# EVALUATION OF THE EXISTING TRANSIT SYSTEM 4


*Credit: SEWRPC Staff*

## 4.1 INTRODUCTION AND SUMMARY

This chapter details the performance evaluation of existing Waukesha Metro Transit services and Waukesha County Transit services. The evaluations utilize the performance standards selected by the Advisory Committee for the Waukesha Area Transit Development Plan and identified in Chapter 3 of this report to determine how well existing transit services fulfill the standards. The performance evaluations provide insights that will help inform potential options to address unmet transportation needs and improve or expand existing transit services.

The evaluations for Waukesha Metro and Waukesha County Transit were analyzed, with the applicable standards for each service listed under their objective in the sections of this chapter. A number of standards require comparing each transit service to a peer group, which is made up of a selection of transit systems that provide a similar type, level, and quantity of service as Waukesha Metro and Waukesha County Transit. The process for selecting the systems that make up the peer groups is described in more detail later in this chapter. The remaining sections in this chapter present the findings of the performance evaluation of Waukesha Metro and Waukesha County Transit services. Figure 4.1 and the remaining text in this section provide a brief summary of the results of the performance evaluation.

**Summary of the Performance Evaluation of Waukesha Metro Transit**

The Waukesha Metro Transit System performed very well under the performance evaluation summarized in Figure 4.1, with a few areas of noted weaknesses. The service provides substantial coverage in the City of Waukesha and adjacent communities, with reasonable access to the service for a majority of the residents. It also serves a majority of jobs and major activity centers within the City of Waukesha. Waukesha Metro compares well with its peers in the Region and across the Nation, in some cases exceeding the median for the peer transit systems. Certain routes perform poorly in regard to service effectiveness and cost effectiveness, including routes with circuitous alignments that can increase travel time and make transit travel less attractive (Routes 2, 6, and 15). However, these circuitous alignments also provide greater coverage and access service to more residents, which presents a trade-off between service coverage and direct routing that is considered as part of the proposed route changes in the next chapter.

**Figure 4.1**
**Summary of the Results of the Performance Evaluation of Waukesha Metro Transit Services and the Waukesha County Transit System**

| Objective | Standard | Waukesha Metro Transit | Waukesha County Transit |
|---|---|---|---|
| Objective 1<br>Meeting the demand and need for transit services | Local Bus Service | Fulfilled | Fulfilled |
| | Commuter Bus Service | Not Applicable | Fulfilled |
| | Paratransit Service | Fulfilled | Fulfilled |
| | Major Activity Centers | Largely Fulfilled | Partially Fulfilled |
| | Population | Largely Fulfilled | Largely Fulfilled |
| | Employment | Largely Fulfilled | Partially Fulfilled |
| | Density | Fulfilled | Partially Fulfilled |
| Objective 2<br>Operating safely, reliably, conveniently, comfortably, and efficiently | Route Design and Operations | Largely Fulfilled | Partially Fulfilled |
| | Bus Stop and Park-Ride Lot Design | Partially Fulfilled | Partially Fulfilled |
| | Passenger Demand | Fulfilled | Largely Fulfilled |
| | Service Frequency and Availability | Partially Fulfilled | Fulfilled |
| | Service Travel Speeds | Fulfilled | Fulfilled |
| | Vehicle Age and Condition | Fulfilled | Not Applicable |
| | Ridership and Service Effectiveness | Fulfilled | Largely Fulfilled |
| | Travel Time | Fulfilled | Largely Fulfilled |
| Objective 3<br>Achieving the other objectives at the lowest possible cost | Fare Structure | Fulfilled | Fulfilled |
| | Operating Expenses | Fulfilled | Largely Fulfilled |
| | Cost Effectiveness | Fulfilled | Largely Fulfilled |

*Source: SEWRPC*

### Summary of the Performance Evaluation of Waukesha County Transit

Waukesha County performs relatively well under the evaluation, with the Commuter routes providing fairly good coverage to Waukesha County residents and serving many areas in Milwaukee County with the highest employment density. However, the percentage of Waukesha County jobs served is relatively low due, in part, to the lack of concentrated employment centers. In addition, the small number of reverse commute trips from Milwaukee County to Waukesha County limits the number of jobs served for those who wish to commute to Waukesha County for employment. When compared to its peers, Waukesha County does not meet a number of standards, including two that compare operating expenses per unit of service provided. However, the services measured in these standards are partially dictated by the costs of service included in the operating contract with transit operators, and therefore are not easily addressed through transit service changes. At the route level, none of the 900-series routes meet the cost effectiveness standards, indicating changes to routes, runs, service areas, and service periods should be considered.

## 4.2 PEER SYSTEMS

As part of the evaluation of the Waukesha Metro and Waukesha County Transit services, a number of standards require comparing the performance of the two systems to the performance of a peer group of transit systems. In order to make this comparison, six peer systems were identified for the Waukesha Metro Transit system, and seven peer systems were identified for the Waukesha County Transit system. These peer systems were selected according to data gathered from the National Transit Database (NTD) for 2017 and supplemented with research to understand their service characteristics, including annual ridership, urban area population, total vehicle miles operated annually, total annual operating budget, proximity to Waukesha County, percentage of university students, and climate. Peer systems for the Waukesha Metro Transit service were also selected based on the provision of a pulse, or timed transfer system, while County transit peers were selected based on their provision of commuter services to a metropolitan area from locations that most closely matched Waukesha County's land use and population density characteristics.

**Waukesha Metro Transit Peer Group**

Table 4.1 lists the service characteristics of the six transit systems selected for the Waukesha Metro peer group, all of which offer services that are generally similar to Metro. Waukesha Metro's service characteristics generally fall within the range of its peers for revenue vehicle hours and miles operated, operating expense, service area, and population density. The data contained within Table 4.1 reflect only their local bus service.

**Waukesha County Transit Peer Group**

The seven peer systems selected for the Waukesha County comparison are shown in Table 4.2. These systems similarly operate commuter bus services from suburban communities to central business districts.

As discussed in Chapter 2, Waukesha County funds local services that provide connections to employment centers in Waukesha County, including the Route 1 extension between Goerke's Corners and the Brookfield Square Mall, and the Gold Line connection from Brookfield Square Mall to 124th Street. In order to analyze comparable transit services, Commission staff reviewed the land use and transit service characteristics for the seven peer systems. For those peers that had similar land use patterns as Waukesha County, both their commuter and local fixed route bus services were included in the analysis. The services that include both commuter bus and local bus service statistics include Johnson County Transit, Laketran, and Gwinnett County Transit, while the remaining peers were analyzed using data for their commuter bus service only (Yuba-Sutter Transit Authority, Belle Urban Systems, Ozaukee County Express, and the Washington County Commuter Express).

## 4.3 PERFORMANCE EVALUATION OF WAUKESHA METRO TRANSIT SERVICE

Evaluating the performance of Waukesha Metro Transit requires identifying which standards from Figure 3.1 need to be examined to determine if the service is meeting the public transit service objectives established in Chapter 3 of this report. Those three objectives seek to provide a service that meets the demand and need for transit service within the City of Waukesha; operates safely, reliably, conveniently, comfortably, and efficiently; and utilizes public resources cost-effectively.

**Objective 1: Meet the Need and Demand for Service**

In order to determine if Waukesha Metro effectively serves existing travel patterns, meeting the demand for transit services in the City of Waukesha, each applicable standard and associated performance measures were individually evaluated. These individual evaluations were collectively considered to determine how effectively the current service meets the overall objective. Figure 4.2 contains the full text of Objective 1, the applicable design and performance standards, and associated performance measures used to evaluate Waukesha Metro Transit's fulfillment of the objective.

***Local Bus Service and Paratransit Design and Operating Standards***

Waukesha Metro successfully fulfills the Local Bus Service Design and Operating Standard, as it connects areas of urban development to the largest major activity centers in the City of Waukesha and additional locations adjacent to the City of Waukesha, including the Waukesha County Technical College in the Village of Pewaukee and the Goerke's Corners Park-Ride Lot in the City of Brookfield. The City of Waukesha's paratransit service, Waukesha Metrolift, also successfully fulfills the applicable design and operating standard as it operates within the required 0.75 miles of the fixed-route transit system, thereby offering service to people with disabilities who are unable to use fixed-route service for travel within the City.

***Major Activity Centers Performance Standard***

The Major Activity Centers Standard encourages maximizing the number of major activity centers accessible by transit within the City of Waukesha. To analyze access to major activity centers, the centers were mapped, along with a transit service area of one-quarter mile from Waukesha Metro bus routes. The number of major activity centers served are shown in Table 4.3, while the geographic distribution of the activity centers are shown on Map 4.1. Waukesha Metro provides service to most of the major activity centers within the City of Waukesha, including all major economic activity areas, institutions of higher education, middle and high schools, and senior centers. However, four of the six major hospitals or clinics with 10 or more physicians are not currently within one-quarter mile of a transit route. In addition, there are a number of major employers within the City of Waukesha that are not within the Waukesha Metro service area, particularly on the northern and western edges of the City. Although not all major activity centers are served, the Major Activity Centers Standard is largely fulfilled with most centers in the City of Waukesha served by Waukesha Metro Transit.

