, a decline in vehicle occupancy due to growth in vehicle availability and a change in population lifestyles including household size, and an increase in vehicle trip length.

Per mile, freeways in the seven-county Southeastern Wisconsin Region carried substantially more traffic than surface arterials and nonarterials. In 2011, freeways in Southeastern Wisconsin carried 57,400 VMT per mile on an average weekday, as compared to 8,300 VMT per mile on standard surface arterials, and 500 VMT per mile on collector and land access streets. Within Milwaukee County in 2011, freeways carried an average of 102,900 VMT per mile on an average weekday.

The freeway system in Southeastern Wisconsin carries about 34% of all travel on an average weekday, and about 38% of all arterial street and highway system travel.

The freeway system in Southeastern Wisconsin carries about 34 percent of travel across all modes on an average weekday, and about 38 percent of all arterial street and highway system travel. The arterial street and highway system carries about 90 percent of all street and highway travel (arterials and nonarterials). In total, streets and highways carry about 90 to 95 percent of travel across all modes.

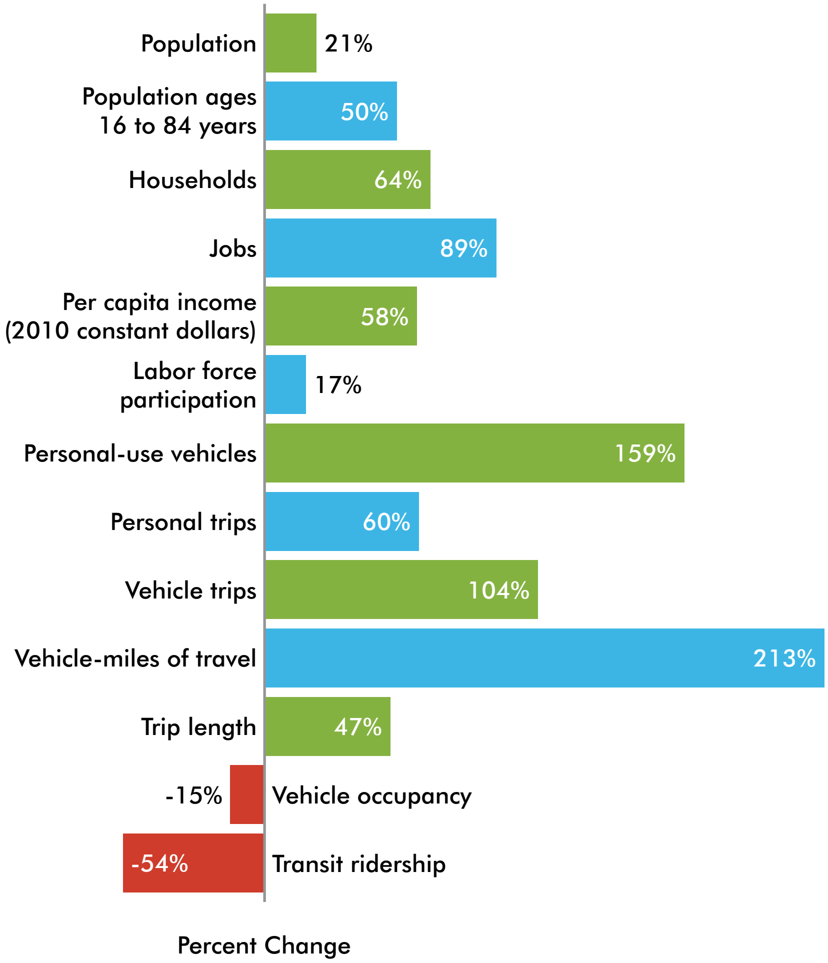
Arterial Street and Highway System Traffic Congestion

The traffic congestion on the arterial street and highway system can be assessed by comparing the average weekday traffic volume on each segment of arterial street and highway to its design capacity. Table 4.5 presents the estimated design capacity of freeway and surface arterial facilities, and the estimated impacts on traffic—estimated average speed and typical operating conditions—as those design capacities are exceeded.

Table 4.6 and Map 4.2 present the existing level of traffic congestion experienced in the year 2011 on the arterial street and highway system. Table 4.7, Figure 4.2, and Map 4.3 present more detail on existing year 2011 congestion on the freeway system, and historic freeway congestion, including the number of hours of congestion experienced on congested freeway segments on an average weekday.

Table 4.8 and Figure 4.3 compare the estimated change in traffic congestion on the arterial street and highway system over the years 1972, 1991, 2001, 2005, and 2011. The miles of arterials experiencing traffic congestion declined from 217 miles in 1963 to 160 miles in 1972, even though traffic

Figure 4.1
Relative Changes in Selected Travel and Socioeconomic Characteristics in the Region: 1963 to 2011



Source: SEWRPC

grew during that period by over 50 percent. The decline in traffic congestion may be attributed to the completion of the freeway system during that period. Between 1972 and 1991, the miles of arterials experiencing traffic congestion is estimated to have increased from 160 miles to 273 miles, as traffic grew during that period by nearly 65 percent, as regional employment and households increased by about 30 percent, and vehicle occupancy and carpooling significantly declined. The decline in vehicle occupancy from an average of 1.39 people per vehicle to 1.22 people per vehicle is estimated to have resulted in nearly a 15 percent increase in vehicle traffic. As well, only limited transportation system improvement and expansion was completed between 1972 and 1991 in Southeastern Wisconsin. The miles of arterials carrying traffic volumes exceeding their design capacity and experiencing traffic congestion is estimated to have increased modestly from 273 miles in 1991 to 290 miles in 2001, and to 310 miles in 2005. From 2005 to 2011, the miles decreased from 310 miles to 274 miles. From 1991 to 2001, traffic is estimated to have increased by about 21 percent, and from 2001 to 2011 by about 3 percent. The modest increase in traffic congestion from 1991 to 2011 may be attributed to the implementation of an extensive number of significant surface arterial street and highway widening and new construction projects between 1991 and 2011. The estimated modest

Table 4.5
Estimated Freeway and Surface Arterial Facility Design Capacity and Attendant Level of Congestion[a]

	Average Weekday Traffic Volumes (Vehicles per 24 Hours)			
Facility Type	Design Capacity and Upper Limit of Level of Service C	Upper Limit of Moderate Congestion and Level of Service D	Upper Limit of Severe Congestion and Level of Service E	Extreme Congestion and Level of Service F
Freeway				
Four-Lane	60,000	80,000	90,000	>90,000
Six-Lane	90,000	121,000	135,000	>135,000
Eight-Lane	120,000	161,000	180,000	>180,000
Surface Arterial				
Two-Lane	14,000	18,000	19,000	>19,000
Four-Lane Undivided	18,000	23,000	24,000	>24,000
Four-Lane with Two-Way Left Turn Lane	21,000	29,000	31,000	>31,000
Four-Lane Divided	27,000	31,000	32,000	>32,000
Six-Lane Divided	38,000	45,000	48,000	>48,000
Eight-Lane Divided	50,000	60,000	63,000	>63,000

The level of congestion on arterial streets and highways may be summarized by the following operating conditions:

Freeway

Level of Traffic Congestion	Level of Service	Average Speed	Operating Conditions
None	A and B	Freeway operates at free-flow speed	No restrictions on ability to maneuver and change lanes.
None	C	Freeway operates at free-flow speed	Ability to maneuver and change lanes noticeably restricted.
Moderate	D	Freeway operates at 1 to 2 mph below free-flow speed	Ability to maneuver and change lanes more noticeably limited. Reduced driver physical and psychological comfort levels.
Severe	E	Freeway operates at up to 10 mph below free-flow speed	Virtually no ability to maneuver and change lanes. Operation at maximum capacity. No usable gaps in the traffic stream to accommodate lane changing.
Extreme	F	Freeway average speeds are 20 to 30 mph or less	Breakdown in vehicular flow with stop-and-go, bumper-to-bumper traffic.

Surface Arterial

Level of Traffic Congestion	Level of Service	Average Speed	Operating Conditions
None	A and B	70 to 100 percent of free-flow speed	Ability to maneuver within traffic stream is unimpeded. Control delay at signalized intersections is minimal.
None	C	50 to 100 percent of free-flow speed	Restricted ability to maneuver and change lanes at mid-block locations.
Moderate	D	40 to 50 percent of free-flow speed	Restricted ability to maneuver and change lanes. Small increases in flow lead to substantial increases in delay and decreases in travel speed.
Severe	E	33 to 40 percent of free-flow speed	Significant restrictions on lane changes. Traffic flow approaches instability.
Extreme	F	25 to 33 percent of free-flow speed	Flow at extremely low speeds. Intersection congestion with high delays, high volumes, and extensive queuing.

[a] *Design capacity is the maximum level of traffic volume a facility can carry before beginning to experience morning and afternoon peak traffic hour traffic congestion, and is expressed in terms of number of vehicles per average weekday.*

Source: SEWRPC

Table 4.6
Traffic Congestion on the Arterial Street and Highway System in the Region by County: 2011

County	Under or At Design Capacity		Over Design Capacity: Moderate Congestion		Over Design Capacity: Severe Congestion		Over Design Capacity: Extreme Congestion		Total Mileage
	Mileage	Percent of Total	Mileage	Percent of Total	Mileage	Percent of Total	Mileage	Percent of Total	
Kenosha	303.2	94.8	11.3	3.5	4.9	1.5	0.6	0.2	320.0
Milwaukee	647.5	82.1	64.6	8.2	49.5	6.3	26.8	3.4	788.4
Ozaukee	236.2	94.2	9.6	3.8	4.7	1.9	0.3	0.1	250.8
Racine	345.0	96.3	9.5	2.7	2.5	0.7	1.3	0.4	358.3
Walworth	442.6	99.3	2.4	0.5	0.4	0.1	0.2	0.0	445.6
Washington	397.8	97.9	6.1	1.5	2.3	0.6	0.3	0.1	406.5
Waukesha	676.5	89.8	43.4	5.8	27.9	3.7	5.5	0.7	753.3
Region	3,048.8	91.8	146.9	4.4	92.2	2.8	35.0	1.1	3,322.9

Source: SEWRPC

increase in congestion between 1991 and 2011 is not uniform systemwide, as the extent and severity of congestion on the Milwaukee area freeway system is estimated to have substantially increased between 1991 and 2011 (see Table 4.7).

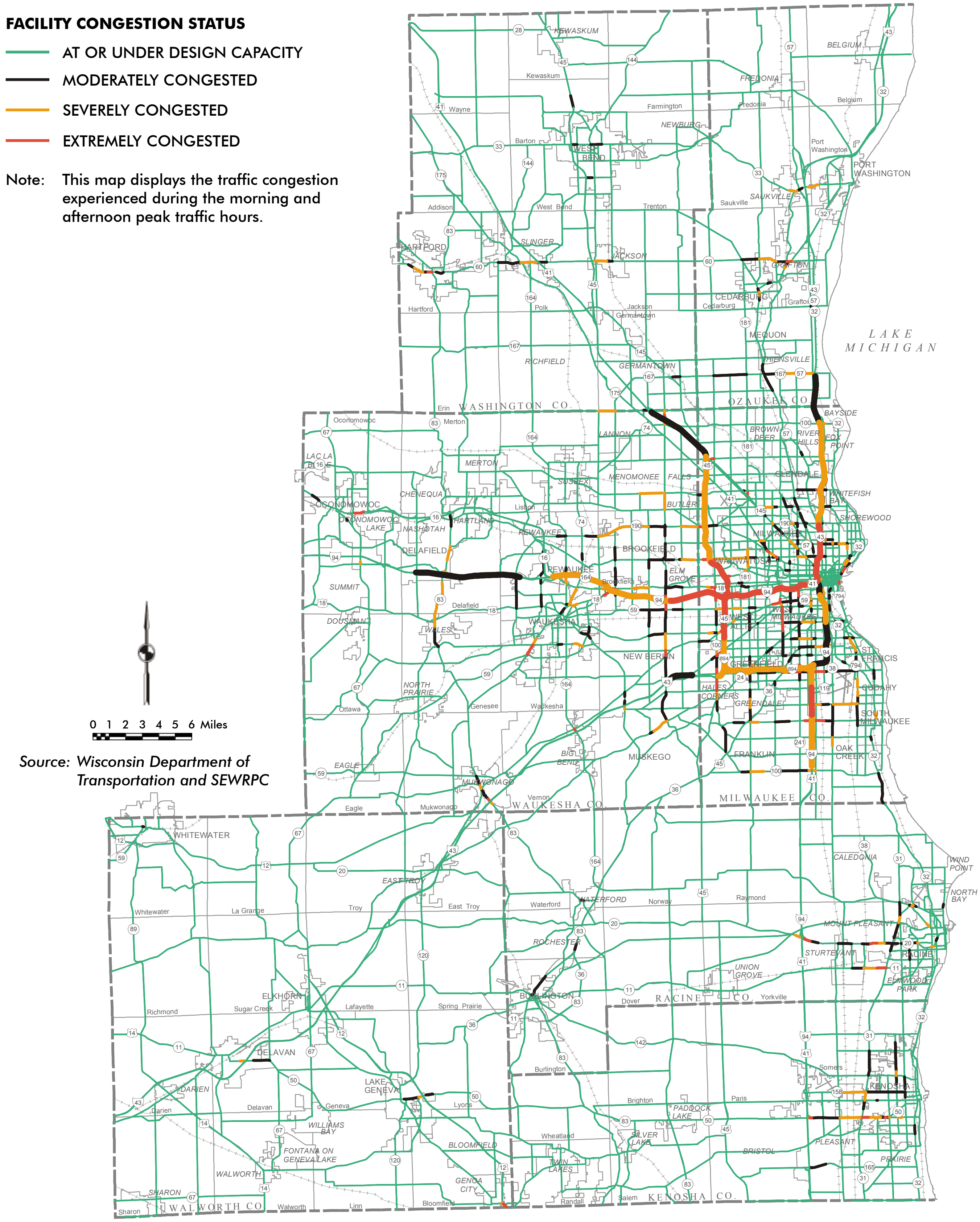
While the extent of congestion on the Milwaukee area freeway system is estimated to have increased between 2001 and 2011, some segments of the freeway system have experienced a decrease in congestion. This decrease in congestion is likely attributed to the requisite maintenance and reconstruction of the freeway system, and attendant diversion of traffic. Most notably in 2011, traffic volumes on IH 894 between the Hale Interchange and Zoo Interchange, IH 43/894 between the Hale Interchange and Mitchell Interchange, IH 43/94 between the Mitchell Interchange and Marquette Interchange, and USH 45 south of W. Hampton Avenue were likely impacted by lane closures associated with the resurfacing of IH 94 generally between STH 16 and the Stadium Interchange and the reconstruction and reconfiguration of the Mitchell Interchange in Milwaukee County. It is anticipated that traffic volume estimates on various segments of the Milwaukee area freeway system will continue to be impacted as the Milwaukee area freeway system is reconstructed segment by segment.

While the extent of congestion on the Milwaukee area freeway system increased between 2001 and 2011, some segments of the freeway system experienced a decrease in congestion.

Congestion on Designated Truck Routes and National Highway System

Table 4.9 and Map 4.4 present the existing level of traffic congestion experienced on designated truck routes and the National Highway System (NHS) in the year 2011 compared to the congestion level experienced in 2001. The State of Wisconsin maintains a truck operations map that identifies streets and highways for operation of vehicles and combination of vehicles for which the overall lengths cannot be limited. In addition, the truck operations map identifies restricted truck routes where the overall lengths are limited. The NHS includes highways important to the nation's economy, defense, and mobility. In 2012, the NHS was expanded to include interstate highways, multimodal connections, and roadways functionally classified as a principal arterial previously not on the NHS. The coverage of these two systems illustrates the ability of truck freight to move throughout the Region. The miles of designated truck routes and the expanded NHS carrying traffic volumes exceeding their design capacity increased from 202 miles in 2001 to 205 miles in 2011, or by about 1.5 percent. Reductions in congestion on these roadways favorably affect the travel time of freight movement.

Map 4.2
Traffic Congestion on the Arterial Street and Highway System in the Region: 2011



Source: Wisconsin Department of Transportation and SEWRPC

Table 4.7
Traffic Congestion on the Freeway System in the Region on an Average Weekday: 1972, 1991, 2001, 2005, and 2011

Year	Highest Level of Hourly Congestion Experienced	Miles of Congested Freeways: Number	Miles of Congested Freeways: Percent of Freeway System	Average Hours of Congestion on an Average Weekday: Extreme	Severe	Moderate	Total
1972	Extreme	--	--	--	--	--	--
	Severe	2	1.2	--	1.0	3.0	4.0
	Moderate	7	4.3	--	--	2.8	2.8
	Total	9	5.5	--	--	--	--
1991	Extreme	11	4.4	1.0	2.1	3.1	6.2
	Severe	12	4.8	--	1.1	2.9	4.0
	Moderate	23	9.1	--	--	2.3	2.3
	Total	46	18.3	--	--	--	--
2001	Extreme	24	8.9	1.4	3.3	4.4	9.1
	Severe	18	6.7	--	1.5	2.5	4.0
	Moderate	22	8.1	--	--	2.1	2.1
	Total	64	23.7	--	--	--	--
2005	Extreme	29	10.7	1.2	2.7	3.7	7.6
	Severe	23	8.5	--	1.2	2.3	3.5
	Moderate	16	6.0	--	--	2.2	2.2
	Total	68	25.2	--	--	--	--
2011	Extreme	18	6.8	1.3	2.9	3.9	8.1
	Severe	34	12.9	--	1.4	2.3	3.7
	Moderate	21	7.7	--	--	1.8	1.8
	Total	73	27.4	--	--	--	--

Source: SEWRPC

Traffic Safety—Vehicular Crashes

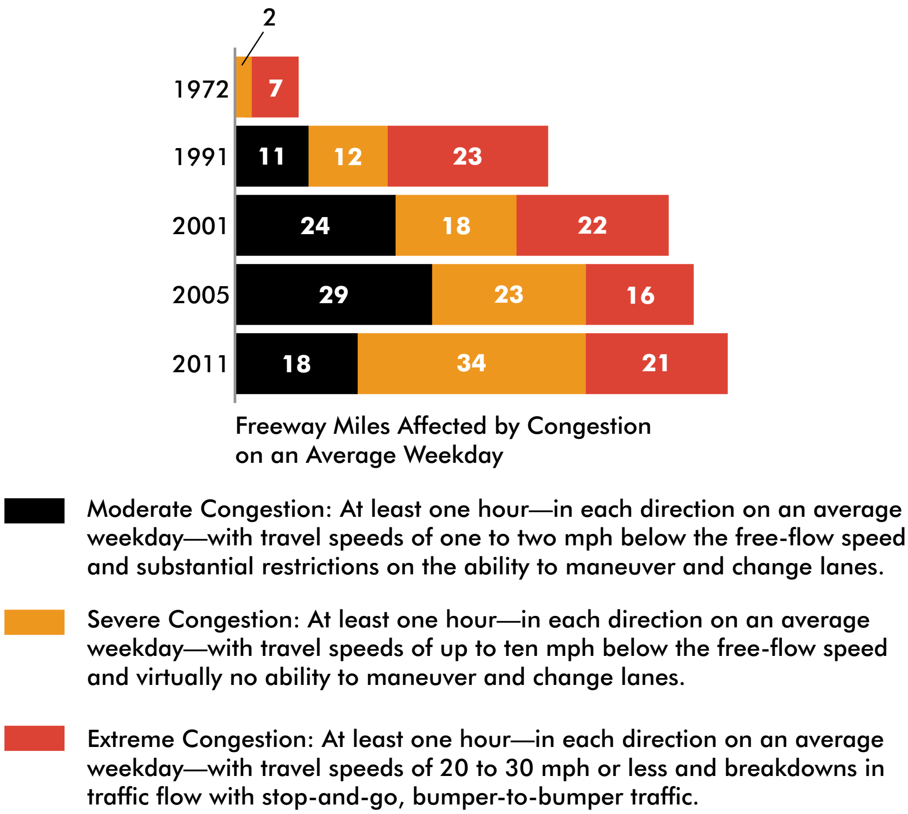
Number of Vehicular Crashes

Historic vehicular crash data over a 19-year period—1994 through 2012—were collated from data maintained for WisDOT by the Wisconsin Traffic Operations and Safety Laboratory (TOPS Lab) at the University of Wisconsin-Madison. Figure 4.4 shows that there has been a general decline in the number and severity of vehicular crashes over this time period. Vehicular crashes in the Region totaled about 35,600 in 2012, representing a nearly 27 percent decline in vehicular crashes since 1994. Crashes involving an injury or a fatality totaled about 11,500 crashes in 2012, representing about one-third of all crashes. Between 1994 and 2012, crashes involving an injury or a fatality decreased by about 35 percent. Property damage-only crashes decreased by 24 percent over the 19-year period to about 24,200 crashes in 2012, representing the remaining two-thirds of all crashes. The overall decrease in vehicular crashes since 1994 is particularly significant given the increase in annual VMT over that same period of about 17 percent.

There were 140 vehicular crashes in the Region in 2012 that resulted in 156 fatalities. As shown in Figure 4.5, roadway crash fatalities dropped from a peak of 190 in 2005 to a low of 130 fatalities in 2009, and then rose again by about 20 percent between 2009 and 2012. Figure 4.6 presents selected characteristics of vehicle-related fatalities in the Region during 2012. Alcohol was cited as a contributing factor in about 40 percent of all fatalities.

In 2012, there were about 830 non-fatal vehicular crashes in the Region that resulted in at least one serious injury. While serious injury vehicular crashes increased by about 3 percent from 2011 to 2012, as shown in Figure 4.7, such injury crashes have declined significantly—about 62 percent—since 1994.

Figure 4.2
Traffic Congestion on the Freeway System in the Region on an Average Weekday: 1972, 1991, 2001, 2005, and 2011



Source: SEWRPC

Vehicular Crash Rate

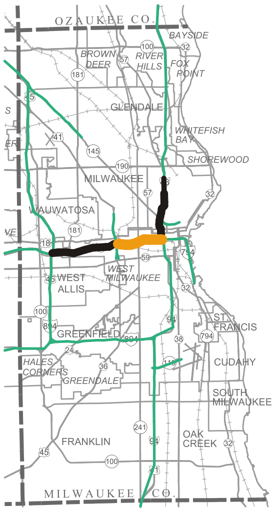
Traffic safety problems are typically identified by reviewing a five-year history of traffic crash records and determining the crash rate—crashes per 100 million VMT—on a roadway segment. Using the traffic crash history of the freeway and state trunk highway surface arterial systems over the recent five-year period from 2008 to 2012, the traffic crash rate for each segment of the regional freeway system and state trunk highway surface arterial system was estimated. The estimated traffic crash rate, expressed as the number of crashes per 100 million VMT for each freeway segment, was compared to both the regional freeway system average crash rates and the average crash rate for freeways within the county within which the freeway segment was located.

The average freeway and surface arterial crash rates on state trunk highways in the Region and within each of the seven counties are shown in Table 4.10. Only the Milwaukee County freeway crash rate, 120.2 crashes per 100 million VMT, is greater than the Region average freeway crash rate of 72.5 crashes per 100 million VMT. Only Milwaukee County state trunk highway surface arterials, with 372.8 crashes per 100 million VMT, exceed the Region average surface arterial crash rate of 265.0 crashes per 100 million VMT.

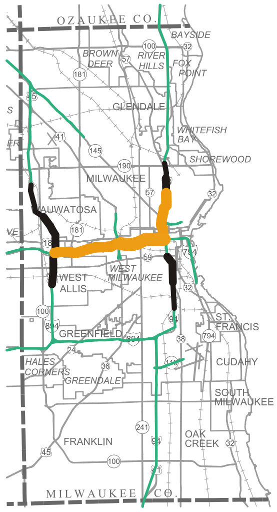
Map 4.5 displays those freeway and state trunk highway surface arterial segments in the Region with average traffic crash rates that exceed the Region average freeway crash rate. Within each county there are freeway

Map 4.3
Historical Traffic Congestion on the Freeway System in the Region

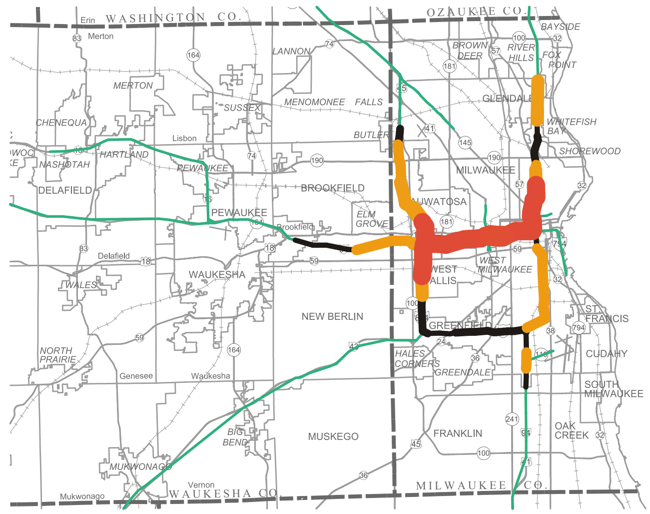
1972



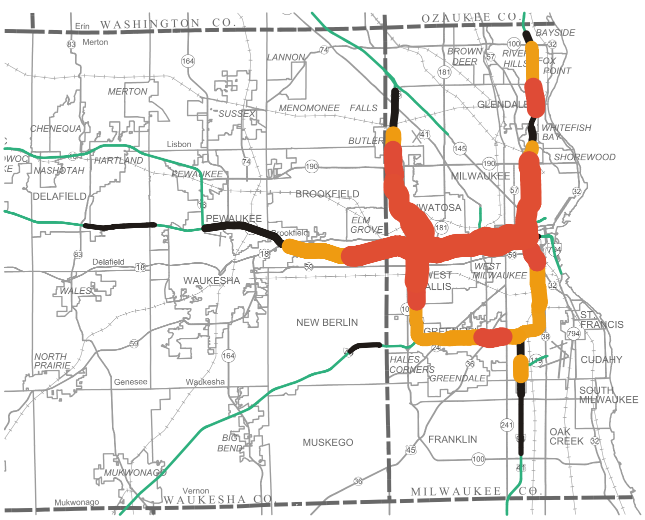
1980



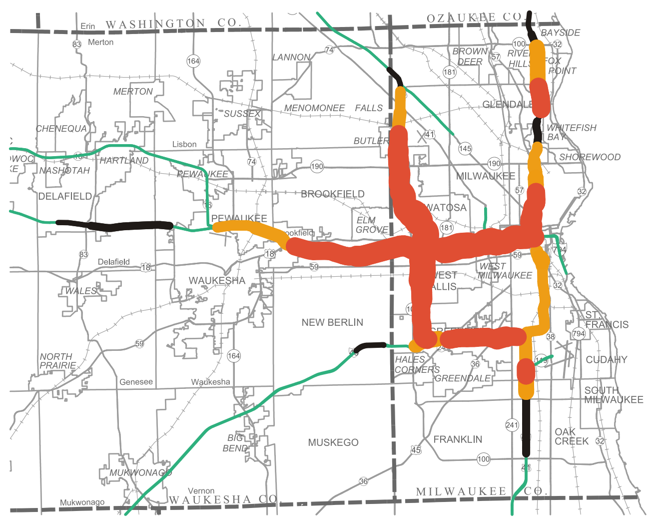
1991



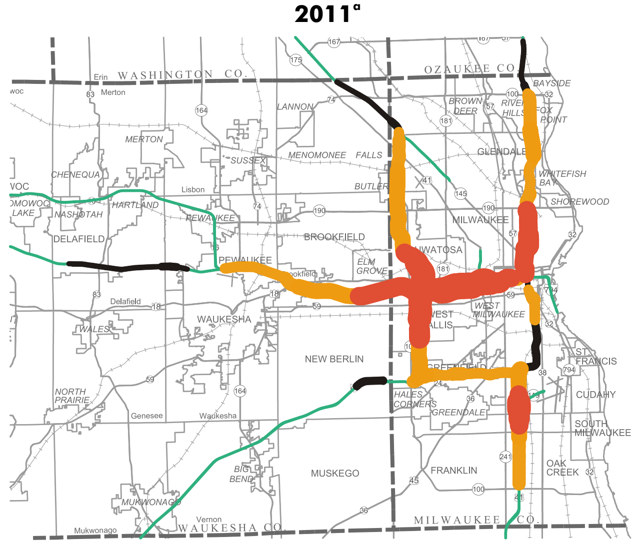
2001



2005



2011[a]



MOST SEVERE LEVEL OF WEEKDAY HOURLY CONGESTION EXPERIENCED	ESTIMATED HOURS OF CONGESTION ON AN AVERAGE WEEKDAY	ESTIMATED AVERAGE WEEKDAY HOURS OF CONGESTION BY CONGESTION LEVEL		
		EXTREME	SEVERE	MODERATE
- -	NO CONGESTION	- -	- -	- -
MODERATE	1	- -	- -	1
MODERATE	3	- -	- -	3
SEVERE	3	- -	1	2
SEVERE	4	- -	1	3
SEVERE	4	- -	2	2
EXTREME	6	1	2	3
EXTREME	8	1	3	4
EXTREME	11	2	4	5
EXTREME	13	2	5	6
EXTREME	14	2	5	7
EXTREME	15	3	5	7
EXTREME	16	4	5	7
EXTREME	17	4	6	7

[a] *During 2011, the traffic volume on the freeway system was impacted by lane closures attendant to the resurfacing of IH 94 between STH 16 and the Stadium Interchange, and the reconstruction of the Mitchell Interchange.*

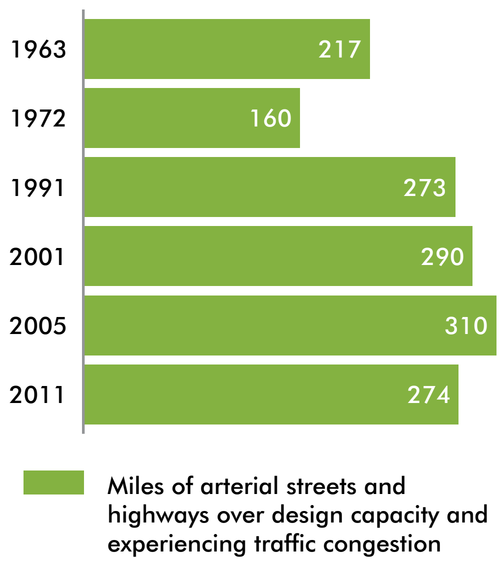
Source: Wisconsin Department of Transportation and SEWRPC

Table 4.8
Traffic Congestion on the Arterial Street and Highway System in the Region: 1963, 1972, 1991, 2001, 2005, and 2011

	Arterial Street and Highway Mileage					
Traffic Congestion	1963	1972	1991	2001	2005	2011
Under or At Design Capacity	2,971	2,959	2,986	3,002	2,993	3,049
Over Design Capacity and Experiencing Traffic Congestion	217	160	273	290	310	274
Total	3,188	3,119	3,259	3,292	3,303	3,323

Source: SEWRPC

Figure 4.3
Traffic Congestion on the Arterial Street and Highway System in the Region: 1963, 1972, 1991, 2001, 2005, and 2011



Source: SEWRPC

Table 4.9
Traffic Congestion on Designated Truck Routes and the National Highway System in the Region: 2001 and 2011

		Over Design Capacity			
Year	**Under or At Design Capacity**	Moderate Congestion	Severe Congestion	Extreme Congestion	**Total Mileage**
2001	1,114	119	32	51	1,316
2011	1,126	98	76	31	1,331

Source: Wisconsin Department of Transportation and SEWRPC

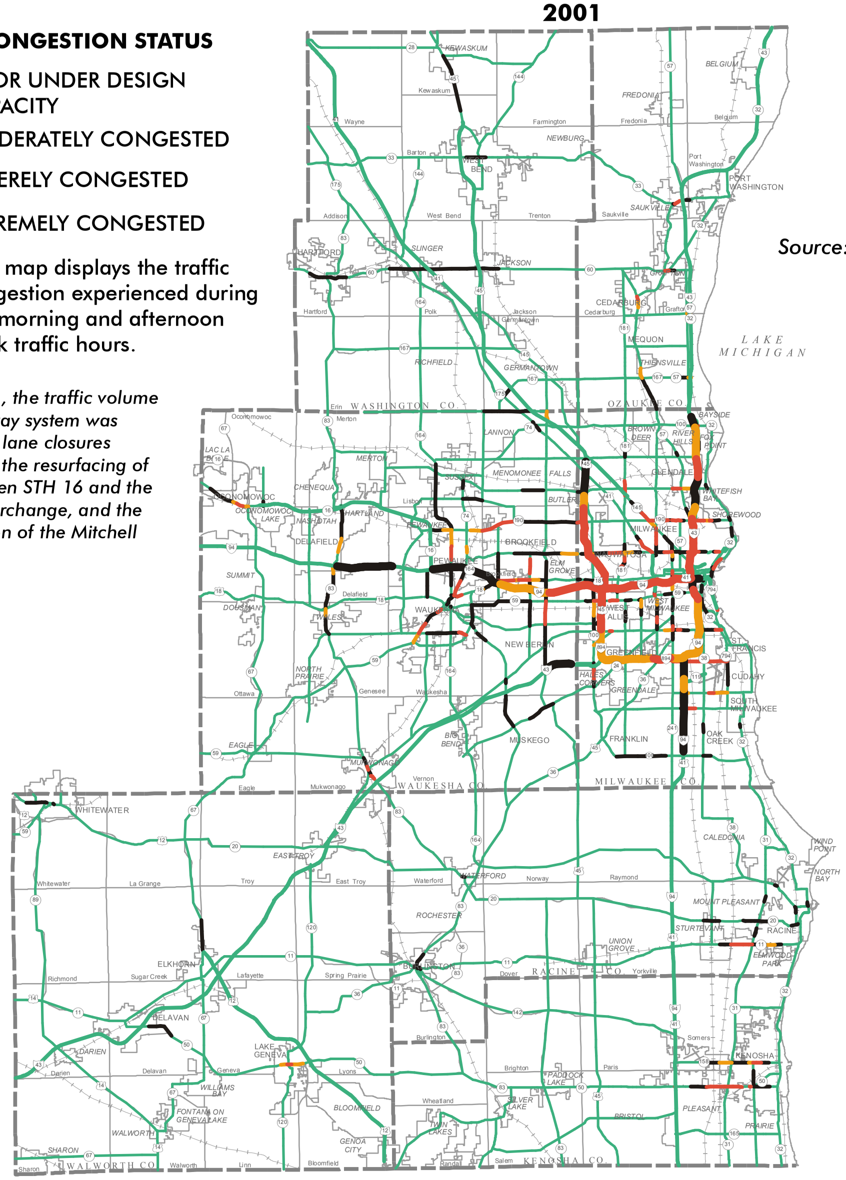
Map 4.4
Traffic Congestion on Designated Truck Routes and the National Highway System in the Region: 2001 and 2011

FACILITY CONGESTION STATUS

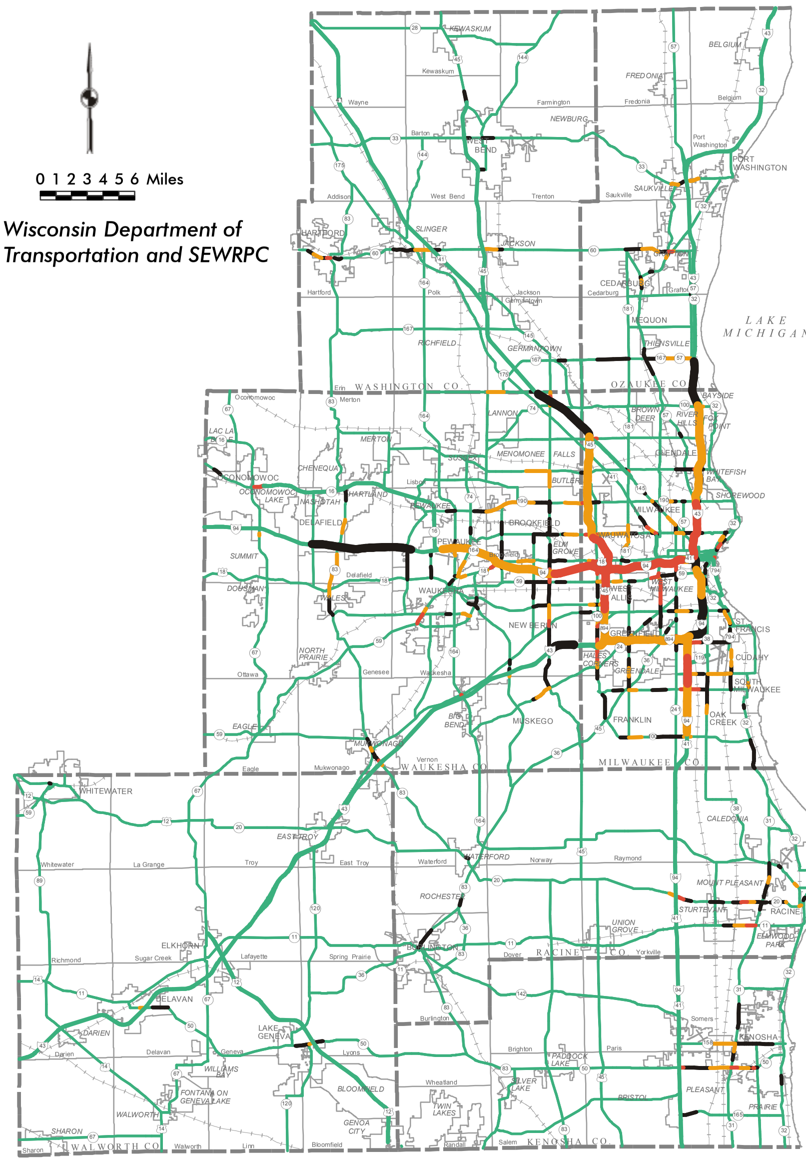
- AT OR UNDER DESIGN CAPACITY
- MODERATELY CONGESTED
- SEVERELY CONGESTED
- EXTREMELY CONGESTED

Note: This map displays the traffic congestion experienced during the morning and afternoon peak traffic hours.

