2024 REVIEW & UPDATE OF VISION 2050

This document represents one of the seven elements of the 2024 Review and Update of VISION 2050, which is documented in Memorandum Report No. 268.

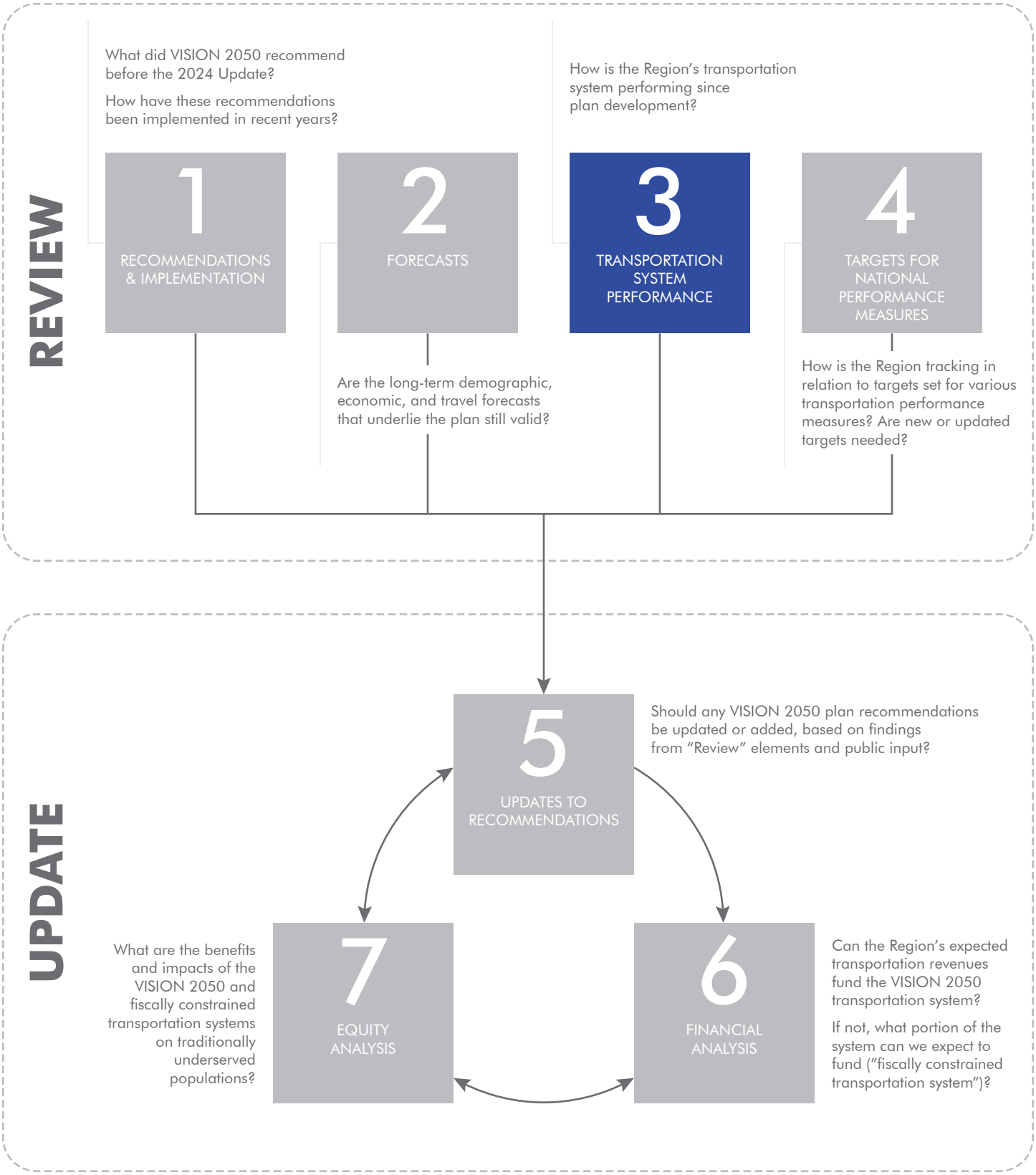
Prepared by the Southeastern Wisconsin Regional Planning Commission

June 2024

3 REVIEW OF TRANSPORTATION SYSTEM PERFORMANCE

2024 REVIEW & UPDATE OF VISION 2050

The Review & Update Process



INTRODUCTION

This document, titled *Review of Transportation System Performance,* was largely prepared in late 2023 as one of the initial elements of the 2024 Review and Update of VISION 2050, which is documented in Memorandum Report No. 268. It summarizes the current performance of the transportation system in Southeastern Wisconsin as it relates to public transit, the arterial street and highway system, park-ride lots, and transportation-related emissions. Performance is reported for the year the most recent data are available and is noted accordingly. Historical data and base year data from the development of VISION 2050 are included in some measures as well and are also noted accordingly.

PUBLIC TRANSIT PERFORMANCE

Review of Existing Transit Service

Map 1 shows public transit services currently provided in the Region. Below is a description of the public transit service types provided in the Region.

Rapid Transit Service

Rapid transit, as defined in VISION 2050, consists of either bus rapid transit (BRT) or light rail transit lines, with vehicles operating in exclusive lanes and stations typically spaced every one-half to one mile. The Region's first BRT line, formerly referred to as the East-West BRT Project and now branded as CONNECT 1, began service in June 2023 and is currently the only rapid transit route in the Region. The service is operated by the Milwaukee County Transit System (MCTS) and runs along a nine-mile route connecting Downtown Milwaukee to the Milwaukee Regional Medical Center via Wisconsin Avenue and Bluemound Road. The service utilizes dedicated lanes, enhanced stations with elevated boarding platforms, an off-board fare collection system, and battery electric buses. Service is provided throughout the week from approximately 5:00 a.m. to 1:00 a.m. every 10 minutes during the day on weekdays and every 15 minutes during the day on weekends. Fares on CONNECT 1 were free through April 2024, and returned to MCTS's system-wide base adult fare of $2.00 per ride with a $4.00 per day fare cap.

Commuter Transit Service

Commuter transit service within the Region in 2023 consisted of five bus routes operating primarily over the freeway system with extensions over major arterial streets and highways. These routes connect suburban and rural residential areas of the Region to urban job centers, frequently utilizing park-ride lots to serve communities located off the freeway system. Service was sponsored by Waukesha County, Ozaukee County, and the City of Racine. Base adult fares range from $2.25 to $5.00 per trip. Beginning in September 2023, the Washington County Commuter Express no longer operates service to and from Washington County.

Express Transit

Express transit service provides fixed-route bus service with higher frequency and fewer stops to service major thoroughfares more efficiently in an area. As of 2023, there were four express routes operating in the Region, all provided by MCTS. These routes provided service from approximately 4:30 a.m. to 1:00 a.m. seven days a week, with buses arriving every 10 to 30 minutes during the week and every 15 to 45 minutes on weekends. Base adult fares are $2.00 per ride with a $4.00 per day fare cap.

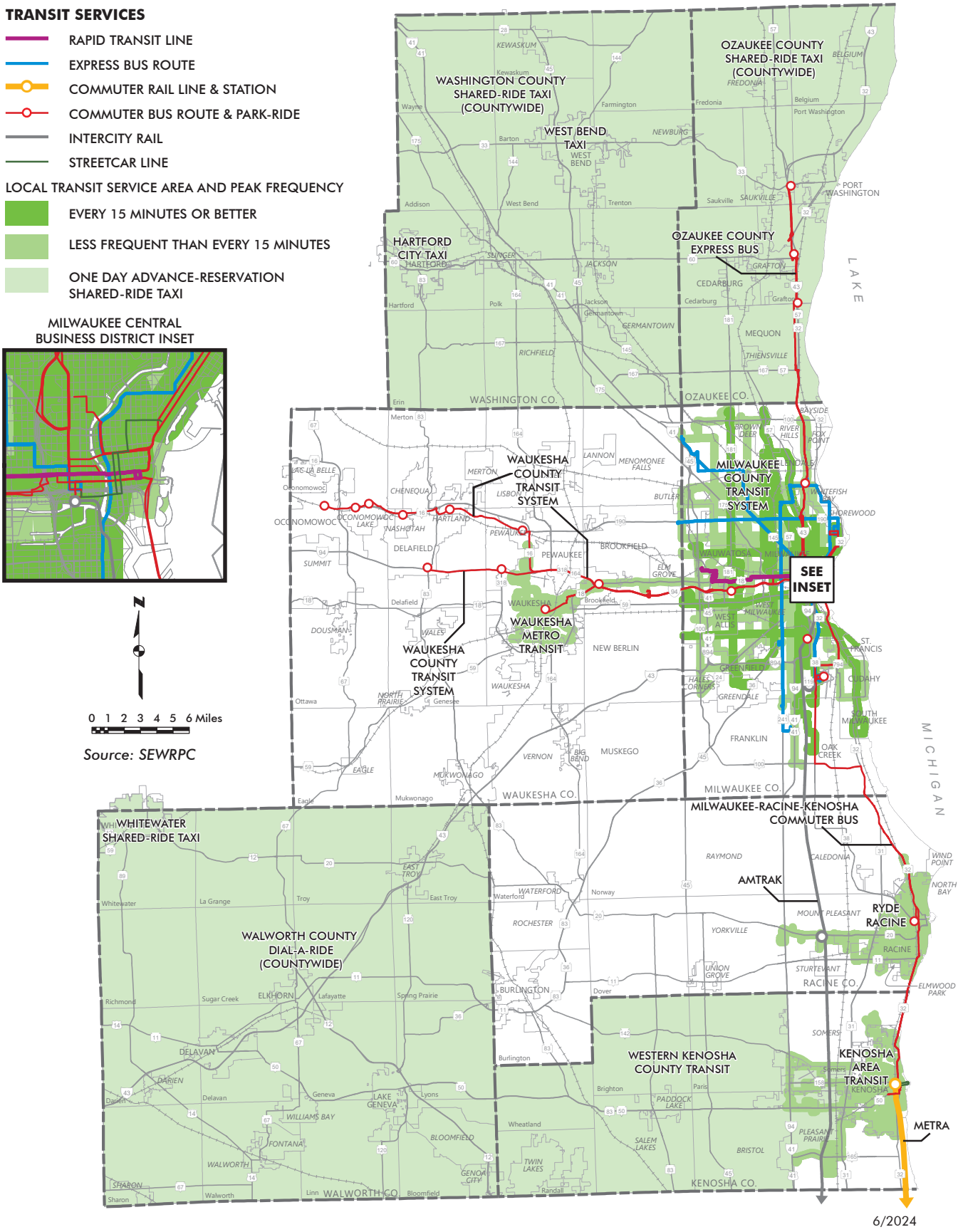
Fixed-Route Local Transit Service

Fixed-route local public transit was provided in 2023 within the Kenosha, Milwaukee, and Racine urbanized areas. These local transit services are described below.

<u>Kenosha</u>

The Kenosha Area Transit system provided fixed-route local transit service in the City of Kenosha in 2023 over seven regular fixed routes, an express route to the Amazon Distribution Center, a school tripper, and an electric streetcar line. Local service is provided on most routes from 6:00 a.m. to 12:30 a.m. on weekdays and 9:00 a.m. to 4:00 p.m. on Saturdays, with buses arriving every 30 to 60 minutes during weekday peak periods and every 60 minutes during weekday off-peak periods and on Saturdays. Service was provided

Map 1
Public Transit Services in the Region: 2023



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 Kenosha Area Transit were $2.00 per trip for bus service and $1.00 per trip for the streetcar line.

Racine

In 2023, RYDE Racine, operated by the City of Racine, provided local service over nine fixed routes. The system provided service from 5:30 a.m. to 11:30 p.m. on weekdays, from 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.

Milwaukee

MCTS provided local transit service in the Milwaukee area in 2023 over 33 regular fixed routes. The system provided local bus service seven days a week, typically from 5:00 a.m. to 1:00 a.m., with an adult base fare of $2.00 per trip with a $4.00 per day fare cap. Peak weekday bus frequency ranged from 10 to 60 minutes, with 10 designated high-frequency routes providing service every 15 minutes or less, 13 routes providing service every 15 to 30 minutes, and 10 routes providing service every 30 to 60 minutes—not including rapid and express routes referenced previously in this section.

Service on The Hop streetcar in the City of Milwaukee continued with service every 15 minutes during peak periods, connecting the Milwaukee Intermodal Station, the Historic Third Ward, City Hall, Burns Commons, and locations in between. Through a variety of private sponsorships, fares continue to be free.

Waukesha

Waukesha Metro Transit, operated by the City of Waukesha, provided service over 10 fixed routes in 2023, with service provided from approximately 5:30 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 20 to 60 minutes. The adult cash fare was $2.00 per trip.

Demand-Responsive Transit

Demand-responsive public transit was provided in rural areas of the Region through publicly operated shared-ride taxi services. Shared-ride taxi was operated at the municipal level by the Cities of Hartford, West Bend, and Whitewater, and at the county level by Ozaukee, Walworth, and Washington Counties. Door-to-door taxi service was also provided in Western Kenosha County.

Each of the taxi systems in the Region operated seven days a week in 2023, with the hours of operation varying by system. Many systems required or preferred 24-hour advanced reservations. Fares range from $3.25 to $9.00 per trip and vary by provider and length of trip. Many of the taxi systems contracted with private companies to provide the services.