## Table 4.1
## Selected Characteristics for Waukesha Metro Transit and Peer Transit Systems in the Nation: 2017

| Transit System | Metropolitan Area | Administrative Structure | Hours of Operation | | | Adult Cash Fare | Urban Area Population |
|---|---|---|---|---|---|---|---|
| | | | Weekdays | Saturdays | Sundays | | |
| Waukesha Metro Transit | Milwaukee, WI | Public | 6:00 a.m. - 9:15 p.m. | 8:20 a.m. - 8:50 p.m. | 9:20 a.m. - 6:50 p.m. | $2.00 | 1,387,245 |
| Gary Public Transportation Corporation | Gary, IN | Public | 5:15 a.m. - 6:15 p.m. | 8:15 a.m. - 4:15 p.m. | N/A | $1.60 | 8,667,303 |
| Cedar Rapids Transit | Cedar Rapids, IA | Public | 5:15 a.m. - 7:15 p.m. | 8:15 a.m. - 5:15 p.m. | N/A | $1.50 | 188,160 |
| Sioux Area Metro | Sioux Falls, SD | Public | 5:45 a.m. - 8:45 p.m. | 7:45 a.m. - 6:45 p.m. | N/A | $1.50 | 174,399 |
| Altoona Metro Transit | Altoona, PA | Transit Authority | 7:00 a.m. - 6:00 p.m. | 7:00 a.m. - 6:00 p.m. | N/A | $1.70 | 75,793 |
| La Crosse Municipal Transit Utility | La Crosse, WI | Public | 5:15 a.m. - 10:45 p.m. | 7:45 a.m. - 7:40 p.m. | 7:45 a.m. - 6:30 p.m. | $1.50 | 103,692 |
| Shoreline Metro | Sheboygan, WI | Public | 5:45 a.m. - 8:45 p.m. | 7:45 a.m. - 5:45 p.m. | N/A | $1.75 | 71,518 |

| Transit System | Service Area Population[a] | Population Density | Operating Expenses ($) | Revenue Vehicle Miles | Revenue Vehicle Hours | Annual Passenger Trips | Fixed-Route Vehicle Fleet |
|---|---|---|---|---|---|---|---|
| Waukesha Metro Transit | 72,173 | 2,542 | 4,271,922 | 648,200 | 51,900 | 630,003 | 20 |
| Gary Public Transportation Corporation | 102,746 | 3,549 | 5,603,915 | 770,898 | 56,262 | 750,161 | 21 |
| Cedar Rapids Transit | 158,890 | 2,255 | 7,122,366 | 954,290 | 68,873 | 1,185,726 | 34 |
| Sioux Area Metro | 137,300 | 2,718 | 4,543,786 | 747,194 | 61,894 | 795,026 | 29 |
| Altoona Metro Transit | 69,608 | 2,027 | 4,391,083 | 495,313 | 39,445 | 557,710 | 29 |
| La Crosse Municipal Transit Utility | 71,201 | 2,034 | 5,153,871 | 844,107 | 58,801 | 999,955 | 20 |
| Shoreline Metro | 59,490 | 2,139 | 3,163,112 | 543,561 | 37,679 | 529,726 | 23 |

[a] *Based on population data from the U.S. Bureau of the Census as reported by each transit operator.*

*Source: National Transit Database, U.S. Bureau of the Census, and SEWRPC*

## Table 4.2
## Selected Characteristics for Waukesha County Transit and Peer Transit Systems in the Nation: 2017

| Transit System | Metropolitan Area | Time Period Served | Days Served | Reverse Commute Service | Adult Cash Fare for Commuter Services | Service Area Population[a] |
|---|---|---|---|---|---|---|
| Waukesha County Transit | Milwaukee, WI | Peak, Midday | Weekdays | Provided | $3.50 | 401,070 |
| Johnson County Transit[b] | Kansas City, MO | Peak | Weekdays | Provided | $3.00 | 411,685 |
| Yuba-Sutter Transit Authority[c] | Sacramento, CA | Peak, Midday | Weekdays | Provided | $4.50 | 141,986 |
| Laketran[b] | Cleveland, OH | Peak | Weekdays | Not Provided | $3.75 | 230,041 |
| Gwinnett County Transit[b] | Atlanta, GA | Peak | Weekdays | Not Provided | $5.00 | 920,260 |
| Racine-Kenosha Commuter Bus[c] | Racine, WI | Peak, Midday | Weekdays | Provided | $4.50 | 112,100 |
| Ozaukee County Express[c] | Milwaukee, WI | Peak | Weekdays | Provided | $3.50 | 86,389 |
| Washington County Commuter Express[c] | Milwaukee, WI | Peak | Weekdays | Not Provided | $3.75 | 134,137 |

| Transit System | Urban Area Population | Population Density | Operating Expenses ($) | Revenue Vehicle Miles | Revenue Vehicle Hours | Annual Passenger Trips |
|---|---|---|---|---|---|---|
| Waukesha County Transit | 1,387,245 | 2,542 | 3,821,383 | 500,455 | 22,142 | 375,994 |
| Johnson County Transit[b] | 1,595,437 | 2,354 | 7,137,133 | 1,351,895 | 60,996 | 448,527 |
| Yuba-Sutter Transit Authority[c] | 125,404 | 3,244 | 989,087 | 313,856 | 8,430 | 130,627 |
| Laketran[b] | 1,760,589 | 2,279 | 5,014,503 | 843,652 | 48,903 | 463,609 |
| Gwinnett County Transit[b] | 5,057,220 | 1,912 | 15,614,210 | 1,888,209 | 98,547 | 1,415,078 |
| Racine-Kenosha Commuter Bus[c] | 130,920 | 1,912 | 1,030,177 | 211,310 | 9,021 | 52,383 |
| Ozaukee County Express[c] | 1,387,245 | 2,542 | 1,154,580 | 192,989 | 7,443 | 102,507 |
| Washington County Commuter Express[c] | 1,387,245 | 2,542 | 1,167,422 | 214,185 | 7,311 | 80,858 |

[a] *Based on population data from the U.S. Bureau of the Census as reported by each transit operator.*

[b] *The peer data presented includes both commuter bus and local bus statistics based on their suburban characteristics to serve as a comparison for Waukesha County's local service.*

[c] *Peer data presented includes commuter bus service only, as any local services provided by these operators are not similar to Waukesha County Transit's local service.*

*Source: National Transit Database, U.S. Bureau of the Census, Waukesha County Transit, and SEWRPC*

## Figure 4.2
## Objective 1 and Associated Standards Applicable to the Evaluation of Waukesha Metro Transit

| Objective 1 |
|---|
| **Public transit should efficiently serve the travel needs of residents and employers within the City of Waukesha, connecting to major activity centers, population centers, and areas of employment, which are fully developed or planned to be developed to medium or high densities.** |

| Associated Public Transit Principle |
|---|
| The demand and need for travel in those areas that are fully developed, or planned to be developed to medium or high densities, should be met by the appropriate level of public transit service. |

| Design and Operating Standards | |
|---|---|
| **1. Local Bus Service**<br>Provide local fixed-route transit service to connect areas of urban development to the largest major activity centers within the City, County, and Region. | **2. Paratransit Service**<br>Serve major travel corridors with commuter bus service by connecting major activity centers and concentrations of significant urban development within the City, County, and Region. |

| Performance Standards and Associated Performance Measures | |
|---|---|
| **1. Major Activity Centers**<br>Maximize the number of major activity centers and facilities for transit-dependent people served by transit. This is measured by the number of activity centers within one-quarter mile of a local bus. Major activity centers include the following:[a]<br>a. Commercial areas<br>b. Educational institutions<br>c. Medical centers<br>d. Employers<br>e. Facilities serving transit-dependent populations<br>f. Libraries, government centers, and cultural facilities | **2. Population**<br>Maximize the population served by transit, particularly the transit dependent population. Residents are considered served if they are within one-quarter mile of local bus. |
| **3. Employment**<br>Maximize the number of jobs served by transit. This is measured by the total employment at businesses located within one-quarter mile of local bus. | **4. Density**<br>Maximize the transit-supportive land area accessible by public transit. Land area is considered transit-supportive if it has a density of at least 4 dwelling units per net residential acre, or at least 640 jobs per quarter section. This is measured by the proportion of the total transit-supportive land area within one-quarter mile of a local bus. |

[a] *In order to be considered a major activity center, the following definitions must apply:*