2001



2011[a]

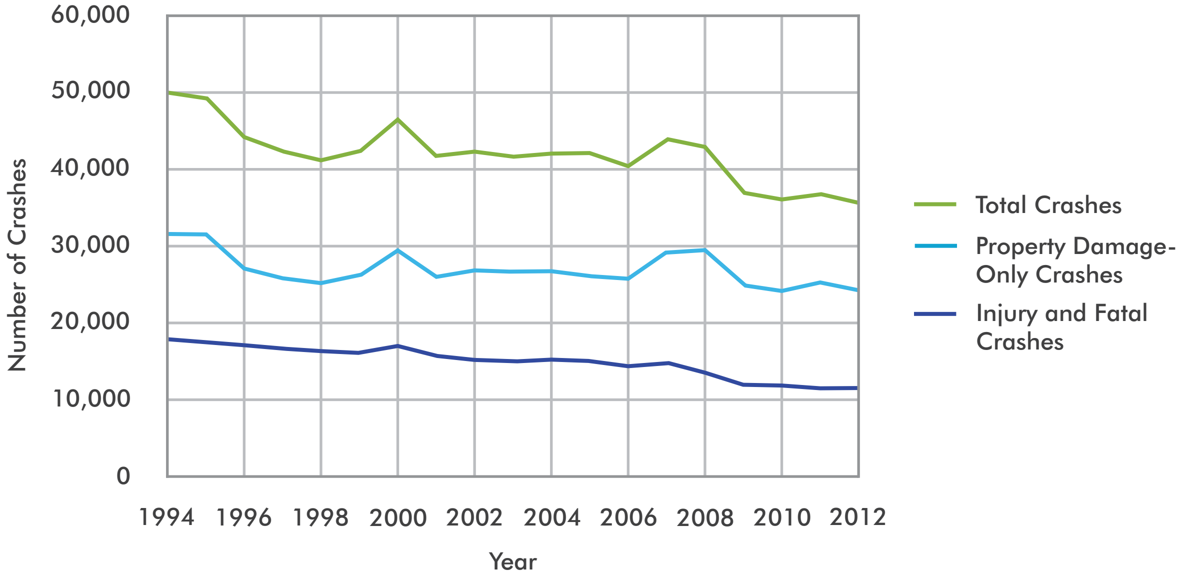


0 1 2 3 4 5 6 Miles

Source: *Wisconsin Department of Transportation and SEWRPC*

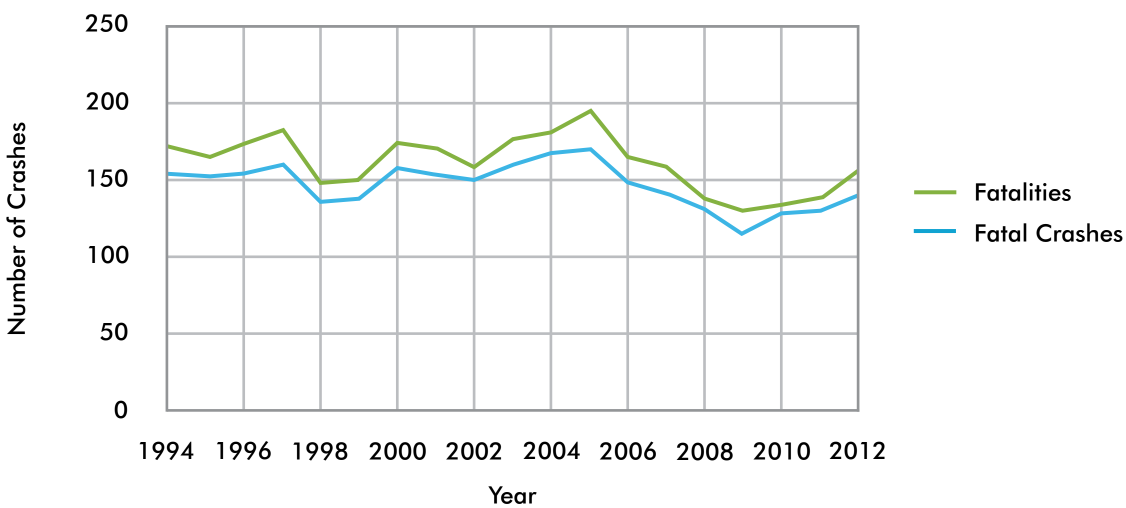
[a] *During 2011, the traffic volume on the freeway system was impacted by lane closures attendant to the resurfacing of IH 94 between STH 16 and the Stadium Interchange, and the reconstruction of the Mitchell Interchange.*

Figure 4.4
Total, Property Damage-Only, and Injury and Fatal Vehicular Crashes Reported in the Region: 1994-2012



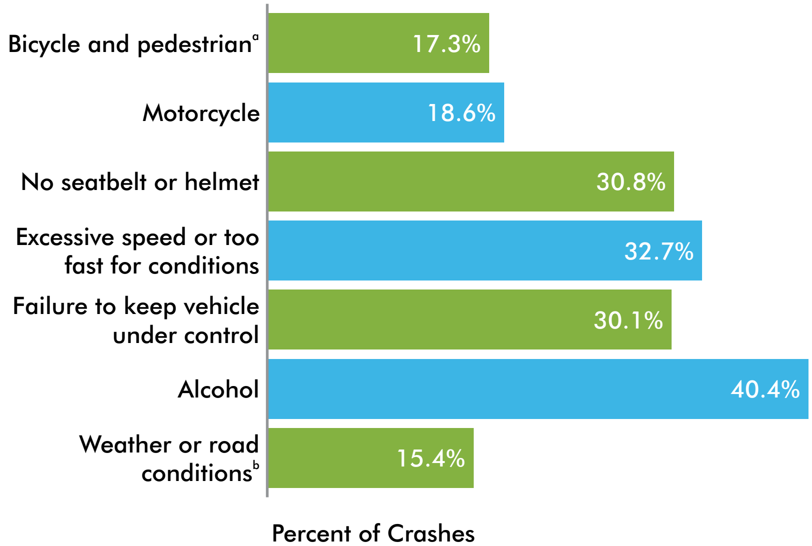
Source: Wisconsin Department of Transportation and SEWRPC

Figure 4.5
Fatal Vehicular Crashes and Fatalities Reported in the Region: 1994-2012



Source: Wisconsin Department of Transportation and SEWRPC

Figure 4.6
Selected Characteristics of Vehicular Crash-Related Fatalities in the Region: 2012



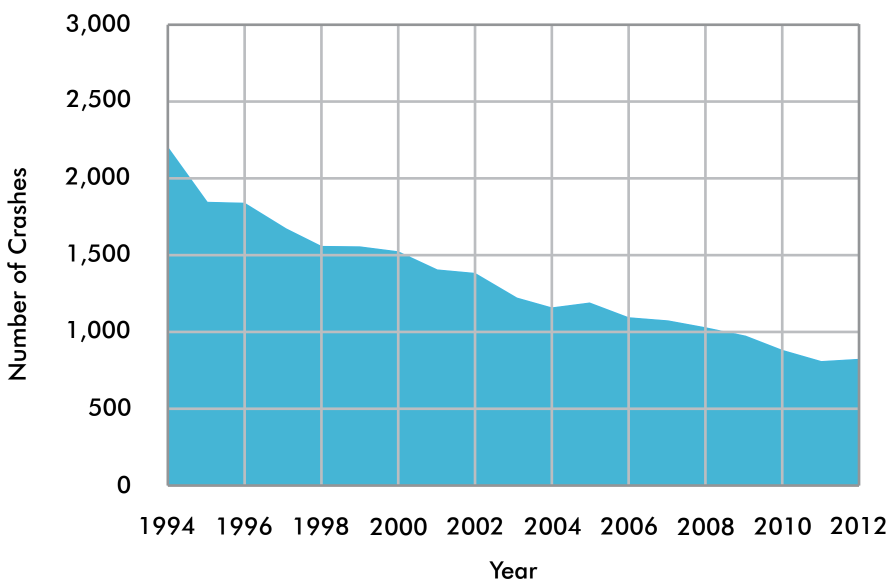
[a] *In 2012, there were four bicycle fatalities (2.6% of total fatalities) and 23 pedestrian fatalities (14.7% of total fatalities).*

[b] *This category includes snowy, rainy, and foggy conditions, and snow-covered, icy or wet roads.*

Note: Fatalities attributable to multiple categories are counted more than once.

Source: Wisconsin Department of Transportation and SEWRPC

Figure 4.7
Total Number of Crashes Resulting in a Serious Injury Reported in the Region: 1994-2012



Source: Wisconsin Department of Transportation and SEWRPC

Table 4.10
Average Vehicular Crash Rate on State Trunk Highways in the Region by Arterial Type and County: 2008-2012

County	Crash Rate Per 100 Million VMT	
	Freeways	Surface Arterials
Kenosha	45.7	255.6
Milwaukee	120.2	372.8
Ozaukee	41.0	119.0
Racine	33.7	234.9
Walworth	38.3	139.2
Washington	43.3	215.0
Waukesha	53.7	222.4
Region	72.5	265.0
State	58.6	149.8

Note: Only crashes that have occurred in years since a roadway segment was last reconfigured are included in the crash rates above.

Source: Wisconsin Department of Transportation and SEWRPC

and state trunk highway surface arterial segments that exceed the regional average crash rate.

Maps 4.6 through 4.12 display, for each of the seven counties, those freeway and state trunk highway surface arterial segments that exceed the average crash rate for freeways within each county.

Bicycle and Pedestrian Crashes
Figure 4.8 shows the total vehicular crashes involving either a bicycle or a pedestrian over the 19-year time period between 1994 and 2012. Following about a 44 percent decline in the number of reported vehicular crashes involving a bicycle from 707 crashes in 1994 to a low of 391 crashes in 2008, the number of such crashes has increased since 2008 by about 8 percent to 424 crashes in 2012. While the number of reported vehicular crashes involving pedestrians increased to 723 crashes in 2012 from the 19-year low of 653 crashes in 2011, such crashes have declined by about 37 percent from 1994 to 2012.

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 in 2012, they accounted for 17 percent of vehicular crashes resulting in a fatality (as shown in Figure 4.6) and 18 percent of vehicular crashes resulting in a serious injury. Map 4.13 shows the location of the reported vehicular crashes involving a bicycle or a pedestrian that resulted in either a fatality or serious injury. As shown in Figure 4.9, the number of reported vehicular crashes involving a bicycle that resulted in either a fatality or a serious injury declined between 1994 and 2000 by 56 percent. Following an increase between 2000 and 2002 of about 33 percent, such crashes declined to 51 crashes in 2003, a reduction of 25 percent. Between 2003 and 2012, fatal and serious injury crashes involving a bicycle have decreased by 6 crashes to 44 crashes, a reduction of 14 percent. Four of these 44 crashes reported in 2012 resulted in a fatality, consistent with the 19-year annual average of four vehicular crashes involving a bicycle that resulted in a fatality. Figure 4.9 also shows that the number of reported vehicular crashes involving a pedestrian that resulted in either a fatality or a serious injury decreased between 1994 and 2003 by 59 percent. Except for an increase in 2006, the number has remained steady between 2003 and 2012, with 134 such crashes reported in 2012. Of these 134 crashes, 23 crashes resulted in a fatality, which is slightly above the 19-year annual average of 22 vehicular crashes involving a pedestrian that resulted in a fatality.

Map 4.5
Average Vehicular Crash Rate of State Trunk Highways in the Region: 2008-2012

STATE TRUNK HIGHWAY

- FREEWAY
- SURFACE ARTERIAL

PERCENT OF REGIONWIDE AVERAGE CRASH RATE

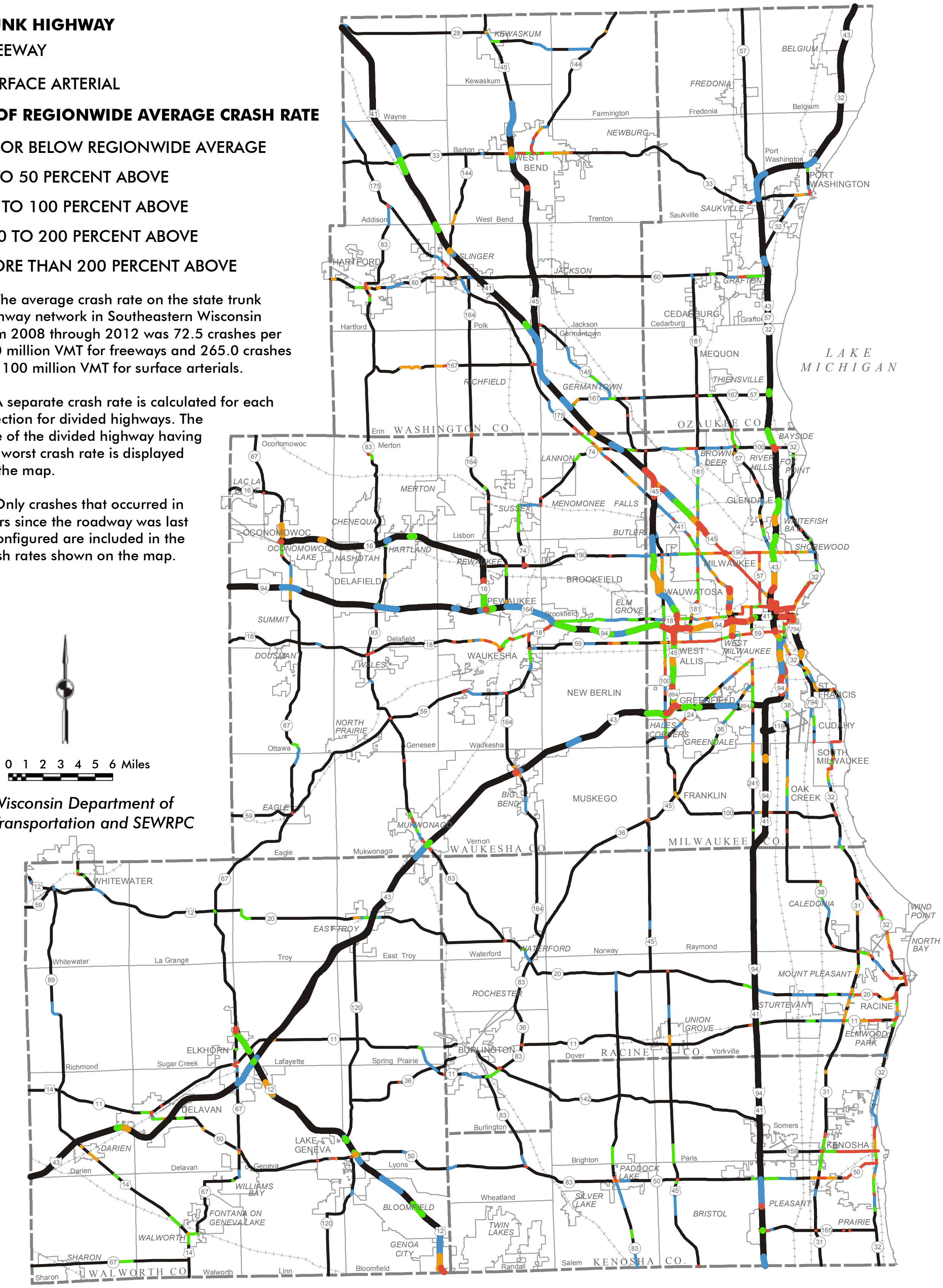
- AT OR BELOW REGIONWIDE AVERAGE
- 1 TO 50 PERCENT ABOVE
- 51 TO 100 PERCENT ABOVE
- 100 TO 200 PERCENT ABOVE
- MORE THAN 200 PERCENT ABOVE

Notes:

1. The average crash rate on the state trunk highway network in Southeastern Wisconsin from 2008 through 2012 was 72.5 crashes per 100 million VMT for freeways and 265.0 crashes per 100 million VMT for surface arterials.

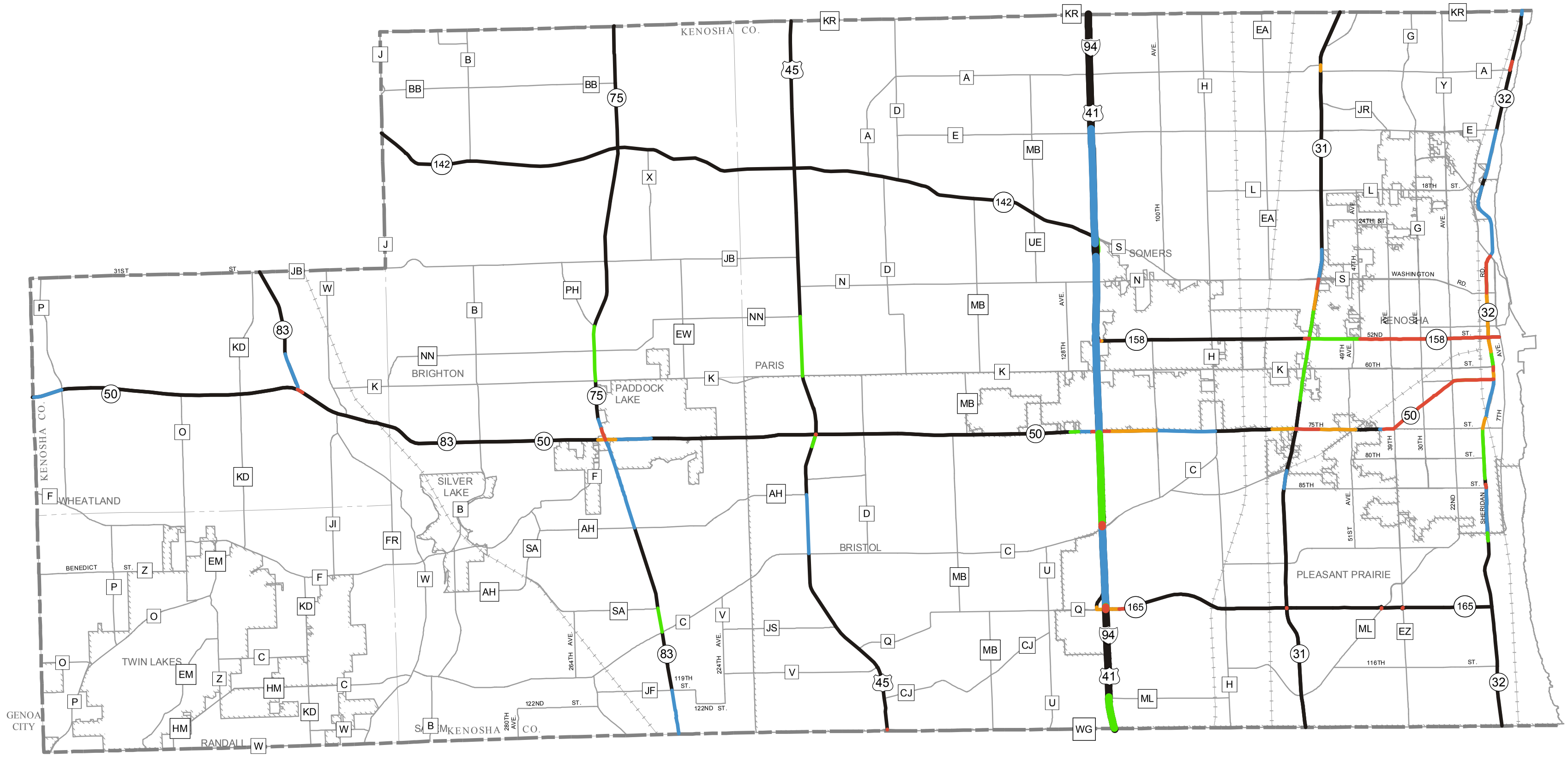
2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.



Source: Wisconsin Department of Transportation and SEWRPC

Map 4.6
Average Vehicular Crash Rate of State Trunk Highways in Kenosha County: 2008-2012



STATE TRUNK HIGHWAY

FREEWAY

SURFACE ARTERIAL

PERCENT OF COUNTYWIDE AVERAGE CRASH RATE

AT OR BELOW COUNTYWIDE AVERAGE

1 TO 50 PERCENT ABOVE

51 TO 100 PERCENT ABOVE

100 TO 200 PERCENT ABOVE

MORE THAN 200 PERCENT ABOVE

Notes:

1. The average crash rate on the state trunk highway network in Kenosha County from 2008 through 2012 was 45.7 crashes per 100 million VMT for freeways and 255.6 crashes per 100 million VMT for surface arterials.

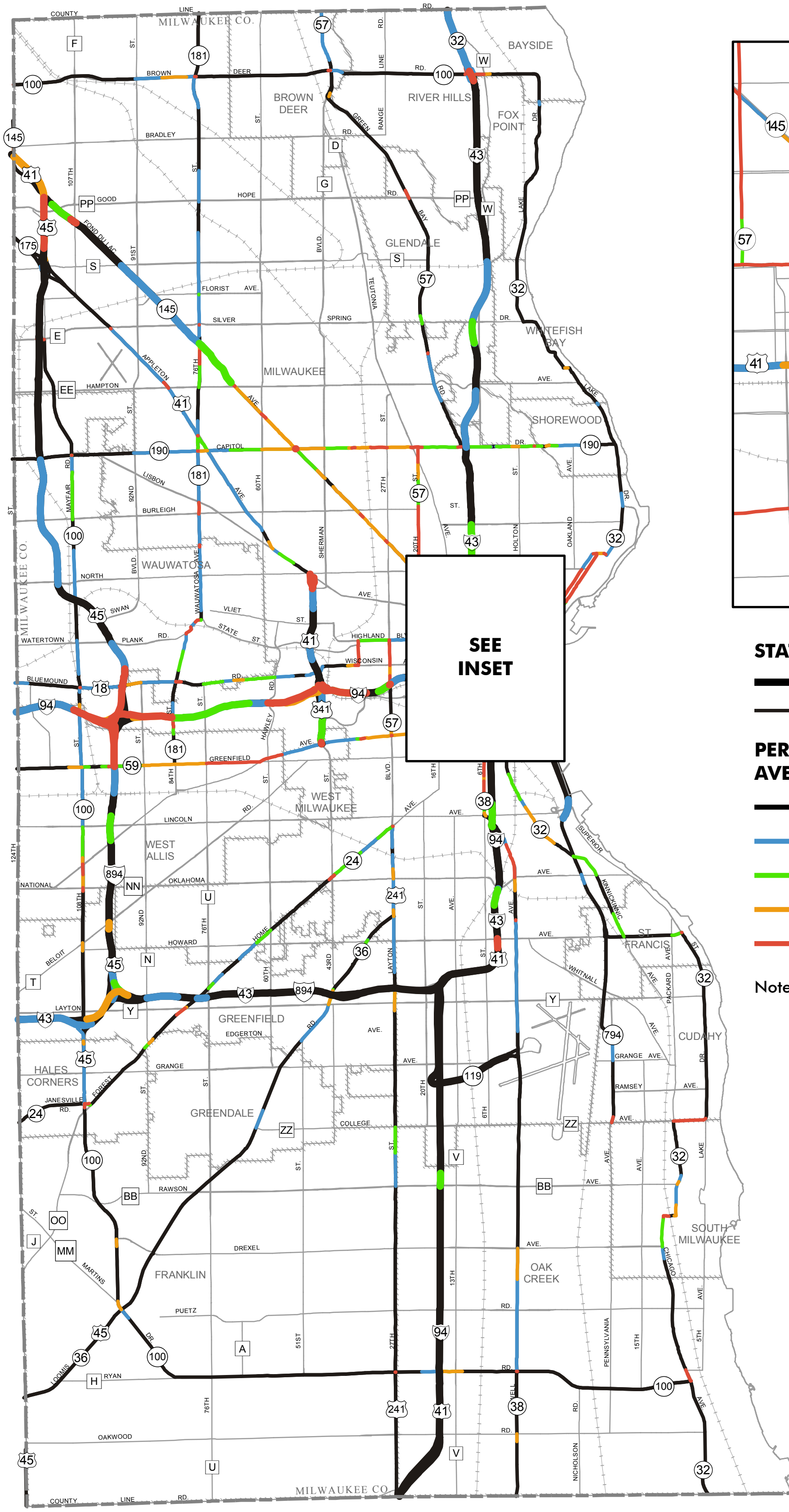
2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

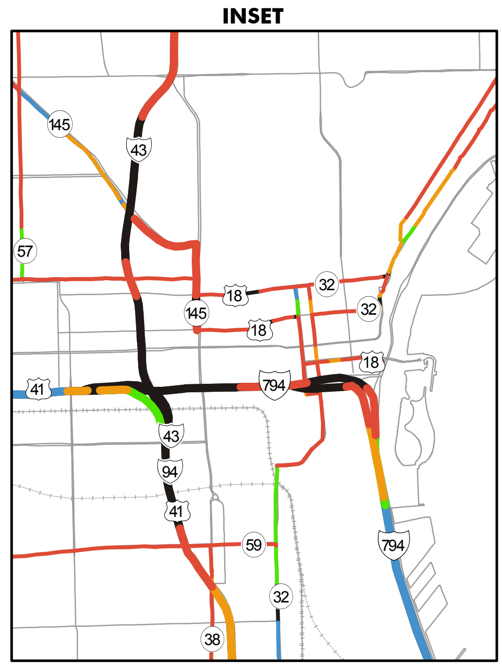
3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.

0 1 2 3 Miles

Source: *Wisconsin Department of Transportation and SEWRPC*

Map 4.7
Average Vehicular Crash Rate of State Trunk Highways in Milwaukee County: 2008-2012





STATE TRUNK HIGHWAY

- FREEWAY
- SURFACE ARTERIAL

PERCENT OF COUNTYWIDE AVERAGE CRASH RATE

- AT OR BELOW COUNTYWIDE AVERAGE
- 1 TO 50 PERCENT ABOVE
- 51 TO 100 PERCENT ABOVE
- 100 TO 200 PERCENT ABOVE
- MORE THAN 200 PERCENT ABOVE

Notes:

1. The average crash rate on the state trunk highway network in Milwaukee County from 2008 through 2012 was 120.2 crashes per 100 million VMT for freeways and 372.8 crashes per 100 million VMT for surface arterials.

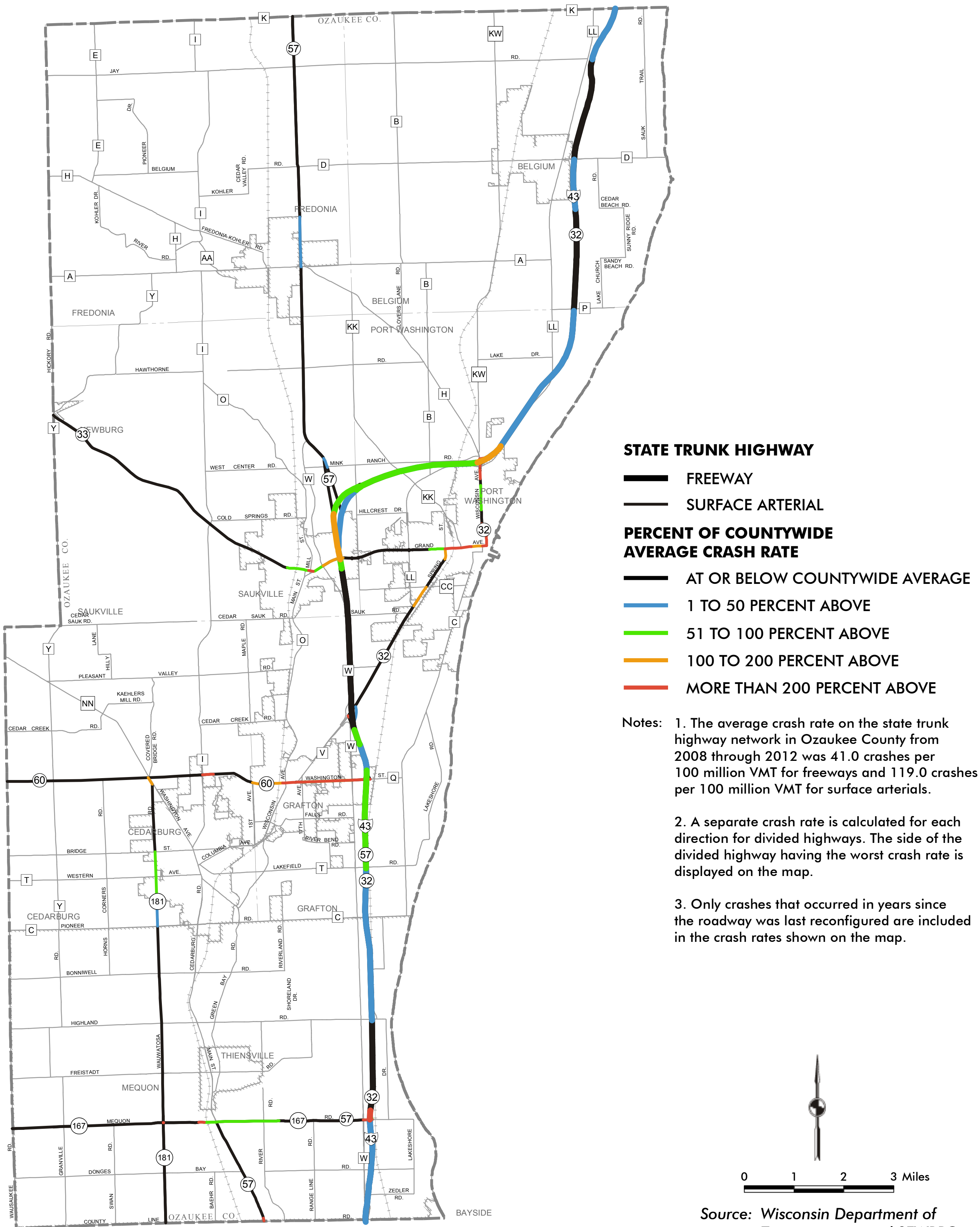
2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.