Intercity Passenger Rail

In 2023, Amtrak provided intercity passenger rail service in Southeastern Wisconsin with stops within the Region at the Milwaukee Intermodal Station in Downtown Milwaukee, Milwaukee Mitchell International Airport, and Sturtevant. Under contract with the State of Wisconsin and the State of Illinois, Amtrak operated seven daily Hiawatha Service trains in each direction between Milwaukee and Chicago, with intermediate stops at Milwaukee Mitchell International Airport, Sturtevant, and Glenview. As part of its national network, Amtrak operated the Empire Builder with one daily train in each direction between Seattle/Portland and Chicago, serving Wisconsin through stops in La Crosse, Tomah, Wisconsin Dells, Portage, Columbus, and Milwaukee.

Commuter Rail

In 2023, the only commuter rail service operated in the Region 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 Union Pacific Railroad under contract with Metra and at no cost to any Wisconsin units of government.

Intercity Bus Service

In 2023, scheduled intercity bus services were provided by eight carriers: Amtrak Thruway; Autobuses Mares; Badger Coaches, Inc.; Coach USA/Megabus; Flixbus; Greyhound Lines, Inc.; Indian Trails, Inc.; Jefferson Lines, Inc.; Lamers Bus Lines, Inc.; and Tornado Bus Company. Intercity bus service currently connects the Region to Appleton, Chicago, Eau Claire, Fond du Lac, Green Bay, La Crosse, Madison, Manitowoc, Marinette, Menomonie, Minneapolis-Rochester, Stevens Point, St. Paul, Tomah, Oconto, Oshkosh, Peshtigo, Sheboygan, Stevens Point, Waupaca, Wausau, Wisconsin Dells, and several communities in Michigan's Upper Peninsula.

Ridership and Service Levels

Passenger boardings and service levels are provided below for the transit systems in the Region for the 10-year period between 2011 and 2021 (the year the most recent data are available). The COVID-19 pandemic impacted transit ridership and service levels significantly, exacerbating the already declining ridership trends. The shift to remote work and need to promote social distancing significantly reduced ridership during the height of the pandemic, which has not yet fully recovered, although data samples from 2022 and 2023, which are not yet available for a Region-wide data analysis, show that ridership is beginning to slowly recover for certain transit services.

The delayed recovery is likely due, in part, to a permanent shift toward remote and hybrid work arrangements. As noted by the American Public Transit Association (APTA), the makeup of local economies impacts the degree of ridership decline. For example, technology-based economies with teleworking options have experienced a more dramatic reduction in ridership than those economies with a service industry or manufacturing focus. In addition, ongoing driver shortages have impacted the transit industry nationally and locally, resulting in reduced service hours and suspension of certain routes. Between 2020 and 2022, several federal programs provided temporary funding relief to address budget shortfalls that resulted from the significant loss in farebox revenue. However, those programs are now ending, and transit systems across the country are looking at ways to permanently adjust to these changes—by finding ways to attract new riders, adjusting their service models, or a combination of both approaches.

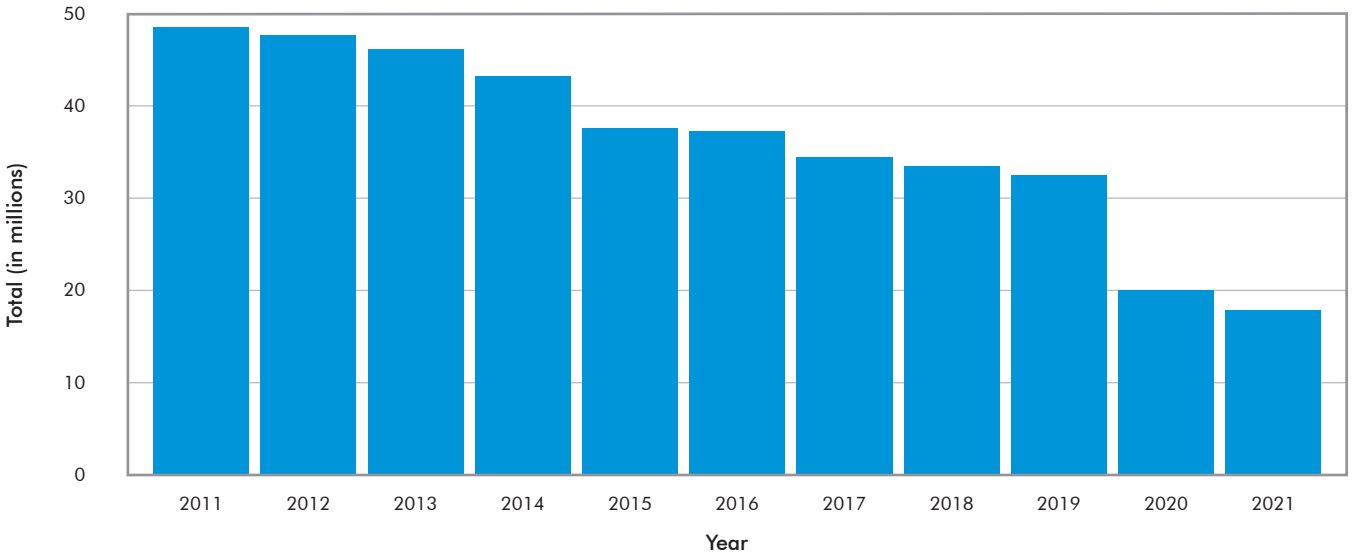
Passenger boardings for local fixed-route transit systems (which includes streetcar, local bus, express bus, and rapid transit) and commuter bus service between 2011 and 2021 are provided in Figures 1 and 2. Passenger boardings on local transit systems declined by nearly 50 percent between 2017 and 2021, and even more significantly during the 10-year period between 2011 and 2021. Commuter bus systems have also seen significant reductions in boarding rates with a decrease of 74 percent between 2017 and 2021, and 81 percent during the 10-year period between 2011 and 2021.

Despite decreases in ridership, annual vehicle-miles of service for local transit systems have remained relatively stable between 2011 and 2021, as shown in Figure 3. This is largely a result of pandemic-related federal funding assistance, which allowed transit agencies to maintain services through declining farebox revenues. There was a significant dip in service during the height of the COVID-19 pandemic, which recovered quickly by 2021. However, most transit operators in the Region continued service throughout the pandemic to provide vital transportation options to essential workers and individuals unable to drive or without access to a personal vehicle. Commuter bus service has seen a more significant overall decrease in annual vehicle-miles of service with a nearly 50 percent decrease since 2011—a trend that began prior to 2020 due to retirements among the historical ridership base, changing commuting patterns, and relatively low fuel prices—as shown in Figure 4.

For demand-responsive public shared-ride taxi service, both passenger boardings and annual vehicle-miles of service have decreased since 2011, shown in Figures 5 and 6, respectively. These figures also show a dip in 2020 and a subsequent increase in 2021, although not returning to pre-2020 levels of ridership or service.

Ridership on Amtrak's Hiawatha Service between 2012 and 2022 is shown in Figure 7. Ridership was steadily increasing between 2015 and 2019, until the COVID-19 pandemic resulted in a significant

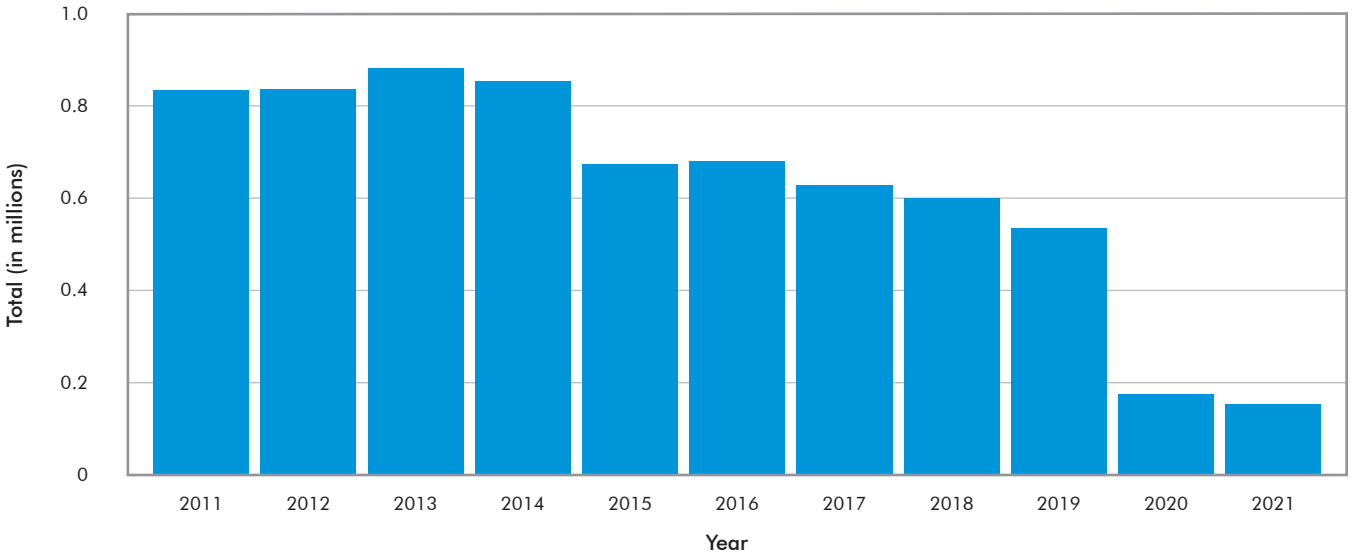
Figure 1
Passenger Boardings on Local Transit Service in the Region: 2011-2021



Note: Includes Kenosha Area Transit, Milwaukee County Transit System, Waukesha Metro, RYDE Racine, and The Hop Streetcar.

Source: National Transit Database and SEWRPC, 8/2023

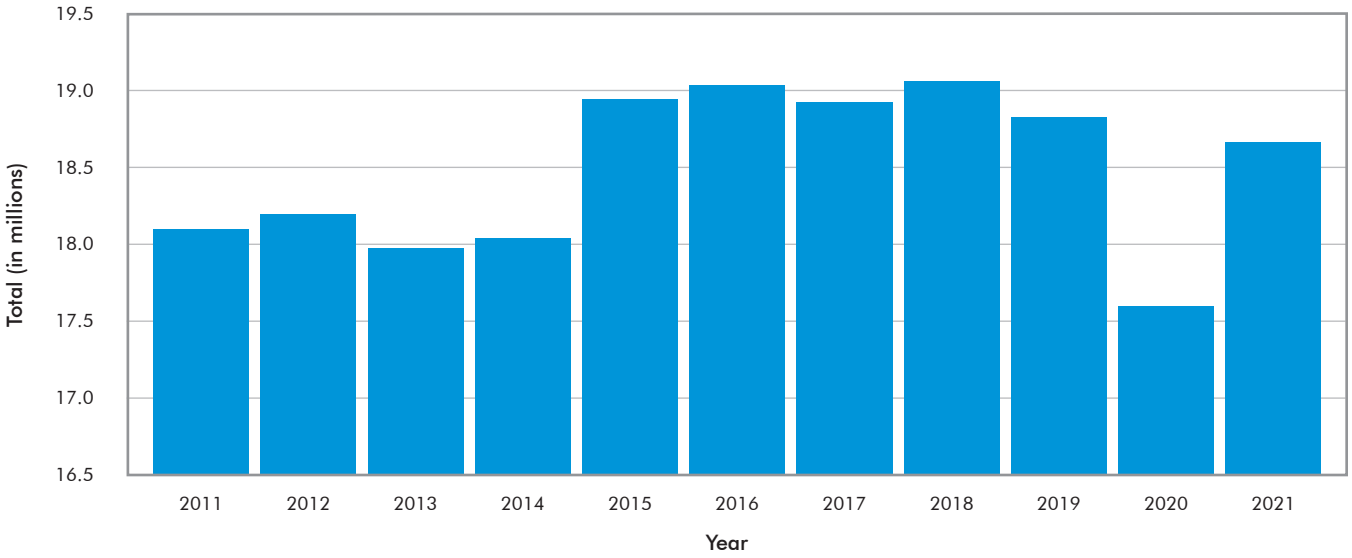
Figure 2
Passenger Boardings on Commuter Bus Service in the Region: 2011-2021



Note: Includes Waukesha County, Kenosha-Racine-Milwaukee Commuter Bus, Washington County Commuter Express, and Ozaukee County Express. Western Kenosha County Transit is also included in 2011-2019, but is not included in 2020 and 2021 as the system changed to a shared-ride taxi model in 2020.