- *Commercial areas are concentrations of retail and service establishments that typically include a department store or a discount store along with a supermarket on 15 to 60 acres, totaling 150,000 or more square feet of gross leasable floor space*
- *Educational institutions are the main campus of traditional four-year institutions of higher education, public technical colleges, and public and private middle schools and high schools*
- *Medical centers are all hospitals and clinics with 10 or more physicians*
- *Employers are all employers with more than 100 employees, or clusters of adjacent employers with collectively more than 100 employees such as in business or industrial parks*
- *Facilities serving transit-dependent populations are senior centers, senior meal sites, residential facilities for seniors and/or people with disabilities, residential facilities for low-income individuals, and government facilities that provide significant services to members of transit-dependent population groups*
- *Libraries include all local public libraries in Waukesha County*
- *Government and public institutional centers include all major government offices, city halls, civic centers, and Department of Motor Vehicles offices*
- *Cultural facilities include those that hold significant public arts events and have prominence within the State*

*Source: SEWRPC*

## Table 4.3
## Transit Service Provided to Land Uses and Population Groups in the Study Area for Waukesha Metro Transit System: 2019

| Performance Measure | Systemwide Performance Characteristics | |
|---|---|---|
| | Within the City of Waukesha | Outside the City of Waukesha |
| Major Activity Centers Served | | |
| Major Economic Activity Areas | 2 of 2 | 2 |
| Institutions of Higher Education | 2 of 2 | 1 |
| Middle Schools and High Schools | 13 of 13 | 1 |
| Hospitals, Medical Centers, and Major Clinics | 4 of 6 | 0 |
| Major Employers | 56 of 65 | 23 |
| Senior Centers, Senior Meal Sites, and Adult Day Centers | 10 of 10 | 0 |
| Residential Facilities for Seniors, People with Disabilities, and Low-Income Households | 39 of 44 | 2 |
| Nursing Homes | 3 of 3 | 1 |
| Job Resource Centers | N/A | 1 |
| Libraries | 1 of 1 | 0 |
| Governmental and Public Institutional Centers | 1 of 1 | 0 |
| Community or Regional Park | 7 of 8 | 0 |
| Cultural Centers | 1 of 1 | 0 |
| Population Served[a] | | |
| Within the City of Waukesha | 55,232 | -- |
| Outside the City of Waukesha | 4,499 | -- |
| Total Population Served | 59,731 | -- |
| City of Waukesha Total Population | 72,173 | -- |
| Percent of City of Waukesha Resident Population Served | 76.5 | -- |
| Areas with Substantial Transit Needs Served | | |
| Census Block Groups with High Transit Needs Served | 7 of 7 | -- |
| Census Block Groups with Moderate Transit Needs Served | 32 of 35 | -- |
| Total Minority Population in the City of Waukesha | | |
| Census Blocks in Waukesha Metro Service Area that Exceed the County-Wide Average of 9.4 Percent of Minority People, Including Hispanic People | 449 of 469 | -- |
| Employment Served[b] | | |
| Within the City of Waukesha | 36,961 | -- |
| Outside the City of Waukesha | 19,592 | -- |
| Total Employment Served | 56,553 | -- |
| City of Waukesha Total Employment | 45,364 | -- |
| Percent of Total Employment Within City of Waukesha Served | 81.5 | -- |
| Proportion of Areas Meeting Density Requirements Served | 50 of 62 | -- |

Note: The data for the population, employment, and density performance measures are provided within the same column to show the calculations.

[a] *Population based on 2010 U.S. Census data allocated to U.S. Public Land Survey quarter sections by Commission staff.*

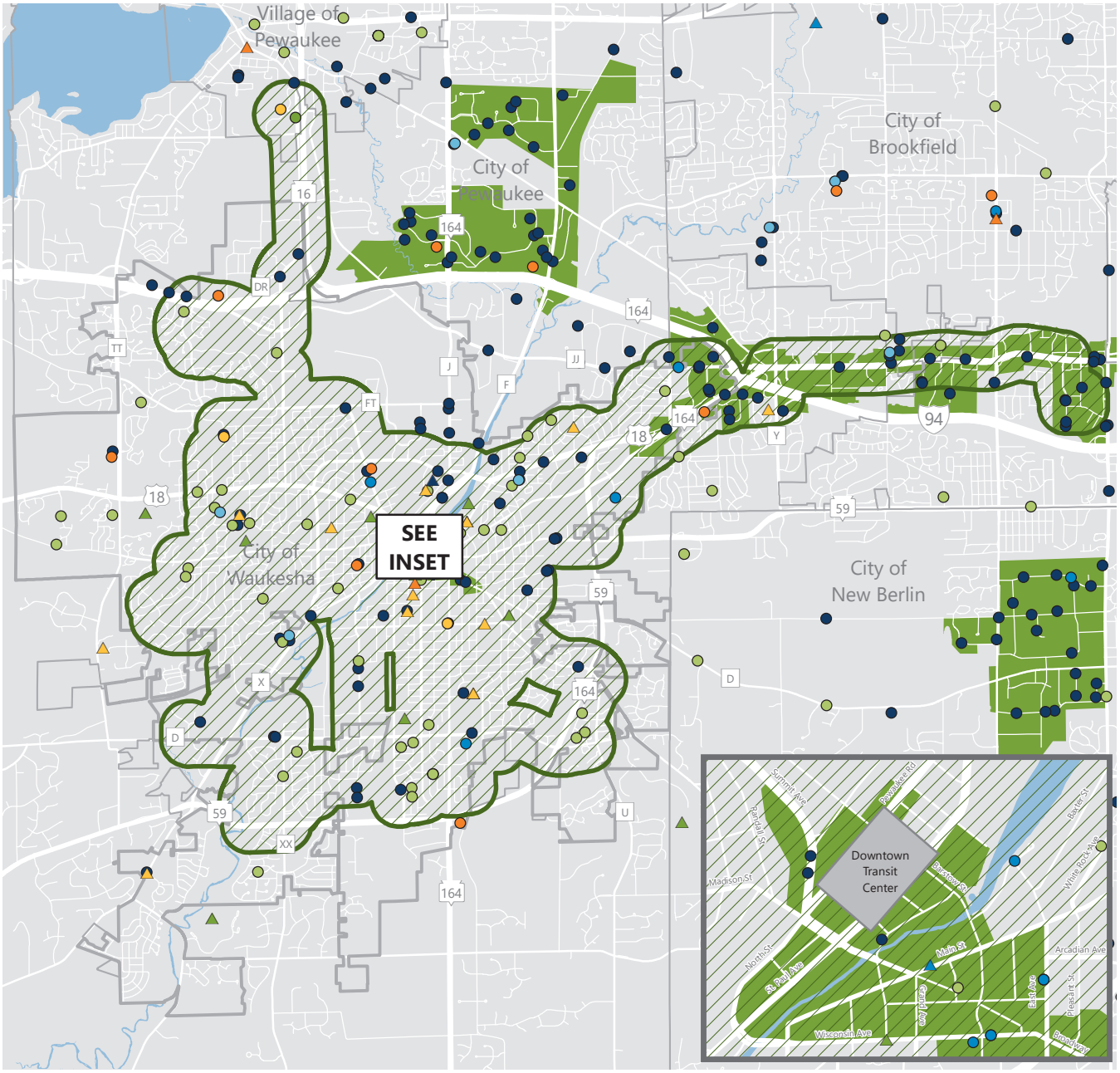
[b] *Employment figures based on 2010 U.S. Bureau of Economic Analysis data allocated to U.S. Public Land Survey quarter sections by Commission staff.*

*Source: U.S. Census, Waukesha Metro Transit, and SEWRPC*

### *Population Performance Standard*

The Population Performance Standard recommends maximizing the number of residents with access to transit. In the case of Waukesha Metro, it is measured using the number of people residing within one-quarter mile of a bus route. Map 4.2 displays residential population by quarter section in the City of Waukesha, with a one-quarter mile buffer from Waukesha Metro routes. As of the 2010 U.S. Census, approximately 55,232 residents (approximately 77 percent of all City of Waukesha residents) lived within one-quarter miles of a Waukesha Metro route. As Waukesha Metro serves more than three out of four city residents, the Population Performance Standard is largely fulfilled.