0 1 2 3 Miles

Source: Wisconsin Department of Transportation and SEWRPC

Map 4.8
Average Vehicular Crash Rate of State Trunk Highways in Ozaukee County: 2008-2012



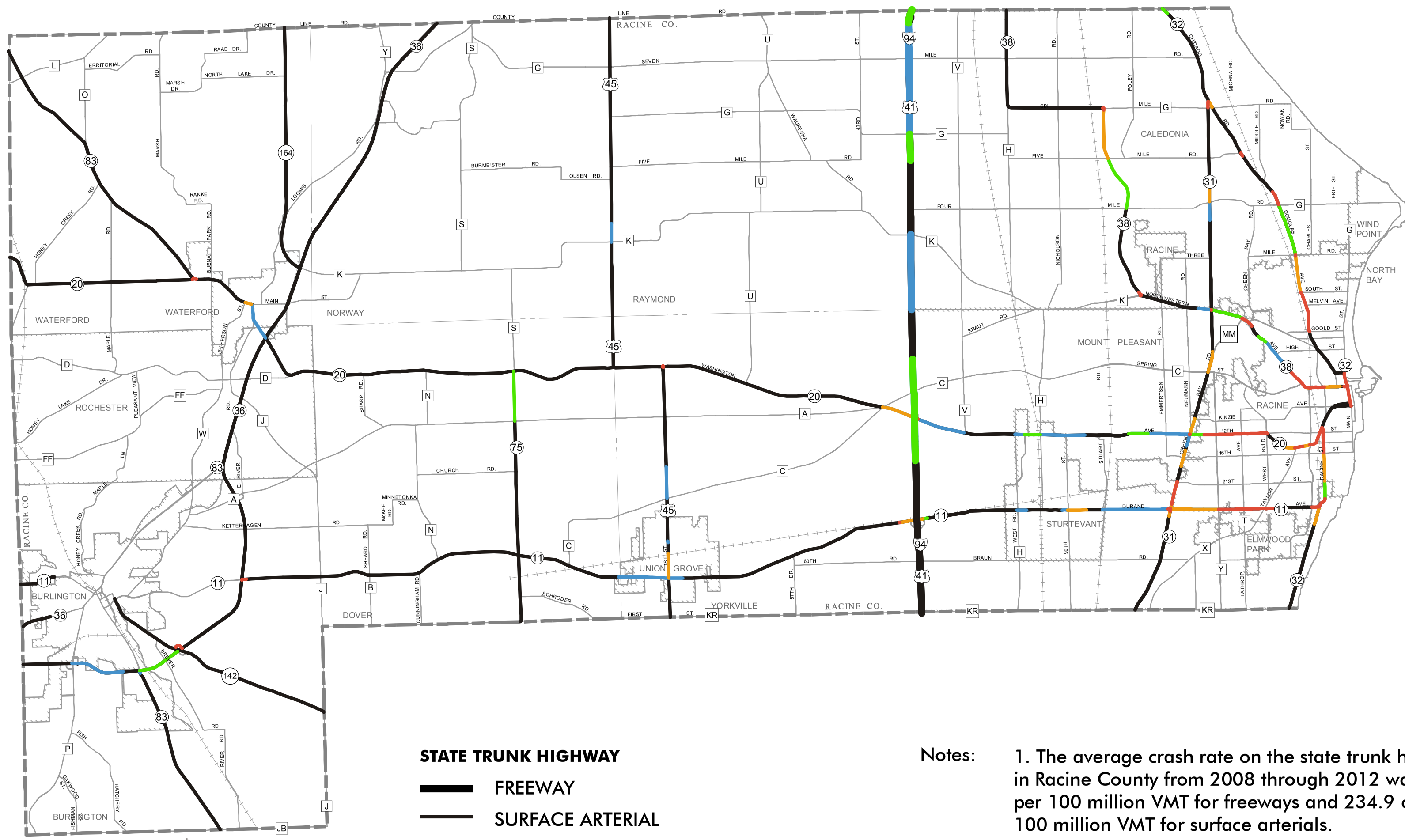
Notes: 1. The average crash rate on the state trunk highway network in Ozaukee County from 2008 through 2012 was 41.0 crashes per 100 million VMT for freeways and 119.0 crashes per 100 million VMT for surface arterials.

2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.

Source: *Wisconsin Department of Transportation and SEWRPC*

Map 4.9
Average Vehicular Crash Rate of State Trunk Highways in Racine County: 2008-2012



STATE TRUNK HIGHWAY

- FREEWAY
- SURFACE ARTERIAL

PERCENT OF COUNTYWIDE AVERAGE CRASH RATE

- AT OR BELOW COUNTYWIDE AVERAGE
- 1 TO 50 PERCENT ABOVE
- 51 TO 100 PERCENT ABOVE
- 100 TO 200 PERCENT ABOVE
- MORE THAN 200 PERCENT ABOVE

0 1 2 3 Miles

Source: *Wisconsin Department of Transportation and SEWRPC*

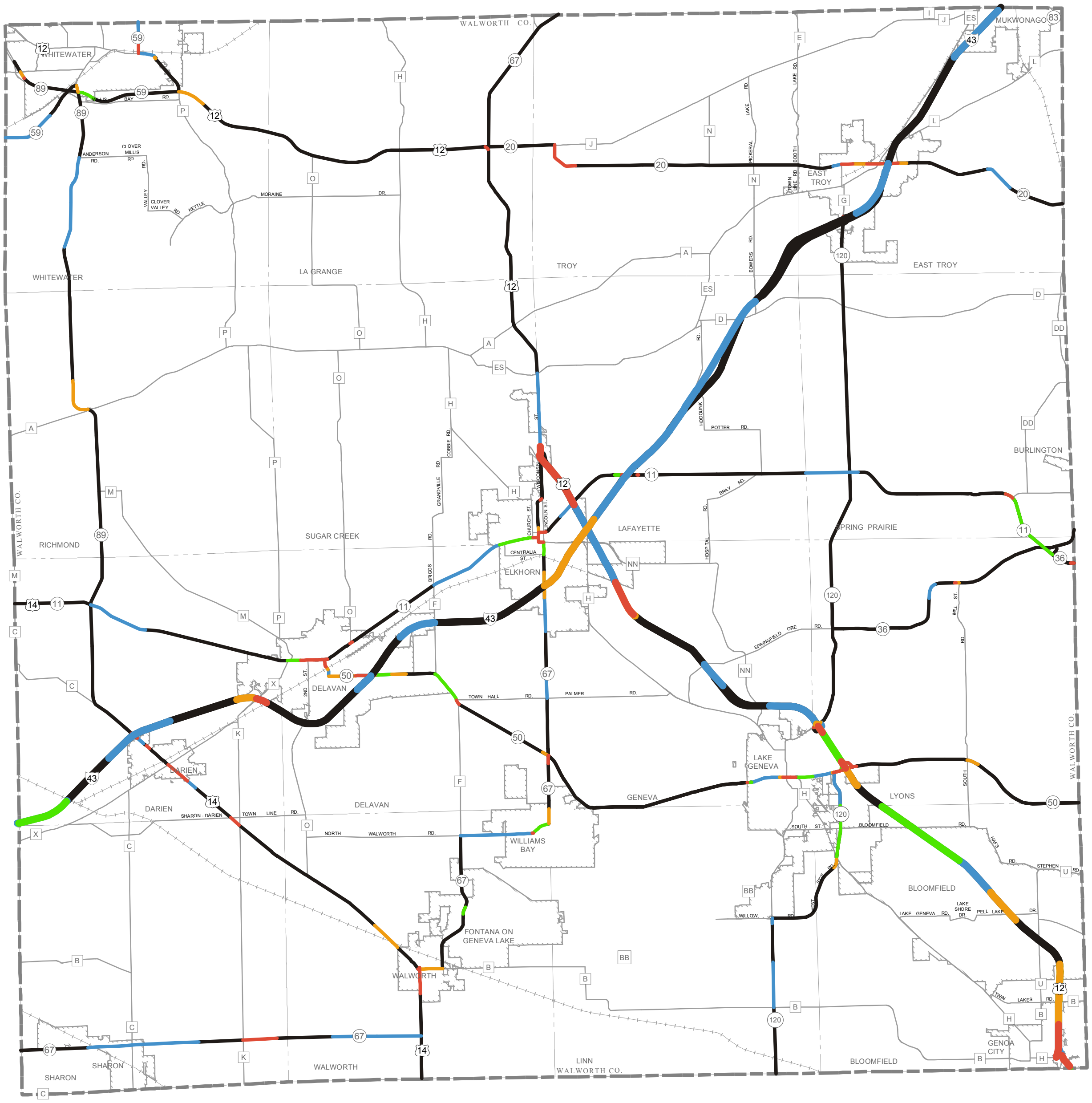
Notes:

1. The average crash rate on the state trunk highway network in Racine County from 2008 through 2012 was 33.7 crashes per 100 million VMT for freeways and 234.9 crashes per 100 million VMT for surface arterials.

2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.

Map 4.10
Average Vehicular Crash Rate of State Trunk Highways in Walworth County: 2008-2012



STATE TRUNK HIGHWAY

FREEWAY

SURFACE ARTERIAL

PERCENT OF COUNTYWIDE AVERAGE CRASH RATE

AT OR BELOW COUNTYWIDE AVERAGE

1 TO 50 PERCENT ABOVE

51 TO 100 PERCENT ABOVE

100 TO 200 PERCENT ABOVE

MORE THAN 200 PERCENT ABOVE

Notes:

1. The average crash rate on the state trunk highway network in Walworth County from 2008 through 2012 was 38.3 crashes per 100 million VMT for freeways and 139.2 crashes per 100 million VMT for surface arterials.

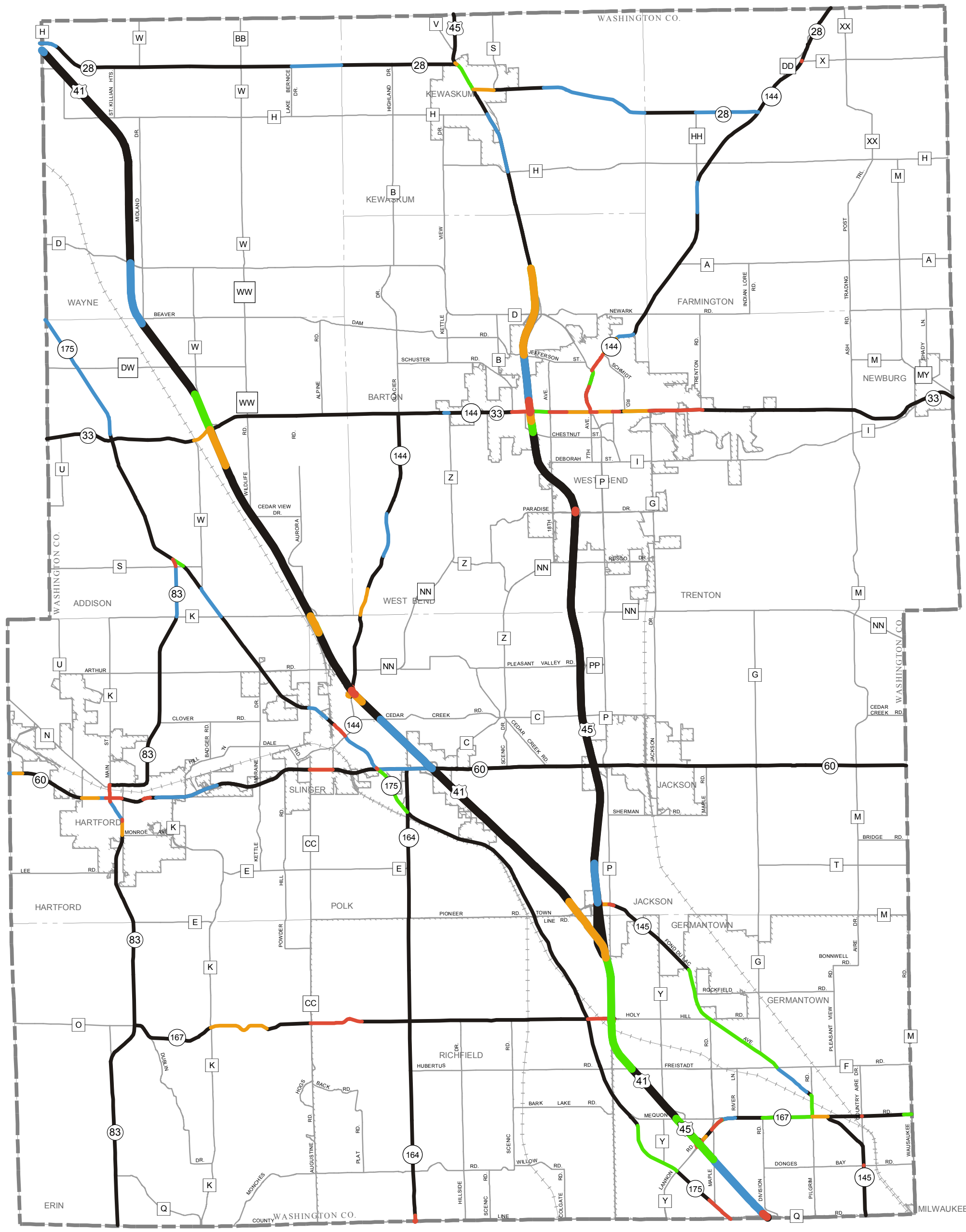
2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadwaywas last reconfigured are included in the crash rates shown on the map.

0 1 2 3 Miles

Source: Wisconsin Department of Transportation and SEWRPC

Map 4.11
Average Vehicular Crash Rate of State Trunk Highways in Washington County: 2008-2012



STATE TRUNK HIGHWAY

FREEWAY

SURFACE ARTERIAL

PERCENT OF COUNTYWIDE AVERAGE CRASH RATE

AT OR BELOW COUNTYWIDE AVERAGE

1 TO 50 PERCENT ABOVE

51 TO 100 PERCENT ABOVE

100 TO 200 PERCENT ABOVE

MORE THAN 200 PERCENT ABOVE

Notes:

1. The average crash rate on the state trunk highway network in Washington County from 2008 through 2012 was 43.3 crashes per 100 million VMT for freeways and 215.0 crashes per 100 million VMT for surface arterials.

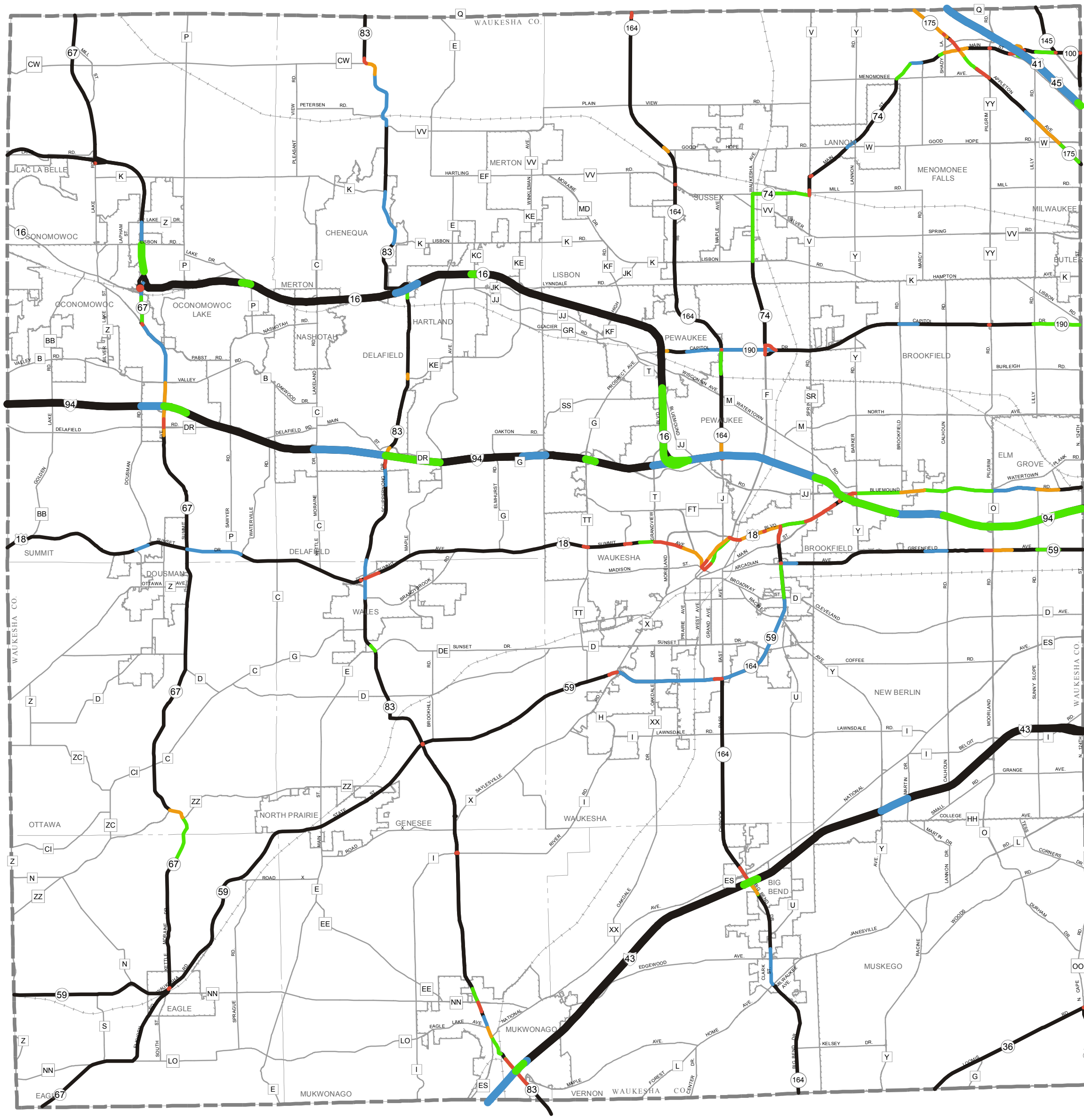
2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having the worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.

0 1 2 3 Miles

Source: Wisconsin Department of Transportation and SEWRPC

Map 4.12
Average Vehicular Crash Rate of State Trunk Highways in Waukesha County: 2008-2012



STATE TRUNK HIGHWAY

FREEWAY

SURFACE ARTERIAL

PERCENT OF COUNTYWIDE AVERAGE CRASH RATE

AT OR BELOW COUNTYWIDE AVERAGE

1 TO 50 PERCENT ABOVE

51 TO 100 PERCENT ABOVE

100 TO 200 PERCENT ABOVE

MORE THAN 200 PERCENT ABOVE

Notes:

1. The average crash rate on the state trunk highway network in Waukesha County from 2008 through 2012 was 53.7 crashes per 100 million VMT for freeways and 222.4 crashes per 100 million VMT for surface arterials.

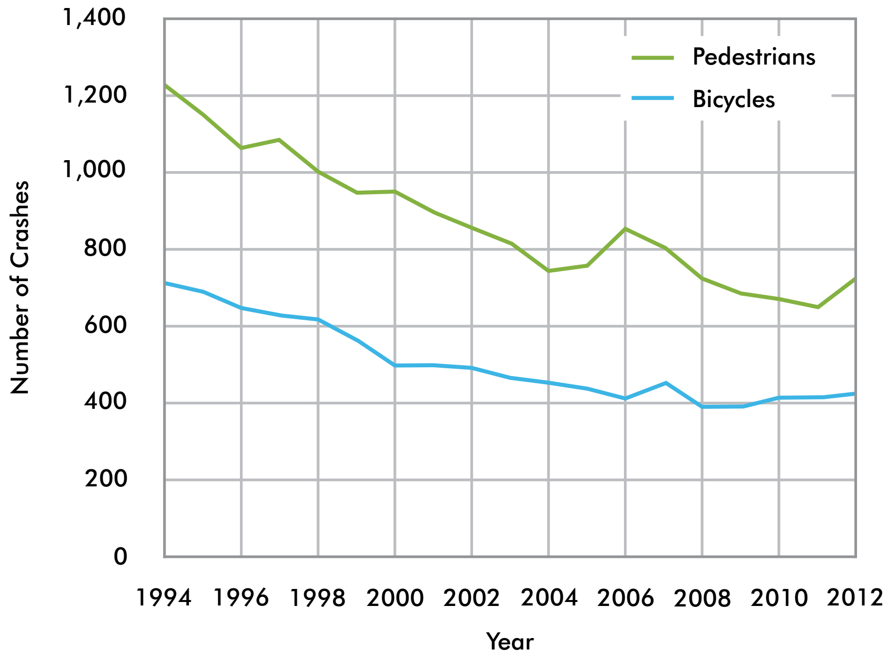
2. A separate crash rate is calculated for each direction for divided highways. The side of the divided highway having he worst crash rate is displayed on the map.

3. Only crashes that occurred in years since the roadway was last reconfigured are included in the crash rates shown on the map.

0 1 2 3 Miles

Source: Wisconsin Department of Transportation and SEWRPC

Figure 4.8
Total Number of Vehicular Crashes Involving Bicycles or Pedestrians as Reported in the Region: 1994-2012



Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC

Transit Crashes and Passenger Injuries
Table 4.11 provides a comparison of the number and rate of transit crashes resulting in property damage and the number of passenger injuries for the six-year period between 2006 and 2011. The rate of transit crashes has decreased from 261 crashes per 100 million revenue vehicle-miles in 2006 to 179 crashes per 100 million revenue vehicle-miles in 2011, or a decrease of about 31 percent over that time period. Following an increase in the rate of passenger injuries from 564 passenger injuries per 100 million revenue vehicle-miles in 2006 to 711 passenger injuries per 100 million revenue vehicle-miles in 2007, the rate of passenger injuries decreased in each of the following years to 140 passenger injuries per 100 million revenue vehicle-miles in 2011.

4.3 PUBLIC TRANSIT

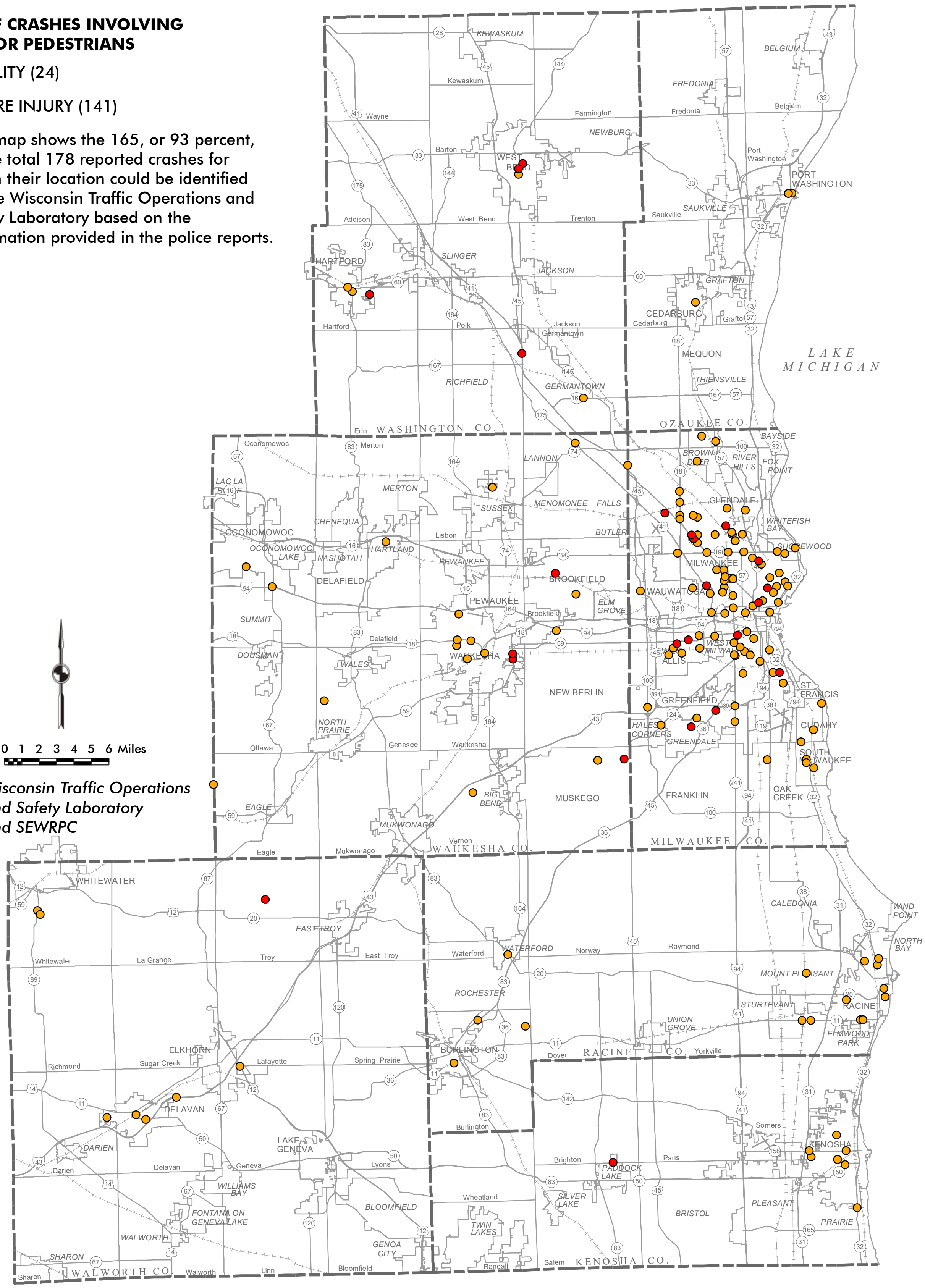
This section of the chapter describes the existing provision and utilization of public transit within the Region. Public transit may be defined as the transportation of people by publicly operated vehicles between trip origins and destinations. A classification of all public transportation provided in the Region is shown in Figure 4.10. Public transportation may be divided into service provided for the general public and service provided to specific population groups. Examples of specific group public transportation include yellow school bus service operated by area school districts, and fixed-route bus and paratransit van service provided by counties or municipalities for seniors and people with disabilities. Service limited to specific population groups is considered only implicitly in the planning process, with the exception of paratransit operated within urban fixed-route transit service areas to meet the transportation needs of people with disabilities who are

Map 4.13
Vehicular Crashes Involving Bicycles or Pedestrians that Resulted in a Fatality or Serious Injury in the Region: 2012

SEVERITY OF CRASHES INVOLVING BICYCLISTS OR PEDESTRIANS

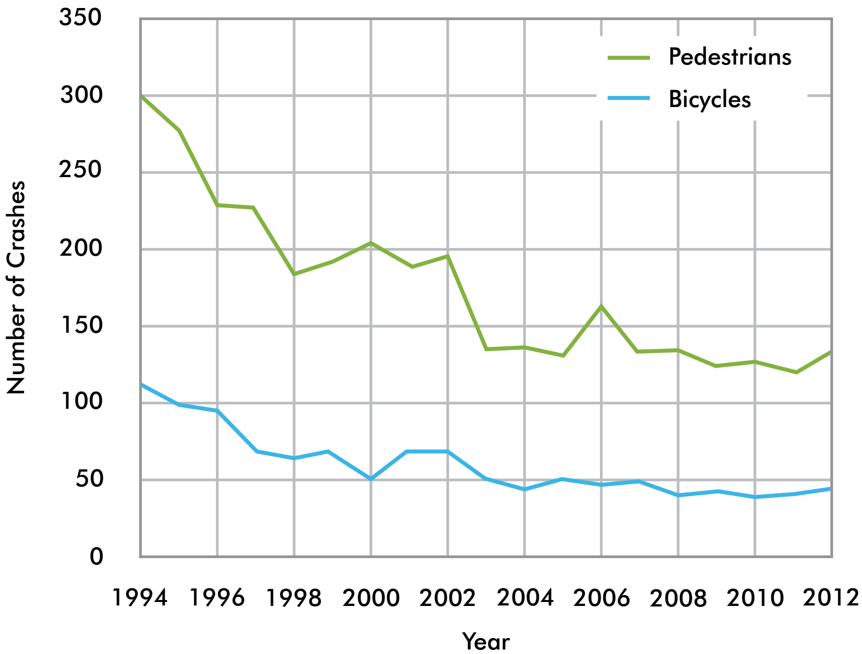
- FATALITY (24)
- SEVERE INJURY (141)

Note: This map shows the 165, or 93 percent, of the total 178 reported crashes for which their location could be identified by the Wisconsin Traffic Operations and Safety Laboratory based on the information provided in the police reports.



Source: *Wisconsin Traffic Operations and Safety Laboratory and SEWRPC*

Figure 4.9
Total Number of Vehicular Crashes Involving Bicycles or Pedestrians Resulting in a Fatality or a Serious Injury as Reported in the Region: 1994-2012



Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC

Table 4.11
Comparison of Transit Crashes and Passenger Injuries in the Region: 2006-2011

Characteristic	2006	2007	2008	2009	2010	2011
Crashes[a]	73	69	68	40	64	46
Crashes[a] per 100,000,000 Revenue Miles	261	247	224	145	236	179
Passenger Injuries[b]	158	199	109	100	80	36
Passenger Injuries[b] per 100,000,000 Revenue Miles	564	711	395	363	295	140

[a] *Includes only crashes that resulted in more than $5,000 in property damage.*

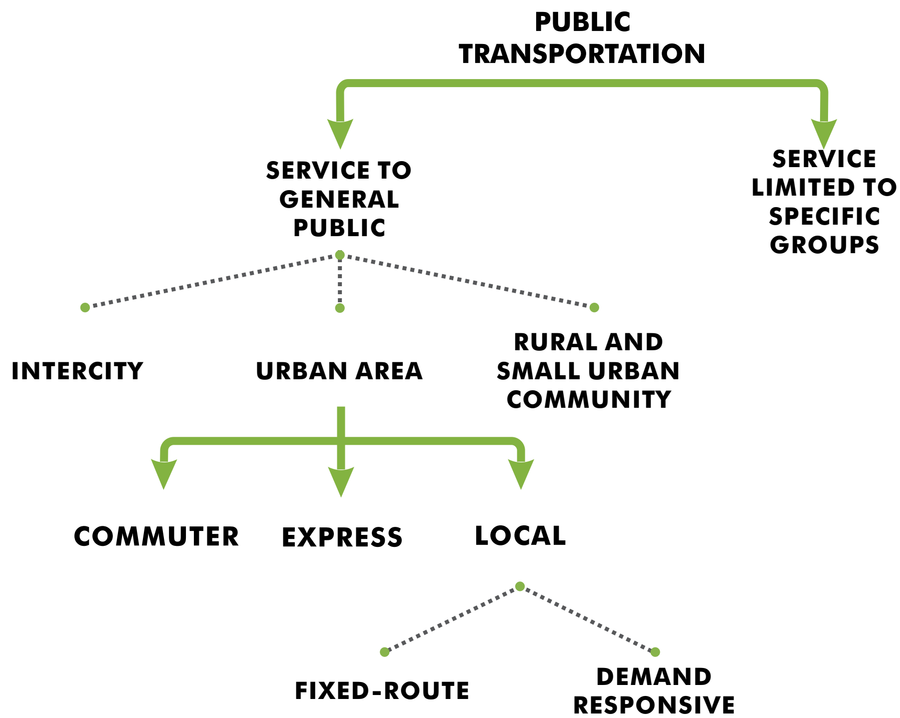
[b] *Includes only passenger injuries that required medical attention.*

Source: National Transit Database and SEWRPC

unable to use conventional transit service. Such service is required to be provided within fixed-route urban transit service areas under the Federal Americans with Disabilities Act of 1990, and the costs of such service are explicitly considered by the Commission in regional transportation planning.

As shown in Figure 4.10, public transit service to the general public may further be divided into three categories: intercity, urban, and rural. Intercity or interregional public transportation provides service across regional boundaries and includes Amtrak railway passenger service, interregional bus service, and commercial air travel. Rural—and small urban community—public transportation provides service in and between small urban communities and rural areas, and may provide connections to urban areas. Urban public transportation provides service within and between the large urban areas of the Region. Public transit is essential in any metropolitan area to meet the travel needs of people unable to use personal automobile transportation; to provide an alternative mode of travel, particularly in heavily traveled

Figure 4.10
Classification of Public Transportation



corridors within and between urban areas and in densely developed urban communities and activity centers; and to provide choice in transportation modes as an enhancement of quality of life and to support and enhance the Region's economy.

The public transit principally addressed in the Commission's regional transportation planning is urban public transit—the public transit that serves intraregional travel demand, is open to serving the general public, and operates within and between the Region's large urban areas. This includes the urban fixed-route bus transit systems operated by Ozaukee, Milwaukee, Washington, and Waukesha Counties and the Cities of Kenosha, Racine, and Waukesha. The Commission's regional transportation planning also addresses rural and small urban community public transit—public transit that also serves intraregional travel demand, is open to the general public, and operates within the Region's small urban communities and rural areas. This includes fixed-route service in western Kenosha County and nonfixed-route shared-ride taxi systems operated by Ozaukee and Washington Counties, and the Cities of Hartford, Whitewater, and West Bend.[34] Interregional public transit service is considered by WisDOT in statewide transportation planning. Regional transportation planning incorporates this statewide planning, and recognizes that terminal and intermodal facilities, such as airports and intercity bus and railway stations, may comprise major trip generators affecting internal travel demand and patterns. Interregional commercial

[34] *Fixed-route public transportation operates relatively large vehicles over predetermined routes on regular schedules between or along concentrations of related trip origins and destinations. Nonfixed-route public transportation provides service on a demand-responsive or as-requested basis, and is characterized by the flexible routing and scheduling of relatively small vehicles to provide shared-occupancy door-to-door transportation. Nonfixed-route demand-responsive transit service that is restricted to people with disabilities is often referred to as paratransit service.*

air travel is explicitly considered by the Commission under a separate comprehensive regional airport system planning program. Interregional public transportation travel has historically represented about 5 to 15 percent of all public transportation travel on an average weekday, about 5 percent of all interregional travel on an average weekday, and less than 0.5 percent of all person travel within the Region on an average weekday.