Source: National Transit Database and SEWRPC, 8/2023

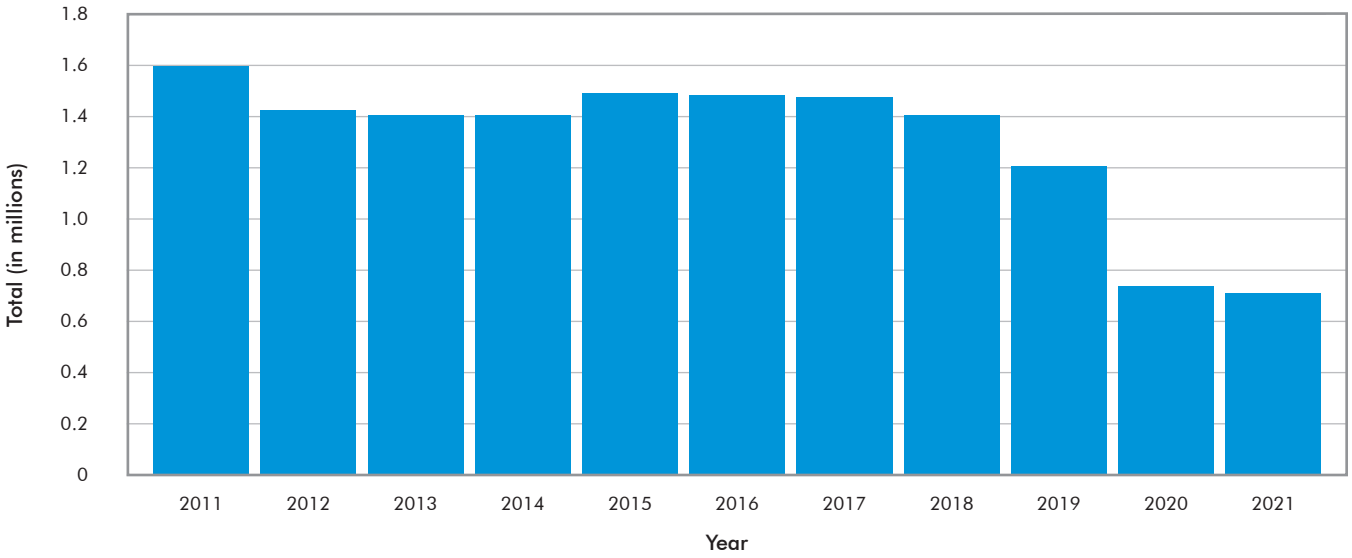
Figure 3
Annual Vehicle-Miles of Service for Local Transit Service in the Region: 2011-2021



Note: Includes Kenosha Area Transit, Milwaukee County Transit System, Waukesha Metro, RYDE Racine, and The Hop Streetcar.

Source: National Transit Database and SEWRPC, 8/2023

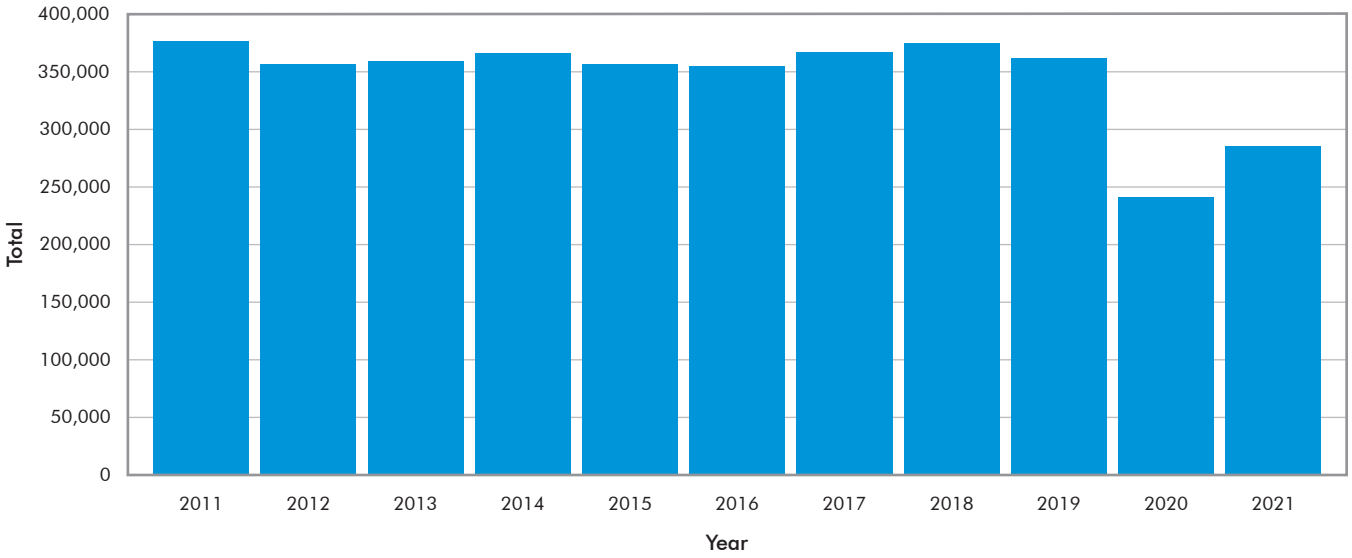
Figure 4
Annual Vehicle-Miles of Service for Commuter Bus Service in the Region: 2011-2021



Note: Includes Waukesha County, Kenosha-Racine-Milwaukee Commuter Bus, Washington County Commuter Express, and Ozaukee County Express. Western Kenosha County Transit is also included in 2011-2019, but is not included in 2020 and 2021 as the system changed to a shared-ride taxi model in 2020.

Source: National Transit Database and SEWRPC, 8/2023

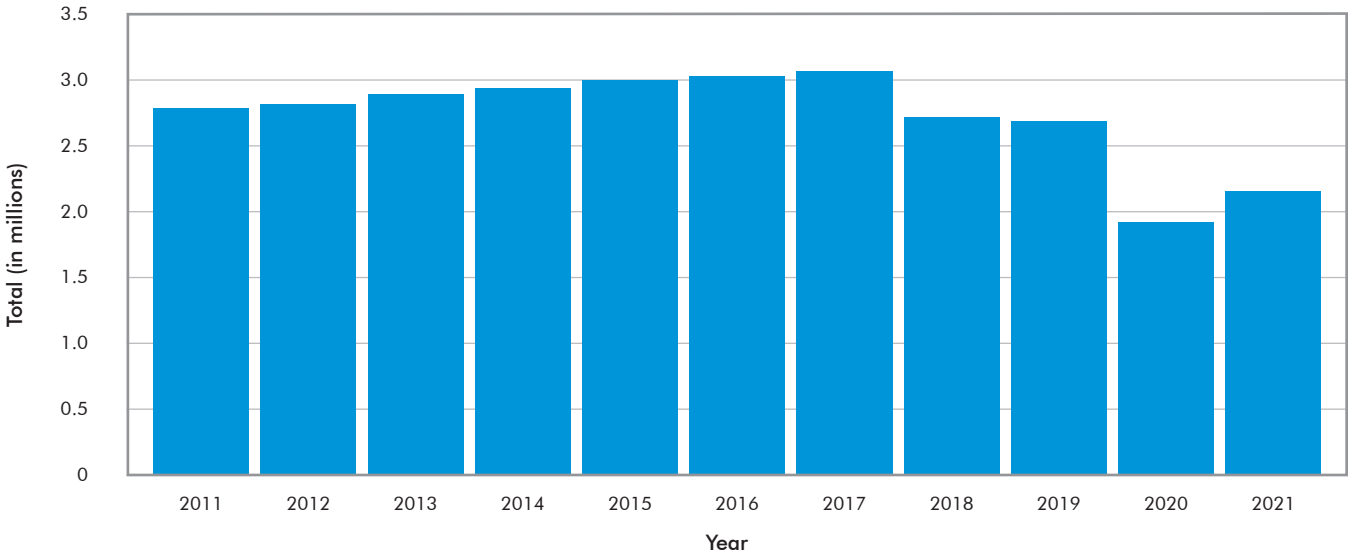
Figure 5
Passenger Boardings on Public Shared-Ride Taxi Systems in the Region: 2011-2021



Note: Includes taxi service in Ozaukee, Walworth, and Washington Counties and the Cities of Hartford, Whitewater, and West Bend. Western Kenosha County Transit is included in 2020 and 2021 as the system did not operate using a shared-ride taxi service model until 2020.

Source: National Transit Database and SEWRPC, 8/2023

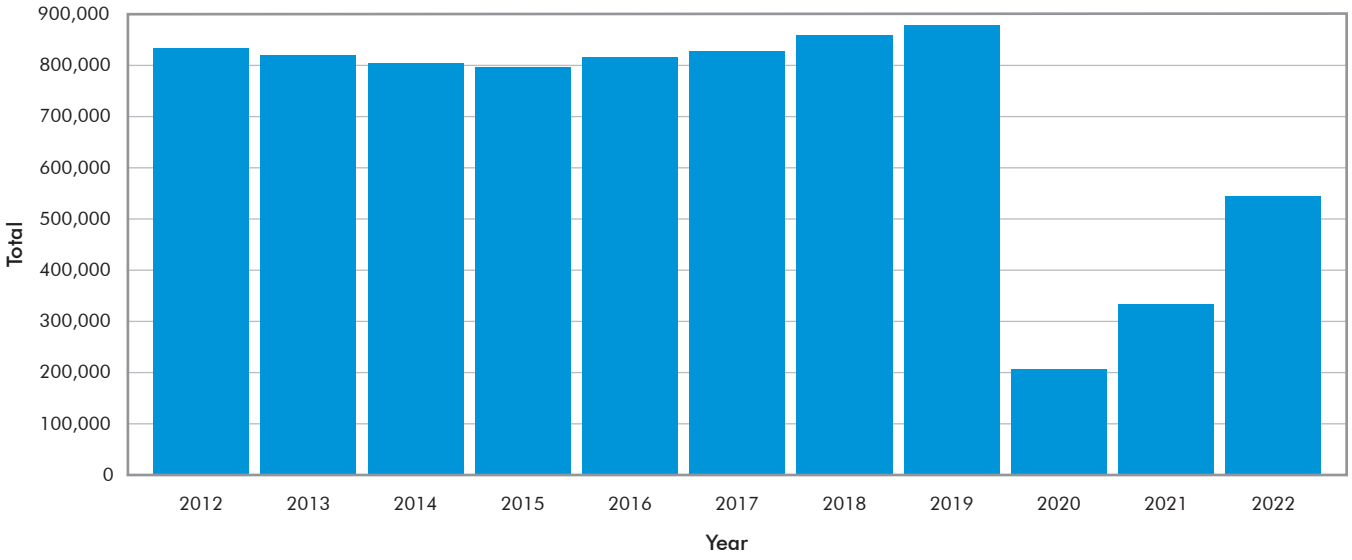
Figure 6
Annual Vehicle-Miles of Service for Public Shared-Ride Taxi Systems in the Region: 2011-2021



Note: Includes taxi service in Ozaukee, Walworth, and Washington Counties and the Cities of Hartford, Whitewater, and West Bend. Western Kenosha County Transit is included in 2020 and 2021 as the system did not operate using a shared-ride taxi service model until 2020.

Source: National Transit Database and SEWRPC, 8/2023

Figure 7
Annual Ridership on Amtrak Hiawatha Service: 2012-2022



Source: WisDOT and SEWRPC, 8/2023

reduction in service and, likewise, in ridership. Between 2020 and 2022, ridership numbers steeply increased, signaling a rebound in ridership following the return to pre-pandemic service levels.

Bus Vehicle Age

The average age of buses operated by transit operators in the Region was about 8.4 years in 2021, approximately two years older than the average age in 2017. The Commission staff monitors and sets regional targets for bus vehicle age as part of the federal transit asset management target-setting process described in the Targets for Federal Performance Measures appendix.

Transit Safety and Reliability

Table 1 provides a comparison of transit safety performance based on criteria established by the federal transit safety target-setting process. The rate of fatalities per 1 million revenue vehicle-miles was the same between 2017 and 2021 for fixed-route bus and fixed-route rail transit, while the rate of injuries and safety events increased for all other transit services. The Federal Transit Administration defines bus reliability as the mean distance between major mechanical failures. As shown in Table 1, the mean distance between major mechanical failures decreased for fixed-route transit service and increased for non-fixed route bus transit service.

ARTERIAL STREETS AND HIGHWAYS PERFORMANCE

Pavement Condition

The Commission coordinates with the State, county, and local governments to monitor pavement conditions using a combination of the International Roughness Index (IRI), used by the State, and the Pavement Surface Evaluation and Rating (PASER) scale, used by county and local governments in the State. For the purposes of a more general analysis and evaluation of pavement conditions in the Region, scores from these two rating systems are designated as good, fair, and poor, as follows: for state trunk highways, a roadway with an IRI of less than 1.5 is considered in good condition, an IRI between 1.5 and 3.5 is considered in fair condition, and an IRI of more than 3.5 is considered in poor condition. For county and local trunk highways, a roadway having a PASER of 7 or more is considered in good condition, a PASER of 5 or 6 is considered in fair condition, and a PASER of 4 or less is considered in poor condition.

As of the most recently available data (2022 for state trunk highways and 2021 for county and local trunk highways), 46.9 percent of pavement is in good condition, 39.9 percent of pavement is in fair condition, and 13.2 percent of pavement is in poor condition. Map 2 shows a comparison of the years 2016/2017 and current condition of pavement in Southeastern Wisconsin. Table 2 shows a comparison of the pavement condition by category since 2013. Since 2013, overall pavement condition of the arterial street and highway system has worsened with both the amount of miles in good condition decreasing (a reduction of about 13.9 percent) and the amount of miles in bad condition increasing (an increase of about 24.7 percent).