## Map 4.1
## Major Activity Centers Within the Study Area for Waukesha Metro




**MAJOR ACTIVITY CENTERS**

- HOSPITAL, MEDICAL CENTER, OR CLINIC WITH 10 OR MORE PHYSICIANS
- RESIDENTIAL FACILITY FOR SENIORS, PEOPLE WITH DISABILITIES, OR LOW-INCOME HOUSEHOLDS
- SENIOR CENTER, SENIOR MEAL SITE, OR ADULT DAY CENTER
- JOB RESOURCE CENTER
- MAJOR EMPLOYER WITH MORE THAN 100 EMPLOYEES
- MAJOR INSTITUTION OF HIGHER EDUCATION
- NURSING HOME
- GOVERNMENTAL OR INSTITUTIONAL CENTER
- PUBLIC LIBRARY
- CULTURAL CENTER
- PUBLIC COMMUNITY OR REGIONAL PARK
- PUBLIC OR PRIVATE MIDDLE OR HIGH SCHOOL
- MAJOR ECONOMIC ACTIVITY AREA

**WAUKESHA METRO TRANSIT SERVICE AREA**

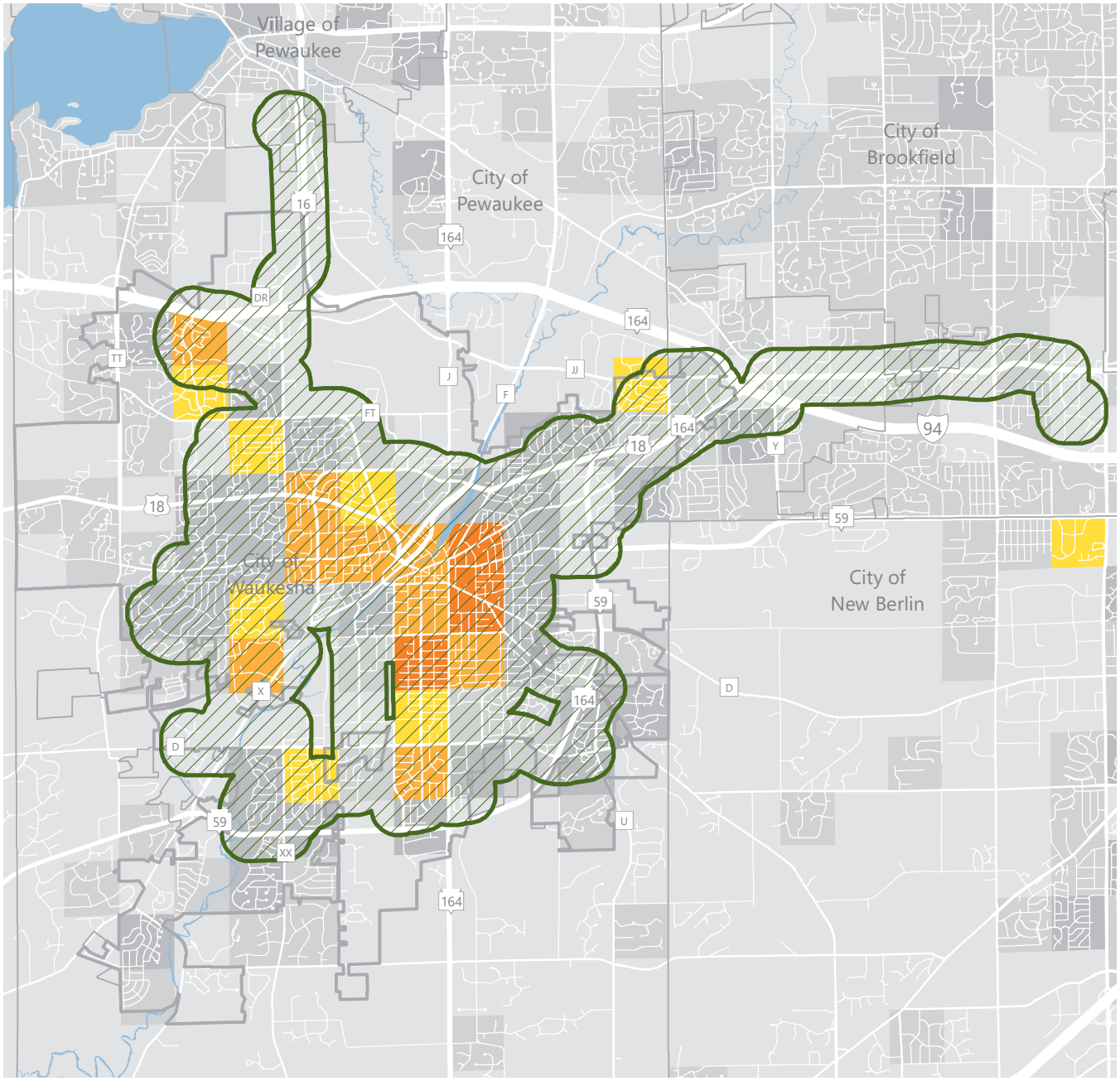
- ONE-QUARTER MILE SERVICE FROM BUS ROUTES

N

0 0.5 1 1.5 Miles

*Source: Waukesha Metro Transit, and SEWRPC*

## Map 4.2
## Population Served by Waukesha Metro Transit




**POPULATION BY QUARTER SECTION (2010)**

- 0 - 250
- 251 - 750
- 751 - 1,194
- 1,195 - 1,500
- 1,501 - 2,000
- 2,001 - 2,329

**WAUKESHA METRO TRANSIT SERVICE AREA**

- ONE-QUARTER MILE FROM BUS ROUTES

Note: Population threshold (1,195+) based on the minimum residential density (3 units per gross acre) determined to support transit service as identified in TCRP 165: Transit Capacity and Quality of Service Manual, 3rd Edition (2013). Persons per unit (2.49) based on U.S. Census, American Community Survey, 2013-2017.

N

0 0.5 1 1.5 Miles

*Source: U.S. Census, Waukesha Metro Transit, and SEWRPC*

Residents with High Transit Needs

Commission staff developed a transit needs index using population data to identify areas of greatest potential transit needs in Waukesha County, including the Waukesha Metro service area, as shown on Map 4.3. U.S. Census block groups within Waukesha County were ranked according to percent of population falling into each of these "high transit needs" categories: school-age children (ages 10 through 17), seniors (ages 75 and older), persons in low-income households, people with disabilities, and households with no vehicle available. Each block group was then scored according to rank, with those block groups with the lowest percentage of a transit need category given a score of "1," while groups with the highest percentage were given a score of "4." The resulting scores were summed for each block group and created an index ranging from 5 to 20. The transit needs were separated into four levels; low (5 through 8), marginal (9 through 12), moderate (13 through 16), and high (17 through 20). Although this methodology does not quantify the potential transit demand, it does indicate where transit needs may be greatest based on resident population characteristics. Waukesha Metro provides good coverage of areas within the City with the greatest potential transit needs, including all seven of the block groups with high transit needs and 32 of 35 Census block groups designated as having moderate transit needs.

Minority Population Served

In addition to the transit needs index, Map 4.4 shows the concentration of total minority population in the City of Waukesha compared to the one-quarter mile service area for Waukesha Metro. 449 of the 469 Census blocks in the City of Waukesha and served by Waukesha Metro have a concentration of minority residents higher than Waukesha County's overall proportion of 9.4 percent. The location of concentrations of minority residents was analyzed given that 32 percent of transit riders on Waukesha Metro were minority in 2011, while 20 percent of the population of the City of Waukesha in 2010 was minority. As shown on Map 4.4 and Table 4.3, Waukesha Metro provides service to nearly all Census blocks comprised of the highest concentration minority people, including those Census blocks that comprise 200 or more minority people.