Urban public transit may be further divided into commuter, express, and local levels of service. Commuter transit is intended to facilitate relatively fast and convenient transportation along heavily traveled corridors and between major activity centers and high- and medium-density urban centers and communities within the Region. Commuter transit has relatively high average operating speeds and relatively low accessibility, with station spacing one to three miles or more apart. Commuter transit service can be provided by rail vehicles operating over exclusive, grade-separated right-of-ways or by buses operating over exclusive, grade-separated busways. Commuter transit can also be provided by buses operating in mixed traffic on freeways.

Express transit service is provided over arterial streets and highways or on exclusive right-of-ways with stops generally one-half to one mile apart at intersecting transit routes, intersecting arterial streets, and major traffic generators. Express transit serves trips of moderate length and can be provided by bus or light rail operating in mixed traffic on shared right-of-ways, in reserved street lanes, or on exclusive right-of-ways. Express transit service provides a greater degree of accessibility at somewhat slower operating speeds than commuter transit and may provide "feeder" service to the commuter transit system. Express transit service operating on exclusive right-of-ways is known as "rapid" transit service, and can be provided by bus or light rail.

Local transit service is characterized by a high degree of accessibility and low operating speeds. Local service is provided over arterial and collector streets with stops generally one-eighth to one-quarter mile apart. Such service can be provided by bus or streetcar. Local transit service can also be provided on a demand-responsive basis, such as with automobiles or vans operating as a shared-ride taxi.

Urban public transit may be divided into commuter, express, and local levels of service.

- **Commuter transit service is intended to facilitate relatively fast and convenient service along heavily traveled corridors.**
- **Express transit service is provided over arterials and highways or exclusive right-of-ways and serves intersecting transit routes and major traffic generators with greater accessibility than commuter transit.**
- **Local transit service is characterized by a high degree of accessibility and low operating speeds.**

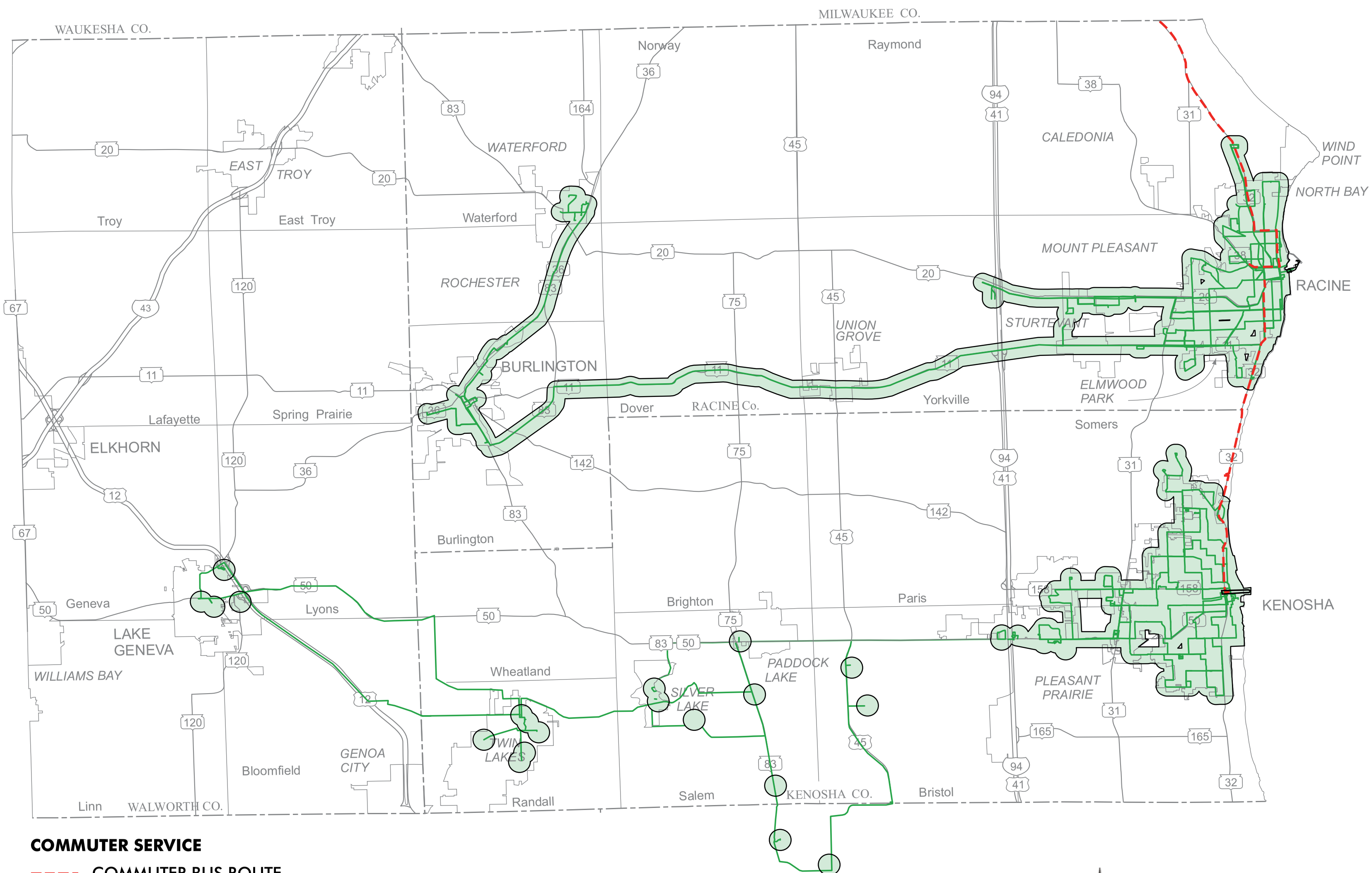
Urban Public Transit

Urban public transit service within the Region in 2012 is shown on Map 4.14 (Kenosha and Racine areas) and Map 4.15 (Milwaukee area).

Commuter Transit Service

Commuter transit service within the Region in 2012 consisted of 19 bus routes operating primarily over the freeway system with extensions over major arterial highways to serve communities or major trip generators located off the freeway system. These routes principally served and connected the Milwaukee urban area with extensions beyond the urban areas in Ozaukee, Washington, and Waukesha Counties. Six "freeway flyer" bus routes were provided by Milwaukee County and operated by the Milwaukee County Transit System (MCTS). Four UBUS routes are operated over the freeway system and arterial streets between outlying areas and park-ride lots to and from the University of Wisconsin-Milwaukee (UWM), Concordia University, Cardinal Stritch University, Milwaukee Area Technical College (MATC) North Campus, MATC Downtown Campus, and MATC South Campus. The UBUS routes operate on only weekdays and only during the fall and spring semesters at the colleges and universities.

Map 4.14
Local Fixed-Route Public Transit Service in the Kenosha and Racine Areas: 2012



COMMUTER SERVICE

COMMUTER BUS ROUTE (NON-FREEWAY)

LOCAL SERVICE

LOCAL BUS ROUTE

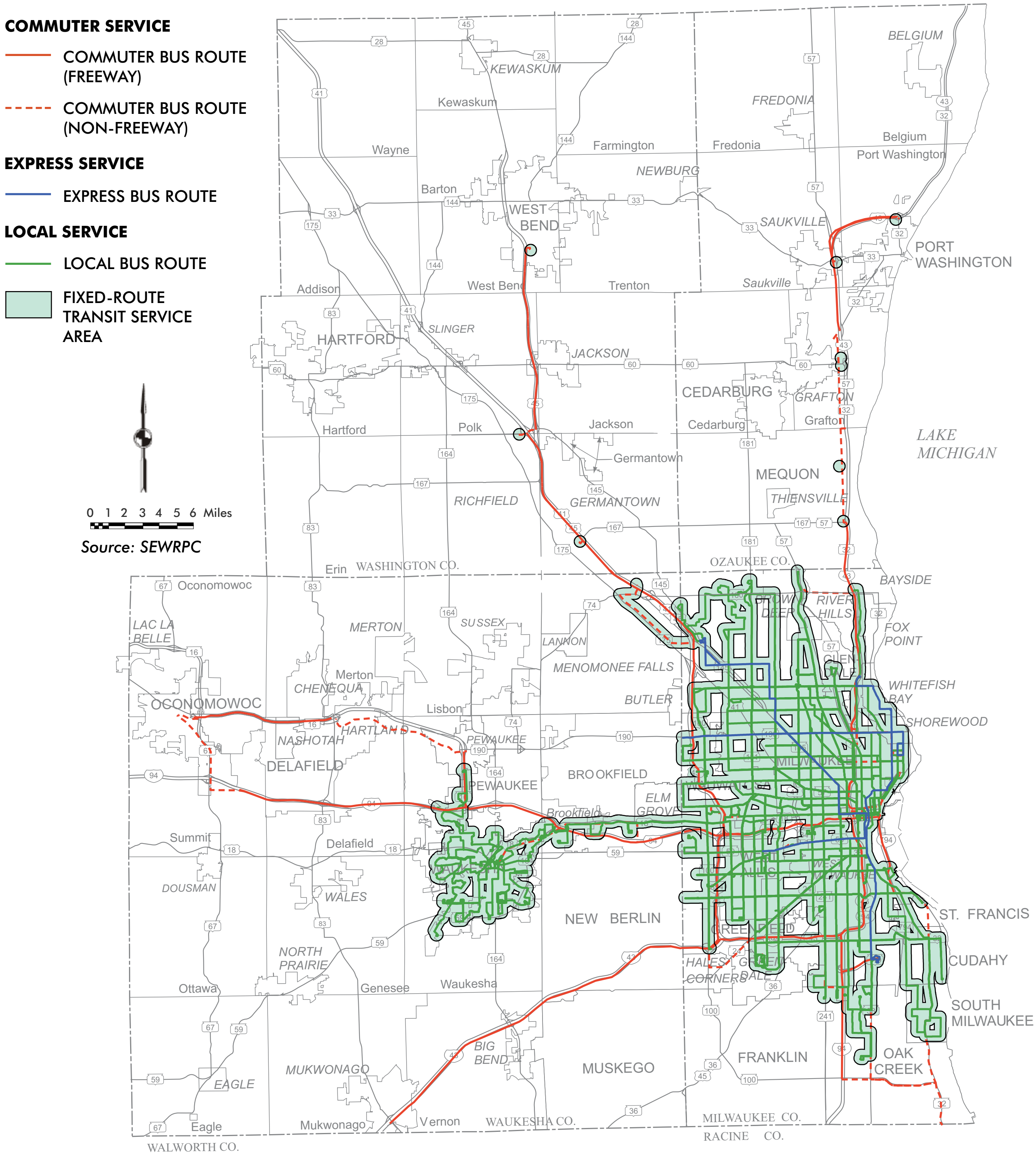
ELECTRIC STREETCAR LINE

FIXED-ROUTE TRANSIT SERVICE AREA

Note: The Racine County Link—a public shuttle service designed to serve cross-county trips between the City of Racine, the Village of Union Grove, and the Burlington/Rochester Areas—is included in this map, but was eliminated in January of 2013.

Source: SEWRPC

Map 4.15
Local Fixed-Route Public Transit Service in the Milwaukee Area: 2012



Five commuter bus routes were provided by Waukesha County. One route between the Village of Menomonee Falls and the central business district (CBD) of Milwaukee was operated for Waukesha County by MCTS. The other four routes between the City of Waukesha, City of Oconomowoc, and the Village of Mukwonago and the Milwaukee CBD were operated for Waukesha County by Wisconsin Coach Lines, Inc., a private transit operator (see Map 4.15). Selected bus trips on the Waukesha-Milwaukee route were extended to serve UWM. Ozaukee County provided one route between the City of Port Washington and central Milwaukee County, including the Milwaukee CBD, operated by MCTS. Ozaukee County also provided connecting shared-ride taxi services as an extension of their commuter bus route to serve major employment centers. Washington County provided two routes between the City of West Bend and central Milwaukee County, including the Milwaukee CBD, the Milwaukee Regional Medical Center, and the Veterans Administration (VA) Medical Center. These routes were operated under contract by Riteway Bus Service, Inc. The City of Racine sponsored the Kenosha-Racine-Milwaukee commuter bus, operated by Wisconsin Coach Lines, between downtown Kenosha, downtown Racine, and the Milwaukee CBD (see Map 4.14).

During 2012, commuter transit service was operated primarily during weekday peak periods from 6:00 a.m. to 8:30 a.m. and from 3:30 p.m. to 6:30 p.m. Commuter service during weekday off-peak periods was limited to that provided only over selected routes in Milwaukee County serving UWM, on the Waukesha County route operated between Waukesha and Milwaukee, on the Kenosha-Racine-Milwaukee bus, and on the Washington County route operated between West Bend and the Milwaukee CBD. On weekends, service was provided on the Waukesha-Milwaukee route and on the Kenosha-Racine-Milwaukee bus. During weekday peak periods, vehicles on the commuter transit services arrived every 12 to 30 minutes on the routes operated within Milwaukee County and every 15 to 60 minutes on the routes serving Kenosha, Ozaukee, Racine, Washington, and Waukesha Counties. Vehicles generally arrived hourly on the services operated during weekday midday and evening periods, and at least every two to three hours on the Waukesha-Milwaukee and Kenosha-Racine-Milwaukee services provided on weekends. The adult cash fare for commuter transit service within Milwaukee County was $3.25, while the adult fares charged between points in the nearby counties and Milwaukee County ranged from $3.25 to $4.50.

Express Transit

In 2012, MCTS began operating three express routes using Federal Highway Administration (FHWA) Congestion Mitigation and Air Quality (CMAQ) funding. Two of these routes served downtown Milwaukee and the third served the Capitol Drive (STH 190) corridor in north Milwaukee. Express service was also provided to UWM, Mitchell Airport, Bayshore Mall, and the VA Center (see Map 4.15). These routes provided service from 4:30 a.m. to 2:00 a.m. seven days a week, with buses arriving every 10 to 30 minutes during the week and every 25 to 45 minutes on weekends. The adult cash fare for these routes was $2.25.

Local Transit: Fixed-Route

Fixed-route local public transit service was provided in 2012 within the Kenosha, Milwaukee, and Racine urban areas. Local transit in the Kenosha urban area was provided by Kenosha Area Transit and Western Kenosha County Transit. Local transit in the Milwaukee urban area was provided by Milwaukee County Transit System, Waukesha Metro Transit, and Waukesha County Transit. Local transit in the Racine urban area was provided by the Racine Belle Urban System.

Kenosha Area Transit
In 2012, Kenosha Area Transit operated service over 20 fixed routes. The City system included six regular bus routes, radial in design and emanating from downtown Kenosha, with direct, nontransfer service from the downtown area to all portions of the City and its immediate environs, including the University of Wisconsin-Parkside (see Map 4.14). One other bus route provided local transit service to major commercial, recreational, and employment centers that have developed west of Green Bay Road (STH 31) outside the regular Kenosha local transit service area. The system also included additional school-day bus routes in the morning and afternoon to serve Kenosha secondary schools, and an electric streetcar line in downtown Kenosha that connected the central transfer terminal for the bus routes, the Metra commuter rail station, the Kenosha CBD, and the Harborpark development. In 2012, the bus system provided service on most routes from 6:00 a.m. to 7:30 p.m. on weekdays and 6:00 a.m. to 5:00 p.m. on Saturday, with buses arriving every 30 to 60 minutes during weekday peak periods and every 60 minutes during weekday off-peak periods and on Saturday. Service was provided on the streetcar line every 15 minutes from 11:00 a.m. to 6:30 p.m. on weekdays and from 10:00 a.m. to 5:30 p.m. on Saturdays, with limited hours from January to March. The adult cash fares charged by the Kenosha transit system were $1.50 per trip for bus service and $1.00 per trip for the streetcar line.

Western Kenosha County Transit
In 2012, Western Kenosha County Transit operated three fixed routes serving communities in rural western Kenosha County, with additional service provided to the City of Lake Geneva in Walworth County, the City of Kenosha, and the Village of Antioch in Illinois. Service to the Village of Antioch included connections to Metra commuter trains to Chicago. The adult cash fare charged by Western Kenosha County Transit was $2 per one way trip.

Racine Belle Urban System
In 2012, the City of Racine Belle Urban System operated local service over 10 fixed routes, including nine regular routes and one school-day route to serve Racine secondary schools. As shown on Map 4.14, eight of the nine regular fixed routes were radial in design, emanating from the Racine Metro Transit Center, and provided service to all portions of the City and to its immediate environs. The ninth regular route acted as an extension of one of the fixed routes serving downtown and the Metro Transit Center. In 2012, the system provided service from 5:30 a.m. to 10:00 p.m. on weekdays, 5:30 a.m. to 6:30 p.m. on Saturdays, and from 9:30 a.m. to 6:30 p.m. on Sundays. Buses arrived every 30 to 60 minutes on weekdays and every 60 minutes on Saturdays and Sundays. The adult cash fare charged by the City of Racine was $2.00 per trip for local bus service.

Racine County Link
From June of 2012 through January of 2013, Racine County operated a cross-county shuttle with Federal Section 5317 New Freedom funding called the Racine County Link. The service was open to the general public and was designed to serve cross-county trips between the City of Racine, the Village of Union Grove, and the Burlington/Rochester areas. Racine County eliminated the service in January 2013 due to low ridership.

Milwaukee County Transit System
As shown on Map 4.15, MCTS provided local transit service in the Milwaukee area in 2012 over 44 fixed routes. Of these local routes, 11 were radial

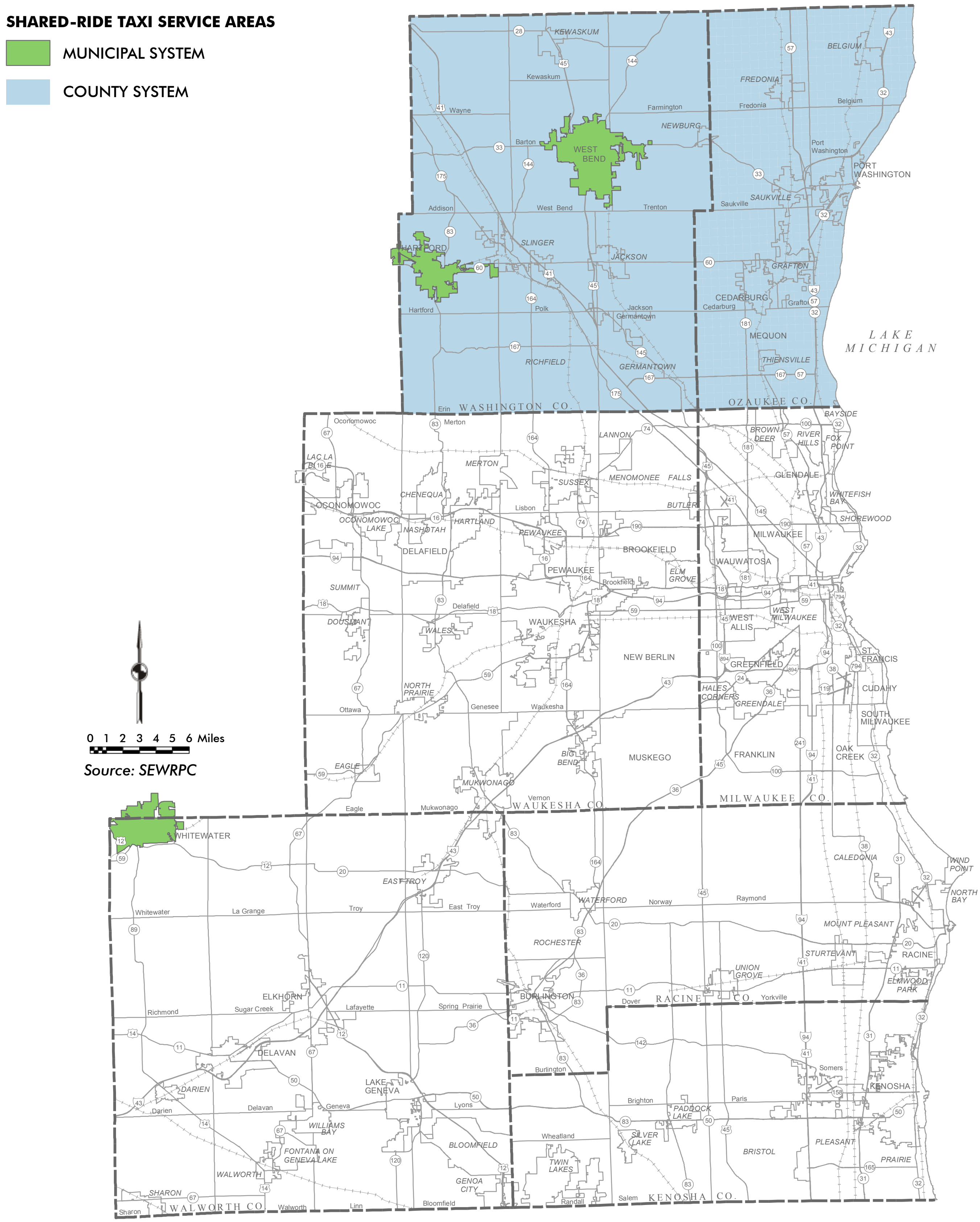
routes serving downtown Milwaukee; 21 were crosstown or feeder routes not serving downtown Milwaukee; two were shuttle routes providing connections from other routes to major concentrations of jobs in industrial parks and commercial development in the outlying portions of the County; and 10 were school-day routes principally designed to serve secondary schools in Milwaukee County. The system provided local bus service seven days a week, typically from 5:00 a.m. to 1:00 a.m., at an adult cash fare of $2.25 per trip. On most routes serving central Milwaukee County, buses arrived every 10 to 20 minutes during weekday peak periods and every 15 to 30 minutes during weekday off-peak periods. Buses arrived every 15 to 60 minutes on the routes serving the outer portions of the County on weekdays and on most routes on weekends.

Waukesha Metro Transit
Waukesha Metro Transit provided service over 10 fixed radial routes in 2012. The routes began in downtown Waukesha and provided direct nontransfer service from downtown to all portions of the City and its immediate environs. In addition, one route operating twice a day each weekday provided service from downtown Waukesha to the Easter Seals Training Center. As shown on Map 4.15, two of the routes served traffic generators outside of the City: the Waukesha County Technical College in the Village of Pewaukee; the Goerke's Corners public transit station in the Town of Brookfield; and the commercial district along Bluemound Road in the Town and City of Brookfield, including Brookfield Square Mall. In 2012, the system provided service from 6:00 a.m. to 10:30 p.m. on weekdays, from 8:00 a.m. to 10:00 p.m. on Saturdays, and from 9:00 a.m. to 7:00 p.m. on Sundays. Buses on the routes arrived every 30 to 60 minutes. The adult cash fare was $2.00 per trip for the local bus service provided by the City of Waukesha.

In 2012, the Waukesha County transit system provided local bus service over one route operated for Waukesha County by MCTS. This route provided service seven days a week from Brookfield Square Mall east along Bluemound Road into Milwaukee County as an extension of MCTS Route 10. Buses on this route arrived every 9 to 30 minutes during weekday peak periods and every 20 to 35 minutes during all other times of operation. The adult cash fare charged on this route was $2.25 per trip.

Rural and Small Urban Community Transit: Demand-Responsive
Demand-responsive rural public transit in the form of publicly operated shared-ride taxi service was also provided in the Region in 2012 (see Map 4.16). Shared-ride taxi service was provided by the Hartford City Taxi Service and City of West Bend Taxi Service in Washington County. These two systems served local travel in and immediately adjacent to the sponsoring municipality. In addition, both Ozaukee and Washington Counties provided shared-ride taxi service on a countywide basis. The two county taxi systems principally served travel in the small urban communities and rural areas in each county and between the rural areas and all communities. The Ozaukee County taxi system also served travel within the City of Port Washington, which discontinued its separate taxi system at the end of 2011. The Ozaukee and Washington County taxi systems did serve some communities located within the Milwaukee urban area, including the communities of Germantown in Washington County; the northern portion of the Village of Menomonee Falls in Waukesha County; and Mequon, Cedarburg, and Grafton in Ozaukee County. The Washington County taxi system, however, did not serve trips that could be made on the Hartford and West Bend municipal systems. Public shared-ride taxi service was also provided in Walworth County by Browns Cab Service, which served local travel in and immediately adjacent to the City of Whitewater.

Map 4.16
Local Rural and Small Urban Community Demand-Responsive Public Transit Service in the Region: 2012



Source: SEWRPC

Each of the taxi systems in the Region operated seven days a week in 2012 with the hours of operation varying by system. Typically, the most extensive service was provided on weekdays and Saturdays when taxi service was available for between 12 and 16 hours a day. The three municipally operated systems provided service with approximately 30-minute response times. The two County systems provided 24-hour advance reservation service, requiring passengers to call a day in advance to guarantee service. Adult cash fares for the municipal taxi systems ranged from $3.00 to $4.00 per trip, with extra charges for trips with origins or destinations within one or two miles of the city limits. The adult fares charged by the county taxi systems varied by the length of the trip and were between $4.00 and $4.25 per trip for short trips and between $8.75 and $9.00 per trip for the longest trips in each county. Rather than using public employees, four of the five taxi systems—all but the City of Hartford—contract with private companies to provide the service including: F.D.S. Enterprises, LLC, which operated the West Bend taxi system; Specialized Transportation Services, Inc., which operated both the Ozaukee and Washington County taxi systems; and Browns Cab Service, which operated the Whitewater taxi system.

Level of Transit Service

The extent and amount of public fixed-route transit service provided within the Region can be measured by the revenue vehicle-hours and revenue vehicle-miles of transit service provided on an average weekday. As shown in Table 4.12, between 2001 and 2011 the average weekday vehicle-hours and vehicle-miles of fixed-route transit service provided within the Region decreased significantly, by about 16 percent and 22 percent, respectively. The level of transit service provided in the Region was also less than the levels provided in 1972 and 1963. In general, vehicle-hours and vehicle-miles of service provided in the Region declined significantly throughout the 1950s, 1960s, and early 1970s. Public transit service began to increase in the mid-1970s with the initiation of public acquisition and operation of transit service. Public transit service continued to increase to the early 1980s due to motor fuel price increases in the mid and late 1970s, and attendant transit ridership increases. Transit service in the Region then declined slightly through the middle and late 1980s. During the 1990s, transit service increased substantially through the year 2000. Since 2001, transit service has decreased each year, due to continued reductions in Federal funding and State and local budget constraints.

The level of demand-responsive service provided by public shared-ride taxi systems has increased significantly since 1991 as the number of public systems in the Region increased from two in 1991 to six in 2011 (the City of Port Washington ceased its shared-ride taxi service at the end of 2011). In 2011, about 360 vehicle-hours and 10,300 vehicle-miles of service were provided on an average weekday by the six public taxi systems in the Region, representing increases of 64 percent and 34 percent from the 2001 average weekday levels of about 220 vehicle-hours and 7,700 vehicle-miles of service and 2,300 percent and 2,475 percent from the 1991 average weekday levels of about 15 vehicle-hours and 400 vehicle-miles of service.

Public Transit Ridership

Public transit ridership levels within the Region on an average weekday in 1963, 1972, 1991, 2001, and 2011 are set forth in Table 4.13. Since 2001, ridership on fixed-route service in the Region has decreased. An estimated 118,400 transit trips were made on fixed-route bus services on an average weekday in 2011, about 17 percent less than in 2001. In comparison, the vehicle-hours and vehicle-miles of service provided on fixed-route bus

Table 4.12
Public Transit Vehicle-Hours and Vehicle-Miles Provided in the Region by Service Type: 1963, 1972, 1991, 2001, and 2011

Service Type	Average Weekday Revenue Vehicle-Hours[a] 1963	1972	1991	2001	2011
Fixed-Route (Bus)	6,900	5,200	5,100	5,600	4,700
Demand-Responsive (Shared-Ride Taxi)	--	--	15	220	360

Service Type	Change in Average Weekday Revenue Vehicle-Hours: 1963-2011 Number	1963-2011 Percent	1972-2011 Number	1972-2011 Percent	1991-2011 Number	1991-2011 Percent	2001-2011 Number	2001-2011 Percent
Fixed-Route (Bus)	-2,200	-31.8	-500	-9.6	-400	-7.8	-900	-16.1
Demand-Responsive (Shared-Ride Taxi)	--	--	--	--	345	2,300.0	140	63.6

Service Type	Average Weekday Revenue Vehicle-Miles[a] 1963	1972	1991	2001	2011
Fixed-Route (Bus)	84,900	64,000	63,300	79,600	61,800
Demand-Responsive (Shared-Ride Taxi)	--	--	400	7,700	10,300

Service Type	Change in Average Weekday Revenue Vehicle-Miles: 1963-2011 Number	1963-2011 Percent	1972-2011 Number	1972-2011 Percent	1991-2011 Number	1991-2011 Percent	2001-2011 Number	2001-2011 Percent
Fixed-Route (Bus)	-23,100	-27.2	-2,200	-3.4	-1,500	-2.4	-17,800	-22.4
Demand-Responsive (Shared-Ride Taxi)	--	--	--	--	9,900	2,475.0	2,600	33.8

[a] *Figures presented in this table are for publicly sponsored transit services for the general public. The data exclude special paratransit services directed at seniors and people with disabilities, including Federally required complementary paratransit services for people with disabilities operated by fixed-route bus systems. On an average weekday during 2011, approximately 1,100 revenue vehicle-hours and 10,600 revenue vehicle-miles of service were operated in the Region as Federally required complementary paratransit services for people with disabilities. This compares to approximately 1,500 revenue vehicle-hours and 19,500 vehicle-miles of service operated in 2001 by ADA paratransit programs. Comparable data for 1991 are not available as paratransit service data were not reported by most transit systems in the Region. Complementary paratransit services were not required or provided in 1963 or 1972.*

Source: SEWRPC

services in 2011 were about 16 percent and 22 percent less, respectively, than in 2001 (see Table 4.12). The decrease in ridership reflects the service reductions that have been implemented by the transit operators in the Region, particularly MCTS, since 2001, largely to meet constrained operating budgets.

The transit ridership levels on demand-responsive, public shared-ride taxi service increased steadily from 2001 to 2011. No public shared-ride taxi systems were in operation in 1972 or 1963. In 2011, about 1,300 transit trips were made on an average weekday on the six public taxi systems in the Region. This represented an increase of about 18 percent from the 2001 average weekday ridership of about 1,100 transit trips on public taxi services.

In general, transit ridership in the Region and in the United States was in decline throughout the 1950s and 1960s. Ridership on public transit began a gradual growth in the mid-1970s with the initiation of publicly owned transit operations. Motor fuel price increases, in the mid and late 1970s, contributed to the ridership increases which peaked in 1980. Transit ridership in the Region then experienced a moderate decline through the 1980s and the early 1990s, and then increased somewhat through the year 2000. Since 2001, ridership has decreased in each year. Factors that have contributed to the general decline in transit ridership in the Region since 1980 include the location of housing and jobs outside established transit service areas; the continuing decline in population and employment density; the increase in household income and automobile ownership and use, particularly in

Table 4.13
Average Weekday Public Transit Trips in the Region by Service Type: 1963, 1972, 1991, 2001, and 2011

Service Type	Average Weekday Transit Trips[a]				
	1963	1972	1991	2001	2011
Fixed-Route (Bus)	320,500	184,200	172,200	142,200	118,400
Demand-Responsive (Shared-Ride Taxi)	--	--	200	1,100	1,300

Service Type	Change in Average Weekday Transit Trips							
	1963-2011		1972-2011		1991-2011		2001-2011	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Fixed-Route (Bus)	-202,100	-63.1	-65,800	-35.7	-53,800	-31.2	-23,800	-16.7
Demand-Responsive (Shared-Ride Taxi)	--	--	--	--	1,100	550.0	200	18.2

[a] *Average weekday transit trips shown in this table approximate the number of one-way trips made by transit between specific origins and destinations. Passengers are counted only once and transfers between routes are not counted as the transfer is a continuation of a single trip. Ridership figures are for publicly sponsored transit services for the general public. The data exclude special paratransit services directed at seniors and people with disabilities, including Federally required complementary paratransit services for people with disabilities operated by fixed-route bus systems. During 2011, approximately 972,400 annual passengers were carried on Federally required complementary paratransit services for people with disabilities in the Region, or about 11 percent less than the 1,099,200 annual passengers that were carried on complementary paratransit services in 2001, and about 118 percent more than the 446,300 annual passengers carried in 1991. Complementary paratransit services were not required or provided in 1972 or 1963.*

Source: SEWRPC

terms of the number of households with two or more vehicles; increases in transit adult cash fares to defer service reductions; and the inability, owing to lack of funding, to significantly improve and expand transit service to the entire metropolitan area, provide faster express transit and commuter transit service, and provide reasonably attractive and convenient frequent transit service.

Interregional Public Transit

Intercity Passenger Rail

In 2012, Amtrak provided intercity passenger rail service in Southeastern Wisconsin using track owned by Canadian Pacific Railway, with stops within the Region at the Milwaukee Intermodal Station in downtown Milwaukee, General Mitchell International Airport, and Sturtevant. Under contract with the State of Wisconsin and the State of Illinois, Amtrak operated seven daily Hiawatha Service trains (six on Sundays) in each direction between Milwaukee and Chicago, with intermediate stops at General Mitchell International Airport, Sturtevant, and Glenview. As part of its national network of train service, Amtrak operated one daily Empire Builder train in each direction between Seattle/Portland, Minneapolis-St. Paul, and Chicago, with intermediate stops in La Crosse, Tomah, Wisconsin Dells, Portage, Columbus, Milwaukee, and Glenview. East-bound Empire Builder trains stop at Milwaukee Intermodal Station only to drop off passengers, and west-bound Empire Builder trains stop at Milwaukee Intermodal Station only to pick up passengers.