Bridge Condition

Similarly, the Commission monitors bridge condition in the Region using bridge sufficiency ratings provided by WisDOT. These data are collected through bridge inspections performed by WisDOT and local municipalities following State guidelines for bridge inspection and maintenance. A bridge sufficiency rating scale of 0 to 100 is used, with 0 being a failing structure and 100 being a structure in perfect condition. Ratings are based on four factors: structural adequacy and safety; serviceability and functional obsolescence; essentiality for public use; and special reductions. For the purposes of this analysis, sufficiency ratings are designated as good, fair, and poor, as follows: a bridge with a sufficiency rating of 80 or greater is considered to be in good condition, a bridge with a sufficiency rating of 50 to 79.9 is considered to be in fair condition, and a bridge with a sufficiency rating less than 50 is considered to be in poor condition.

As of 2022, 80.9 percent of bridges were rated in good condition, 16.5 percent were rated in fair condition, and 2.6 percent were rated in poor condition. Map 3 compares the bridge condition in the Region for the years 2018 and 2022. Table 3 compares the bridge condition by count and percent for

Table 1
Transit Safety Performance: 2017 and 2021

Transit System Type	Fatalities per 1 Million Revenue Vehicle Miles		Injuries per 1 Million Revenue Vehicle Miles		Safety Events per 1 Million Revenue Vehicle Miles		System Reliability[a]	
	2017	2021	2017	2021	2017	2021	2017	2021
Fixed-Route Bus	0.01	0.01	4.52	5.25	4.07	5.77	18,689	5,718
Fixed-Route Rail[b]	0.00	0.00	0.00	44.19	0.00	55.24	0	30,170
Non-Fixed Route	0.00	0.22	8.28	3.04	7.95	3.26	104,711	155,823

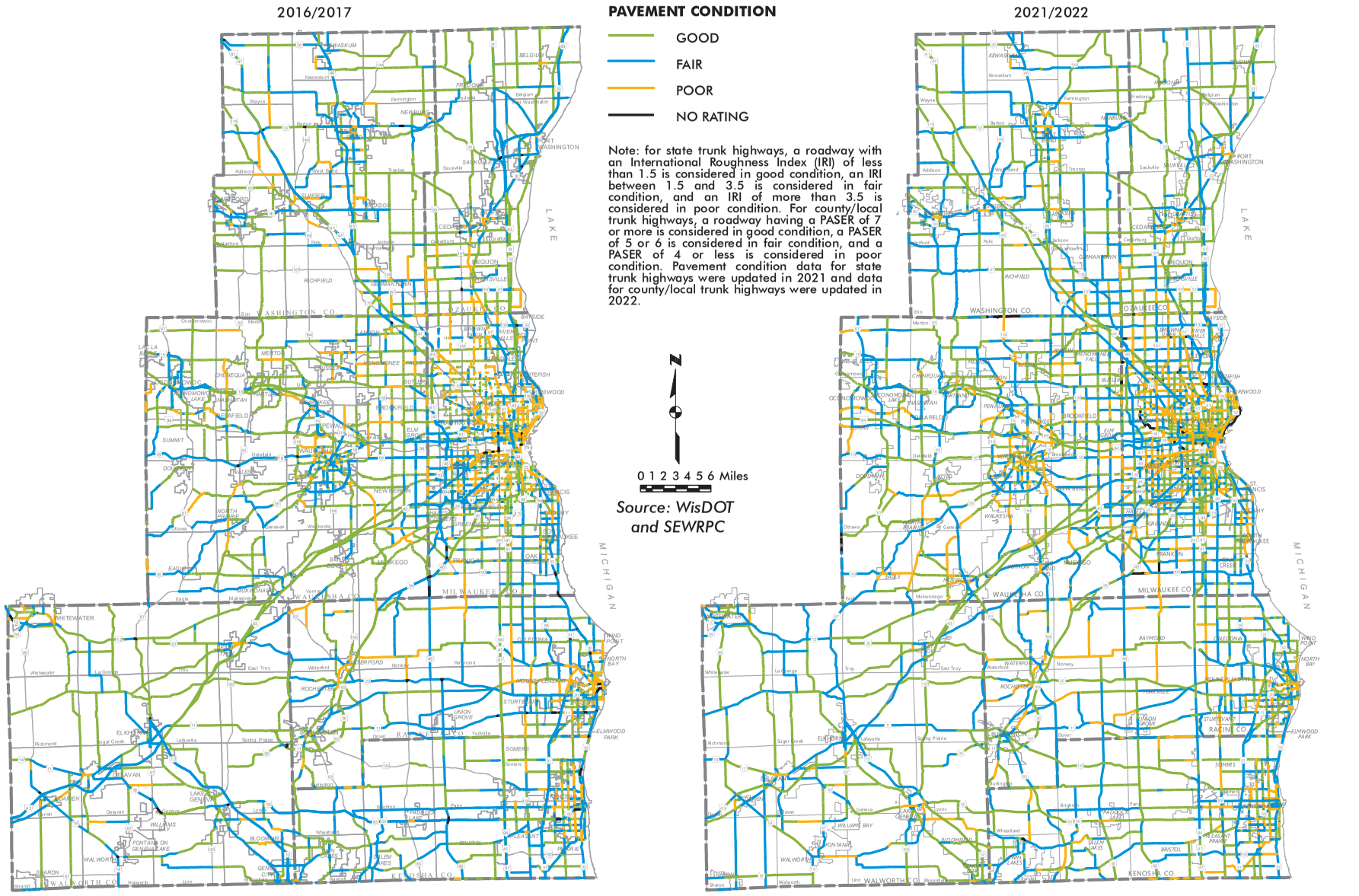
Note: Performance categories are based on safety performance criteria established under the National Public Transportation Safety Plan pursuant 49 CFR Part 673, Public Transportation Agency Safety Plan.

[a] *System reliability is measured as revenue miles operated divided by the number of major mechanical failures.*

[b] *The data for fixed-route rail include the five-year average annual data for the City of Kenosha's streetcar plus three years of data for The Hop streetcar operated by the City of Milwaukee starting in 2019, the system's first full year of revenue service. Metra commuter rail safety data are not included in the fixed-route rail data because Metra is regulated by the Federal Railroad Administration (FRA).*

Source: National Transit Database and SEWRPC, 6/2024

Map 2
Pavement Condition on Arterial Streets and Highways in the Region: 2016/2017 and 2021/2022



6/2024

Table 2
Pavement Condition of Arterial Streets and Highways: 2013-2022

Condition[a]	Base Year (2013)		2016/2017[b]		2021/2022[c]	
	Miles	Percent	Miles	Percent	Miles	Percent
Poor	380	10.6	338	9.4	474	13.2
Fair	1,239	34.7	1,410	39.2	1,432	39.9
Good	1,958	54.7	1,849	51.4	1,685	46.9
Total	3,577	100.0	3,597	100.0	3,591	100.0

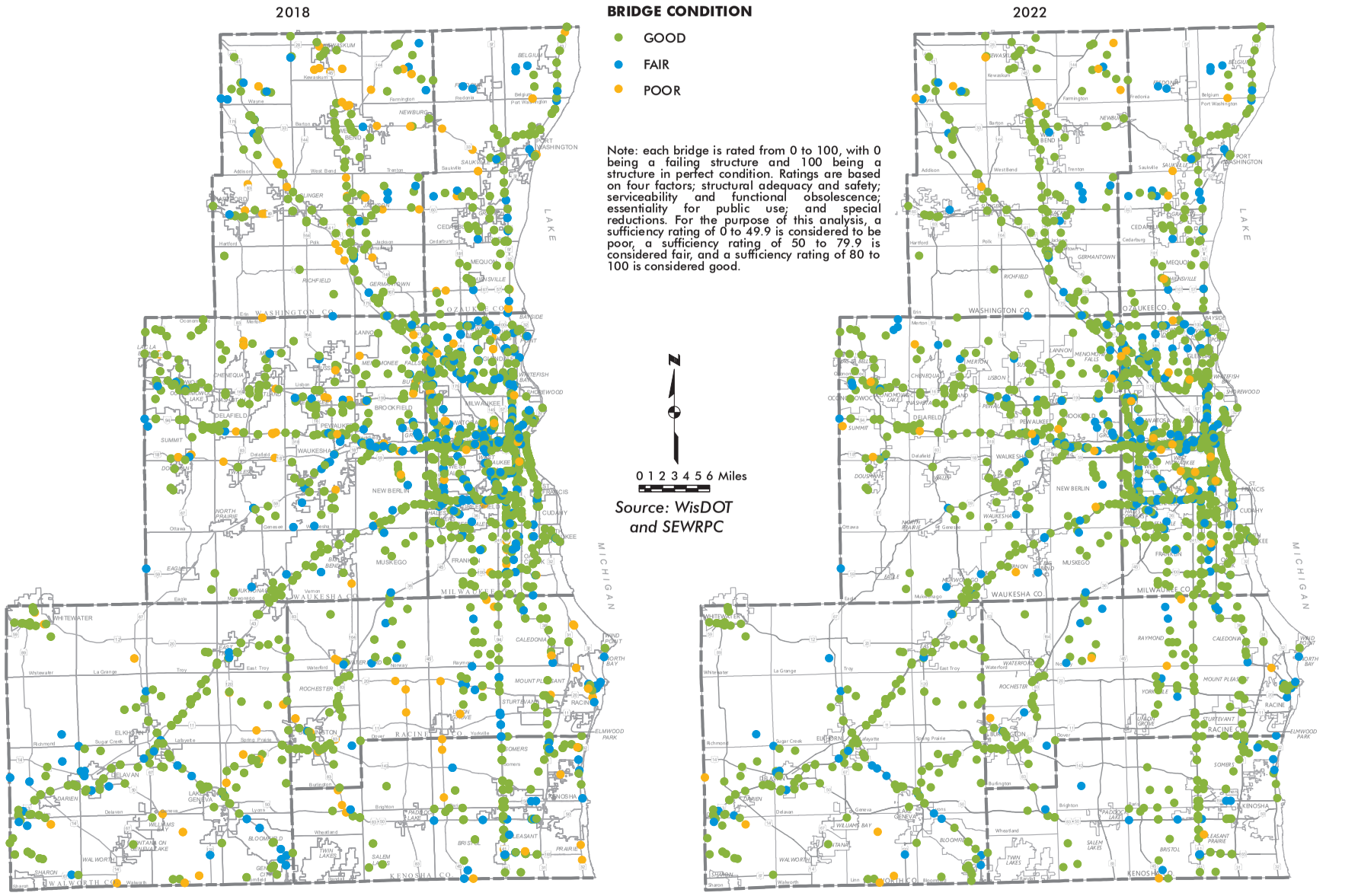
[a] *For state trunk highways, a roadway with an International Roughness Index (IRI) of less than 1.5 is considered in good condition, an IRI between 1.5 and 3.5 is considered in fair condition, and an IRI of more than 3.5 is considered in poor condition. For county/local trunk highways, a roadway having a PASER of 7 or more is considered in good condition, a PASER of 5 or 6 is considered in fair condition, and a PASER of 4 or less is considered in poor condition.*

[b] *The data year for state trunk highways is 2016 and the data year for local/county trunk highways is 2017.*

[c] *The data year for state trunk highways is 2022 and the data year for local/county trunk highways is 2021.*

Source: WisDOT and SEWRPC, 6/2024

Map 3
Bridge Structure Condition in the Region: 2018 and 2022



6/2024

Table 3
Bridge Structure Condition in the Region: 2013, 2018, and 2022

Sufficiency Rating[a]	2013		2018		2022	
	Number of Bridges	Percent	Number of Bridges	Percent	Number of Bridges	Percent
Poor	81	4.3	73	3.7	51	2.6
Fair	441	23.3	371	19.0	323	16.5
Good	1,372	72.4	1,508	77.3	1,589	80.9
Total	1,894	100.0	1,952	100.0	1,963	100.0

[a] *Each bridge is rated from 0 to 100, with 0 being a failing structure and 100 being a structure in perfect condition. Ratings are based on four factors: structural adequacy and safety, serviceability and functional obsolescence, essentiality for public use, and special reductions. For the purpose of this analysis, a sufficiency rating of 80 to 100 is considered good, a sufficiency rating of 50 to 79.9 is considered fair, and a sufficiency rating of 0 to 49.9 is considered poor.*

Source: WisDOT and SEWRPC, 6/2024

the years 2013, 2018, and 2022. Since 2013, the number of bridges in good condition has consistently increased (increasing by about 16 percent) and the number of bridges in poor condition has consistently decreased (decreasing by about 37 percent).

Peak Hour Traffic Congestion and Delay

Measuring the estimated level of traffic congestion on an arterial facility is a function of estimated actual[1] average weekday traffic volumes relative to facility design capacities, which are based on the maximum volume of traffic a facility can carry before beginning to experience morning or afternoon peak hour traffic congestion (see Table 4). This estimated level of congestion in peak traffic may be categorized as none, moderate, severe, or extreme, with each level characterized by the travel speeds and operating conditions, and level of service.