***Employment Performance Standard***

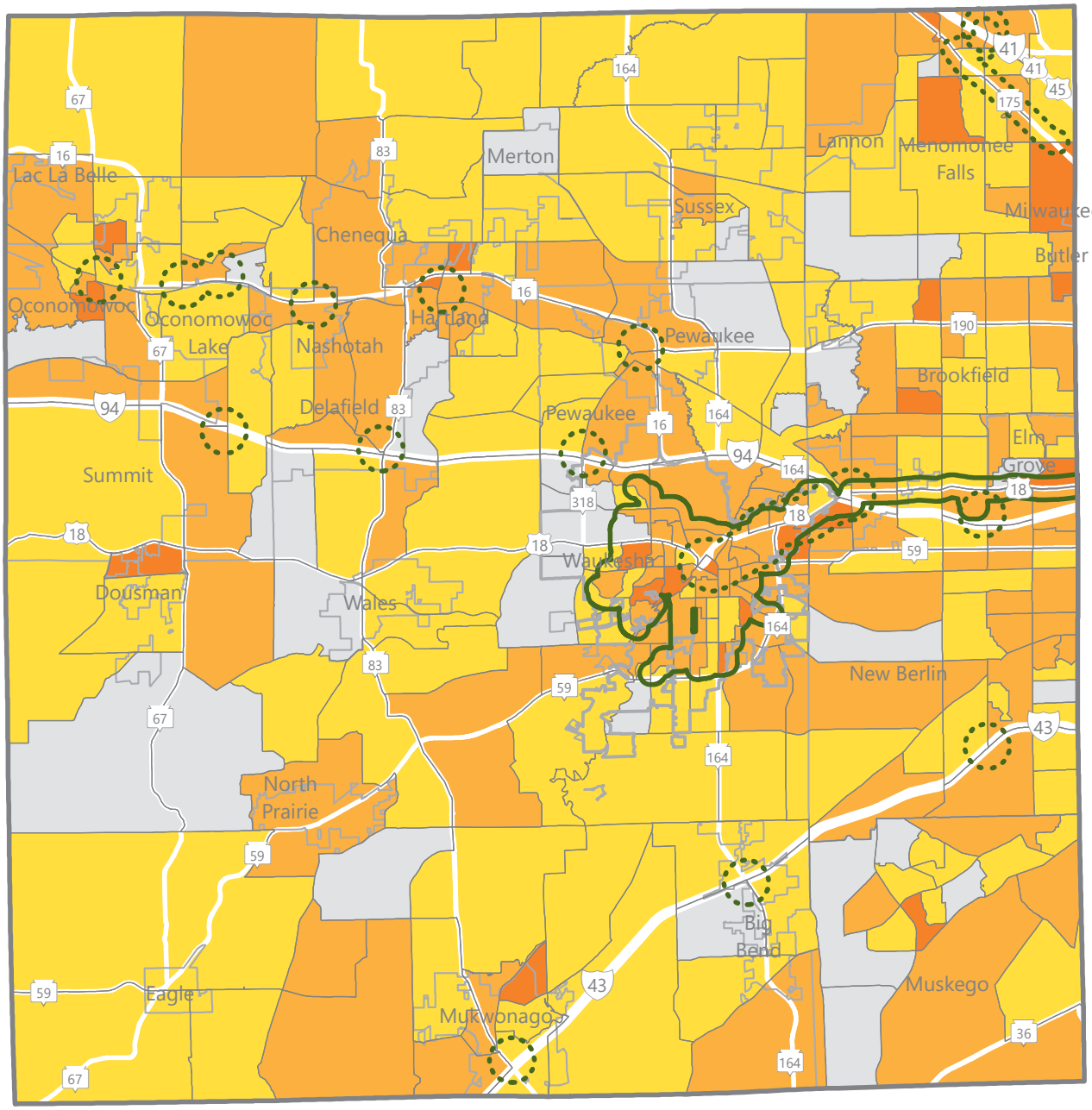
The Employment Performance Standard recommends maximizing the number of jobs accessible via transit. The total employment within one-quarter mile of local transit was measured to determine how well Waukesha Metro fulfills the Employment Performance Standard. Map 4.5 displays employment by quarter section in the City of Waukesha and adjacent communities. Based on 2010 employment data, of the 45,364 jobs in the City of Waukesha, 36,961 jobs within the City, or about 82 percent, were served by Waukesha Metro. In addition, 56 of the 65 major employers in the City of Waukesha are served by Waukesha Metro, as shown in Table 4.3. There are areas with dense development just outside the City of Waukesha's boundaries, particularly businesses north of IH 94 on STH 164 in the City of Pewaukee that are not currently served by fixed-route transit. This area was previously served by a flexible shuttle route that was discontinued in 2006 due to low ridership levels. However, if there is interest from employers, transit service options could be considered. Overall, Waukesha Metro largely fulfills the Employment Performance Standard by maximizing the number of jobs accessible by transit.

***Density Performance Standard***

The Density Performance Standard seeks to maximize the transit-supportive land area accessible by public transit. Based on National Standards established by the *Transit Cooperative Research Program Report 165: Transit Capacity and Quality of Service Manual*, land area is considered transit-supportive if it has a density of four jobs per gross acre and a household density of three units per gross acre. The population and employment density was initially identified using quarter section data provided by the U.S. Census American Community Survey and from SEWRPC's 2010 employment survey. The density thresholds were converted to quarter section areas to match the data available, resulting in a minimum of 640 jobs per quarter section and 1,195 people per quarter section.

The Density Performance Standard described in this section compares quarter sections that could be considered transit supportive based on population and employment densities either individually or combined. Map 4.2 identifies those quarter sections that have population densities and Map 4.5 identifies those quarter sections that have employment densities that exceed thresholds considered appropriate to support transit service based on National standards. Based on these thresholds, Waukesha Metro serves 18 of the 62 quarter sections in the City that meet the minimum population density threshold, and 23 of the 62 quarter sections in the City that meet the minimum employment density threshold.

## Map 4.3
## Residents in Waukesha County with High Transit Needs




**TRANSIT NEEDS INDEX LEVEL**

- LOW (5-8)
- MARGINAL (9-12)
- MODERATE (13-16)
- HIGH (17-20)

Note: The Transit Need Index is calculated by ranking census block groups based on the percent of total population or households in five categories: school-age children (10 through 17), seniors (75 and older), persons in low-income households, people with disabilites, and households with no vehicle available. Each ranked block group is assigned a score from 1 to 4, in each category, with a 1 for the lowest percentages and a 4 for the highest percentages. The Transit Need Index is equal to the sum of the scores for all five categories.

**TRANSIT SERVICE AREA**

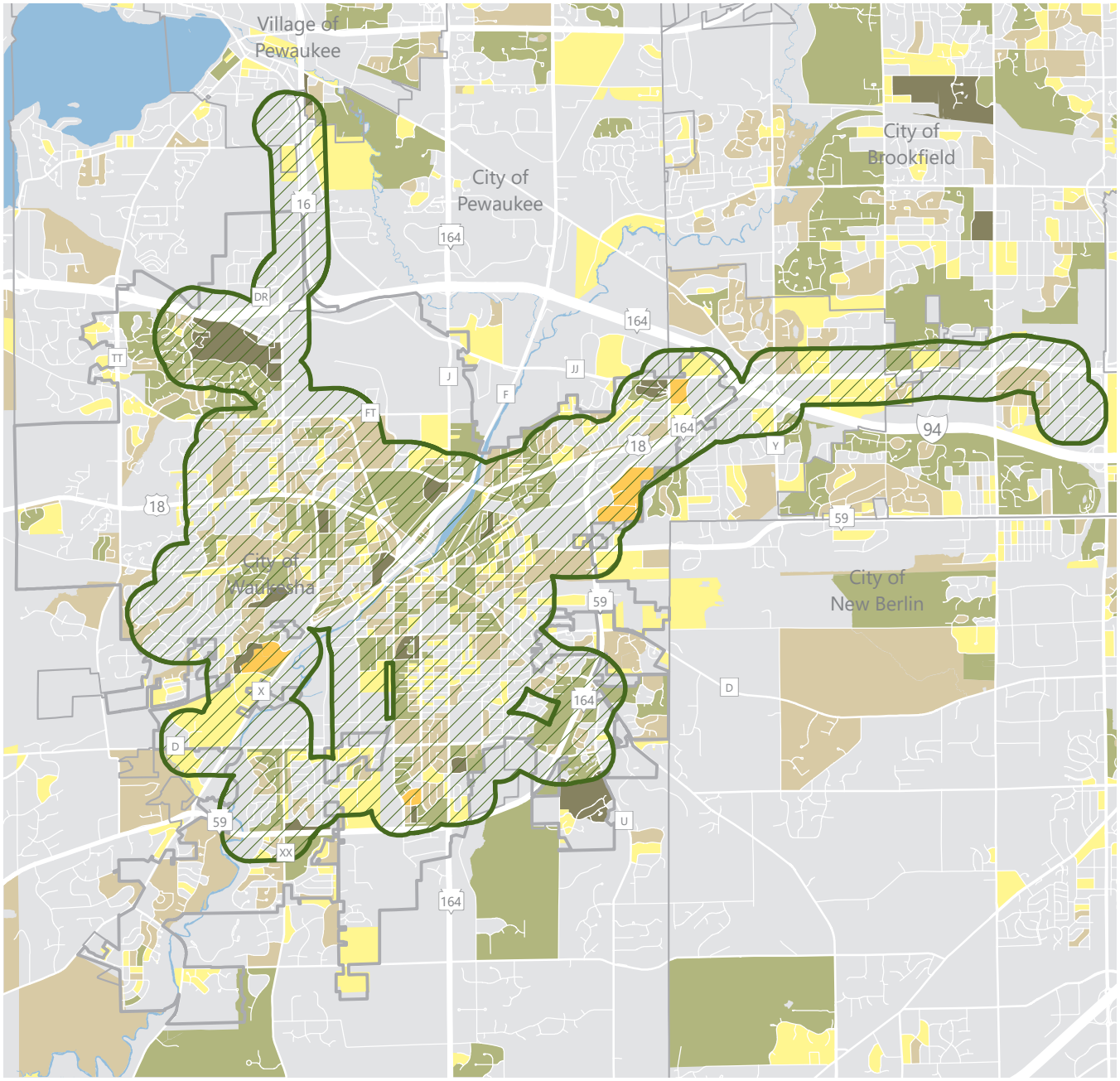
- LOCAL TRANSIT (ONE-QUARTER MILE FROM BUS ROUTES)
- COMMUTER ROUTES (ONE-HALF MILE FROM BUS ROUTES)

N

0 1 2 3 4 Miles

*Source: U.S. Census American Community Survey and SEWRPC*

## Map 4.4
## Concentration of Total Minority Population in the City of Waukesha: 2010




**CENSUS BLOCKS WHEREIN THE PERCENTAGE OF MINORITY PEOPLE, INCLUDING HISPANIC PEOPLE, EXCEEDS THE COUNTY-WIDE AVERAGE OF 9.4 PERCENT BASED ON THE 2010 U.S. CENSUS**

- 500 OR MORE MINORITY PEOPLE
- 200 TO 499 MINORITY PEOPLE
- 100 TO 199 MINORITY PEOPLE
- 25 TO 99 MINORITY PEOPLE
- 10 TO 24 MINORITY PEOPLE
- 1 TO 9 MINORITY PEOPLE

Note: Areas in gray are comprised of census blocks wherein the percentage of minority people, including Hispanic people, is less than or equal to the County-wide average of 9.4 percent.