By comparison, in 2001, under contract with the State of Wisconsin and the State of Illinois, Amtrak operated six daily Hiawatha Service trains (five on Sundays) in each direction between Milwaukee and Chicago and one daily Empire Builder train in each direction between Seattle/Portland, Minneapolis-St. Paul, Milwaukee, and Chicago. In 1991, nearly two years after the State of Wisconsin and the State of Illinois began contracting with Amtrak to provide the Hiawatha Service, Amtrak operated five daily Hiawatha Service trains (six on Fridays and Saturdays) in each direction between Milwaukee and Chicago and one daily Empire Builder train in each direction between Seattle/Portland, Minneapolis-St. Paul, Milwaukee, and Chicago. In 1972, Amtrak—which had assumed operation of most intercity passenger trains from the private railroad companies on May 1, 1971—operated three daily trains in each direction between Milwaukee and Chicago, two daily trains in each direction between Milwaukee, Chicago, and St. Louis, and two weekday trains in each direction between Chicago, Milwaukee, Minneapolis-St. Paul, and Seattle.

In 1963, intercity passenger trains in the United States were operated by private railroad companies and still provided extensive service in southeastern Wisconsin. At this time, passenger train service in the Region was provided by three railroads: the Chicago, Milwaukee, St. Paul and Pacific Railroad (known as the Milwaukee Road and predecessor to Canadian Pacific Railway); the Chicago and North Western Railway (predecessor to the Union Pacific Railroad); and the Soo Line Railroad (predecessor to the Canadian National Railway). Also during 1963, the Chicago, North Shore, and Milwaukee Railway (North Shore Line), one of the last electric interurban railways in the United States, ceased operations.

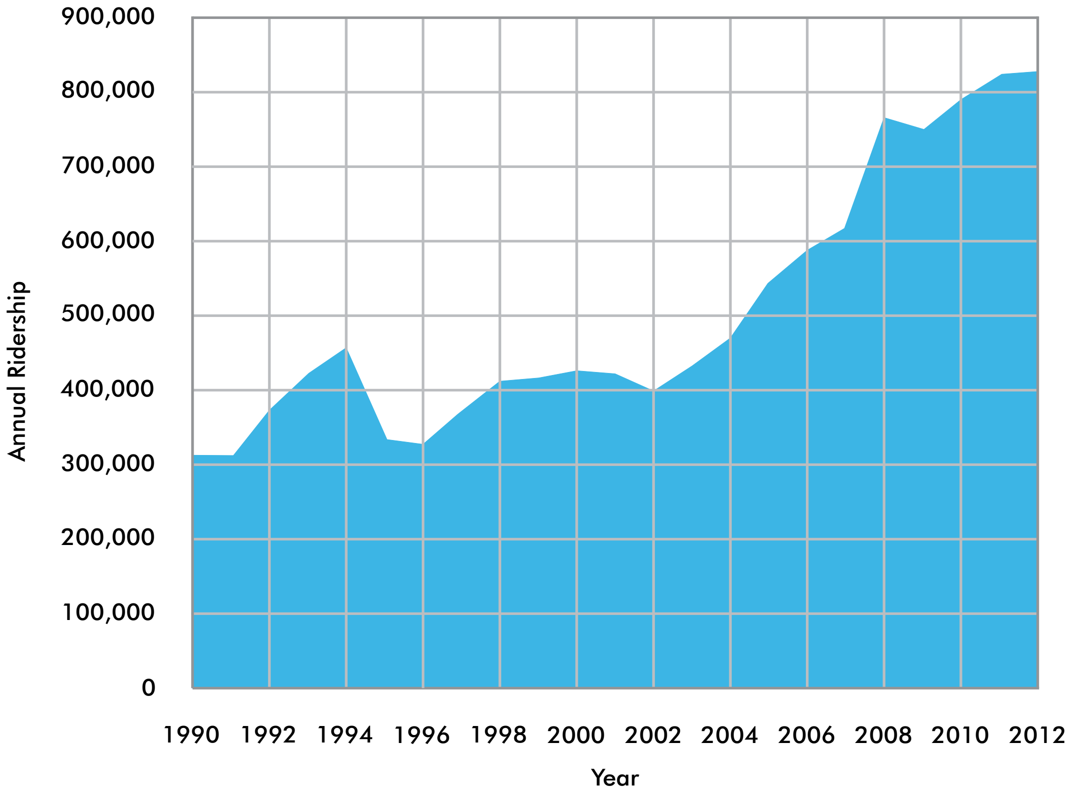
Amtrak Hiawatha Service Ridership

Ridership on Amtrak's Hiawatha Service between 1990 and 2012 is shown in Figure 4.11. Ridership on the Hiawatha Service increased from 312,404 in 1991 to 832,500 in 2012, a 166 percent increase. Following an increase in service from five daily trains (six on Fridays and Saturdays) in each direction to seven daily trains (six on Sundays) in October 1991, Hiawatha Service ridership increased from 312,404 in 1991 to 457,680 in 1994, a 47 percent increase. By 1996, Hiawatha Service ridership declined to 327,616, a 28 percent decrease, due in part to a significant reduction in service. In early 1995, as a result of an Amtrak system-wide restructuring and cost-cutting plan, Hiawatha Service fares were increased 50 percent and service was reduced from seven to four daily trains in each direction. By mid-1995 Hiawatha Service frequencies were increased to six daily trips per day (five on Sundays) in each direction. The Hiawatha Service maintained this level of service through 2002, and ridership increased from 327,616 in 1996 to 426,652 in 2000. Due in part to an economic recession, Hiawatha Service ridership declined slightly to 397,518 in 2002. Following a service increase to seven daily trips (six on Sundays) at the end of 2002, Hiawatha Service ridership increased from 397,518 in 2002 to 766,167 in 2008, a 93 percent increase. During this period, WisDOT added a new Hiawatha Service stop at General Mitchell International Airport in 2005, the Village of Sturtevant constructed a new station to replace its former station in 2006, and WisDOT opened the renovated Milwaukee Intermodal Station in downtown Milwaukee in 2007. Due in part to an economic recession, Hiawatha Service ridership declined to 741,780 in 2009. Hiawatha Service ridership steadily increased from 2010 to 2012, reaching 832,500 in 2012.

Commuter Rail

The only commuter rail service operated in the Region in 2012 was Metra's Union Pacific North Line between Kenosha and Chicago, with intermediate stops in the north shore suburbs of Northeastern Illinois. Metra is the commuter rail service division of the Regional Transportation Authority, which serves the six-county Northeastern Illinois Region. Service on this route was provided by the Union Pacific Railroad under contract with Metra and at no cost to Wisconsin residents. On weekdays in 2011, as in 2001 and 1993, this service consisted of nine commuter trains in each direction on weekdays between Kenosha and Chicago. In 1972, weekday commuter rail service in Southeastern Wisconsin consisted of nine trains in each direction between the City of Kenosha and Chicago; two trains in each direction between the City of Lake Geneva and

Figure 4.11
Annual Ridership on Amtrak Hiawatha Service: 1990-2012



Source: Amtrak

Chicago; one train in each direction between the Village of Walworth and Chicago; and one train in each direction between Watertown and Milwaukee, making intermediate stops throughout Waukesha and Milwaukee Counties. The Watertown-Milwaukee train—known as the Cannonball—was discontinued during 1972. In 1963, weekday commuter rail service consisted of the same trains operating in 1972 except that the Lake Geneva trains continued west to the Village of Williams Bay until their discontinuance in 1965.

Intercity Bus Services

In 2012, scheduled intercity bus services were provided by seven carriers: Badger Coaches, Inc.; Greyhound Lines, Inc.; Indian Trails, Inc.; Jefferson Lines, Inc.; Lamers Bus Lines, Inc.; Megabus; and Wisconsin Coach Lines. Service provided on weekdays by Badger Coaches included seven daily round-trips between Madison, downtown Milwaukee, and General Mitchell International Airport, one daily round-trip between Milwaukee and Eau Claire, and two daily round-trips between Milwaukee and Minneapolis-St. Paul. Service provided by Greyhound in Southeastern Wisconsin was centered in Milwaukee, which the carrier used as a regional hub at which passengers had the opportunity to transfer between buses. In 2012, Greyhound operated a total of 13 daily round-trips to and from Milwaukee. Most of these trips were Chicago-based, going to and from Madison, Minneapolis-St. Paul, and Green Bay. Daily service by Indian Trails included one bus trip in each direction between Milwaukee and Hancock, Michigan, with stops in Sheboygan, Manitowoc, Green Bay, Oconto, Peshtigo, Marinette, and many communities in Michigan's Upper Peninsula, including Escanaba, Marquette, L'Anse, Baraga, and Houghton. Daily service by Jefferson Lines included one bus trip in each direction between Milwaukee and Menomonie, including service to Green Bay, Wausau, and Eau Claire. Daily service by Lamers Bus Lines included one bus trip in each direction between Milwaukee and Wausau with intermediate stops in Stevens Point, Waupaca, New London, Appleton, Oshkosh, and Fond du Lac. In 2012, Megabus operated two round-trips daily from Milwaukee to Chicago and two round-trips daily from Milwaukee to Minneapolis. In 2012, Wisconsin Coach Lines operated 15 round-trips daily from Milwaukee to Chicago's O'Hare International Airport.

In 2001, scheduled intercity bus services were provided by four carriers: Badger Coaches, Inc.; Greyhound Lines, Inc.; Lamers Bus Lines, Inc.; and United Limo, Inc. Service provided on weekdays by Badger Coaches included seven daily round-trips between Madison, downtown Milwaukee, and General Mitchell International Airport. Service provided by Greyhound in Southeastern Wisconsin was centered in Milwaukee, which the carrier used as a regional hub at which passengers had the opportunity to transfer between buses. In 2001, Greyhound operated a total of 21 daily one-way bus trips to and from Milwaukee. Most of these trips were Chicago-based, going to and from Madison, Minneapolis-St. Paul, Green Bay, Stevens Point, Wausau, Minocqua, Marquette, and Calumet. Some of these bus trips made only limited stops and some made local stops. Daily service provided by Lamers Bus Lines included one bus trip in each direction between Milwaukee and Wausau with a stop in Appleton. Weekday service provided by United Limo, Inc., included 11 round-trips between downtown Milwaukee and Chicago O'Hare International Airport with a stop at General Mitchell International Airport. Together, the four intercity motor coach carriers operated a combined total of 58 weekday one-way bus trips.

In 1993, there were four intercity carriers providing service through the operation of 71 weekday one-way bus trips in the Region. Of these 71 weekday one-way bus trips, 39 trips were operated by Greyhound to Chicago, to various locations in Wisconsin and Upper Michigan, and to cities as far away as Minneapolis-St. Paul; 12 trips were operated by Badger Coaches between Milwaukee and Madison; 18 trips were operated by United Limo between Milwaukee and Chicago's O'Hare International Airport with stops at General Mitchell International Airport and at the interchanges of IH 94 and STH 20 in Racine County and IH 94 and STH 50 in Kenosha County; and two trips were operated by Lamers Bus Lines between Milwaukee and Wausau with a stop in Appleton.

In 1972, there were six intercity carriers providing service through the operation of 142 weekday one-way bus trips in the Region. Of these 142 weekday one-way bus trips, 96 trips were operated by Greyhound to Chicago, to and from various locations in Wisconsin and Upper Michigan, and to cities as far away as Seattle; 12 trips were operated by Tri-State Coach Lines, Inc., between Milwaukee and Chicago's O'Hare International Airport; eight trips were operated by Wisconsin-Michigan Coach Lines, Inc., between Milwaukee and Green Bay, Sister Bay, and Marshfield; four trips were operated by Peoria-Rockford Bus Company between Milwaukee, Rockford, and Dixon, Illinois; 14 trips were operated by Badger Coaches between Milwaukee and Madison; and a total of eight intercity trips were operated by Wisconsin Coach Lines, with four trips operated between Milwaukee and Fond du Lac, and four trips between Milwaukee and Rockford, Illinois.

In 1963, there were four private intercity motor coach carriers providing interregional bus service to and from Southeastern Wisconsin. These included Greyhound Lines, Badger Coaches, Peoria-Rockford Bus Company, and Wisconsin Coach Lines. Greyhound provided by far the greatest amount of service with Milwaukee serving as a regional network hub for routes radiating from Milwaukee to Chicago using two routes, along IH 94/USH 41 and through Racine; to Madison using three routes, along IH 94, through Oconomowoc and Watertown, and through Waukesha and Fort Atkinson; to Minneapolis-St. Paul and Seattle using two routes, through Columbus and Portage and through Madison; to Dubuque through Madison; to Stevens Point using two routes, through Hartford and Beaver Dam, and through Fond du Lac and Appleton; to Duluth-Superior via Fond du Lac and Stevens Point, and to Green Bay using three routes, through Fond du Lac, through Plymouth, and through Sheboygan. Many of the Green Bay buses continued north to various northern Wisconsin and Upper Michigan communities. Greyhound also operated a route between Chicago and Madison via Lake Geneva and Whitewater. Weekday scheduled bus frequencies varied from a low of one or two bus trips in each direction on some routes to a high of 23 bus trips in each direction between Milwaukee and Chicago. Badger Coaches operated between Milwaukee and Madison along IH 94 providing seven scheduled weekday bus trips in each direction. Peoria-Rockford operated between Milwaukee and Rockford via Whitewater and Janesville providing two scheduled weekday bus trips in each direction. Wisconsin Coach Lines operated three intercity bus routes radiating out of Milwaukee: Milwaukee to Fond du Lac via West Bend with two weekday trips in each direction; Milwaukee to Rockford, Illinois via Lake Geneva with four weekday trips in each direction; and Milwaukee to Watertown via Oconomowoc with three weekday trips in each direction.

Passenger and Automobile Ferry Service

In 2012, a passenger and car cross-lake ferry was operated by Lake Express between Milwaukee and Muskegon, Michigan, with two daily scheduled round-trips from May to October and an extra third round-trip in July and August. This service was initiated in 2004 (no cross-lake ferry service was provided to the Region from 1984 to 2003).

In 1972, cross-lake car ferry service on Lake Michigan was operated by the Chesapeake & Ohio Railway Company between Milwaukee and Ludington, Michigan. This service, which carried passengers, automobiles, and railway freight cars, had two scheduled weekday departures from each port during the summer season and was discontinued in 1984. In 1963, cross-lake ferry service serving Southeastern Wisconsin was operated across Lake Michigan by three carriers. Service between Milwaukee and Ludington, Michigan was operated by the Chesapeake & Ohio Railway Company and carried passengers, automobiles, and railroad freight cars on three scheduled round-trips per day. Service between Milwaukee and Muskegon, Michigan was provided by two carriers. The Wisconsin and Michigan Steamship Company, which operated the Milwaukee Clipper, carried passengers and automobiles on one scheduled daily round-trip; and the Grand Trunk Western Railway carried railroad freight cars and passengers on one to two regular daily round-trips, depending on railroad traffic.

Scheduled Air Carrier Service

Scheduled air carrier service to and from Milwaukee County's General Mitchell International Airport was provided by eight airline companies in 2012. These airline companies included: Air Canada, AirTran Airways, American Airlines, Delta, Frontier, Southwest Airlines, United Airlines, and US Airways. In 2012, these carriers provided over 800 scheduled nonstop weekday flights between Mitchell International and 36 other cities or metropolitan areas. Cities with 10 or more nonstop weekday flights to or from Milwaukee included: Atlanta; Charlotte; Chicago; Dallas-Fort Worth;

Table 4.14
Number of Interregional Person Trips on an Average Weekday on Intercity Modes in the Region: 1963, 1972, 1993, 2001, and 2011

Mode	1963 Number	1963 Percent of Total	1972 Number	1972 Percent of Total	1993 Number	1993 Percent of Total
Intercity Motor Bus	2,000	1.0	1,300	0.7	1,300	0.4
Intercity Rail	4,000	2.0	900	0.3	1,800	0.5
Cross-Lake Car Ferry	1,200	0.6	700	0.4	--	--
Commercial Air Carrier	2,600	1.3	6,200[a]	3.3	12,600[b]	3.8
Personal Vehicle	191,700	95.1	176,900	95.1	317,400[c]	95.3
Total	201,500	100.0	186,000	100.0	333,100	100.0

Mode	2001 Number	2001 Percent of Total	2011 Number	2011 Percent of Total
Intercity Motor Bus	1,200	0.3	1,600	0.4
Intercity Rail	1,900	0.4	2,800	0.6
Cross-Lake Car Ferry	--	--	300	0.1
Commercial Air Carrier	16,400	4.0	18,800	4.4
Personal Vehicle	394,900	95.3	403,800	94.5
Total	414,400	100.0	427,300	100.0

[a] *Survey taken in 1971.*

[b] *Survey taken in 1989.*

[c] *Survey taken in 1991.*

Source: SEWRPC

Minneapolis-St. Paul; Philadelphia; New York; and Washington, DC. In comparison, six airline companies provided flights from Milwaukee in 1971, increasing to 16 in 1989 and 19 in 2001. These airlines provided nonstop service to 32 cities in 1971, 33 cities in 1989, and 50 cities in 2001.

Interregional Person Trips

Table 4.14 displays an estimate of existing and historic interregional person trips on an average weekday, including travel on interregional public transit modes of intercity rail and bus, commercial air carrier, and car ferry, and also travel by personal vehicle. Interregional travel by personal vehicle has consistently accounted for about 95 percent of total interregional travel within Southeastern Wisconsin over the past 50 years.

4.4 PARK-RIDE FACILITIES

Park-ride facilities enable more efficient travel within Southeastern Wisconsin through transfer of mode between private vehicle and public transit, and between single occupant private vehicles and carpools, and also from bicycle to transit and carpools. In 2012, there were 52 park-ride lots serving intra-regional travel within the Region, with 39 served by commuter or express transit bus service. In comparison, in 2004, there were 48 park-ride lots serving intra-regional travel within the Region, with 35 served by commuter or express transit bus service. In 1991, there were 37 park-ride lots within Southeastern Wisconsin, including 19 served by public transit, and eight park-ride lots all served by public transit in 1972.

Park-Ride Lots Served by Transit

In 2012, commuter or express transit bus service was provided to 39 park-ride lots within the Region, as shown on Map 4.17 and in Table 4.15. These intermodal parking facilities provided 6,875 parking spaces. The utilization of parking spaces at all park-ride lots served by transit in 2012 ranged from a high of 134 percent at the IH 43 and CTH C park-ride lot in the Town of Grafton to a low of 18 percent at the West Loomis Road park-ride lot in the

Map 4.17
Existing Park-Ride Lots and Transit Stations Located in the Region

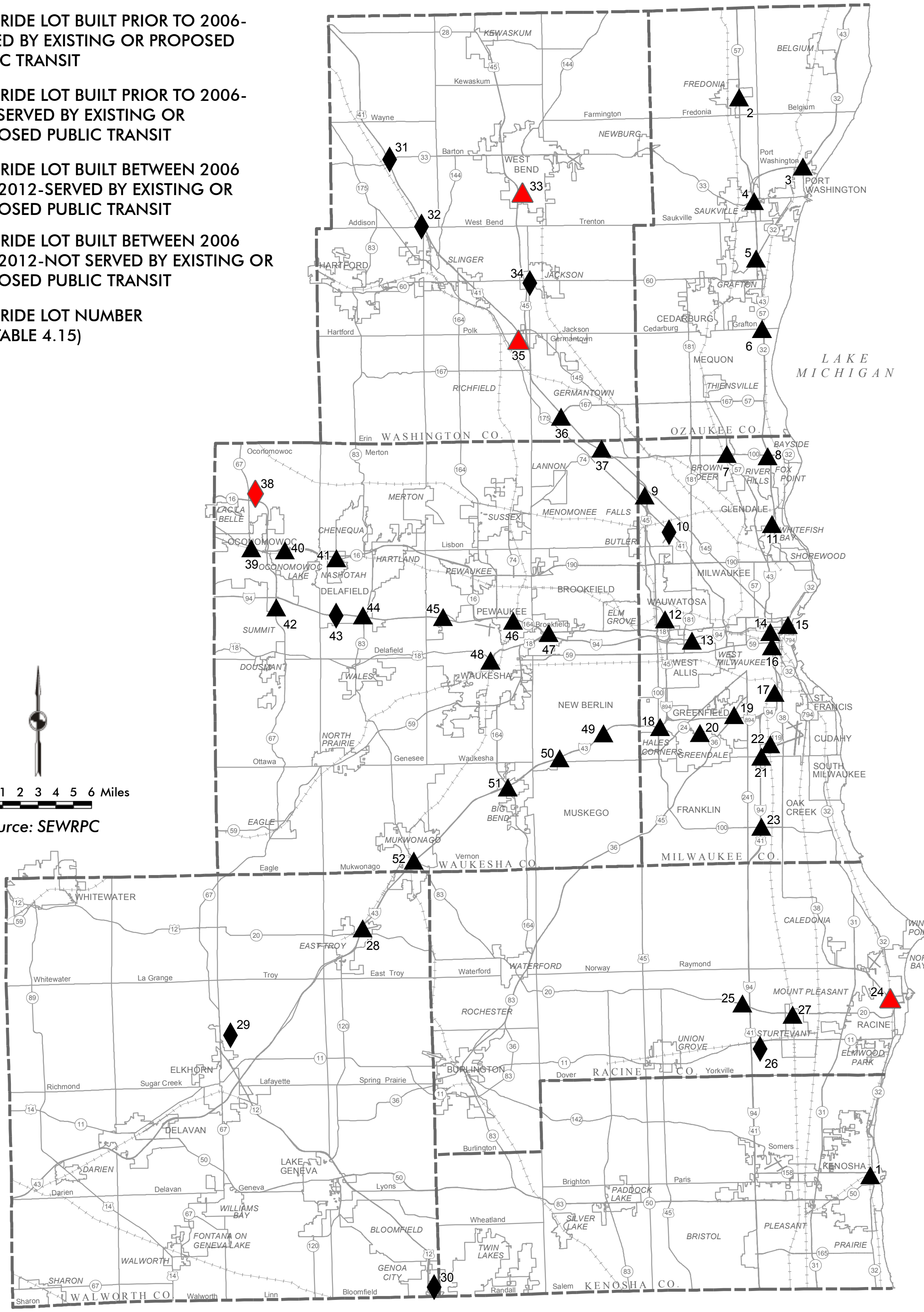
PARK-RIDE LOT BUILT PRIOR TO 2006-SERVED BY EXISTING OR PROPOSED PUBLIC TRANSIT

PARK-RIDE LOT BUILT PRIOR TO 2006-NOT SERVED BY EXISTING OR PROPOSED PUBLIC TRANSIT

PARK-RIDE LOT BUILT BETWEEN 2006 AND 2012-SERVED BY EXISTING OR PROPOSED PUBLIC TRANSIT

PARK-RIDE LOT BUILT BETWEEN 2006 AND 2012-NOT SERVED BY EXISTING OR PROPOSED PUBLIC TRANSIT

52 PARK-RIDE LOT NUMBER (SEE TABLE 4.15)



0 1 2 3 4 5 6 Miles

Source: SEWRPC

Table 4.15
Average Weekday Use of Park-Ride Lots and Transit Stations: 2012

No. On Map 4.17	Location	Served by Transit	Not Served by Transit	Shared Use	Available Parking Spaces	Autos Parked on an Average Weekday: 2012	Percent of Spaces Used
Kenosha County							
1	Metra Station (Kenosha)	X		X	145	--[a]	--[a]
Ozaukee County							
2	STH 57 and CTH H (Fredonia)		X		60	10	17
3	IH 43 and STH 32-CTH H (Port Washington)	X			50	21	42
4	Wal-Mart (Saukville)	X		X	50	13	26
5	IH 43 and CTH V (Grafton)	X			85	30	35
6	IH 43 and CTH C (Grafton)	X			65	87	134
Milwaukee County							
7	Kohl's (Brown Deer)	X		X	130	57	44
8	Brown Deer (River Hills)	X			360	98	27
9	W. Good Hope Road (Milwaukee)	X			135	36	27
10	Timmerman Field (Milwaukee)		X		140	6	4
11	North Shore (Glendale)	X			195	98	50
12	W. Watertown Plank Road (Wauwatosa)	X			240	90	38
13	State Fair Park (Milwaukee)	X			285	186	65
14	Downtown Milwaukee Intermodal Amtrak Station	X			240	--[a]	--[a]
15	Milwaukee County Transit System Downtown Transit Center (Milwaukee)	X		X	--[b]	--[a]	--[a]
16	National Avenue and IH 43/94 (Milwaukee)	X		X	55	--[a]	--[a]
17	W. Holt Avenue (Milwaukee)	X			235	87	37
18	Whitnall (Hales Corners)	X			360	205	57
19	W. Loomis Road (Greenfield)	X			410	75	18
20	Southridge (Greendale)	X		X	170	57	34
21	W. College Avenue (Milwaukee)	X			650	257	40
22	Mitchell Airport Amtrak Station (Milwaukee)	X			280	178	64
23	W. Ryan Road (Oak Creek)	X			305	164	54
Racine County							
24	Racine Metro Transit Center (Racine)	X			120	--[a]	--[a]
25	IH 94 and STH 20 (Ives Grove)	X			75	65	87
26	IH 94 and STH 11 (Mount Pleasant)		X		60	48	80
27	Sturtevant Amtrak Station (Sturtevant)	X			180	--[a]	
Walworth County							
28	East Troy Municipal Airport (East Troy)		X		40	7	18
29	USH 12 and STH 67 (Elkhorn)		X		40	13	33
30	USH 12 and CTH P (Genoa City)		X		40	10	25
Washington County							
31	USH 41 and STH 33 (Allenton)		X		35	48	137
32	USH 41 and CTH K (Addison)		X		50	11	22
33	USH 45 and Paradise Drive (West Bend)	X			100	123	123
34	STH 60 and CTH P (Jackson)		X		30	10	33
35	USH 41 and Pioneer Road (Richfield)	X			280	75	27
36	USH 41 and Lannon Road (Germantown)	X			155	132	85

Table continued on next page.

Table 4.15 (Continued)

No. On Map 4.17	Location	Served by Transit	Not Served by Transit	Shared Use	Available Parking Spaces	Autos Parked on an Average Weekday: 2012	Percent of Spaces Used
Waukesha County							
37	Pilgrim Road (Menomonee Falls)	X			70	36	51
38	STH 67 and Lang Road (Oconomowoc)		X		35	6	17
39	Collins Street Parking Lot (Oconomowoc)	X		X	--[b]	--[a]	--[a]
40	STH 16 and CTH P (Oconomowoc)	X			45	9	20
41	STH 16 and CTH C (Nashotah)	X			60	13	22
42	STH 67 and CTH DR (Summit)	X			100	56	56
43	IH 94 and CTH C (Delafield)		X		30	25	83
44	IH 94 and STH 83 (Delafield)	X			200	70	35
45	IH 94 and CTH G/CTH SS (Pewaukee)	X			245	69	28
46	IH 94 and CTH F (Pewaukee)		X		85	35	41
47	Goerke's Corners (Brookfield)	X			315	216	69
48	Waukesha Metro Transit Downtown Transit Center (Waukesha)	X		X	--[b]	--[a]	--[a]
49	IH 43 and Moorland Road (New Berlin)	X			175	33	19
50	IH 43 and CTH Y (New Berlin)		X		45	19	42
51	IH 43 and STH 164 (Big Bend)	X			145	54	37
52	IH 43 and STH 83 (Mukwonago)	X			165	66	40
	Total	39	13	8	7,565	3,004	40

[a] *Data not available.*

[b] *Parking available within larger public lot or structure.*

Source: SEWRPC

City of Greenfield. In addition to the IH 43 and CTH C site, other park-ride lots served by transit with utilization rates greater than 60 percent include: State Fair Park in the City of Milwaukee; the Mitchell Airport Amtrak station; IH 94 and STH 20 in the Town of Yorkville; USH 45 and Paradise Drive in the City of West Bend; USH 45 and Lannon Road in the Village of Germantown; and IH 94 at CTH Y (Goerke's Corners) in the Town of Brookfield. On an average weekday during 2012, 40 percent of the 6,875 parking spaces at park-ride lots served by transit were in use.

Park-Ride Lots Not Served by Transit

In 2012, there were 13 park-ride lots not served by transit located within the Region containing 690 parking spaces as shown on Map 4.17 and in Table 4.15. The utilization of parking spaces on an average weekday at the individual park-ride lots not served by transit varied from a high of 137 percent at the USH 41 and STH 33 park-ride lot in Allenton in the Town of Addison to a low of 4 percent at the Timmerman Field park-ride lot in the City of Milwaukee. In addition to the US 41 and STH 33 site, other park-ride lots not served by transit with average weekday utilization rates greater than 60 percent included IH 94 and STH 11 in the Village of Mount Pleasant and IH 94 and CTH C in the City of Delafield. On an average weekday during 2012, 36 percent of the 690 parking spaces at park-ride lots not served by transit were in use.

4.5 BICYCLE AND PEDESTRIAN FACILITIES

This section of the chapter documents the existing bicycle and pedestrian facilities in the Region associated with the arterial street and highway system and public transit system, including the accommodation of bicycles on the Region's arterial street and highway system and the provision of a system of off-street bicycle paths connecting the Region's urban centers and communities.

Accommodation of Bicycles on the Arterial Street and Highway System

On arterial streets and highways with a rural cross-section, bicycles may be accommodated with a four-foot paved shoulder and six-foot gravel shoulder on a two traffic-lane facility, and with an eight-foot paved shoulder on a four-traffic lane facility. On arterial streets with an urban cross-section, bicycles may be accommodated with bicycle lanes five to six feet in width, or with a widened outside lane of 14 feet. Accommodations may also be provided on urban and rural arterials with parallel, physically separate paths of eight to 12 feet in width (five to six feet for one-way paths) and ten feet of separation from the travel lanes. In addition, although not identified as an accommodation in the 2035 regional transportation plan because none existed when the plan was developed, enhanced bicycle facilities—such as protected bicycle lanes, buffered bicycle lanes, and green lanes—represent a newer type of bicycle accommodation.[35] Map 4.18 identifies those 882 miles of arterial streets and highways that provided accommodation through paved shoulders, bicycle lanes, enhanced bicycle facilities, or separate paths in 2014. Data are not available to identify those urban arterials with outside lanes of 14 feet in width which also accommodate bicycles.

Off-Street Bicycle Paths

Map 4.19 displays the existing 283 miles of regional off-street bicycle paths (including 28 miles of paths that were not previously in the regional transportation plan) largely developed within former railway right-of-ways and parkway corridors in 2014. These paths are envisioned, upon completion, to connect the Region's major urban centers—Milwaukee, Racine, Kenosha, and Waukesha—and the Region's urban communities. These paths provide particularly safe and aesthetically attractive routes with separation from motor vehicle traffic.

4.6 TRANSPORTATION MANAGEMENT AND OPERATIONS SYSTEMS

Regional transportation system management and operations systems currently exist on the regional freeway system, selected elements of the surface arterial street and highway system, and the public transit system. The goals of these systems include improving operations, reducing travel time, improving safety, and reducing operating costs.

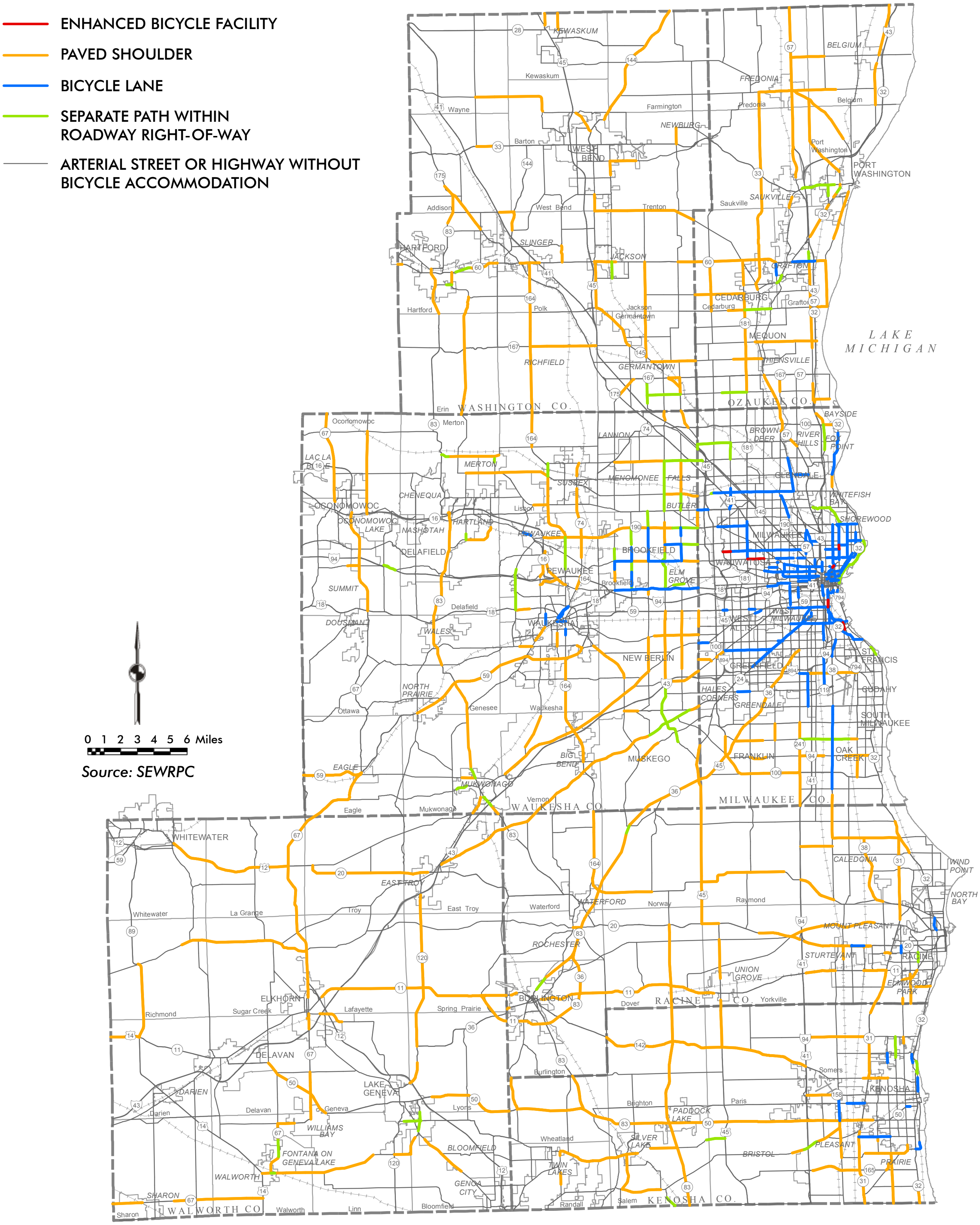
Freeway Traffic Management and Operation System

The existing freeway traffic management system in Southeastern Wisconsin consists of many elements that are often referred to as intelligent transportation systems. The elements of the Southeastern Wisconsin freeway traffic management system include: traffic detectors, ramp metering, high-occupancy vehicle bypass ramps, ramp gates, variable message signs, highway advisory radio, closed-circuit television, service patrols, crash investigation sites, and enhanced reference markers.