Peak Hour Traffic Congestion on the Arterial Street and Highway System

The estimated levels of peak hour traffic congestion on the arterial street and highway system for the years 2017 and 2022 are presented in Map 4 and Table 5. The freeway system represents only about 8 percent of total arterial system mileage but carries about 41 percent of total regional average weekday vehicle-miles of travel. Because of its high level of utilization, a greater proportion of the freeway system than the surface arterial street system experiences traffic congestion during peak weekday hours and outside of that window. System mileage remained relatively stable between 2017 and 2022 while the percentage of total system miles experiencing congestion decreased from 8.2 percent to 5.4 percent during this period. The miles of roadway experiencing extreme congestion decreased by almost 50 percent, from 34.0 to 18.0 miles, largely due to reduced congestion in Milwaukee County. This congestion decrease is attributable to decreased vehicle-miles of travel from the COVID-19 pandemic, which have not returned to pre-pandemic levels. Some capital projects completed between 2017 and 2022, such as the Zoo Interchange reconstruction, which added capacity, also affects levels of congestion in Milwaukee County.

Peak Hour Traffic Congestion on Designated Truck Routes and the National Highway System

The estimated levels of peak hour traffic congestion on the National Highway System (NHS) and on designated truck routes for the years 2017 and 2022 are presented in Map 5 and Table 6. The NHS includes highways important to the nation's economy, defense, and mobility. As with the arterial street and highway system, the total miles of designated truck routes and NHS facilities remained relatively stable from 2017 to 2022. However, the number of system miles carrying traffic volumes exceeding their design capacity dropped by almost 32 percent, from 232 in 2017 to 159 in 2022. These decreases in congestion improve travel time and freight movement throughout the Region.

Peak Hour Arterial Highway Travel Times

Estimated average weekday peak-hour arterial street and highway travel sheds for 2017 and 2022 are shown on Map 6 for two locations: the Milwaukee central business district (Downtown) and the Milwaukee Regional Medical Center. The reduction in congestion, attributed to COVID-19, coupled with the completion of some significant roadway improvement projects, like the widening of IH 94 in Racine and Kenosha Counties and the completion of the Zoo Interchange Reconstruction project, have improved travel times generally west and south of the Milwaukee Regional Medical Center and Downtown.

Roadway Safety

Number of Crashes

Following an increase from 2012 to 2019, total vehicular crashes decreased from a high of 46,558 crashes in 2019 to 40,677 crashes in 2022 (see Figure 8), a decrease of approximately 13 percent. The drop to 37,632 crashes in 2020 was likely attributable to changes in travel behavior resulting from the COVID-19 pandemic. The 10,094 crashes involving an injury or a fatality in 2022 continued the general decline of such crashes over the last two decades, an overall decrease of about 34 percent since 2002.

---

[1] *The estimated actual weekday volume is based on a combination of short-term (2-day) counts collected throughout Southeastern Wisconsin on a 3-year or 10-year cycle and continuous (freeway) counts.*

Table 4
Estimated Freeway and Surface Arterial Facility Design Capacity and Attendant Peak Hour Level of Traffic Congestion

Estimated arterial facility design capacities based on the maximum level of traffic volume a facility can carry before beginning to experience morning or afternoon peak hour traffic congestion, along with the threshold of level of service C, D, E, and F, expressed in terms of number of vehicles per average weekday, are as follows for the various facility types:

Facility Type	Average Weekday Traffic Volumes (Vehicles per 24 Hours)			
	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 peak hour level of traffic 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.

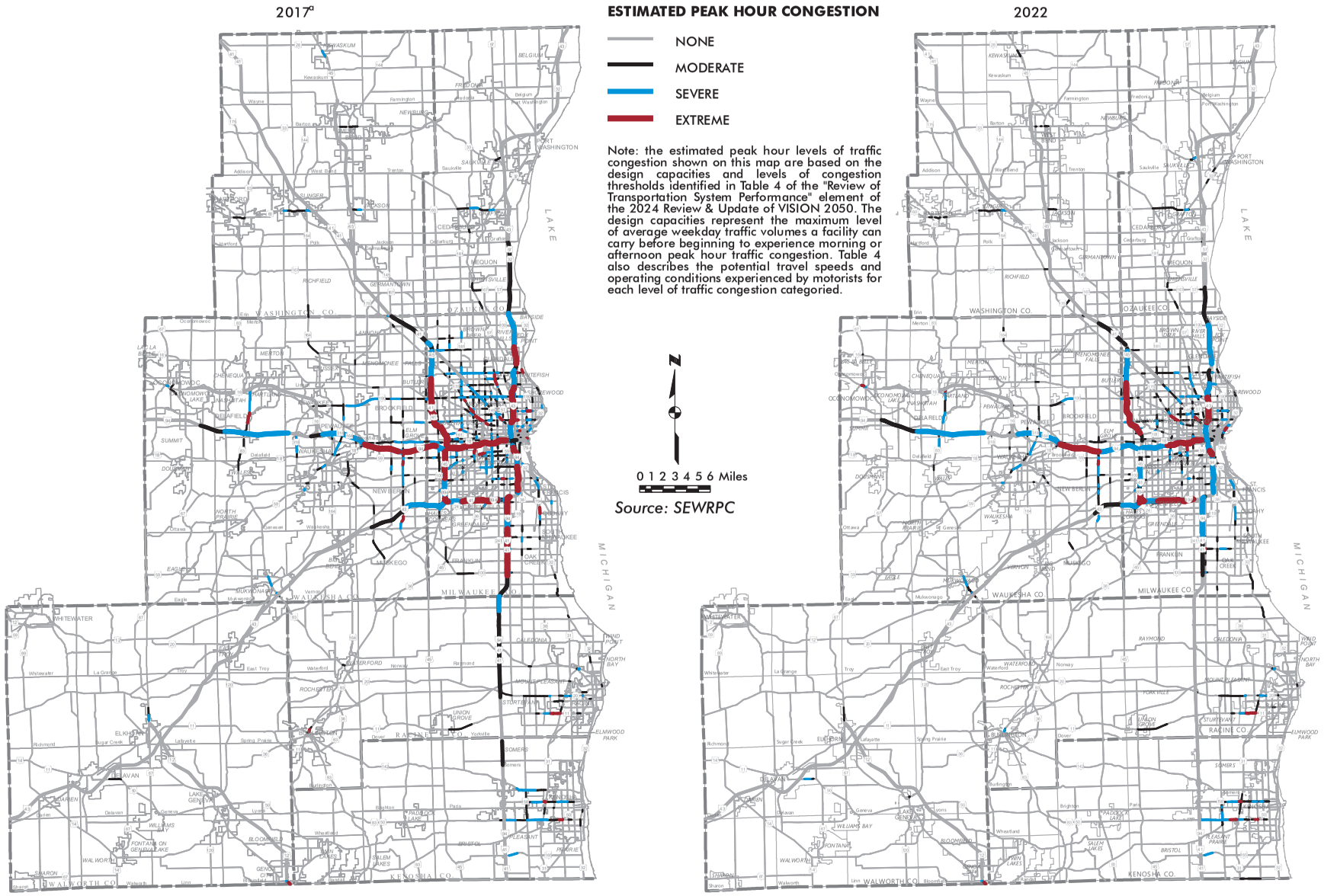
Surface Arterial

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.

Note: the application of the design capacities to actual arterial traffic volume data in years 2017 and 2022 is provided on Maps 4 and 5 and in Tables 5 and 6 of the "Review of Transportation System Performance" element of the 2024 Review & Update of VISION 2050.

Source: SEWRPC, 6/2024

Map 4
Peak Hour Level of Traffic Congestion Estimated on the Arterial Street and Highway System: 2017 and 2022



[a] *In 2017, the traffic volume on the freeway system was impacted by lane and ramp closures primarily due to the reconstruction of the Zoo and Lake Interchanges.*

6/2024

Table 5
Estimated Average Weekday Peak Hour Level of Traffic Congestion on the Arterial Street and Highway System in the Region by County: 2017 and 2022

2017

County	Under or at Design Capacity[a]		Over Design Capacity[a]						Total Mileage
			Moderate Congestion		Severe Congestion		Extreme Congestion		
	Mileage	Percent of Total	Mileage	Percent of Total	Mileage	Percent of Total	Mileage	Percent of Total	
Kenosha	304.6	95.2	8.7	2.7	6.5	2.0	0.2	0.1	320.0
Milwaukee	635.9	80.6	72.4	9.2	51.0	6.5	29.1	3.7	788.4
Ozaukee	239.0	95.3	10.8	4.3	1.0	0.4	--	--	250.8
Racine	342.5	95.0	15.3	4.2	2.4	0.7	0.5	0.1	360.7
Walworth	445.3	99.4	2.0	0.4	0.3	0.1	0.2	0.1	447.8
Washington	399.4	98.3	5.8	1.4	1.3	0.3	--	--	406.5
Waukesha	686.8	91.2	37.9	5.0	24.6	3.3	4.0	0.5	753.3
Region	3,053.5	91.8	152.9	4.6	87.1	2.6	34.0	1.0	3,327.5

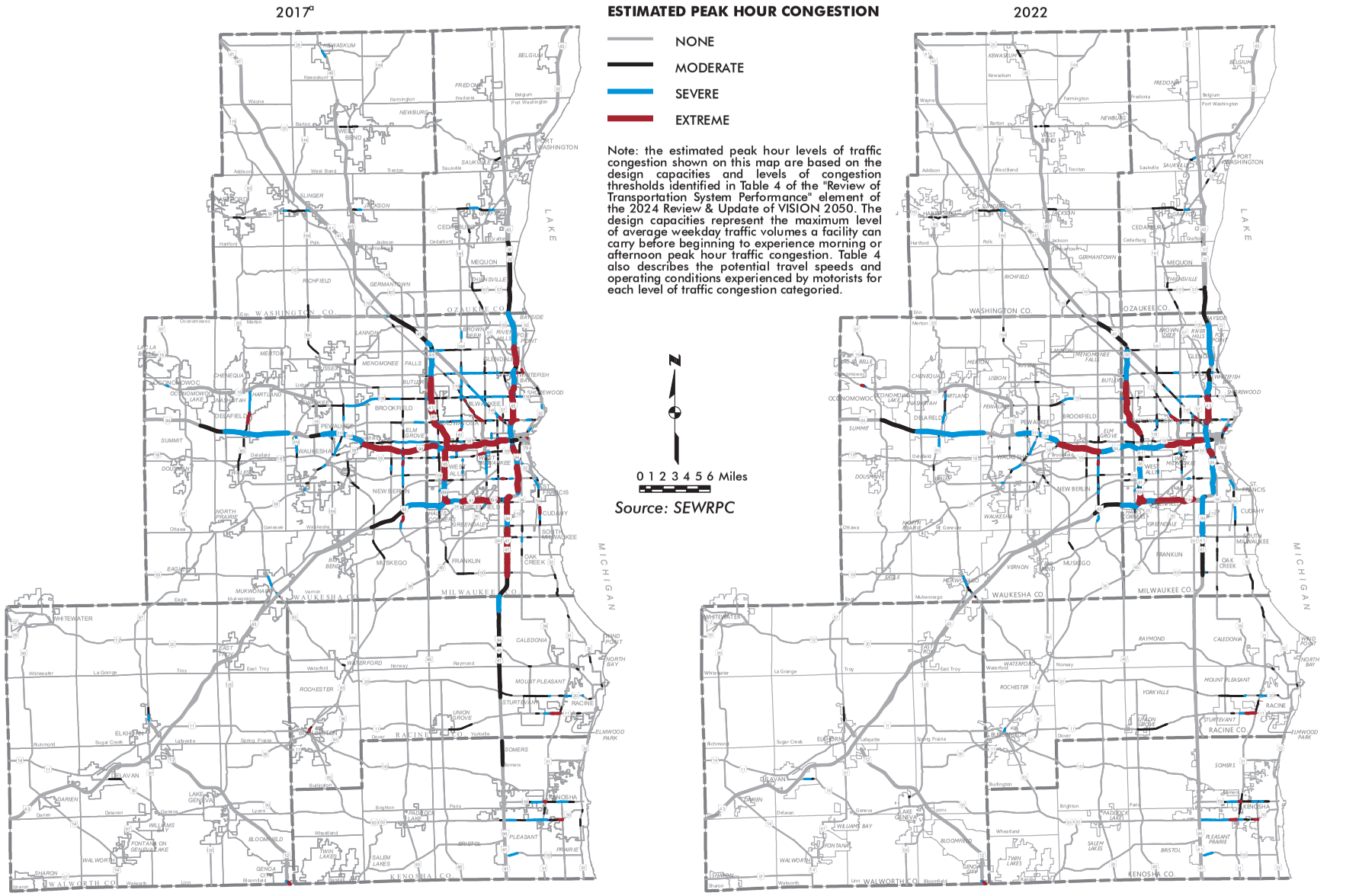
2022

County	Under or at Design Capacity[a]		Over Design Capacity[a]						Total Mileage
			Moderate Congestion		Severe Congestion		Extreme Congestion		
	Mileage	Percent of Total	Mileage	Percent of Total	Mileage	Percent of Total	Mileage	Percent of Total	
Kenosha	307.1	95.9	7.4	2.3	5.3	1.7	0.5	0.2	320.3
Milwaukee	692.1	87.9	48.4	6.1	33.9	4.3	13.1	1.7	787.5
Ozaukee	243.3	97.0	7.2	2.9	0.3	0.1	--	--	250.8
Racine	357.8	97.6	6.9	1.9	1.0	0.3	0.8	0.2	366.5
Walworth	445.9	99.6	1.4	0.3	0.3	0.1	0.2	0.0	447.8
Washington	400.5	98.5	5.5	1.4	0.5	0.1	--	--	406.5
Waukesha	708.0	93.9	24.5	3.2	18.4	2.4	3.4	0.5	754.3
Region	3,154.7	94.6	101.3	3.0	59.7	1.8	18.0	0.5	3,333.7