**WAUKESHA METRO TRANSIT SERVICE AREA**

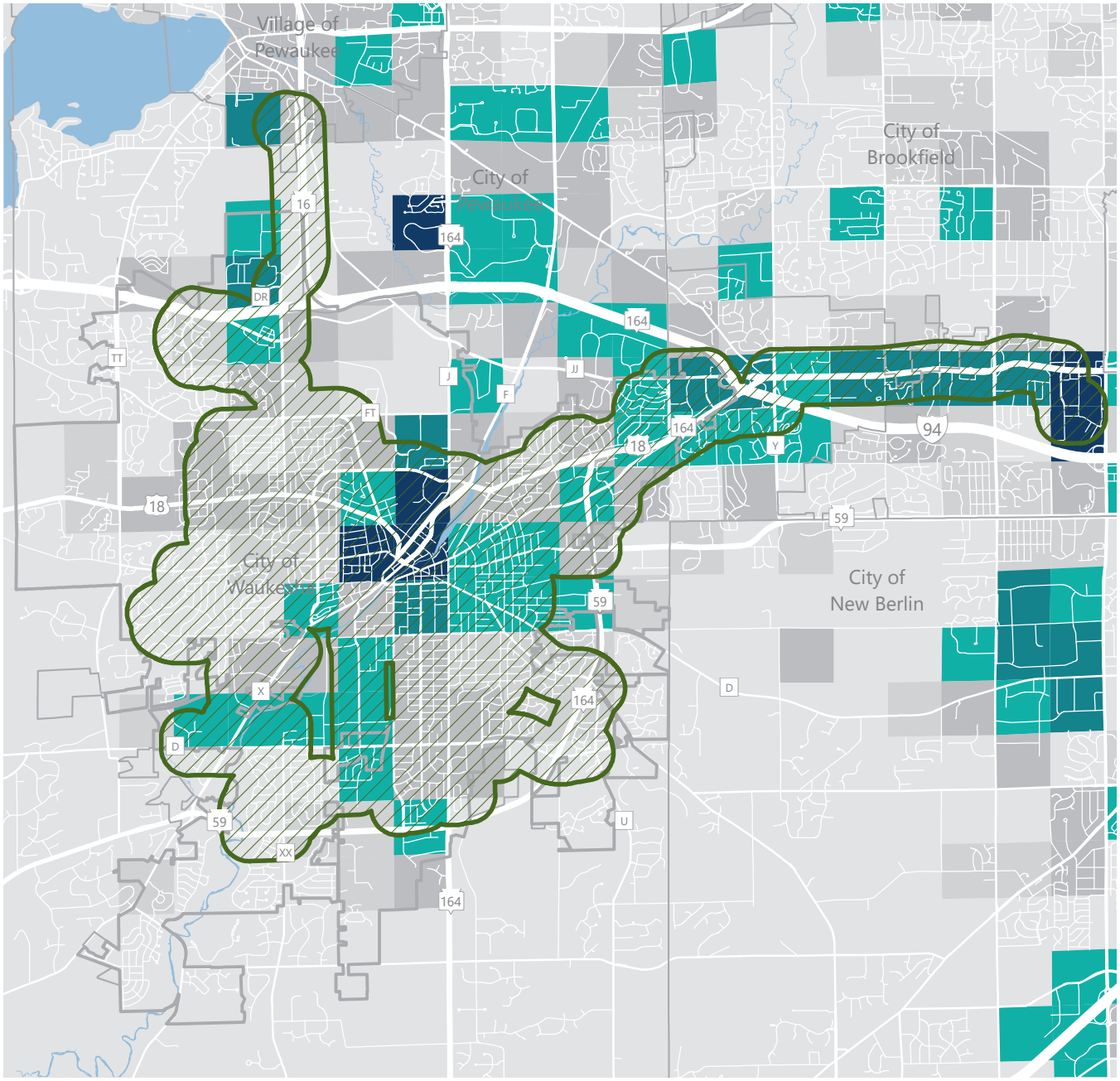
- ONE-QUARTER MILE FROM BUS ROUTES

N

0 0.5 1 1.5 Miles

*Source: U.S. Census, Waukesha Metro Transit, and SEWRPC*

## Map 4.5
## Employment Served by Waukesha Metro Transit




**EMPLOYMENT BY QUARTER SECTION (2010)**

- 0 - 100
- 101 - 250
- 251 - 639
- 640 - 1,500
- 1,501 - 2,500
- 2,501 - 5,329

**WAUKESHA METRO TRANSIT SERVICE AREA**

- ONE-QUARTER MILE FROM BUS ROUTES

Note: Employment threshold (640+) based on the minimum employment density (4 jobs per acre) determined to support transit service as identified in TCRP 165: Transit Capacity and Quality of Service Manual, 3rd Edition (2013).

N

0 0.5 1 1.5 Miles

*Source: U.S. Census, Waukesha Metro Transit, and SEWRPC*

When combining the existing population and jobs present by quarter section to determine if transit-supportive densities are present, a scoring metric was developed to equate the value of each person or job in terms of generating transit ridership. On a scale of 0 to 100, a point was given to a quarter section for each 11.95 people or 6.4 jobs. A quarter section was then considered transit supporting if it reached 100 or more points. Those quarter sections that scored a total of 100 points or above are displayed on Map 4.6 as either a shade of orange or hatched lines. The differing shades of orange or shades of hatching indicate the population and employment score for each quarter section meeting the jobs plus population transit-supportive threshold. As shown on Map 4.6 and in Table 4.3, 50 of the 62 quarter sections in the City of Waukesha served by Waukesha Metro are transit-supportive based on the population and employment scores. Based on these analyses, Waukesha Metro successfully fulfills the Density Performance Standard.

**Objective 2: Operating Safely, Reliably, Conveniently, Comfortably, and Efficiently**

Figure 4.3 contains the applicable standards that were used to determine if Waukesha Metro is providing a service that is efficient, safe, reliable, convenient, and comfortable.

***Route Design and Operating Standard***

The Route Design and Operating Standard encourages routes with direct alignments with a limited number of turns. Waukesha Metro's service includes some alignments that have numerous turns. However, these alignments are largely a result of land use patterns, hilly terrain, and a sometimes-compromised street grid. Waukesha Metro operates within areas with varying land use densities, from the central business district in downtown Waukesha, to shopping centers, business parks, and neighborhoods with single-family housing. In addition, the City of Waukesha includes neighborhoods with relatively steep slopes, which can make certain areas difficult to access, particularly for those with limited mobility. Given the need to connect these various destinations, Waukesha Metro's routes have a number of turns to provide maximum coverage. This extensive coverage avoids unnecessary transfers and Waukesha Metro routes are aligned to prevent the duplication of services, where possible. However, certain popular destinations are served by multiple routes, including the Shoppes at Fox River, which is served by Routes 5 and 6, and the Westbrook Shopping Center, which is served by Routes 1 and 2. In order to evaluate each route's performance, the following sections summarize the ridership, financial performance, and boardings and alightings by route. Overall, Waukesha Metro largely fulfills the Route Design and Operating Standard, however, the transit service recommendations will consider opportunities to create more direct alignments in certain areas of low ridership, while balancing the need to provide access to riders.