Traffic detectors measure the speed, volume, and density of freeway traffic. These data are monitored at WisDOT's State Traffic Operation Center (TOC) in Milwaukee for disruptions in traffic flow and for use in determining the operation of the ramp meter system in the Region. Congestion information derived from the speed, volume, and density data collected via the detectors is mapped, and may be viewed by the traveling public through WisDOT's

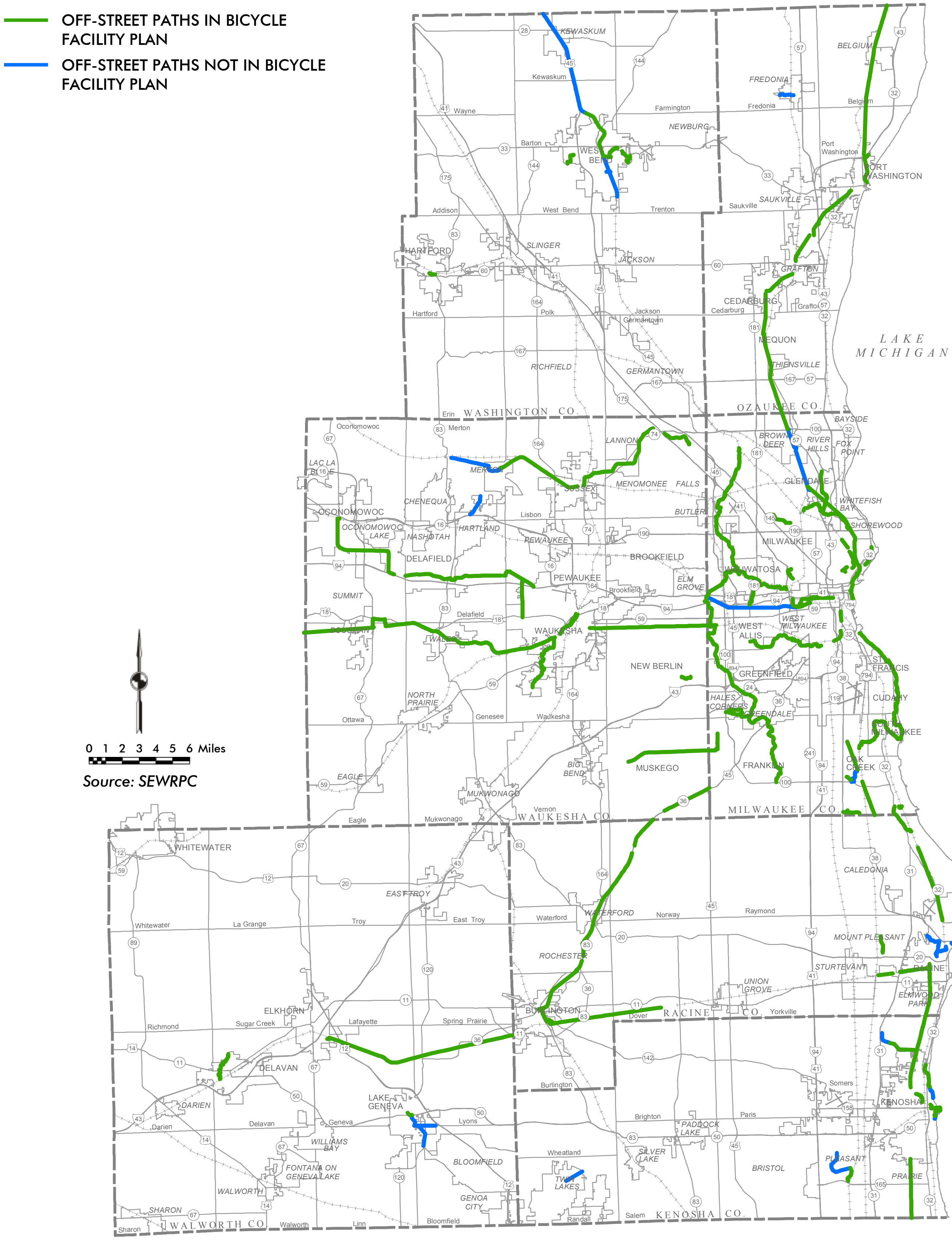
[35] In Volumes II and III of this report, the definition for enhanced bicycle facilities was expanded to include separate paths within the road right-of-way.

Map 4.18
Accommodation of Bicycles on the Surface Arterial Street and Highway System: 2014



Source: SEWRPC

Map 4.19
Existing Off-Street Bicycle Paths: 2014



Source: SEWRPC

website. In 2013, the traffic detectors were located throughout the Milwaukee area freeway system, including the freeways in Milwaukee County, IH 94 and portions of IH 43 and STH 16 in Waukesha County, and portions of IH 43 in Ozaukee County, and on the freeways in Racine and Kenosha Counties. The spacing of these traffic detectors is about one-half mile on most of the freeways in Milwaukee County and on portions of IH 94 in eastern Waukesha County, and about one to two miles on the remaining freeway segments.

In 2013, 121 freeway on-ramps were equipped with ramp meters and attendant traffic detectors in Southeastern Wisconsin. The metered on-ramps are located adjacent to and upstream of freeway segments that experience traffic congestion during the morning and evening peak-traffic periods. In 2013, preferential access was provided at 51 freeway on-ramps to high-occupancy vehicles.[36] Map 4.20 and Table 4.16 indicate the location and ramp meter type provided on the freeway system in Southeastern Wisconsin.

Variable message signs provide real-time information to travelers about downstream freeway traffic conditions. WisDOT uses the variable message signs to display current travel times to selected areas and to display information about lane and ramp closures as well as where travel delays begin and end. In the event of a child abduction, the variable message signs are also used to display an AMBER alert. In 2013, there were 31 variable message signs at fixed locations on the freeway system in Southeastern Wisconsin as shown on Map 4.21 and in Table 4.17, as well as 13 portable variable message signs used primarily for special events and incident management.

Highway advisory radio is a system of low-power radio transmitters licensed for state use. WisDOT uses highway advisory radio to transmit pre-recorded messages in areas with ongoing highway construction projects as well as information regarding special events to the motoring public. In the event of a child abduction, the highway advisory radio system is also used to broadcast the AMBER alert. Roadside signing with flashing beacons is used to advise motorists of the specific locations of individual transmitters and the frequency to which they need to tune to receive the transmission.

In 2013, 159 closed-circuit television cameras (see Map 4.21 and Table 4.17) provided live video of traffic conditions. The video provided by these cameras allows for the identification and confirmation of congested areas and incident locations. Video is monitored at the TOC in Milwaukee. Video is supplied to some emergency response agencies so that their dispatchers can provide personnel with incident locations and information. WisDOT also provides some of its camera images to the media and to its website for viewing by the general public.

Freeway service patrols assist disabled motorists with specially equipped vehicles. When freeway service patrols encounter severe incidents, they have the appropriate communication equipment to ensure that the appropriate personnel and equipment may be dispatched to the scene, prior to arrival by a first responder. In 2013, there were freeway service patrols in Milwaukee County (see Map 4.22 and Table 4.18). The patrol service is operated by the Milwaukee County Sheriff's Department and consists of a special fleet of two vehicles dedicated to handling and clearing incidents on weekdays from 6:00 a.m. to 10:00 p.m. In previous years, patrols were also used in Kenosha, Racine, and Waukesha Counties, but those services were eliminated in 2013 due to budgetary reasons. Temporary service patrols were also operated in

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[36] *In Southeastern Wisconsin, a high-occupancy vehicle is defined as a transit vehicle or passenger vehicle with a minimum of two occupants.*

Map 4.20
Locations of Ramp Meters on the Existing Freeway System in the Region: 2013

EXISTING FREEWAY RAMP METER

EXISTING FREEWAY RAMP METER WITH HIGH-OCCUPANCY VEHICLE BYPASS

121 REFERENCE NUMBER (SEE TABLE 4.16)

Source: Wisconsin Department of Transportation and SEWRPC

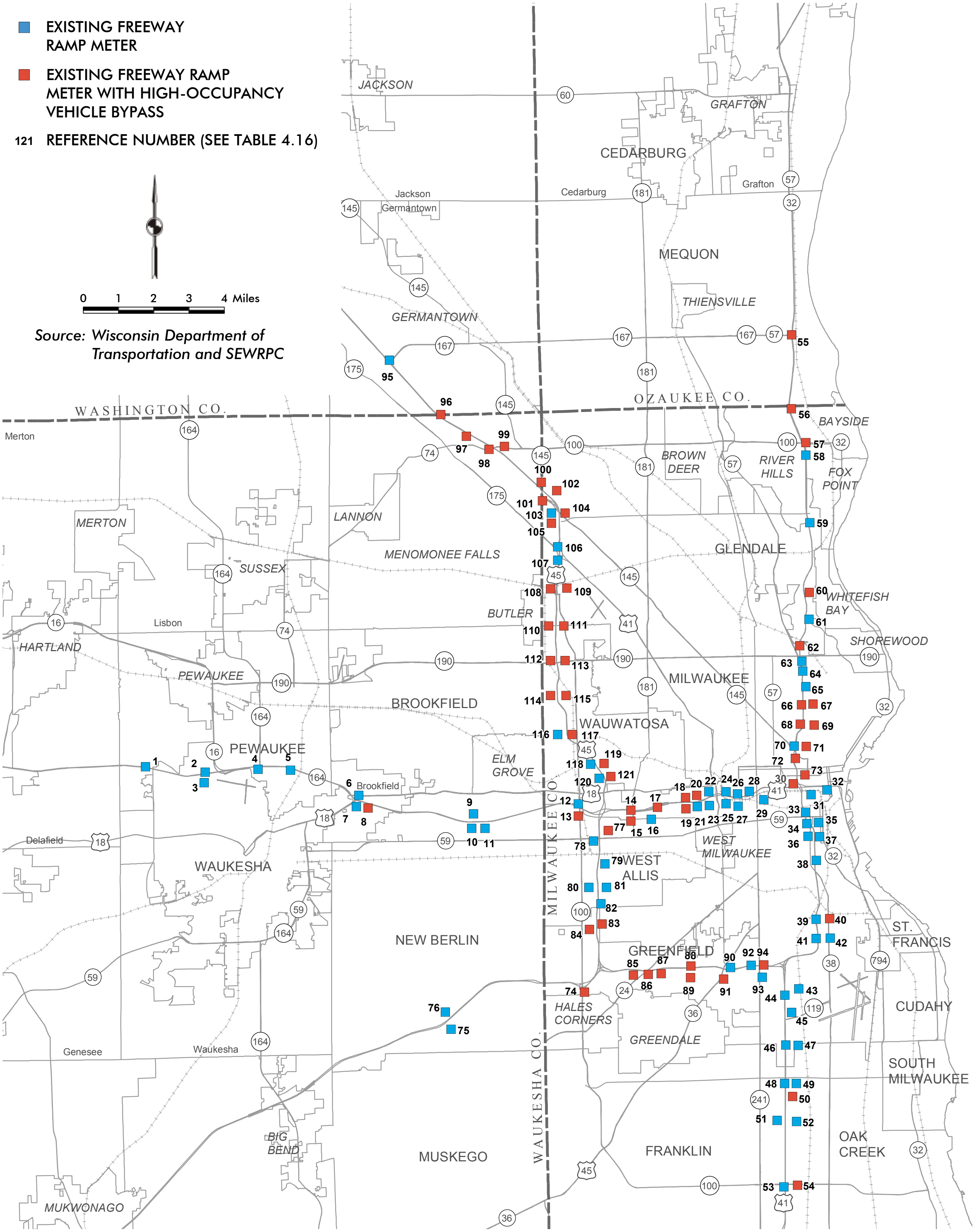


Table 4.16
Locations of Ramp Meters on the Existing Freeway System in the Region: 2013

Reference Number[a]	Ramp Meter Location
IH 94 East-West Corridor	
1	Westbound at CTH G
2	Westbound at CTH T (Grandview Boulevard)
3	Eastbound at CTH T (Grandview Boulevard)
4	Eastbound at STH 164 / CTH J
5	Eastbound at STH 83
6	Westbound at CTH JJ
7	Eastbound at USH 18
8	Eastbound at Barker Road
9	Westbound at CTH O (Moorland Road)
10	CTH O (Moorland Road) Southbound to Eastbound IH 94
11	CTH O (Moorland Road) Northbound to Eastbound IH 94
12	Westbound at STH 100 (S. 108th Street)
13	Eastbound at STH 100 (S. 108th Street)
14	Westbound at STH 181 (N. 84th Street)
15	Eastbound at STH 181 (N. 84th Street)
16	Westbound at N. 70th Street
17	Eastbound at N. 68th Street
18	Westbound at Hawley Road
19	Eastbound at Hawley Road
20	Eastbound at Mitchell Boulevard
21	Westbound at Mitchell Boulevard
22	USH 41 Southbound to Westbound IH 94
23	USH 41 Southbound to Eastbound IH 94
24	STH 341 Northbound to Eastbound IH 94
25	STH 341 Northbound to Westbound IH 94
26	Westbound at N. 35th Street
27	Eastbound at N. 35th Street
28	Westbound at N. 28th Street
29	Eastbound at N. 25th Street
30	Westbound at W. Tory Hill Street and N. 11th Street
31	Westbound at N. 7th Street and W. Clybourn Avenue
32	Northbound/Southbound at N. 2nd Street and W. Clybourn Avenue
IH 94 South Corridor	
33	Northbound at S. 6th Street and Mineral Street
34	Southbound at S. 9th Street and Mineral Street
35	Southbound at Lapham Boulevard (C-D)
36	Southbound at Lapham Boulevard
37	Northbound at Lapham Boulevard
38	Southbound at Becher Street
39	Southbound at Holt Avenue
40	Northbound at Holt Avenue
41	Southbound at W. Howard Avenue
42	Northbound at W. Howard Avenue
43	Northbound at CTH Y (W. Layton Avenue)
44	Southbound at CTH Y (W. Layton Avenue)
45	STH 119 Westbound to Northbound IH 94
46	Southbound at CTH ZZ (W. College Avenue)
47	Northbound at CTH ZZ (W. College Avenue)
48	Southbound at CTH BB (W. Rawson Avenue)
49	Westbound CTH BB (W. Rawson Avenue) to Northbound IH 94
50	Eastbound CTH BB (W. Rawson Avenue) to Northbound IH 94
51	Southbound at Drexel Avenue
52	Northbound at Drexel Avenue
53	Southbound at STH 100 (W. Ryan Road)
54	NB at STH 100 (W. Ryan Road)
IH 43 North Corridor	
55	Southbound at STH 57/167 (Mequon Road)
56	Southbound at Milwaukee—Ozaukee County Line Road
57	Eastbound STH 100 (W. Brown Deer Road) to Southbound IH 43
58	Westbound STH 100 (W. Brown Deer Road) to Southbound IH 43
59	Southbound at CTH PP (W. Good Hope Road)
60	Southbound at W. Silver Spring Drive
61	Southbound at W. Hampton Avenue
62	Southbound at Green Bay Avenue
63	Southbound at N. 9th Street and W. Abert Place
64	Northbound at Atkinson Avenue
65	Southbound at W. Keefe Avenue
66	Southbound at W. Locust Street
67	Northbound at W. Locust Street
68	Southbound at W. North Avenue
69	Northbound at W. North Avenue
70	Southbound at W. Fond du Lac Avenue (W. McKinley Avenue)
71	Northbound at W. Fond du Lac Avenue
72	Northbound at W. Highland Avenue and W. Kilbourn Avenue
73	Southbound at W. Wisconsin Avenue
74	Northbound at STH 100 (S. 108th Street)
75	Northbound at Moorland Road Northbound
76	Northbound at Moorland Road Southbound
IH 894 Corridor	
77	Northbound at STH 59 (W. Greenfield Avenue)
78	Southbound at STH 59 (W. Greenfield Avenue)
79	Northbound at W. Lincoln Avenue
80	Southbound at W. National Avenue
81	Northbound at W. National Avenue
82	Northbound at CTH NN (W. Oklahoma Avenue)
83	Northbound at W. Beloit Road
84	Southbound at W. Beloit Road
85	Westbound at S. 84th Street
86	Eastbound at W. Forest Home Avenue
87	Eastbound at S. 76th Street
88	Westbound at S. 60th Street
89	Eastbound at S. 60th Street
90	Westbound at STH 36 (S. Loomis Road)
91	Eastbound at STH 36 (S. Loomis Road)
92	Southbound WIS 241 (S. 27th Street) to Westbound IH 894
93	Northbound WIS 241 (S. 27th Street) to Westbound IH 894
94	Southbound at STH 241 (S. 27th Street) to Eastbound IH 894
USH 45 Corridor	
95	Southbound at Lannon Road
96	Southbound at CTH Q (Washington—Waukesha County Line Road)
97	Southbound at Pilgrim Road
98	Southbound at STH 74 (Main Street)
100	Northbound at N. 124th Street (Waukesha—Milwaukee County Line)
102	Northbound STH 145 to Northbound USH 45
103	Westbound CTH PP (W. Good Hope Road) to Southbound USH 45
104	Northbound at CTH PP (W. Good Hope Road)

Table continued on next page.

Table 4.16 (Continued)

Reference Number[a]	Ramp Meter Location
USH 45 Corridor (Continued)	
105	Eastbound CTH PP (W. Good Hope Road) to Southbound USH 45
106	Northbound at USH 41 (W. Appleton Avenue)
107	Southbound at STH 175 (W. Appleton Avenue)
108	Southbound at CTH E (W. Silver Spring Drive)
109	Northbound at CTH E (W. Silver Spring Drive)
110	Southbound at CTH EE (W. Hampton Avenue)
111	Northbound at CTH EE (W. Hampton Avenue)
112	Southbound at STH 190 (W. Capitol Drive)
113	Northbound at STH 190 (W. Capitol Drive)
114	Southbound at W. Burleigh Street
115	Northbound at W. Burleigh Street
116	Southbound at W. North Avenue
117	Northbound at W. North Avenue
118	Southbound at Watertown Plank Road
119	Northbound at Watertown Plank Road
120	Southbound at N. 97th Street and W. Wisconsin Avenue
121	Northbound at W. Wisconsin Avenue

[a] *See Map 4.20.*

Source: Wisconsin Department of Transportation and SEWRPC

addition to the Milwaukee County patrol services along segments of freeway that were under construction during 2013, such as the Hoan bridge, portions of IH 94 in Kenosha County, and segments of IH 94 and USH 45 as part of the Zoo Interchange project.

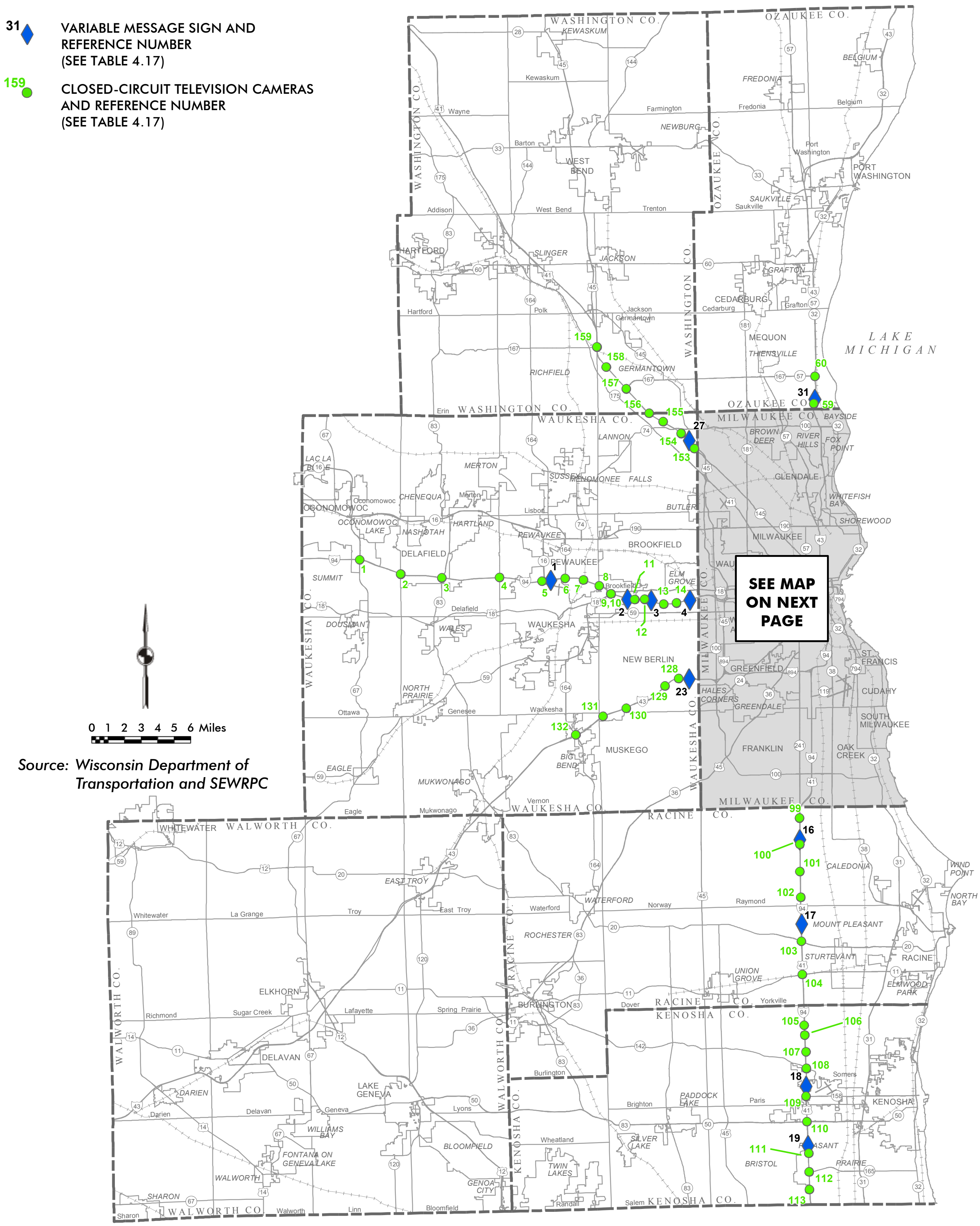
Crash investigation sites are designated safe zones for distressed motorists to relocate to if they are involved in a crash or an incident on the freeway. In 2013, there were 32 crash investigation sites (see Map 4.22 and Table 4.18) on the freeway system in Southeastern Wisconsin. These sites are intended for use by motorists involved in an incident to exchange insurance information or to make emergency repairs to their vehicle following a minor collision or breakdown. These sites are also used by the freeway service patrols to relocate the distressed motorists they assist.

Enhanced reference markers are designed to save time in identifying locations of disabled motorists to improve emergency response times to highway incidents. Enhanced reference markers can improve emergency response times, improve traffic incident clearance times, reduce crash related delays, and reduce the number of secondary crashes. In Southeastern Wisconsin, as of 2013, enhanced reference markers have been installed in the freeway median at each one-tenth or two-tenths of a mile on IH 94 through Waukesha, Milwaukee, Racine, and Kenosha Counties; on USH 45 from the Zoo Interchange in Milwaukee County to the Waukesha-Washington County line; on IH 43 in Waukesha County and from the Marquette Interchange to North Avenue in Milwaukee County; and on IH 794 in Milwaukee County.

In 2013, ramp closure devices were deployed at interchanges on IH 94 in Kenosha, Milwaukee, Racine, and Waukesha Counties; on IH 43 in Milwaukee, Waukesha, and Walworth Counties; and on IH 794 and IH 894 in Milwaukee County. The ramp closure devices were typically swing arm gates. These ramp closure devices allow for the closure of freeway on-ramps during planned and unplanned major incidents, such as special events and severe inclement weather.

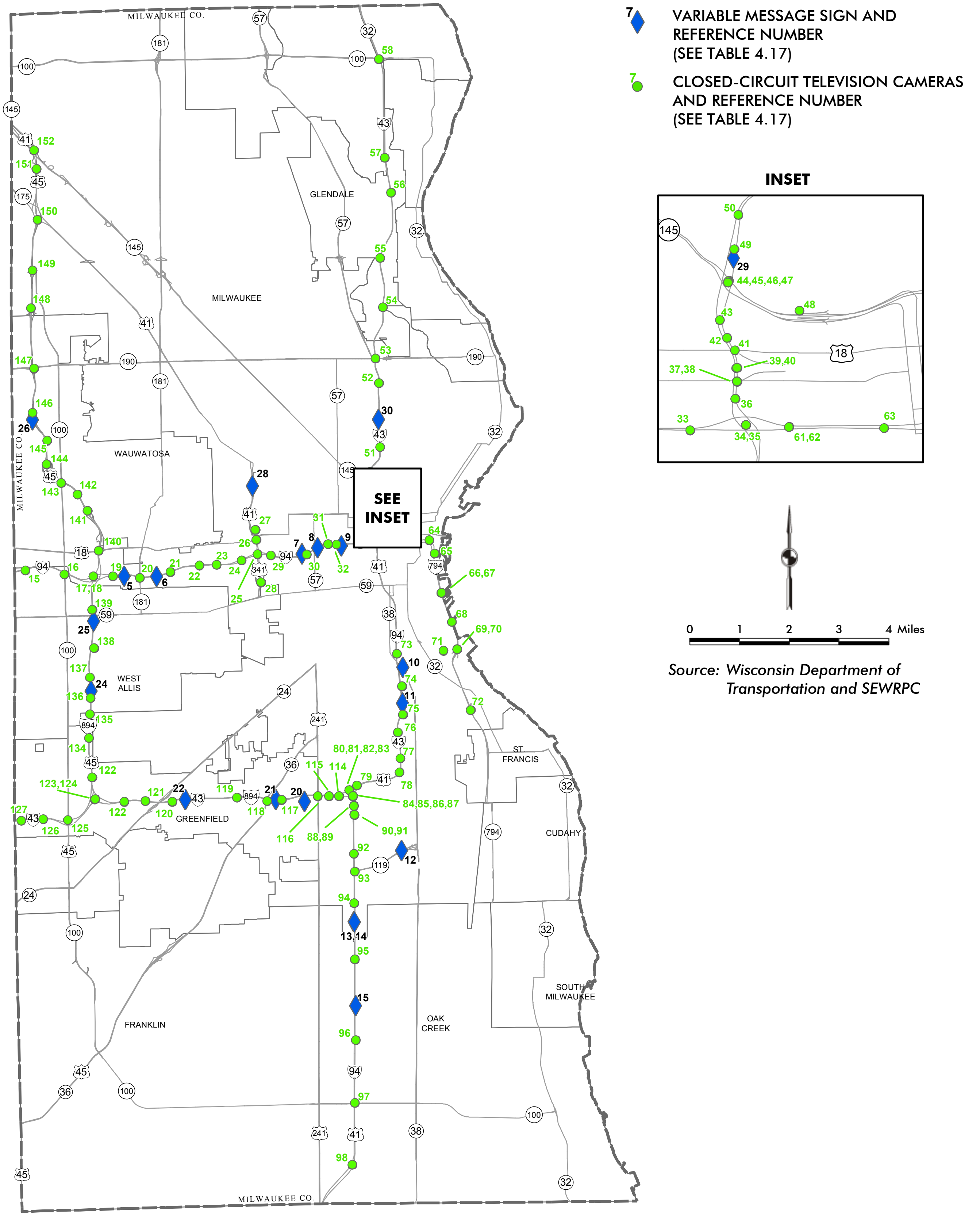
The day-to-day operation and management of the Southeastern Wisconsin regional freeway system is conducted at the TOC in Milwaukee. The TOC staff coordinates the freeway lane and ramp closures in Southeastern Wisconsin, including construction projects and county maintenance work. Additionally, WisDOT works closely with local law enforcement, media, emergency responders, tow operators, transit operators, municipal governments, and others through the Traffic Incident Management Enhancement (TIME)

Map 4.21
Locations of Variable Message Signs and Closed-Circuit Television Cameras on the Existing Freeway System in the Region: 2013



Source: *Wisconsin Department of Transportation and SEWRPC*

Map 4.21 (Continued)



Source: *Wisconsin Department of Transportation and SEWRPC*

Table 4.17
Locations of Variable Message Signs and Closed-Circuit Television Cameras on the Existing Freeway System in the Region: 2013

Reference Number[a]	Variable Message Sign Locations
1	IH 94 eastbound at STH 16 (Silvernail Road)
2	IH 94 eastbound at Brookfield Road
3	IH 94 westbound at Calhoun Road
4	IH 94 eastbound at Elm Grove Road
5	IH 94 eastbound at S. 89th Street
6	IH 94 eastbound at N. 76th Street
7	IH 94 eastbound at N. 30th Street
8	IH 94 westbound at N. 27th Street
9	IH 94 westbound at N. 22nd Street
10	IH 43 and IH 94 northbound at Kinnickinnic River
11	IH 43 and IH 94 southbound at Oklahoma Avenue
12	STH 119 westbound at Mitchell Airport
13	IH 94 southbound at CTH ZZ (W. College Avenue)
14	IH 94 northbound at CTH ZZ (W. College Avenue)
15	IH 94 northbound at W. Drexel Avenue
16	IH 94 northbound at CTH G
17	IH 94 southbound at STH 20
18	IH 94 southbound at STH 158 (52nd Street)
19	IH 94 northbound at CTH C
20	IH 43 and IH 894 eastbound at S. 35th Street
21	IH 43 and IH 894 westbound at STH 36 (W. Loomis Road)
22	IH 894 eastbound at S. 72nd Street
23	IH 43 northbound at CTH T (W. Beloit Road)
24	IH 894 northbound at Cleveland Avenue
25	IH 894 and USH 45 southbound at STH 59 (W. Greenfield Avenue)
26	USH 45 southbound at W. Burleigh Street
27	USH 41 and USH 45 southbound at STH 145
28	STH 41 southbound at W. Cherry Street
29	IH 43 northbound at W. Walnut Street
30	IH 43 southbound at W. Locust Avenue
31	IH 43 southbound at Ozaukee - Milwaukee County Line Road

Reference Number[a]	Closed-Circuit Television Camera Locations
1	IH 94 at STH 67 (Summit Avenue)
2	IH 94 at CTH P (N. Sawyer Road)
3	IH 94 at STH 83
4	IH 94 at CTH SS
5	IH 94 at CTH T
6	IH 94 at STH 164 (Pewaukee Road)
7	IH 94 at STH 74/CTH F
8	IH 94 at Springdale Road
9	IH 94 at USH 18 (Blue Mound Road)
10	IH 94 at Moorland Road
11	IH 94 west of N. Brookfield Road
12	IH 94 at Calhoun Road
13	IH 94 at Sunnyslope Road
14	IH 94 at Elm Grove Road
15	IH 94 at S. 121st Street
16	IH 94 at STH 100 (N. 108th Street)
17	IH 94 at IH 894 and USH 45 (Zoo Interchange) Upper

Reference Number[a]	Closed-Circuit Television Camera Locations (continued)
18	IH 94 at IH 894 and USH 45 (Zoo Interchange) Lower
19	IH 94 at S. 92nd Street
20	IH 94 at STH 181 (N. 84th Street)
21	IH 94 at S. 76th Street
22	IH 94 at N. 68th Street
23	IH 94 at Hawley Road
24	IH 94 at Mitchell Boulevard
25	IH 94 at USH 41
26	USH 41 at USH 18 (W. Bluemound Road)
27	USH 41 at W. Wells Street
28	STH 341 (Miller Park Way) at Stadium Pedestrian Bridge
29	IH 94 at N. 39th Street
30	IH 94 at N. 30th Street
31	IH 94 at N. 25th Street
32	IH 94 at N. 20th Street
33	IH 94 at N. 13th Street
34	IH 43 Northwest Ramp Northwest
35	IH 43 Northwest Ramp North
36	IH 43 at W. Wisconsin Avenue
37	IH 43 Southbound at W. Wells Street
38	IH 43 at Northbound at W. Wells Street
39	IH 43 at W. Kilbourn Avenue Tunnel Exit
40	IH 43 at W. Kilbourn Avenue Tunnel Entrance
41	IH 43 at STH 18 (W. State Street)
42	IH 43 at W. Highland Avenue
43	IH 43 at W. Juneau Avenue
44	IH 43 at STH 145 SW (W. Fond du Lac Avenue)
45	IH 43 at STH 145 E (W. Fond du Lac Avenue)
46	IH 43 at STH 145 NE (W. Fond du Lac Avenue)
47	IH 43 at STH 145 W (W. Fond du Lac Avenue)
48	USH 145 at McKinley Avenue
49	IH 43 at W. Walnut Street
50	IH 43 at W. Brown Street
51	IH 43 at W. Wright Street
52	IH 43 at W. Keefe Avenue
53	IH 43 at STH 190 (W. Capitol Drive)
54	IH 43 at W. Hampton Avenue
55	IH 43 at W. Silver Spring Drive
56	IH 43 at W. Daphne Road
57	IH 43 at CTH PP (W. Good Hope Road)
58	IH 43 at STH 100 (W. Brown Deer Road)
59	IH 43 at County Line Road
60	IH 43 at STH 167 and STH 57 (Mequon Road)
61	IH 794 at N. 7th Street (James Lovell Street) Upper
62	IH 794 at N. 7th Street (James Lovell Street) Lower
63	IH 794 at N. 2nd Street/Plankinton Avenue
64	IH 794 at Lincoln Memorial Drive (Lake Interchange)
65	IH 794 at north end of Daniel W. Hoan Bridge
66	IH 794 at south end of Daniel W. Hoan Bridge (Upper)
67	IH 794 at south end of Daniel W. Hoan Bridge (Lower)
68	IH 794 at Lake Pier
69	IH 794 at S. Carferry Drive (Upper)
70	IH 794 at S. Carferry Drive (Lower)

Table continued on next page.