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

Source: SEWRPC, 6/2024

Map 5
Peak Hour Level of Traffic Congestion Estimated on Designated Truck Routes and the National Highway System: 2017 and 2022



[a] *In 2017, the traffic volume on the freeway system was impacted by lane and ramp closures primarily due to the reconstruction of the Zoo and Lake Interchanges.*

6/2024

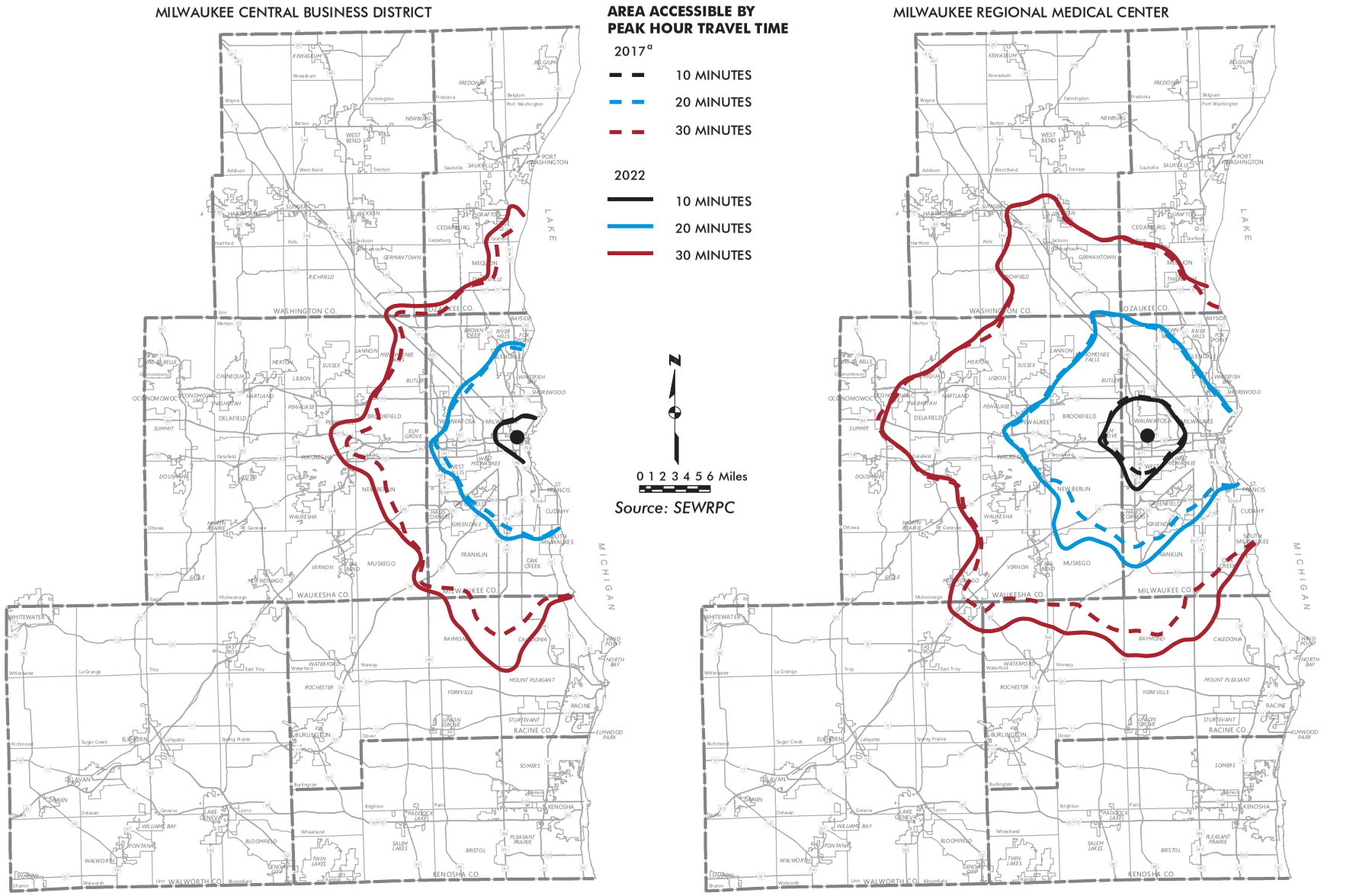
Table 6
Estimated Average Weekday Peak Hour Level of Traffic Congestion on Designated Truck Routes and the National Highway System in the Region: 2017 and 2022

Year	Under or At Design Capacity[a]	Over Design Capacity[a]			Total Mileage
		Moderate Congestion	Severe Congestion	Extreme Congestion	
2017	1,419	123	77	32	1,651
2022	1,493	87	55	17	1,652

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

Source: SEWRPC, 6/2024

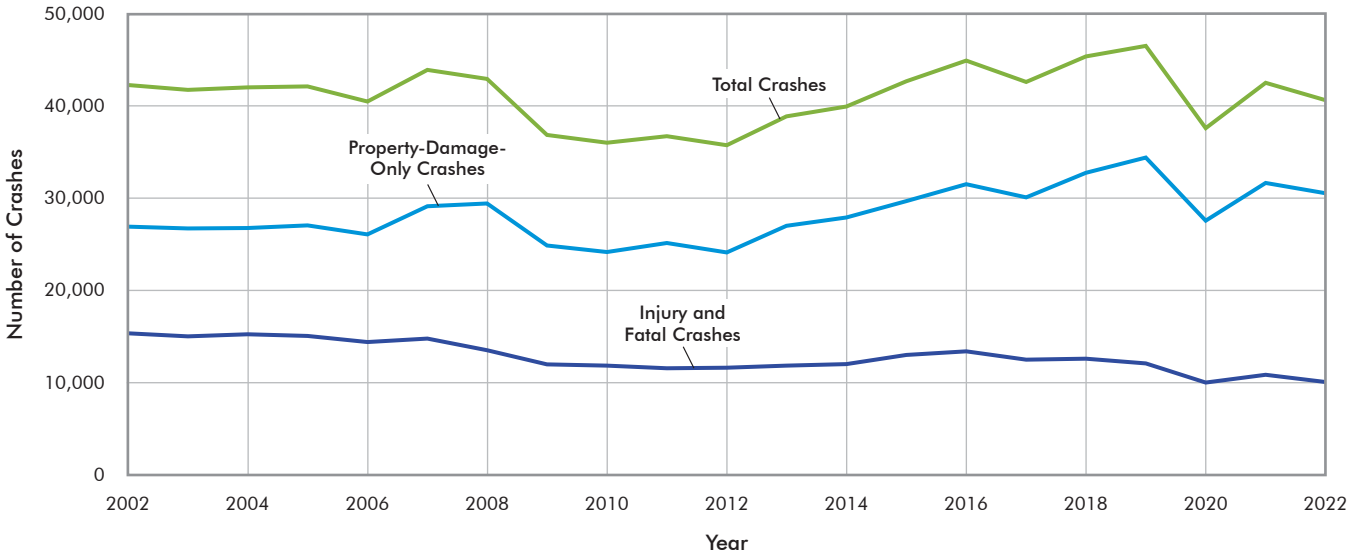
Map 6
Areas Accessible by Arterial Street and Highway Peak Hour Travel Time: 2017 and 2022



[a] *In 2017, travel times were impacted by lane and ramp closures primarily due to the reconstruction of the Zoo and Lake Interchanges.*

6/2024

Figure 8
Total, Property Damage-Only, and Injury and Fatal Vehicular Crashes Reported in the Region: 2002-2022



Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Fatal Crashes

The number of fatal vehicular crashes and fatalities are shown in Figure 9. While injury and fatal crashes have been declining in recent years, fatal vehicular crashes have continued a general upward trend, increasing from a low in of 119 in 2009 to a high of 182 in 2022. Similarly, the number of fatalities has also risen in recent years to a high of 197 fatalities in 2022. Both represent the highest numbers recorded in the past 20 years.

Figure 10 presents selected characteristics of vehicle crash-related fatalities between 2002 and 2022. The three most common characteristics associated with fatal crashes include lack of a seatbelt or helmet, failure to keep the vehicle under control, and excessive speeding—each representing over 30 percent of fatal crashes. As shown in Figure 10, these three characteristics have consistently been the main characteristics of fatal crashes since 2016, coinciding with a decline in alcohol-related fatal crashes. In 2022, the fourth-highest characteristic of fatal crashes involved pedestrians and bicyclists, which increased to about 25 percent—a 20-year high.

Serious Injury Crashes

Figure 11 shows non-fatal serious-injury crashes and crash-related serious injuries between 2002 and 2022. Following declines to historical lows in 2015, serious-injury crashes and people seriously injured have steadily increased to 847 and 1,002, respectively. While fatal crashes and fatalities increased between 2021 and 2022, non-fatal serious-injury crashes and people seriously injured declined over the same timeframe.

Bicycle and Pedestrian Crashes

In 2022, there were 247 vehicular crashes involving bicycles and 555 vehicular crashes involving pedestrians. Over the past 20 years, bicycle and pedestrian crashes have decreased by nearly 50 percent and 35 percent, respectively (see Figure 12). However, following lows in 2014, fatal and non-fatal serious injury crashes involving a pedestrian generally increased, from 117 crashes in 2014 to 136 crashes in 2022 (a 16 percent increase), while such crashes involving a bicyclist remained the same over the 2014 to 2022 time period (31 crashes) with slight increases and decreases occurring within the intermediate years (see Figure 13). With respect to fatalities, fatal crashes involving bicyclists and pedestrians were at their highest recorded level in 20 years at 7 and 39 crashes, respectively (see Figure 14).

State Trunk Highway Vehicular Crash Rates

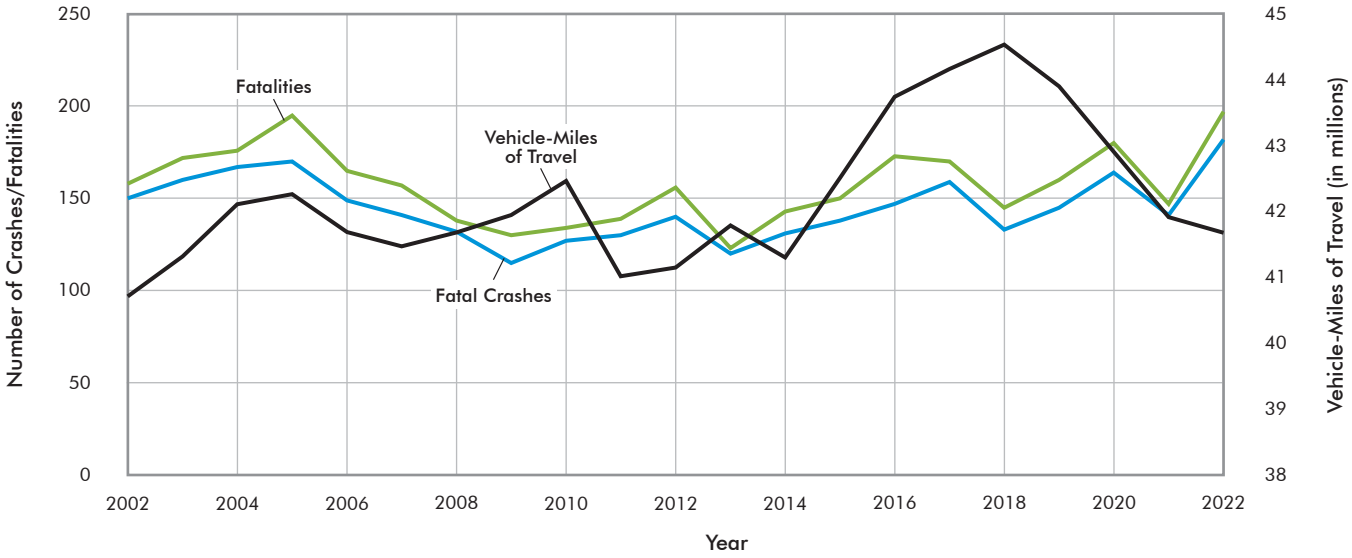
A summary of the five-year average annual crash rates on freeways and surface arterials on the state trunk highway network in the Region is presented in Table 7 for three time periods—2008-2012, 2012-2016, and 2017-2021. Crash rates, expressed based on the number of crashes per 100 million vehicle-miles driven, increased regionally for both freeways and surface arterials on the Region's state trunk highway system.

PARK-RIDE FACILITY AND TRANSIT STATION UTILIZATION

In 2023, there were 51 park-ride lots in the Region, with 25 lots served by commuter or express bus transit service, as shown on Map 7 and as listed in Table 8. Table 8 also includes average weekday park-ride lot utilization for all park-ride lots with utilization data available and indicates whether lots are served by transit or if lots are shared use, meaning that the parking lot serves non-transportation uses such as stores, restaurants, or parks. Park-ride lot utilization data were provided by WisDOT with the most complete data available as of 2022. The majority of designated park-ride lots are owned by WisDOT and maintained by the county in which they are located through an intergovernmental agreement, although some lots are owned and maintained by a local government entity or a private landowner.