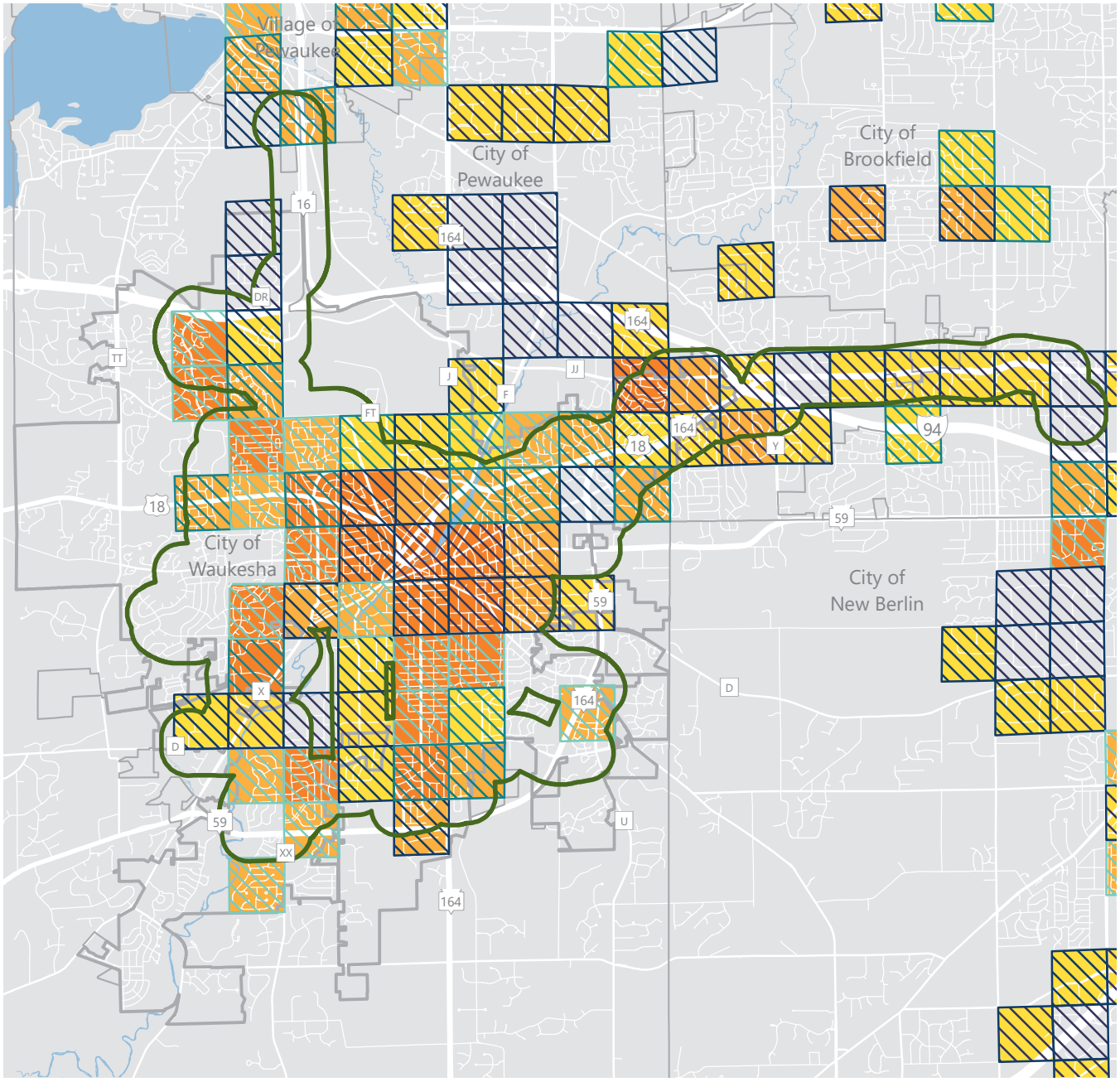
***Bus Stop and Park-Ride Lot Design Standard***

The Bus Stop and Park-Ride Lot Design Standard encourages transit systems to have easily recognizable signs or shelters that include an accessible path to and from nearby destinations. At the request of the Advisory Committee, Commission staff inventoried all bus stops served by Waukesha Metro Transit to determine the presence of signage, pedestrian accommodations, bus pads, curb ramps, bus shelters, benches, and trash cans. The inventory results indicate that some of the 589 Waukesha Metro Transit bus stops are missing signage or do not include accessible paths, as recommended in the bus stop design standard. The bus stop deficiencies include 111 stops without a bus pad, 96 stops without a nearby curb ramp, 54 stops without nearby sidewalk, and 18 stops without signage. Table 4.4 summarizes the number and percentage of Waukesha Metro bus stops with deficiencies, including example photos of bus stops without the amenity. To address the limited pedestrian access due to the lack of nearby sidewalks and crosswalks, it is recommended that the City of Waukesha and other communities served by Waukesha Metro encourage the provision of pedestrian accommodations in areas of existing or planned urban development and design pedestrian amenities in accordance with the Federal American with Disabilities Act and its implementing regulations.

In terms of the spacing of bus stops, Waukesha Metro provides excellent coverage, with bus stops placed at least every three blocks on local routes. Although bus stops placed closely together can assist with access for those individuals with limited mobility, if bus stops are located too tightly together it can increase the travel time on the bus due more frequent stops for boarding and at signalized intersections.

As identified in this design standard, stops should be clearly marked with signs or shelters and minimize the walking distance over an accessible path to and from major destinations. Based on the inventory of bus stop locations served by Waukesha Metro, deficiencies exist that reduce the convenience, comfort,

## Map 4.6
## Waukesha Metro Relative Population Plus Employment Score for Transit Supportive Land Uses by Quarter Section and Existing Transit Service Areas




**POPULATION SCORE**

- 1 - 49
- 50 - 99
- 100 - 195

**EMPLOYMENT SCORE**

- 10 - 49
- 50 - 99
- 100 - 833

**WAUKESHA METRO TRANSIT SERVICE AREA**

- ONE-QUARTER MILE FROM BUS ROUTES

N

0 0.5 1 1.5 Miles

Note: Population + Employment Density Score was calculated by identifying a minimum transit threshold for both population and employment and equalizing them on a weighted scoring scale. Any quarter section scoring 100 or above meets the minimum threshold for transit service. Only quarter sections scoring 100 or above are shown, and the range of weighted scores are provided in the legend.

*Source: SEWRPC*

## Figure 4.3
## Objective 2 and Associated Standards Applicable to the Evaluation of Waukesha Metro Transit

**Objective 2**

**Provide efficient, safe,[a] reliable, convenient, and comfortable transit services in the City of Waukesha**

**Associated Public Transit Principle**

The benefits to the entire public of a transit service are directly related to the level of utilization—measured by ridership—of that service. Ridership is influenced by the level of access the public has to services that are reliable and provide for quick, convenient, comfortable, and safe travel. Riders view transit services with these attributes as an effective and attractive alternative to the private automobile.

**Design and Operating Standards**

**1. Route Design**

Public transit routes should have direct alignments with a limited number of turns, and should be arranged to minimize duplication of services and unnecessary transfers.

**2. Bus Stop Design**

Clearly mark bus stops with easily recognizable signs or shelters and locate them so as to minimize the walking distance over an accessible path to and from residential areas and major activity centers, and to facilitate connections with other transit services where appropriate. For local routes, place stops approximately every three blocks and provide accessible paths and crosswalks to bus stops.[b] For express transit routes, place stops at intersecting transit routes, signalized intersections, and major activity centers. Place park-ride lots at least one mile apart on commuter bus routes. Within business parks, stop spacing may need to differ from standard local route stop spacing based on the spacing between businesses and the presence or lack of sidewalks and crosswalks.

**3. Passenger Demand**

The maximum load factor for each route, measured as the ratio of passengers to seats at that point where passenger loads are highest, should not exceed the following:

| Service Type | Peak Periods | All Other Times |
|---|---|---|
| Local | 1.25 | 1.00 |

**4. Service Frequency and Availability**

Operate all fixed-route transit services, as noted in the table below.

| | Maximum Headway (minutes) | |
|---|---|---|
| Service Type | Weekday Peak Periods | Off-Peak Periods/ Weekends/Holidays |
| Rapid | 15 | 15 |
| Express | 15 | 30 |
| Local/Shuttle | 30 | 60 |

**5. Service Travel Speeds**

Operate transit services such that average travel speeds are not less than 10 miles per hour for local fixed-route services.