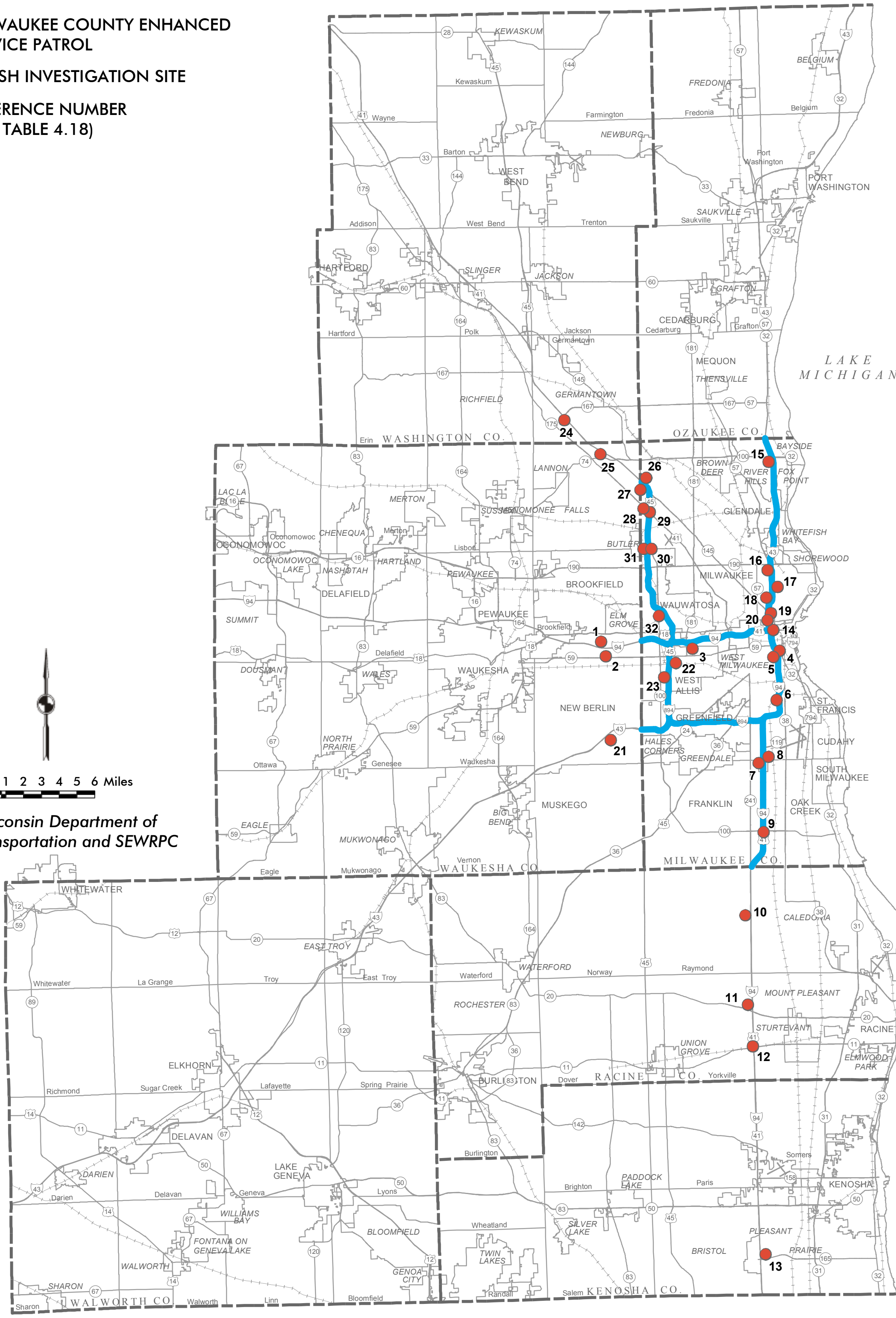
Table 4.17 (Continued)

Reference Number[a]	Closed-Circuit Television Camera Locations (continued)	Reference Number[a]	Closed-Circuit Television Camera Locations (continued)
71	IH 794 at E. Bay Street	119	IH 894 and IH 43 at S. 60th Street
72	STH 794 at E. Oklahoma Avenue	120	IH 894 and IH 43 at CTH U (S. 76th Street)
73	IH 94 and IH 43 at W. Mitchell Street	121	IH 894 and IH 43 at S. 84th Street
74	IH 94 and IH 43 at STH 38 (Chase Avenue)	122	IH 894 and IH 43 at CTH N (S. 92nd Street)
75	IH 94 and IH 43 at W. Oklahoma Avenue	123	IH 43 and IH 94 at Mitchell Interchange (NE)
76	IH 94 and IH 43 at W. Holt Avenue	124	IH 43 at Mitchell Interchange (SW)
77	IH 94 and IH 43 at W. Howard Avenue	125	IH 43 at STH 100 (S. 108th Street)
78	IH 94 and IH 43 at W. Plainfield Avenue	126	IH 43 at S. 116th Street
79	IH 894 and IH 43 at 19th Street	127	IH 43 at S. 124th Street
80	IH 94 West-North Ramp #1	128	IH 43 at S. Sunnyslope Road
81	IH 94 West-North Ramp #2	129	IH 43 at S. Moorland Road
82	IH 94 North-West Ramp #1	130	IH 43 at CTH Y (S. Racine Avenue)
83	IH 94 North-West Ramp #2	131	IH 43 at Crowbar Road
84	IH 43 East Entrance Tunnel	132	IH 43 at STH 164 (Big Bend Road)
85	IH 43 East Exit Tunnel	133	IH 894 and USH 45 at Cold Spring Road
86	IH 43 West Entrance Tunnel	134	IH 894 and USH 45 at CTH T (W. Beloit Road)
87	IH 43 West Exit Tunnel	135	IH 894 and USH 45 at CTH NN (W. Oklahoma Avenue)
88	IH 94 and IH 894 South-West Exit Tunnel	136	IH 894 and USH 45 at W. Cleveland Avenue
89	IH 94 and IH 894 South-West Entrance Tunnel	137	IH 894 and USH 45 at W. Lincoln Avenue
90	IH 94 at CTH Y (W. Layton Avenue)	138	IH 894 and USH 45 at STH 59 (W. National Avenue)
91	IH 94 at CTH Y (W. Layton Avenue) Tunnel Signs	139	IH 894 and USH 45 at STH 59 (W. Greenfield Avenue)
92	IH 94 at Grange Avenue	140	USH 45 at USH 18 (W. Bluemound Road)
93	IH 94 at STH 119 (Airport Interchange)	141	USH 45 at W. Watertown Plank Road
94	IH 94 at CTH ZZ (W. College Avenue)	142	USH 45 at Swan Boulevard
95	IH 94 at CTH BB (W. Rawson Avenue)	143	USH 45 at STH 100 (N. Mayfair Road)
96	IH 94 at W. Drexel Avenue	144	USH 45 at W. North Avenue
97	IH 94 at S. STH 100 (W. Ryan Road)	145	USH 45 at W. Center Street
98	IH 94 at W. Oakwood Road	146	USH 45 at W. Burleigh Road
99	IH 94 at Seven Mile Road	147	USH 45 at STH 190 (W. Capitol Drive)
100	IH 94 at CTH G	148	USH 45 at W. Hampton Avenue
101	IH 94 at CTH K	149	USH 45 at CTH E (W. Silver Spring Drive)
102	IH 94 at CTH E (W. 27th Street)	150	USH 45 and STH 100 at USH 41 (W. Appleton Avenue)
103	IH 94 at STH 20 (Washington Avenue)	151	USH 41 and USH 45 at CTH PP (W. Good Hope Road)
104	IH 94 at STH 11 (W. Durand Avenue)	152	USH 41 and USH 45 at W. Park Place
105	IH 94 at CTH A (W. 7th Street)	153	USH 41 and USH 45 at Waukesha—Milwaukee County Line (W. 124th Street)
106	IH 94 at CTH KR (County Line Road)	154	USH 41 and USH 45 at Leon Road
107	IH 94 at CTH E (W. 12th Street)	155	USH 41 and USH 45 at Pilgrim Road
108	IH 94 at STH 142 (Burlington Road)	156	USH 41 and USH 45 at CTH Q (Washington—Waukesha County Line Road)
109	IH 94 at STH 158 (W. 52nd Street)	157	USH 41 and USH 45 at STH 167 (Lannon Road)
110	IH 94 at STH 50 (W. 75th Street)	158	USH 41 and USH 45 at CTH F (Freistadt Road)
111	IH 94 at CTH C (Spring Street)	159	USH 41 and USH 45 at STH 167 (Holy Hill Road)
112	IH 94 at STH 165 (W. 104th Street)		
113	IH 94 at CTH ML (Springbrook Road)		
114	IH 894 and IH 43 at S. 20th Street		
115	IH 894 and IH 43 at S. 22nd Street Tunnel Signs		
116	IH 894 and IH 43 at USH 41 (S. 27th Street)		
117	IH 894 and IH 43 at S. 35th Street		
118	IH 894 and IH 43 at STH 36 (W. Loomis Road)		

[a] *See Map 4.21.*

Source: SEWRPC

Map 4.22
Extent of Freeway Service Patrols and Location of Crash Investigation Sites Along the Existing Freeway System in the Region: 2013



Source: Wisconsin Department of Transportation and SEWRPC

Table 4.18
Locations of Crash Investigation Sites Along the Existing Freeway System in the Region: 2013

Reference Number[a]	Crash Investigation Site
IH 94 Corridor	
1	Westbound exit ramp to CTH O (Moorland Road) southbound
2	Eastbound exit ramp to CTH O (Moorland Road) southbound
3	State Fair Park park-ride lot (S. 76th Street)
4	Northbound exit ramp to E. Becher Street/Mitchell Street
5	Southbound exit ramp to E. Becher Street/Lincoln Avenue
6	Holt Avenue park-ride lot
7	Southwest W. College Avenue park-ride lot
8	Northeast W. College Avenue park-ride lot
9	W. Ryan Road park-ride lot
10	State Patrol truck weigh station (CTH G)
11	Racine County Sheriff's substation (STH 20)
12	STH 11 (Durand Avenue) park-ride lot
13	Wisconsin Tourism Information Center (STH 165)
IH 794 Corridor	
14	Eastbound exit ramp to St. Paul Avenue
IH 43 Corridor	
15	STH 100 (W. Brown Deer Road) park-ride lot
16	Southbound exit ramp to Atkinson Avenue
17	Northbound exit ramp to Locust Street
18	Southbound exit ramp to W. North Avenue
19	Northbound exit ramp to westbound W. Fond du Lac Avenue
20	Southbound exit ramp to W. Highland Avenue
21	CTH O (Moorland Road) park-ride lot
IH 894 Corridor	
22	Northbound exit ramp to STH 59 (W. Greenfield Avenue)
23	Southbound exit ramp to W. Lincoln Avenue
USH 45 Corridor	
24	Lannon Road park-ride lot
25	Northwest of the Pilgrim Road/USH 45 interchange on Stopler Drive
26	Northbound exit ramp to STH 145 (N. 124th Street)
27	Southbound exit ramp to CTH PP (W. Good Hope Road)
28	Northbound exit ramp to USH 41 (W. Appleton Avenue)
29	Southbound exit ramp to USH 41 (W. Appleton Avenue)
30	Northbound exit ramp to CTH EE (W. Hampton Avenue)
31	Southbound exit ramp to CTH EE (W. Hampton Avenue)
32	Milwaukee County Sheriff's substation (Watertown Plank Road)

[a] *See Map 4.22.*

Source: Wisconsin Department of Transportation and SEWRPC

program. The TIME program's goals are to improve and enhance freeway incident management, improve freeway safety, and enhance the quality and efficiency of freeway travel.

Surface Arterial Street and Highway Traffic Management and Operation Systems

In 2013, the surface arterial street and highway traffic management systems in Southeastern Wisconsin consisted mainly of coordinated traffic signal systems, emergency vehicle preemption, closed-circuit television cameras, and variable message signs.

Coordinated traffic signal systems provide for the efficient progression of traffic along arterial streets and highways allowing motorists to travel through multiple signalized intersections along an arterial route at the speed limit minimizing or eliminating the number of stops at signalized intersections. In 2013, coordinated traffic signal systems in the Region generally ranged from systems comprised of two traffic signals to systems comprised of about 100 traffic signals. Approximately 1,200 of the 1,700 traffic signals in the Region in 2013, or about 71 percent, were part of a coordinated signal system.
Emergency vehicle preemption allows emergency vehicles to intervene in the

normal operation of surface arterial intersection traffic signal systems using wireless communications installed on the traffic signal and the emergency vehicles. Light, radio waves, or sound emitted by the emergency vehicle allow the emergency vehicle to interrupt the regular signal cycle and either change the traffic signal cycle to initiate and hold green indication for the approach from which the emergency vehicle is oriented, or to extend the green indication for the approach from which the emergency vehicle is oriented until the emergency vehicle has cleared the intersection. Emergency vehicle preemption reduces the amount of time for response and increases the safety for the law enforcement and emergency responder communities. In 2013, emergency preemption was deployed on selected signal systems operated by the following communities or entities: Cities of Kenosha, Milwaukee, Waukesha, and Wauwatosa; Milwaukee and Waukesha Counties; and WisDOT. In total, traffic signals at nearly 750 intersections, or about 44 percent of signalized intersections, were equipped with emergency vehicle preemption capability.

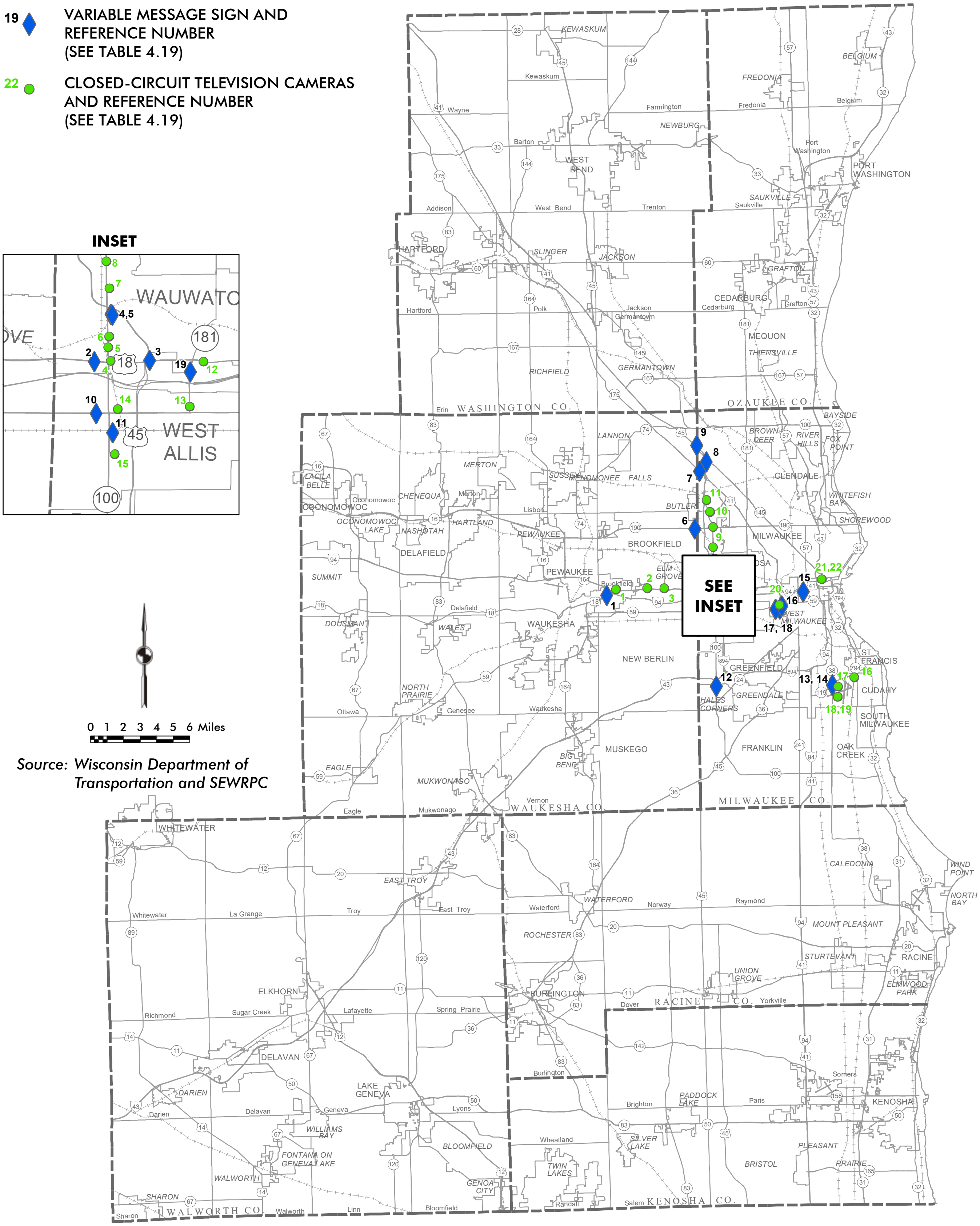
In 2013, 22 closed-circuit television cameras (see Map 4.23 and Table 4.19) provided live video of traffic conditions on the surface arterial street and highway system. The video provided by these cameras allows for the identification and confirmation of congested areas and incident locations. Video is monitored at the TOC in Milwaukee. Video is supplied to some emergency response agencies so that their dispatchers can provide personnel with incident locations and information.

Variable message signs provide real-time information to travelers about upcoming traffic conditions. WisDOT uses the variable message signs to display current travel times to selected areas and to display information about lane closures as well as where travel delays begin and end. In the event of a child abduction, the variable message signs are also used to display an AMBER alert. In 2013, there were 19 variable message signs on the surface arterial street and highway system in Southeastern Wisconsin, all located near freeway access points, as shown on Map 4.23 and in Table 4.19.

Public Transit Operation and Management Systems

In 2013, public transit operation and management systems were utilized by the following transit systems in Southeastern Wisconsin: MCTS, the City of Waukesha Metro Transit System, Waukesha County Transit, the Kenosha-Racine-Milwaukee commuter bus, the Racine Belle Urban System, the Ozaukee County Express, the Ozaukee County Shared-Ride Taxi service, and the Washington County Shared-Ride Taxi service. MCTS utilizes a computer-aided dispatch and automatic vehicle location (CAD/AVL) system. The CAD/AVL system enhances communication between bus operators and dispatchers and allows MCTS to use global positioning technology to provide updated location information of transit vehicles to dispatchers, and can be used to check the on-time performance of the system. The Waukesha Metro Transit CAD/AVL system was operational beginning in June 2004. MCTS and Waukesha Metro Transit also utilize designated shoulder lanes on USH 18 (Bluemound Road) in Waukesha County between Barker Road and the Milwaukee-Waukesha County line. These shoulder lanes are designated as through lanes for transit vehicles only, and may only be accessed by passenger vehicles for right-turning movements or during distress. The Racine Belle Urban System began using a CAD/AVL system in 2004. Waukesha County Transit's express bus service and the Kenosha-Racine-Milwaukee commuter bus service are operated by Wisconsin Coach Lines and have been using a GPS-based AVL system since 2009. The Ozaukee County Express is operated by MCTS as Route 143 and utilizes the MCTS CAD/AVL system. The Ozaukee

Map 4.23
Locations of Variable Message Signs and Closed-Circuit Television Cameras on the Existing Surface Arterial Street and Highway System in the Region: 2013



Source: *Wisconsin Department of Transportation and SEWRPC*

Table 4.19
Locations of Variable Message Signs and Closed-Circuit Television Cameras on the Existing Surface Arterial Street and Highway System in the Region: 2013

Reference Number[a]	Variable Message Sign Locations
1	USH 18 (E. Moreland Road) eastbound at IH 94 (Goerke's Corners)
2	STH 100 (N. 108th Street) southbound at USH 18 (W. Bluemound Road)
3	USH 18 (W. Bluemound Road) eastbound at 114th Street
4	STH 100 (N. 108th Street) northbound at Watertown Plank Road
5	STH 100 (N. 108th Street) southbound at W. Walnut Street
6	STH 190 (W. Capitol Drive) eastbound at N. 124th Street
7	STH 175 (Appleton Avenue) eastbound at STH 100 (N. 108th Street)
8	CTH PP (W. Good Hope Road) westbound at USH 41/45
9	STH 145 (N. 124th Street) southbound at W. Bradley Road
10	STH 59 (W. Greenfield Avenue) eastbound at 111th Street
11	STH 100 (N. 108th Street) northbound at W. Lapham Street
12	STH 100 (N. 108th Street) northbound at Edgerton Road
13	Mitchell International Airport at Airport Parking Ramp Exit
14	Mitchell International Airport at Airport Drop-off Exit
15	W. Canal Street westbound at 25th Street
16	Miller Park Way northbound at STH 59 (W. National Avenue)
17	STH 59 (W. National Avenue) westbound at Miller Park Way
18	STH 59 (W. National Avenue) eastbound at Miller Park Way
19	84th Street southbound at North IH 94

Reference Number[a]	Closed-Circuit Television Camera Locations
1	USH 18 (W. Bluemound Road) at CTH Y (Barker Road)
2	USH 18 (W. Bluemound Road) at Calhoun Road
3	USH 18 (W. Bluemound Road) at CTH O (Moorland Road)
4	STH 100 (N. 108th Street) at USH 18 (W. Bluemound Road)
5	STH 100 (N. 108th Street) at Research Drive
6	STH 100 (N. 108th Street) at Watertown Plank Road
7	STH 100 (N. 108th Street) at W. North Avenue
8	STH 100 (N. 108th Street) at W. Burleigh Avenue
9	STH 100 (N. 108th Street) at STH 190 (W. Capitol Drive)
10	STH 100 (N. 108th Street) at CTH EE (W. Hampton Avenue)
11	STH 100 (N. 108th Street) at CTH E (W. Silver Spring Drive)
12	USH 18 (E. Bluemound Road) at 80th Street
13	STH 181 (S. 84th Street) at STH 59 (W. Greenfield Avenue)
14	STH 100 (N. 108th Street) at STH 59 (W. Greenfield Avenue)
15	STH 100 (N. 108th Street) at W. Lincoln Avenue
16	USH 794 (Lake Parkway) at E. Layton Avenue
17	USH 38 (S. Howell Avenue) at north Airport Tunnel
18	USH 38 (S. Howell Avenue) at south Airport Tunnel
19	USH 119 at USH 38 (S. Howell Avenue)
20	USH 341 (Miller Parkway) at STH 59 (W. National Avenue)
21	Kilbourn Avenue at Tunnel Entrance
22	Kilbourn Avenue at Tunnel Exit

[a] *See Map 4.23.*

Source: Wisconsin Department of Transportation and SEWRPC

County Shared-Ride Taxi system began using a CAD/AVL system in 2008. The Washington County Shared-Ride Taxi system began using a CAD/AVL system in 2013.

Transit signal priority is beginning to be explored in Southeastern Wisconsin. Transit signal priority systems allow transit operators to extend the green phase of signal cycles using wireless communications between the transit vehicle and the traffic signal.

4.7 PAVEMENT AND BRIDGE CONDITION

The assessment of existing pavement condition in Southeastern Wisconsin is typically accomplished through one of two pavement evaluation techniques. The Pavement Surface Evaluation and Rating (PASER) technique is used for county and municipal roads. The PASER system is a rating system that employs visual inspection techniques to assess pavement condition. Pavement ratings range from 1 (a failed roadway that needs total reconstruction) to 10 (a pavement in excellent condition and typically reflects new construction). In general, the rating system is such that those pavements rated 8 through 10 require little to no maintenance; a rating of 7 indicates a pavement that requires routine maintenance such as crack filling; ratings of 5 or 6 indicate a pavement where preservative treatments such as sealcoating or overlays are considered; ratings of 3 or 4 indicate a pavement where structural improvement such as recycling or overlay is required; and ratings of 1 or 2 indicate a pavement that is severely deteriorated and requires reconstruction. In Southeastern Wisconsin, the PASER system is used by County and local governments to evaluate the condition of the roads under their jurisdiction every two years as required under State Statute. Map 4.24 documents the pavement condition of the county and local arterial streets and highways in the Region under the PASER system for the year 2013. Pavement condition of the county and local arterial street system in the Region improved between 2005 and 2013, as shown in Table 4.20.

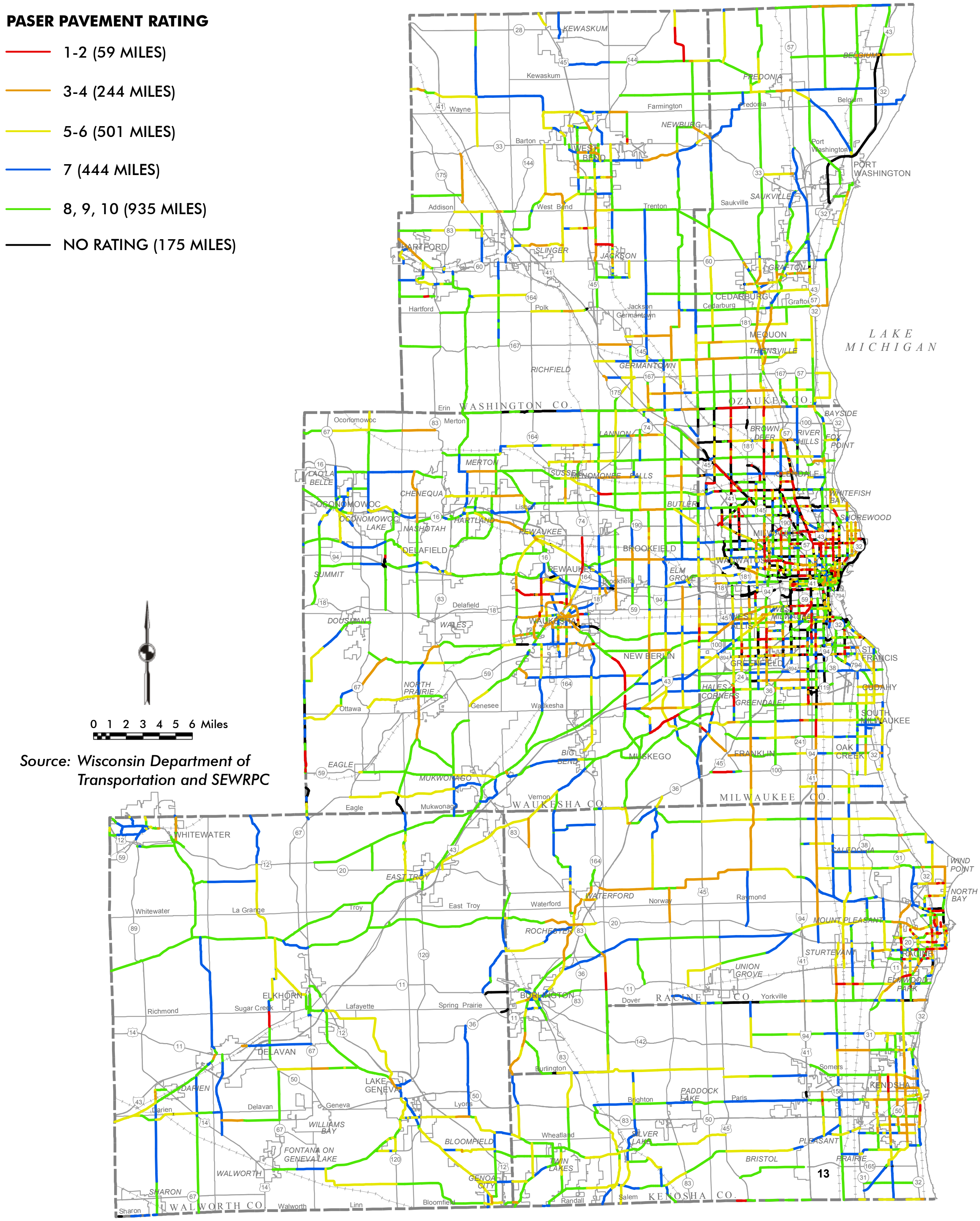
WisDOT uses the International Roughness Index (IRI) to assess pavement condition and the quality of riding comfort of state highways, including Interstate Highways, United States Highways, and State Highways. WisDOT uses special equipment that physically measures the profile of a roadway along the traveled way. The IRI is measured on a scale of 0 to 12, with pavements with a 0 to 2.5 rating having no ride problems, a 2.5 to 2.75 rating having minor ride problems, a 2.75 to 3.0 having moderate ride problems, and greater than 3.0 having severe ride problems. Map 4.25 documents the IRI rating of the arterial streets and highways in the Region under State jurisdiction for the year 2013. Pavement condition of state highways in the Region slightly improved between 2006 and 2013, as shown in Table 4.21.

WisDOT also maintains an assessment of the sufficiency of the bridge structures in the Region. Bridge sufficiency ratings are calculated using four separate factors to obtain a numeric value which, when combined, provide the overall sufficiency rating. The four factors are (1) structural adequacy and safety; (2) serviceability and functional obsolescence (including consideration of number of lanes, average daily traffic, approach roadway width, and bridge roadway width); (3) essentiality for public use; and (4) special reductions. Bridge structure sufficiency ratings range from 0 to 100, with 0 being a failing structure and 100 being a structure in perfect condition. Generally, the structure sufficiency ratings relate to need, and prioritization of funding, for rehabilitation and replacement. WisDOT considers a bridge structure with a sufficiency rating between 80 and 100 as not in need of rehabilitation. A bridge structure is considered in need of rehabilitation if its sufficiency rating is between 50 and 79, and replacement if its sufficiency rating is less than 50. Table 4.22 displays the number of bridge structures in Southeastern Wisconsin within each of the above mentioned ranges of sufficiency rating for the years 2006 and 2013. Map 4.26 displays the 2013 sufficiency ratings for bridge structures in Southeastern Wisconsin. Some improvement in bridge sufficiency is apparent over the last few years.

4.8 ARTERIAL HIGHWAY AND TRANSIT TRAVEL TIMES

Map 4.27 compares the year 2001 and 2011 estimated peak hour travel speeds for selected freeway and surface arterial street segments. Map 4.28 compares estimated peak hour arterial street and highway travel time contours for years 2001 and 2011 for two locations: the Milwaukee CBD and the Milwaukee Regional Medical Center. Year 2001 and 2011 arterial street and highway travel times are very similar, displaying little change.

Map 4.24
County and Local Arterial Pavement Condition in the Region: 2013



Source: Wisconsin Department of Transportation and SEWRPC

Table 4.20
County and Local Arterial Pavement Condition in the Region: 2005 and 2013

PASER Pavement Rating	2005 Local and County Arterial (Miles)	2005 Percent of Total	2013 Local and County Arterial (Miles)	2013 Percent of Total
1 and 2	132	5.7	59	2.5
3 and 4	233	10.2	244	10.3
5 and 6	431	18.8	501	21.2
7	376	16.4	444	18.8
8, 9, and 10	907	39.5	935	39.7
No Rating	215	9.4	175	7.4
Total	2,294	100.0	2,358	100.0

Source: Wisconsin Department of Transportation and SEWRPC

Map 4.29 presents the ratio of total overall transit travel time to automobile travel time between selected locations during the weekday morning peak period and midday off-peak period in 2011. Transit travel time is longer than automobile travel time, because it includes not only the time spent in the transit vehicle, but also includes the time spent walking to a bus stop, waiting for a bus, transferring between routes (including waiting for another bus) and walking to a destination. Much of the transit out-of-vehicle time is related to waiting time for each bus used. Automobile travel time includes the time spent in vehicle parking and walking between parking location and trip origin and destination.

The travel time ratios developed for travel between the selected locations indicate that the lowest ratios—and most competitive transit travel times—are for short transit trips made between areas within and adjacent to downtown Milwaukee, and the highest ratios—and least competitive transit travel times—are generally for transit trips to and from outlying portions of Milwaukee County, including locations in the northwest, southeast, and southwest portions of the Milwaukee County area.