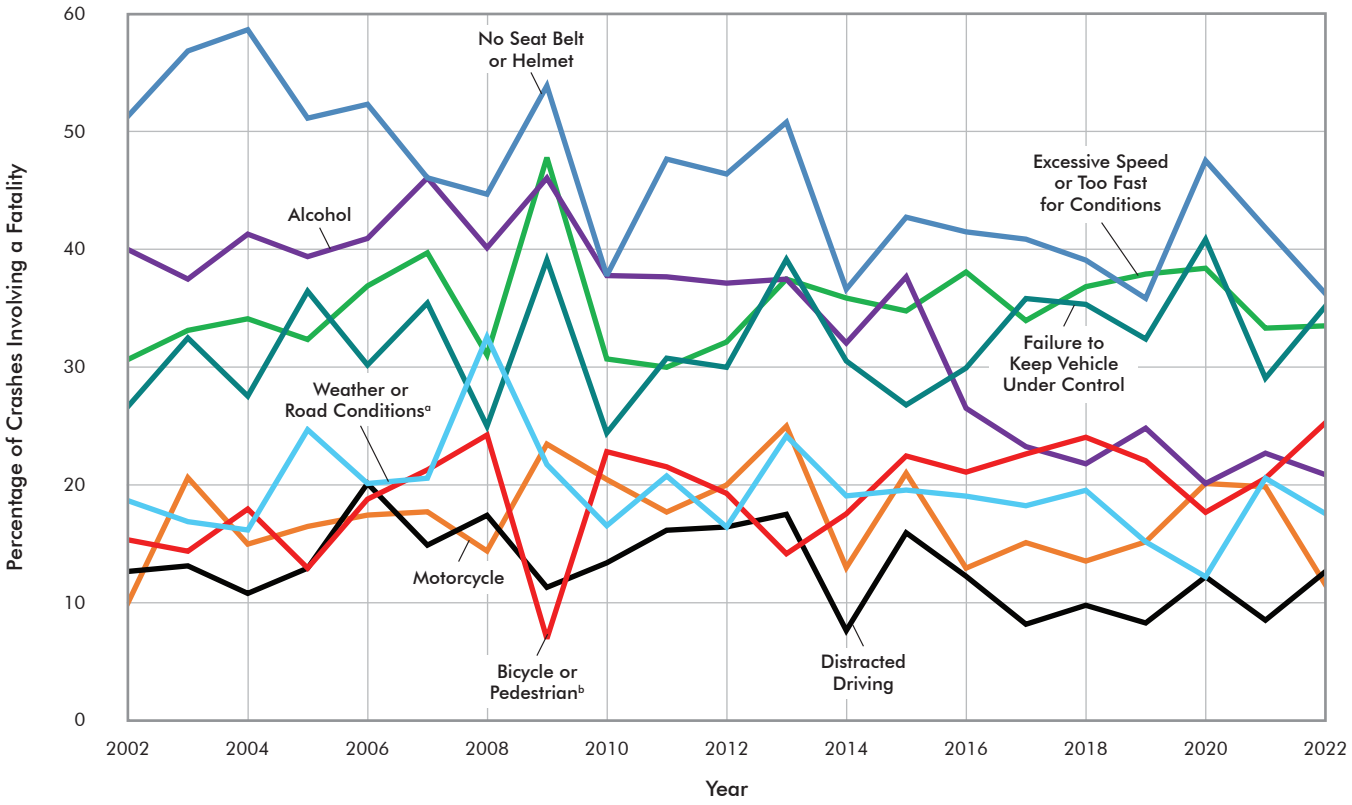
Table 9 shows that Region-wide park-ride lot usage dropped by nearly 70 percent from 2019 to 2022, with only about 12 percent of available spaces used on an average weekday in 2022. This decrease in park-ride lot use could be related to a variety of factors; however, it is likely due, in part, to changing travel patterns that resulted from the COVID-19 pandemic. As it relates to park-ride usage, this includes

Figure 9
Fatal Vehicular Crashes and Fatalities Reported in the Region: 2002-2022



Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Figure 10
Percentage of Fatal Vehicular Crashes Involving Selected Crash Characteristics in the Region: 2002-2022



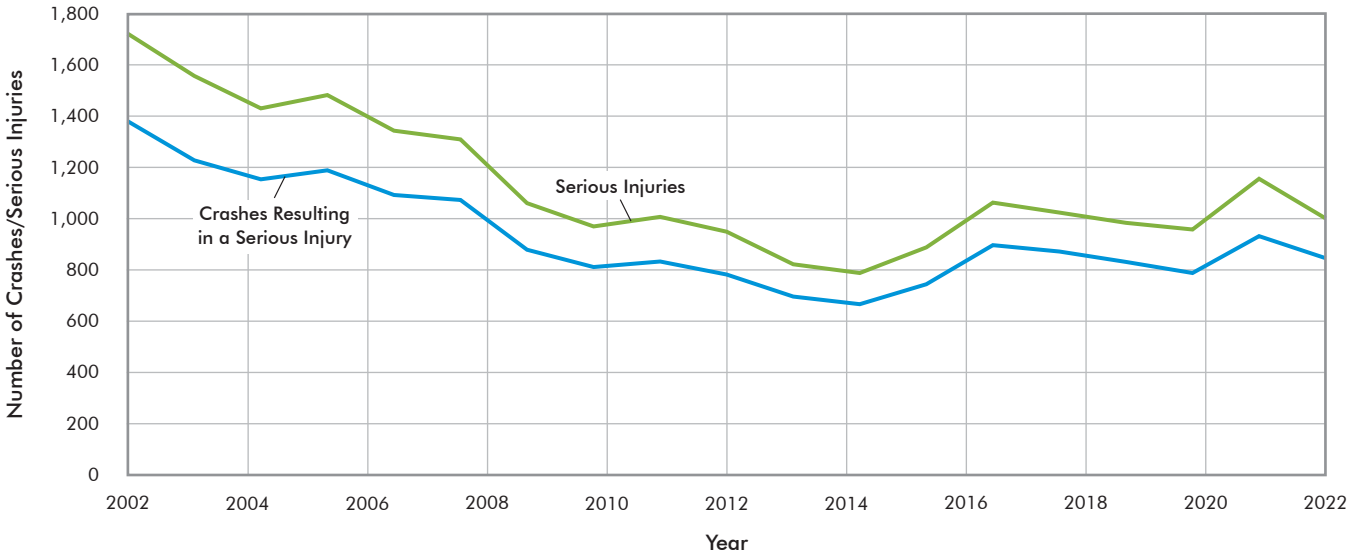
Note: Crash characteristics are based on documentation prepared by the law enforcement officer investigating each crash.

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

[b] *In 2022 there were seven fatal crashes associated with bicycles (3.9 percent of total fatal crashes) and 39 fatal crashes associated with pedestrians (21.4 percent of total fatal crashes).*

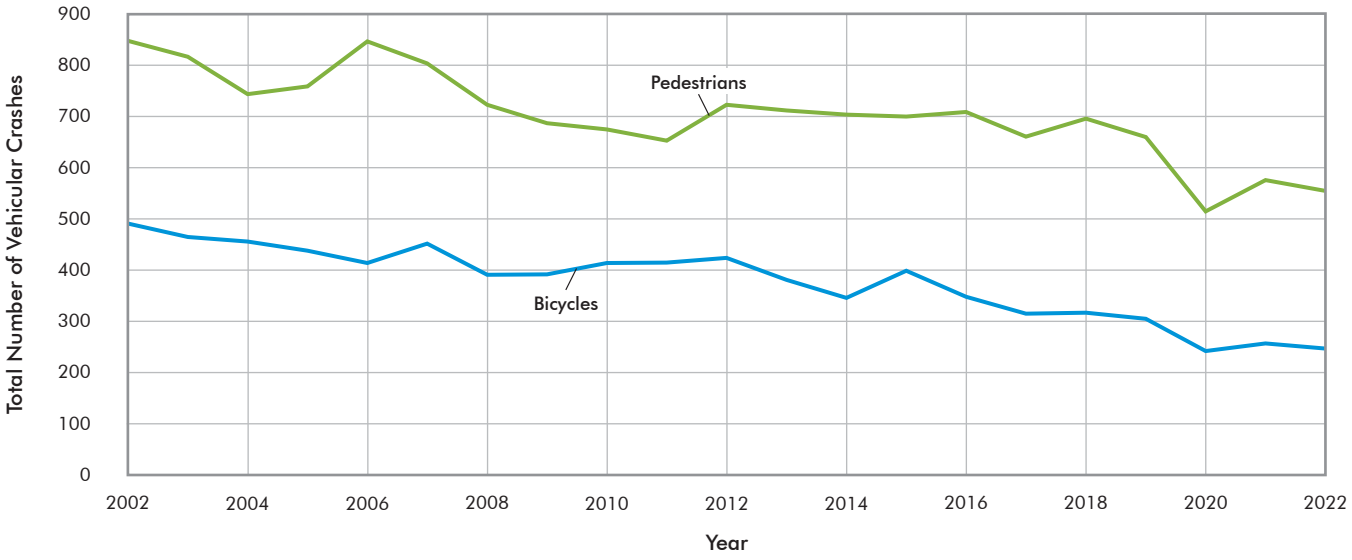
Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Figure 11
Vehicular Crashes Resulting in a Serious Injury and Serious Injuries Reported in the Region: 2002-2022



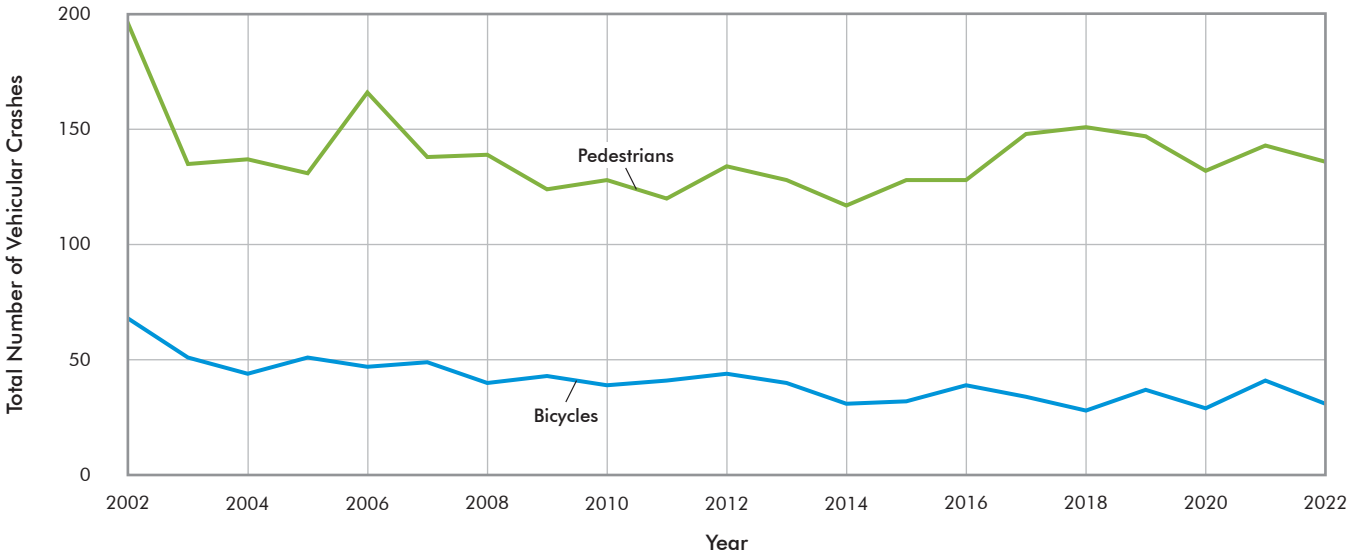
Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Figure 12
Total Number of Vehicular Crashes Involving Bicycles or Pedestrians as Reported in the Region: 2002-2022