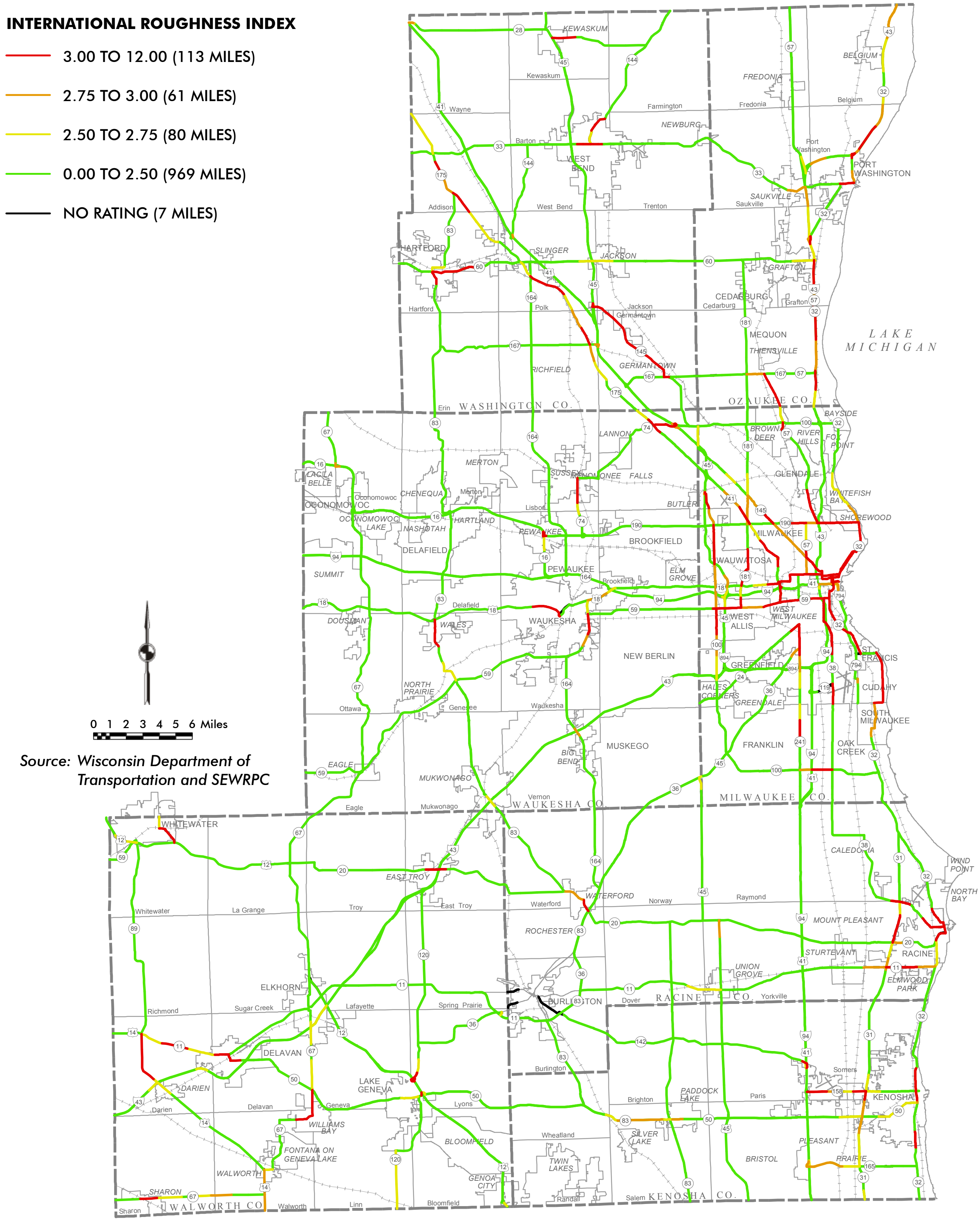
4.9 TRANSPORTATION AIR POLLUTANT AND AIR TOXIC EMISSIONS

Table 4.23 presents the estimated transportation system air pollutant and air toxic emissions and motor fuel consumption within Southeastern Wisconsin for the years 2001 and 2010. Estimated air pollutant and air toxic emissions declined between 2001 and 2010. In particular, volatile organic compounds and nitrogen oxides have been in decline due to cleaner, more efficient vehicles and lower sulfur fuels. The exception to the historic trend in emissions reductions has been carbon dioxide emissions, which are estimated to have increased from 2001 to 2010 as fuel consumption has increased slightly over these years.

4.10 SUMMARY

This chapter has described the characteristics of the existing regional transportation system, including arterial streets and highways, public transit, park-ride lots, bicycle and pedestrian facilities, and transportation management and operations systems. The chapter has also documented—to the extent data are available—the changes that have occurred in the system since 2001, 1991, 1972, and 1963, the base years of the fourth, third, second, and first generation regional transportation system plans. Inventory findings include:

Map 4.25
State Trunk Highway Pavement Condition in the Region: 2013



Source: Wisconsin Department of Transportation and SEWRPC

Table 4.21
State Trunk Highway Pavement Condition in the Region: 2006 and 2013

International Roughness Index	2006 State Trunk Highway (Miles)	2006 Percent of Total	2013 State Trunk Highway (Miles)	2013 Percent of Total
0.00 to 2.50	916	74.2	969	78.8
2.50 to 2.75	76	6.2	80	6.5
2.75 to 3.00	61	4.9	61	5.0
3.00 to 12.00	161	13.0	113	9.2
No Rating	20	1.6	9	0.6
Total	1,234	100.0	1,230	100.0

Source: Wisconsin Department of Transportation and SEWRPC

Table 4.22
Bridge Structure Condition in the Region: 2006 and 2013

Sufficiency Rating[a]	Number of Bridges 2006	Number of Bridges 2013	Percent Change 2006-2013
Less than 50.0	98	81	-17.3
50.0 to 79.9	520	441	-18.2
80.0 to 100.0	1,244	1,372	10.3
Total	1,862	1,894	1.7

[a] *Sufficiency ratings for bridges ranges from 0 to 100 and are used to prioritize funding for improvement of a particular bridge. WisDOT considers a bridge to be eligible for rehabilitation when its sufficiency rating is less than 80 and to be eligible for replacement funding when its sufficiency rating is less than 50.*

Source: Wisconsin Department of Transportation and SEWRPC

1. As of 2011, there were approximately 12,487 miles of streets and highways—land-access, collector, and arterial—within the Region. Only 26.6 percent, or 3,323 miles, of the street and highway system were arterials with the principal function of moving traffic. The miles of arterials within the Region have increased from 3,188 in 1963 to 3,323 miles in 2011, an increase of 135 miles, or 4.2 percent. The 269 miles of freeway system in 2011 accounted for 8 percent of the total arterial street and highway system and 2 percent of the total street and highway system.

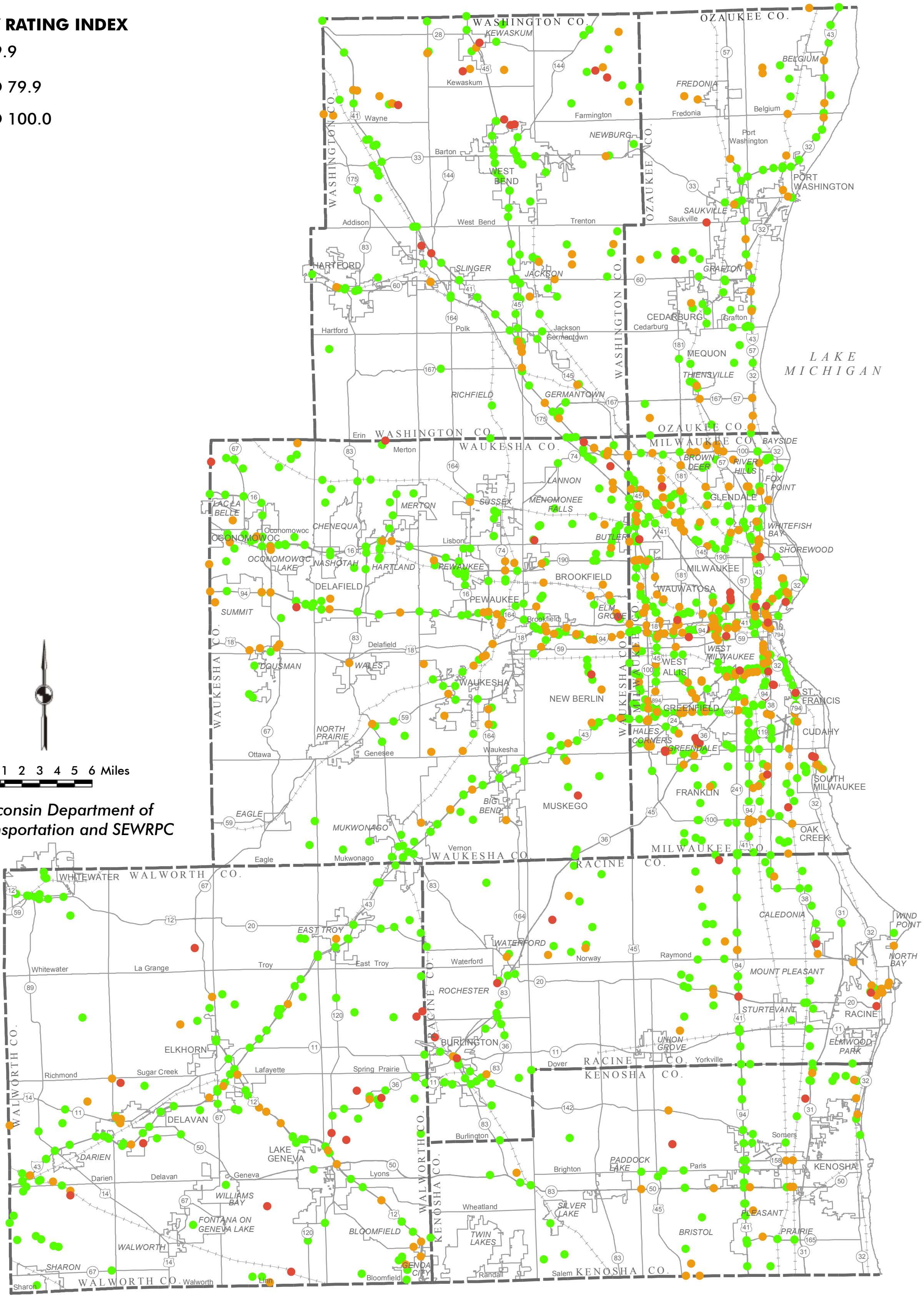
2. In 2011, approximately 40.9 million vehicle-miles of travel were estimated to occur on the arterial street and highway system on an average weekday within the Region. The arterial street and highway system accounted for about 26.6 percent of the total miles of streets and highways in the Region, and 90 percent of the total average weekday traffic in the Region. Freeways in the Region constituted about 268 miles and 8 percent of the total arterial system, but carried 38 percent of total arterial system VMT on an average weekday in 2011. Between 1963 and 2011, average weekday VMT on the arterial street and highway system increased by over 200 percent, while centerline miles of arterial streets and highways increased by only about 4 percent and arterial lane-miles increased by only about 15 percent. The growth in VMT, which has slowed in each decade, is a result of growth in average weekday trips made by the Region's residents due to increases in households and jobs; increases in the proportion of drive-alone trips due to increases in vehicle ownership and changes in population lifestyles, including declines in household size; and increases in trip length.

3. The miles of arterials carrying traffic volumes exceeding design capacity and experiencing traffic congestion declined from 217 miles in 1963

Map 4.26
Bridge Structure Condition in the Region: 2013

SUFFICIENCY RATING INDEX

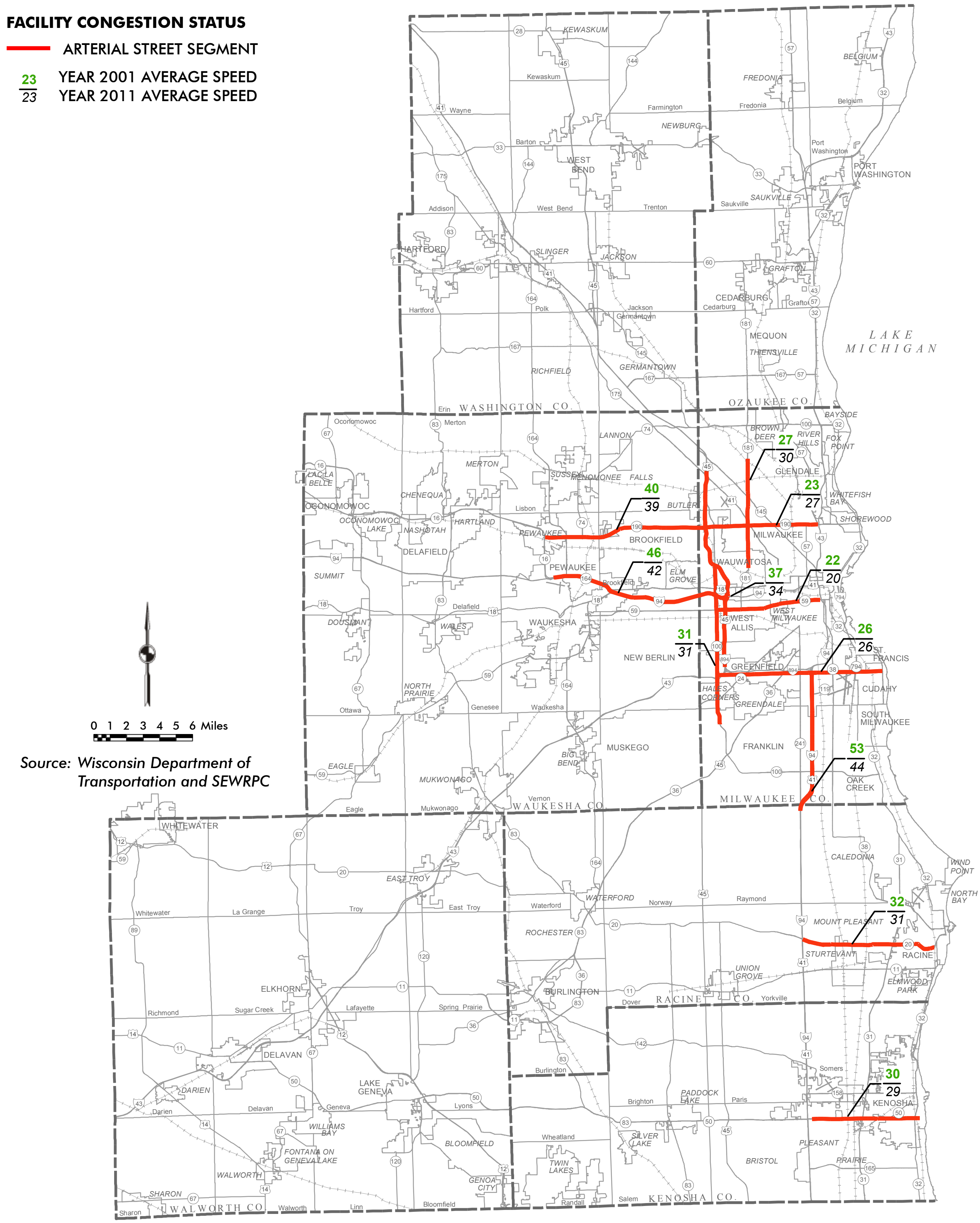
- 0 TO 49.9
- 50.0 TO 79.9
- 80.0 TO 100.0



0 1 2 3 4 5 6 Miles

Source: Wisconsin Department of Transportation and SEWRPC

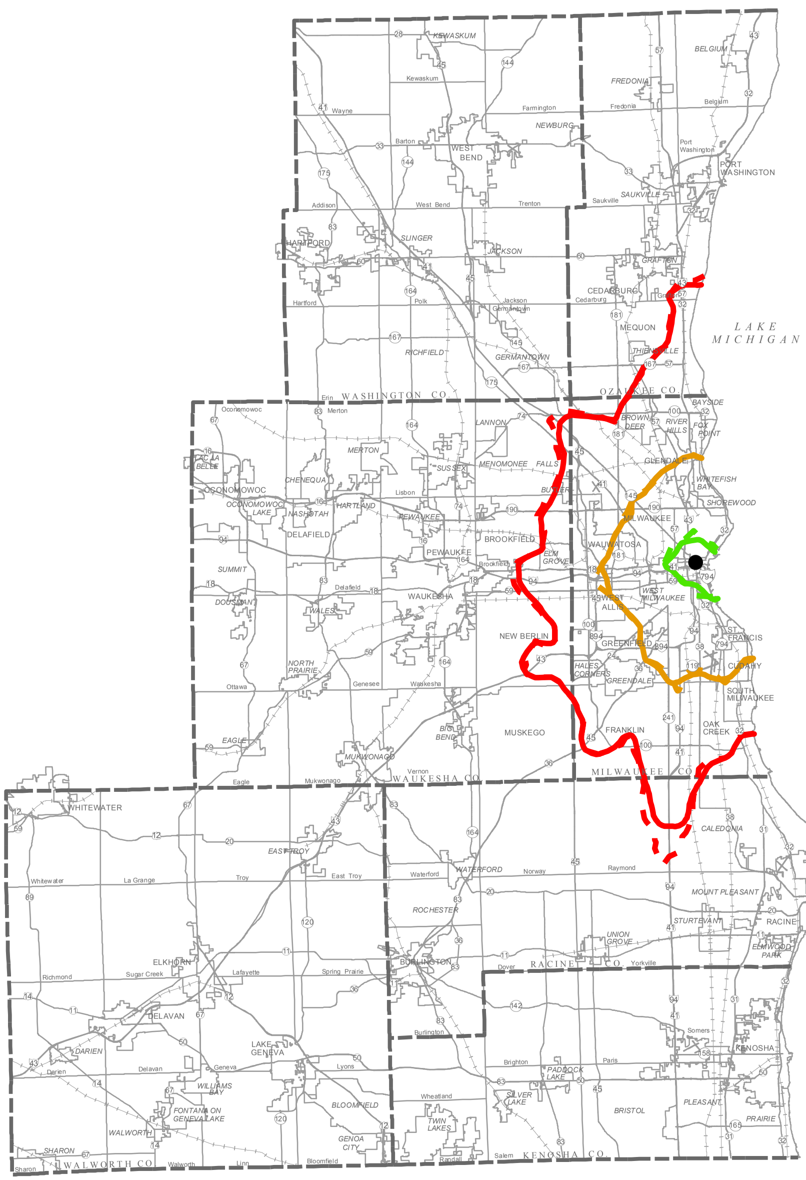
Map 4.27
Comparison of Estimated Year 2001 and 2011 Peak Hour Travel Speeds for Selected Freeway and Surface Arterial Streets in the Region



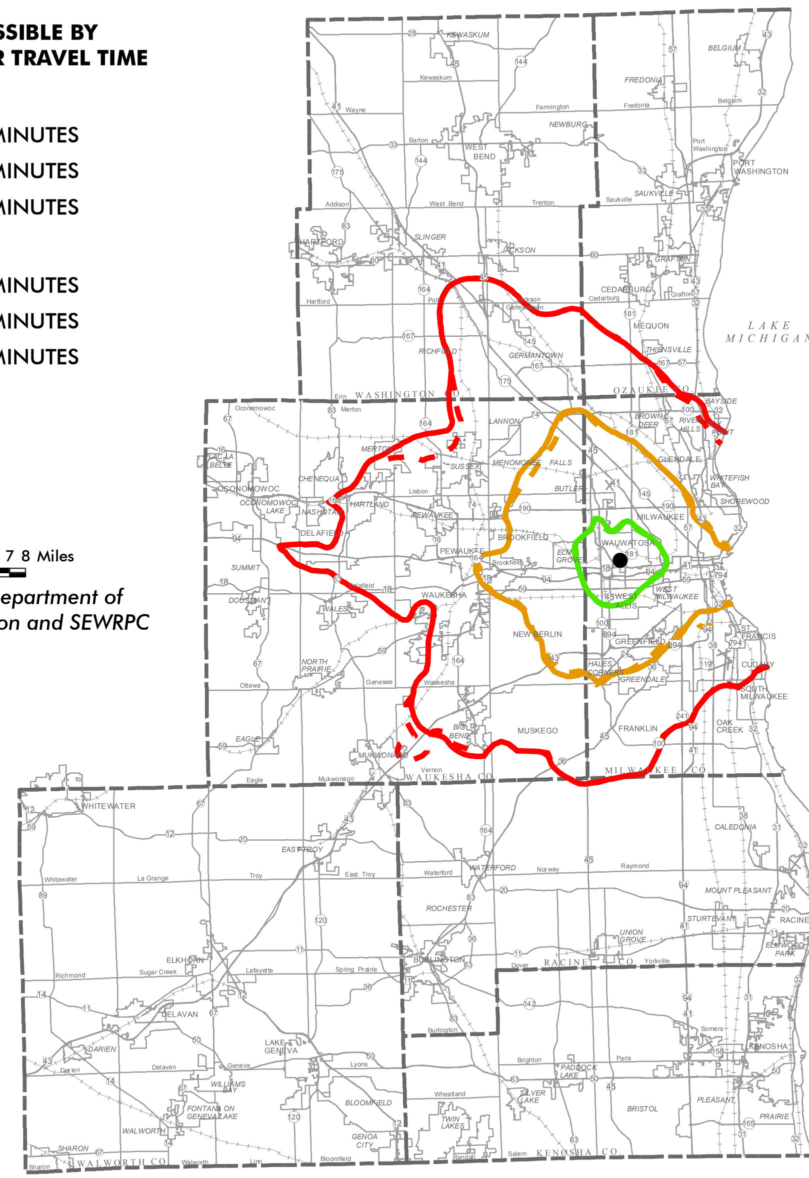
Source: Wisconsin Department of Transportation and SEWRPC

Map 4.28
Estimated Peak Hour Arterial Street and Highway Travel Time Contours: 2001 and 2011

MILWAUKEE CENTRAL BUSINESS DISTRICT



MILWAUKEE REGIONAL MEDICAL CENTER



AREA ACCESSIBLE BY PEAK HOUR TRAVEL TIME

2001

- 10 MINUTES
- 20 MINUTES
- 30 MINUTES

2011

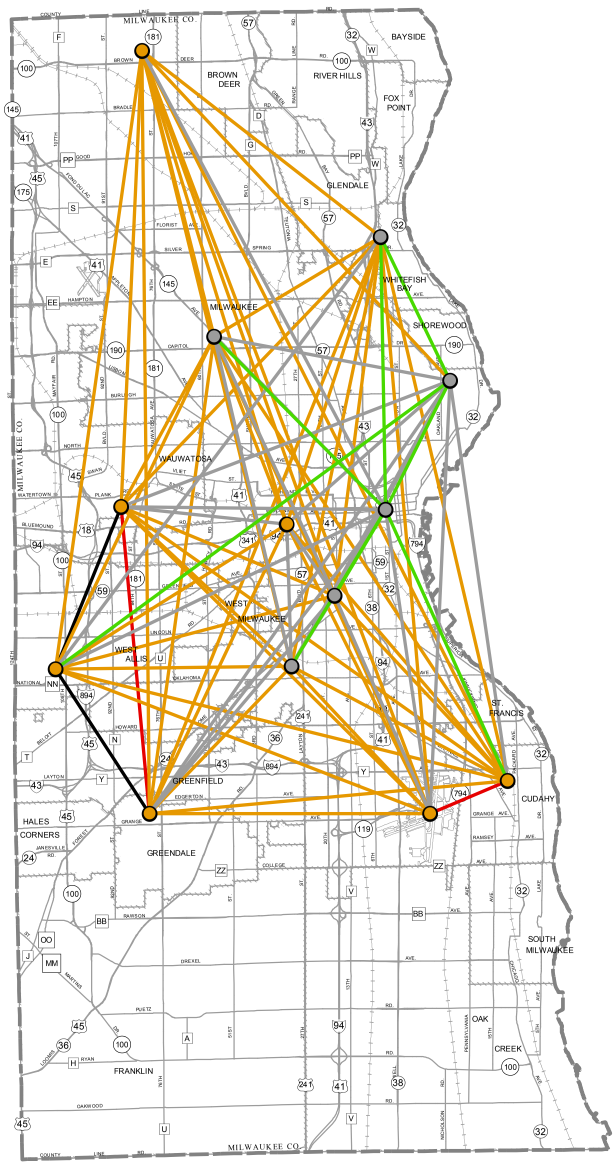
- 10 MINUTES
- 20 MINUTES
- 30 MINUTES

0 1 2 3 4 5 6 7 8 Miles

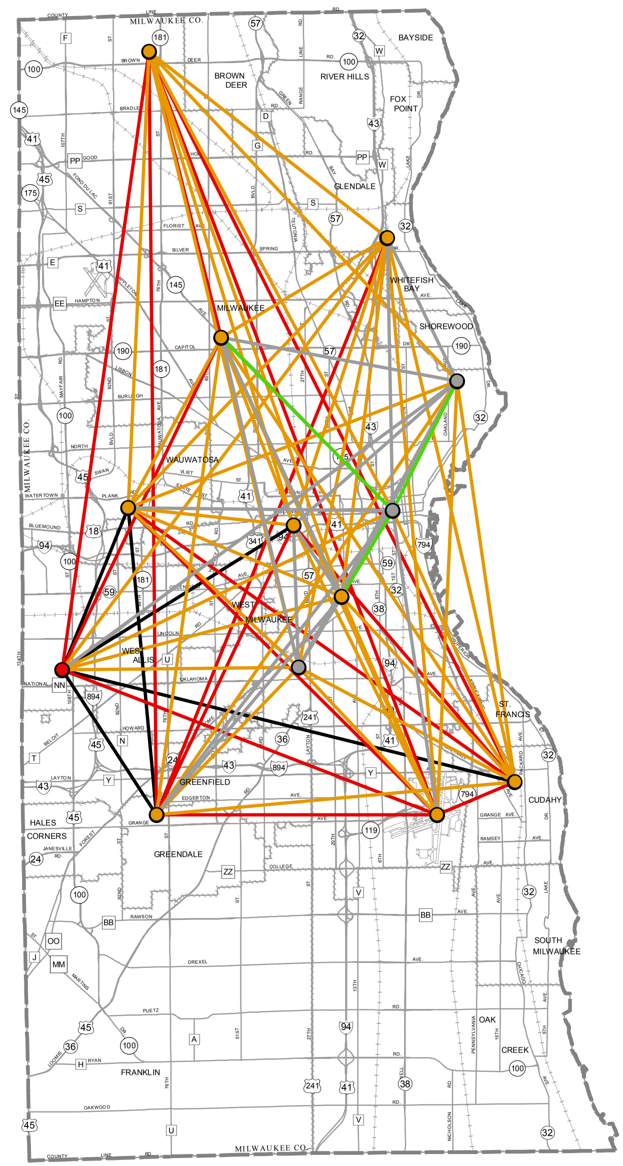
Source: Wisconsin Department of Transportation and SEWRPC

Map 4.29
Ratios of Overall Transit Travel Times to Overall Automobile Travel Times Between Selected Locations in Milwaukee County for Weekday Peak and Off-Peak Periods: 2011

MORNING PEAK PERIOD



MIDDAY OFF-PEAK PERIOD

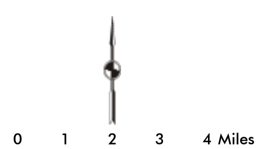


TRANSIT TO AUTOMOBILE TRAVEL TIME RATIO

- 1.51 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- 4.00 - 4.99
- 5.00 AND OVER

AVERAGE TRANSIT TO AUTOMOBILE TRAVEL TIME RATIO FOR SELECTED TRIPS FROM LOCATION

- 1.51 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- 4.00 - 4.99
- 5.00 AND OVER



Source: SEWRPC

Table 4.23
Estimated Southeastern Wisconsin Region Transportation System Air Pollutant Emissions and Fuel Consumption: 2001 and 2010

	Estimated Air Pollutant Emissions (Tons per Hot Summer Weekday)						
Year	Volatile Organic Compounds[a]	Nitrogen Oxides[a]	Carbon Monoxide	Carbon Dioxide	Fine Particulate Matter	Sulfur Dioxide	Ammonia
2001	50.03	114.23	592.48	18,050	1.77	2.77	4.84
2010	27.30	60.92	358.29	18,500	1.18	0.51	5.62
Year	Butadiene	Acetaldehyde	Acrolein	Benzene	Formaldehyde	Estimated Fuel Consumption (Gallons per Average Weekday)	
2001	0.20	0.43	0.03	1.40	0.63	1,805,000	
2010	0.09	0.20	0.01	0.66	0.30	1,865,000	

[a] *Estimated 1990 emissions were 154.6 tons of volatile organic compounds and 136.3 tons of nitrogen oxides. Estimated 1999 emissions were 61.3 tons of volatile organic compounds and 118.0 tons of nitrogen oxides.*

Source: SEWRPC

to 160 miles in 1972, even though traffic grew during that period by over 50 percent. The decline in traffic congestion may be attributed to the completion of the freeway system during that period. Between 1972 and 1991, the miles of congested arterials are estimated to have increased from 160 miles to 273 miles, as traffic grew by nearly 65 percent, regional employment and households increased by about 30 percent, and vehicle occupancy and carpooling significantly declined. The decline in vehicle occupancy from an average of 1.39 people per vehicle to 1.22 people per vehicle is estimated to have resulted in nearly a 15 percent increase in vehicle traffic. In addition, only limited transportation system improvement and expansion was completed between 1972 and 1991 in the Region. The miles of congested arterials are estimated to have increased modestly from 273 miles in 1991 to 290 miles in 2001. During that period, traffic is estimated to have increased by about 21 percent. The modest increase in traffic congestion from 1991 to 2001 may be attributed to implementing an extensive number of significant arterial street and highway widening and new construction projects in that time period. The estimated modest increase in congestion between 1991 and 2011 is not uniform systemwide, as for example, the extent and severity of congestion on the Milwaukee-area freeway system is estimated to have substantially increased between 1991 and 2011.

4. Review of a five-year history—2008 through 2012—of traffic crashes on the regional freeway and state trunk highway surface arterial system determined that the average crash rate was 72.5 crashes per 100 million VMT on freeways and 265.0 crashes per 100 million VMT on state trunk highway surface arterials. Countywide freeway system crash rates ranged from a low of 33.7 to a high of 120.2 crashes per 100 million VMT for the seven counties in Southeastern Wisconsin. Countywide state trunk highway surface arterial crash rates ranged from a low of 119.0 to a high of 372.8 crashes per 100 million VMT for the seven counties. During that period, only Milwaukee County's freeway and state trunk highway surface arterial crash rates exceeded the regional average crash rates.

5. The level of fixed-route public transit service in the Region significantly decreased from 2001 to 2011, from 5,600 vehicle-hours and 79,600 vehicle-miles of service on an average weekday to 4,700 vehicle-hours and 61,100 vehicle-miles, decreases of about 16 percent and

22 percent, respectively. Vehicle-hours of service in 2011 were also 8 percent less than those provided in 1991, 10 percent less than in 1972, and 32 percent less than in 1963. Vehicle-miles of service in 2011 were 2 percent less than those provided in 1991, 3 percent less than in 1972, and 27 percent less than in 1963. The continued decrease in fixed-route public transit service since 2001 is due to reduced Federal funds and State and local budget constraints. Demand-responsive transit service in the Region increased from 2001 to 2011, from 220 revenue-hours and 7,700 vehicle-miles of service on an average weekday to 360 revenue-hours and 10,300 vehicle-miles.

6. Public transit ridership measured in terms of transit passenger trips made from origin to destination on an average weekday has declined from 320,500 trips, representing 8 percent of regional internal personal travel in 1963, to 184,200 trips and 4 percent of travel in 1972, 172,200 trips and 3 percent in 1991, 142,200 trips and 2 percent in 2001, and 129,100 trips and 2 percent in 2011.

7. Ridership on Amtrak's Hiawatha Service, operating between Milwaukee and Chicago, increased from 312,404 in 1991 to 832,500 in 2012. Improvements to the Hiawatha Service during this period included additional train frequencies, construction of new stations at General Mitchell International Airport and in the Village of Sturtevant, and renovation of Milwaukee Intermodal Station.

8. Between 1963 and 2011, the amount of commercial air passenger service and passengers traveling to and from Southeastern Wisconsin has significantly increased, while significant declines in service and in passengers have occurred on other intercity modes of passenger travel, including rail, bus, and ferry. Commercial air carrier passengers represented only 27 percent of intercity transit passenger travel in the Region in 1963, and represented about 80 percent of intercity passenger travel to, from, and through, the Region in 2011. During the period from 1963 to 2011, passenger travel measured in average weekday passenger trips on intercity transit modes to and from the Region increased by about 140 percent. Over that same period, intercity personal vehicle travel to, from, and through the Region experienced about a 110 percent increase. Of total intercity or interregional travel over the past 50 years to and from the Region, personal vehicle travel has consistently accounted for about 95 percent of total travel, and intercity transit modes for about 5 percent of total travel.

9. The number of park-ride lots enabling the transfer of mode between private vehicles and public transit and from solo driver private vehicles to carpools has increased from eight in 1972, to 37 in 1991, 48 in 2004, and 52 in 2012. Of the 52 park-ride lots in 2012, 39 were provided with transit service. On an average weekday in 2012, about 40 percent of the approximately 7,565 spaces at the 52 park-ride lots were estimated to be in use.

10. Of the Region's 3,300 miles of surface arterial streets and highways, it is estimated that 882 miles accommodate bicycles through paved shoulders, exclusive bicycle lanes, and physically separate parallel off-street paths. Also, 283 miles of regional off-street bicycle paths exist on former railway right-of-ways and in parkways. These off-street paths provide particularly safe and aesthetically attractive routes

separate from motor vehicle traffic and connect—though with gaps—the Region's urban centers and communities.

11. Transportation management and operations systems on the Region's transportation system include an extensive freeway traffic management system, including monitoring, metering, advisory information, and incident management elements; coordinated surface arterial traffic signal systems; and public transit computer aided dispatch and automated vehicle location systems.

12. Pavement conditions of state trunk highways are assessed every three years, and counties and municipalities are required by State law to rate the pavement condition of their arterial street and highway system every two years. In 2013, slightly over 85 percent of the state trunk highway system in the Region was determined to have few or no ride problems, a proportion that increased from 2006 to 2013. From 2005 to 2013, the collective number of miles of county and local arterials with PASER ratings one or two—those classifications that indicate severe deterioration and a need for reconstruction—decreased from about 6 percent of all county and local arterials in 2005 to about 2 percent in 2013.