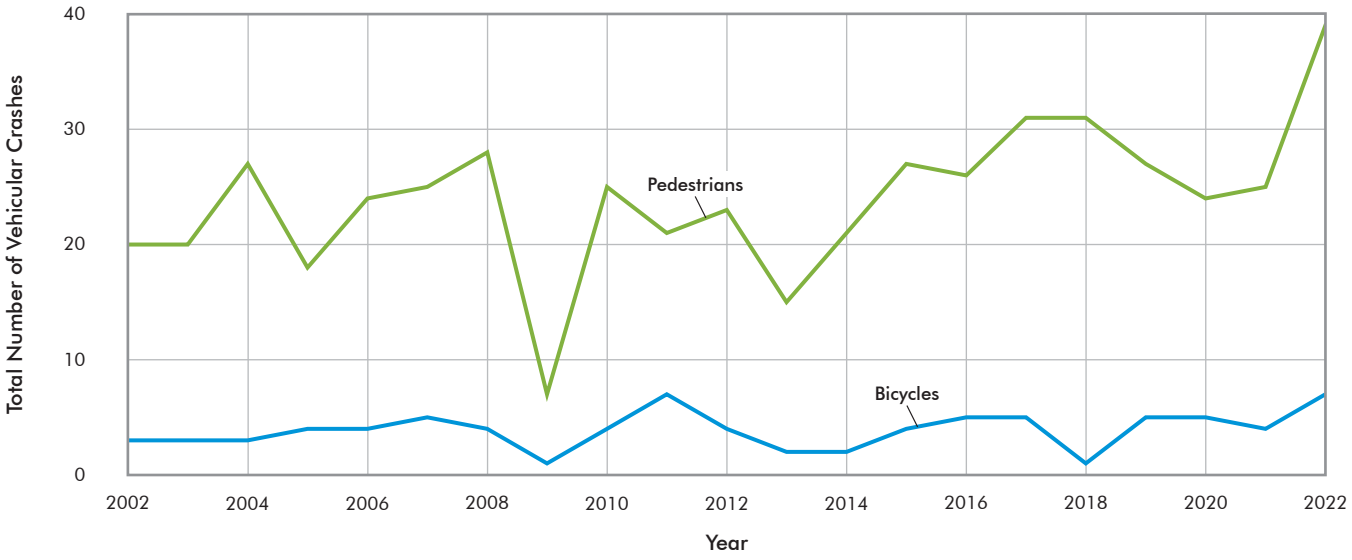
Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Figure 13
Total Number of Vehicular Crashes Involving Bicycles or Pedestrians Resulting in a Fatality or Serious Injury as Reported in the Region: 2002-2022



Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Figure 14
Total Number of Vehicular Crashes Involving Bicycles or Pedestrians Resulting in a Fatality as Reported in the Region: 2002-2022



Source: Wisconsin Traffic Operations and Safety Laboratory and SEWRPC, 8/2023

Table 7
Average Vehicular Crash Rate of State Trunk Highways by Arterial Type by County in the Region: 2008-2012, 2012-2016, and 2017-2021

	Crash Rate per 100 Million Vehicle Miles					
	Freeways			Standard Arterials		
County	2008-2012	2012-2016	2017-2021	2008-2012	2012-2016	2017-2021
Kenosha	45.7	46.8	50.4	255.6	249.7	257.6
Milwaukee	120.2	129.8	124.1	372.8	414.6	462.0
Ozaukee	41.0	45.9	48.4	119.0	154.0	143.3
Racine	33.7	46.3	52.7	234.9	250.4	294.0
Walworth	38.3	33.2	38.1	139.2	135.3	153.5
Washington	43.3	52.6	55.3	215.0	210.7	213.3
Waukesha	53.7	54.3	53.5	222.4	201.9	206.1
Region	72.5	81.2	82.1	265.0	271.0	300.6

Note: crashes that occurred on segments of roadway that no longer exist due to a recent roadway reconfiguration are not included.

Source: SEWRPC, 6/2024

Map 7
Existing Park-Ride Lots and Transit Stations Located in the Region: 2023

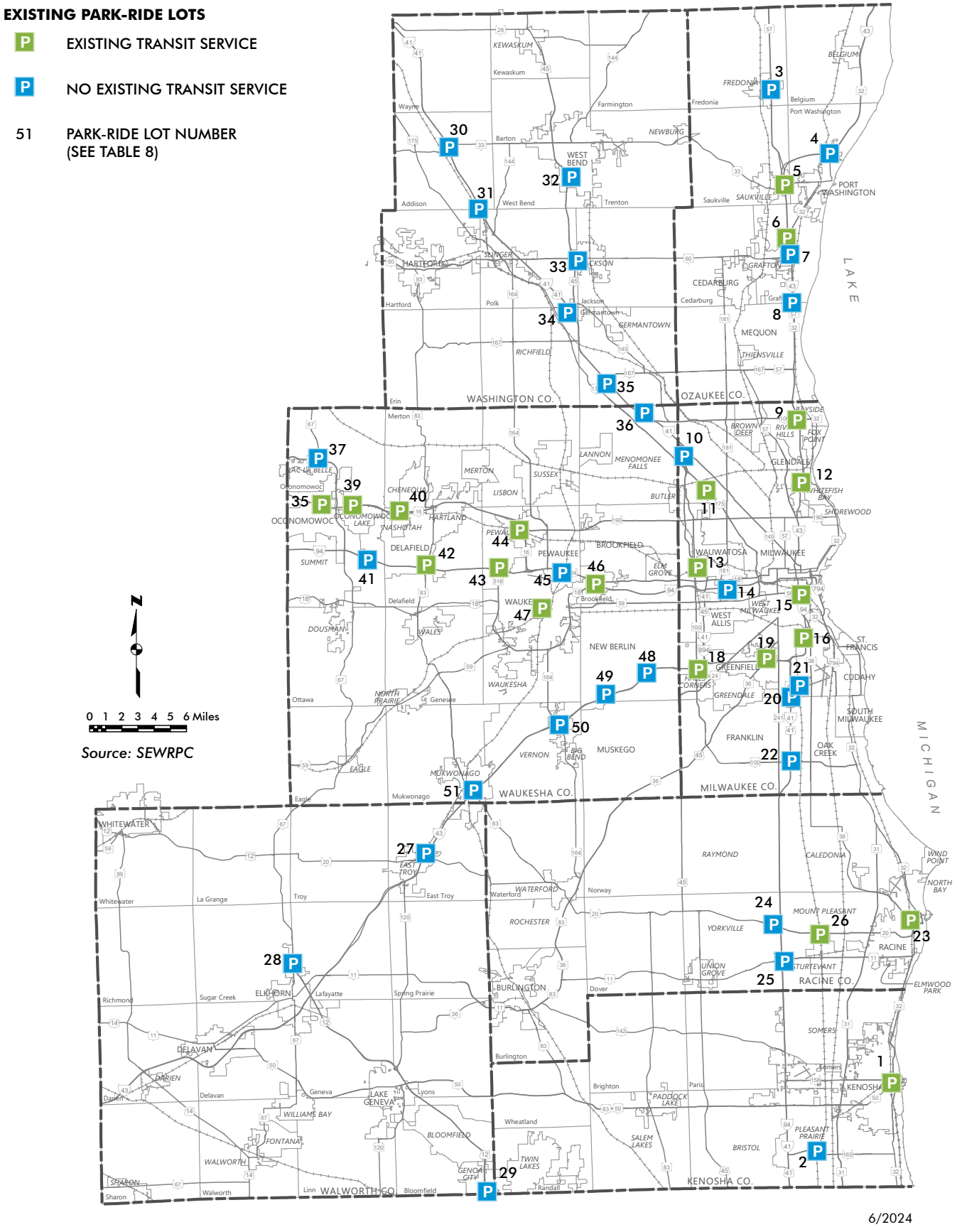


Table 8
Average Weekday Use of Park-Ride Lots and Transit Stations: 2022

No. On Map 7	Location	Served by Transit	Not Served by Transit	Shared Use	Available Parking Spaces	Autos Parked on an Average Weekday: 2022	Percent of Spaces Used
			Kenosha County				
1	Metra Station	X		X	143[a]	33	23
2	STH 165 and Terwall Terrace		X	X	387[a]	20	5
			Ozaukee County				
3	STH 57 and CTH H		X		46	9	19
4	IH 43 and STH 32-CTH LL		X		89	8	9
5	Saukville Walmart	X		X	--[c]	--[b]	--[b]
6	IH 43 and CTH V		X		79	8	9
7	IH 43 and STH 60	X		X	--[c]	--[b]	--[b]
8	IH 43 and CTH C	X			64	48	75
			Milwaukee County				
9	W. Brown Deer Road	X			335	10	3
10	W. Good Hope Road	X			131	16	12
11	Timmerman Field		X		140	2	1
12	Bayshore	X			130	18	14
13	W. Watertown Plank Road	X			236	25	11
14	State Fair Park		X		415	38	9
15	Milwaukee Intermodal Station	X			282	--[b]	--[b]
16	National Avenue and IH 43/94	X		X	173[a]	--[b]	--[b]
17	W. Holt Avenue	X			234	26	11
18	Whitnall	X			355	18	5
19	W. Loomis Road	X			358	13	4
20	W. College Avenue		X		702	50	7
21	Mitchell Airport Amtrak Station		X		280	--[b]	--[b]
22	W. Ryan Road		X		307	35	11
			Racine County				
23	Racine Metro Transit Center	X			125	--[b]	--[b]
24	IH 94 and STH 20		X		78	36	46
25	IH 94 and STH 11		X		62[d]	--[d]	--[d]
26	Sturtevant Amtrak Station	X			181	--[b]	--[b]
			Walworth County				
27	East Troy Municipal Airport		X		30	4	13
28	USH 12 and STH 67		X		40	6	16
29	USH 12 and CTH P		X		47	3	6
			Washington County				
30	IH 41 and STH 33		X		113	32	28
31	IH 41 and CTH K		X		53	7	12
32	USH 45 and Paradise Drive		X		103	23	22
33	STH 60 and CTH P		X		132	10	7
34	IH 41 and Pioneer Road		X		282	--[b]	--[b]
35	IH 41 and Lannon Road		X		158	35	22
			Waukesha County				
36	Pilgrim Road	X			68	13	19
37	STH 67 and Lang Road		X		39	3	6
38	Collins Street Parking Lot	X		X	125[e]	--[b]	--[b]
39	STH 16 and CTH P	X			45	8	18
40	STH 16 and CTH C	X			59	7	12
41	IH 94 and CTH P	X			145	22	15
42	IH 94 and STH 83	X			199	23	12

Table continued on next page.

Table 8 (Continued)

No. On Map 7	Location	Served by Transit	Not Served by Transit	Shared Use	Available Parking Spaces	Autos Parked on an Average Weekday: 2022	Percent of Spaces Used
	Waukesha County (continued)						
43	IH 94 and CTH G/CTH SS	X			247	29	12
44	Kiwanis Village Park	X		X	153[a]	--[b]	--[b]
45	IH 94 and CTH F		X		83	15	18
46	Goerke's Corners	X			322	58	18
47	Downtown Waukesha Transit Center	X		X	494[a]	--[b]	--[b]
48	IH 43 and Moorland Road		X		140	12	8
49	IH 43 and CTH Y		X		49	7	14
50	IH 43 and STH 164		X		147	20	14
51	IH 43 and STH 83		X		166	18	11

[a] *Park-ride lot also serves non-transportation uses (e.g., stores, restaurants, and parks).*

[b] *Data not available.*

[c] *Parking available within a larger private or public lot or structure.*

[d] *Park-ride lot closed due to construction.*

[e] *Number of long-term (10-hour) parking spaces within the larger municipal parking lot.*

Source: WisDOT and SEWRPC, 6/2024

Table 9
Park-Ride Lot Utilization in the Region: 2014, 2019, and 2022

Year	Available Parking Spaces[a]	Autos Parked on Average Weekday	Percent of Spaces Used
2014	5,645	2,603	46.1
2019	6,015	2,320	38.6
2022	6,614	768	11.6
		Percent Change (2019-2022)	-27.0

[a] *Capacity only included for park-ride lots with utilization data available.*

Source: WisDOT and SEWRPC, 6/2024

the significant shift to remote and hybrid work patterns, reduced transit ridership and carpooling to promote social distancing, and an increase in retirements among the historical user base. Usage rates between park-ride lots served by transit and those not served by transit were very similar in 2022.

TRANSPORTATION AIR POLLUTANT AND AIR TOXIC EMISSIONS

The estimated transportation-related greenhouse gas emissions and other air pollutants for Southeastern Wisconsin for the years 2017 and 2022 are shown in Table 10. Except for methane, which has increased by 3,200 average tons per year, estimated air pollutant emissions have declined for all pollutants between these years, with significant reductions of 35 percent or more for 11 of the 14 pollutants included in this analysis. These changes are due in large part to past and current federal fuel and vehicle fuel economy standards, which have led to the adoption of modern automotive technologies that improve emissions controls, including computers, fuel injection, and on-board diagnostics.

Table 10
Transportation-Related Greenhouse Gas Emissions and Other Air Pollutants: 2017 and 2022

Pollutant Name	Type	Average Annual Emissions from Transportation Sources (tons)	
		2017	2022
Carbon Dioxide (CO_2)	GHG	9,878,000	8,579,400
Methane (CH_4) (in CO_2 equivalents)	GHG	9,700	12,900
Nitrous Oxide (N_2O) (in CO_2 equivalents)	GHG	57,300	34,600
Carbon Monoxide (CO)	Criteria	108,500	60,500
Fine Particulate Matter ($PM_{2.5}$)	Criteria	752	303
Sulfur Dioxide (SO_2)	Criteria and precursor for $PM_{2.5}$	70	50
Nitrogen Oxides (NO_x)	Precursor for Ozone/$PM_{2.5}$	14,150	7,020
Volatile Organic Compounds (VOC)	Precursor for Ozone/$PM_{2.5}$	8,120	3,540
Acetaldehyde (C_2H_4O)	Air toxic	92	29
Acrolein (C_3H_4O)	Air toxic	9	3
Ammonia (NH_3)	Air toxic	485	462
Benzene (C_6H_6)	Air toxic	173	58
Butadiene (C_4H_6)	Air toxic	26	7
Formaldehyde (CH_2O)	Air toxic	139	37

Source: SEWRPC, 6/2024