**6. Vehicle Age and Condition**

Consideration should be given to rehabilitating or replacing each public transit vehicle at the end of its normal service life as defined below for different types of transit vehicles:

| | | Service Life[c] | |
|---|---|---|---|
| Vehicle Type | Length (feet) | Years | Mileage |
| Heavy-Duty Bus | 35+ | 12 | 500,000 |
| Heavy-Duty Bus | 25-30 | 10 | 350,000 |
| Medium-Duty Bus | 25-30 | 7 | 200,000 |
| Cars, Vans, and Cutaways | -- | 4 | 100,000 |

**Figure continued on next page.**

**Figure 4.3 (Continued)**

| Performance Standards and Associated Performance Measures | |
|---|---|
| **1. Ridership and Service Effectiveness**<br>Maximize ridership on and the effectiveness of transit services. This is measured using passengers per capita, total passengers per vehicle hour, total passengers per vehicle mile, and passenger miles per vehicle mile, which will be compared to similar transit systems.<br><br>Transit services with service effectiveness measures more than 20 percent below the median of the peer comparison group, with less than 10 passengers per revenue vehicle hour, or less than one passenger per revenue vehicle mile should be reviewed for potential changes to their routes, runs, service areas, and service periods. | **2. Travel Time**<br>Keep travel times on transit services reasonable in comparison to travel time by automobiles for similar trips. This standard is measured using the ratio of transit to automobile distance and the ratio of transit to automobile travel time. |

[a] *The Federal Transit Administration published the Public Transportation Agency Safety Rule (49 CFR part 673) on July 19, 2018, requiring transit operators to develop safety plans, including safety performance measures by July 20, 2020. Waukesha Metro and Waukesha County Transit have good safety records and are in compliance with the Safety Rule.*

[b] *This standard encourages that accessible sidewalks and crosswalks be provided to bus stops and that all pedestrian facilities be designed and constructed in accordance with the Federal American with Disabilities Act (ADA) and its implementing regulations.*

[c] *The service life standards represent the minimum useful life benchmarks defined in FTA Circular 5010.1E, March 21, 2017, revised July 16, 2018. Transit operators are required to measure their transit assets' vehicle age and condition pursuant regulations set forth in 49 CFR part 625 Transit Asset Management, based on a set of maximum useful life benchmarks. However, Figure 4.3 includes the minimum service life measures as they represent the minimum number of years or mileage that recipients of Federal assistance must meet in order to qualify for new vehicles.*

*Source: SEWRPC*

and safety of passengers. As a result, Waukesha Metro partially fulfills the Bus Stop and Park-Ride Lot Design Standard. The City could pursue Federal Transit Administration Enhanced Mobility for Seniors and Individuals with Disabilities Program (Section 5310) funding, which would reimburse 80 percent of the cost of construction of many of the missing bus stop amenities. Additional information on specific improvement recommendations and costs can be found in Chapter 5, Transit Service Recommendations.

### *Passenger Demand*

The load factor measures whether the capacity of fixed-route bus service provided (the number of seats on the bus and the existing headways for routes) is appropriate for the number of passengers using the service. In the case of Waukesha Metro, the range of acceptable passenger loading standards is identified in Objective 2, Passenger Demand Design and Operating Standard. This standard specifies that the maximum load factor, measured as the ratio of passengers to seats on the bus at that point where passenger loads are the highest, should not exceed 1.25 during peak periods, and 1.00 at all other times. This standard ensures a high degree of comfort for passengers using the bus service by limiting the number of persons who have to stand. At least half of the seats in a vehicle should be occupied at some point along each route in order for the fixed-route service to be considered as providing an appropriate capacity.

Commission staff used boarding and alighting passenger counts provided by Waukesha Metro for dates in 2018 and 2019 along each weekday bus route to calculate the passenger loads carried over the length of each bus route for each scheduled trip. The passenger loads were then reviewed to determine the highest passenger loads for each route during each time period: morning, midday, afternoon, and evening.

To calculate the maximum load factor for each of the highest passenger loads, Commission staff adjusted the maximum load factor in order to account for variability in ridership. For example, ridership on Waukesha Metro Transit was approximately 2 percent lower in 2018 than it was in 2008, and ridership varies by day of the week and month, as well as by time of the year. Therefore, the maximum load factor for each route was adjusted upward by 20 percent more than observed in the sampled data.

## Table 4.4
## Waukesha Metro Bus Stop Deficiencies Summary

| Number of Bus Stops with Deficiency | Percentage of Bus Stops with Deficiency | Definition | Photo of Deficiency |
|---|---|---|---|
| | | No Signage | |
| 18 | 3.0 | Missing signage that indicates where the bus will stop |  *Greenmeadow Drive at Summit Avenue* *(City of Waukesha)* |
| | | Damage | |
| 92 | 15.6 | Includes worn route maps in shelters, bent poles, graffiti, or scratches on shelters. |  *Irving Place at Aldoro Drive* *(City of Waukesha)* |
| | | No Bus Pad | |
| 111 | 18.9 | No paved waiting area with access to and from the stop |   *Ellis Street at N Greenfield Avenue* *(City of Waukesha)* |

**Table continued on next page.**

## Table 4.4 (Continued)

| Number of Bus Stops with Deficiency | Percentage of Bus Stops with Deficiency | Definition | Photo of Deficiency |
|---|---|---|---|
| | | No Sidewalk | |
| 54 | 9.2 | Missing connecting sidewalk to the bus stop |  *East St. Paul Avenue at Fuller Street* *(City of Waukesha)* |
| | | No Curb Ramp | |
| 96 | 16.3 | Missing a curb cut visible from the stop, approximately 25 to 50 feet, to allow access for people in wheelchairs or other mobility assistance devices |  *Bluemound Road at Woelfel Road* *(Town of Brookfield)* |
| | | No Detectable Warning Surface | |
| 245 | 41.6 | Walking surface with small truncated domes to provide a tactile cue for pedestrian with visual impairments |  *East Racine Avenue at Cheviot Chase* *(City of Waukesha)* |
| | | No Nearby Lighting | |
| 134 | 22.8 | Bus stops without nearby light poles and lacking light sources that could provide adequate ambient lighting |  *Avalon Drive at Stardust Drive* *(City of Waukesha)* |

*Source: Waukesha Metro Transit and SEWRPC*

Table 4.5 displays the observed maximum passenger loads and the adjusted maximum load factors for each route during each weekday time period. No routes had adjusted maximum load factors that exceed the standard of 1.25 passengers per seat during weekday peak periods and 1.00 passengers per seat during off-peak periods. Therefore, Waukesha Metro successfully fulfills the Passenger Demand Design and Operating standard.

***Service Frequency and Availability Operating Standard***

The Service Frequency and Availability Standard requires that service be provided every 30 minutes during weekday peak periods and every 60 minutes during off-peak periods and weekends or holidays. Routes 1, 3, 4, 8, and 9 generally fulfill this standard, with frequencies of 30 to 35 minutes during the weekday peak periods. The remaining routes (Routes 2, 5, 6, 7, and 15) offer service every 60 to 70 minutes during the peak time periods during the weekdays. All Waukesha Metro routes meet this standard during the off-peak periods, weekends, and holidays. Therefore, Waukesha Metro partially fulfills the Service Frequency and Availability Operating Standard.

***Service Travel Speeds Operating Standard***

The Service Travel Speeds Standard requires that local fixed-route services achieve average travel speeds not less than 10 miles per hour over the duration of the route. As currently scheduled, all Waukesha Metro routes meet or exceed this standard, with an average operating speed for all weekday routes of approximately 15 miles per hour. As a result, Waukesha Metro fulfills the Service Travel Speed Operating Standard.

***Vehicle Age and Condition Standard***

The Vehicle Age and Condition Standard requires that each public transit vehicle be rehabilitated or replaced at the end of its normal service life based on the vehicle type. As described in Chapter 2, Waukesha Metro regularly replaces vehicles such that no public transit vehicle currently exceeds its normal service life. The average age of Waukesha Metro's revenue vehicles is three years, well below the service life for buses (12 years), and below the service life for cutaway vehicles (4 years). As further documented in the Group Transit Asset Management Plan,[10] Waukesha Metro conducts timely preventative maintenance and has a goal for 100 percent on-time performance for their preventative maintenance activities. In order to track their maintenance needs, Waukesha Metro utilizes a software program that alerts staff 750 miles prior to the mileage when preventative maintenance is due and produces a vehicle aging report by vehicle that ranks vehicles by years and life miles. As a result of the current vehicle ages and the on-going maintenance policies and standards, Waukesha Metro successfully fulfills the Vehicle Age and Condition Standard.

***Ridership and Service Effectiveness Performance Standard***

The Ridership and Service Effectiveness Standard uses four performance measures (passengers per capita, passengers per revenue vehicle hour, passengers per revenue vehicle mile, and passenger miles per revenue vehicle mile) to compare the service effectiveness of Waukesha Metro's service to six peer transit systems from around the Nation and the State. If the service effectiveness measures are more than 20 percent below the median of the peer comparison group, this standard encourages modifying routes, runs, service areas, or service periods. Figure 4.4 shows the results of this comparison of Waukesha Metro to its peers by displaying the range of the peer group's performance, the median of the peer group's performance, the range of performance that meets the standard, and the performance of Waukesha Metro for each measure. The data for each peer system is presented in Table 4.6.

Figure 4.4 shows that Waukesha Metro is within the acceptable range for all of the four performance measures. Passengers per capita is dependent upon the attractiveness of a transit system's service to the residents within its service area. This attractiveness can be influenced by many factors, some within a transit system's control (such as frequency of service or fare levels) and some outside a system's control (such as land use density and community demographics). Waukesha Metro provides good coverage within the City of Waukesha, with a focus on serving the downtown area and locations with higher density commercial development, including major shopping and business parks. Therefore, Waukesha Metro performs very well when compared to its peers on this measure.

[10] *Group Transit Asset management Plan for Tier II Operators in Southeastern Wisconsin, Memorandum Report No. 238, September 2018.*

## Table 4.5
## Maximum Passenger Loads and Maximum Load Factors for Waukesha Metro Transit Routes

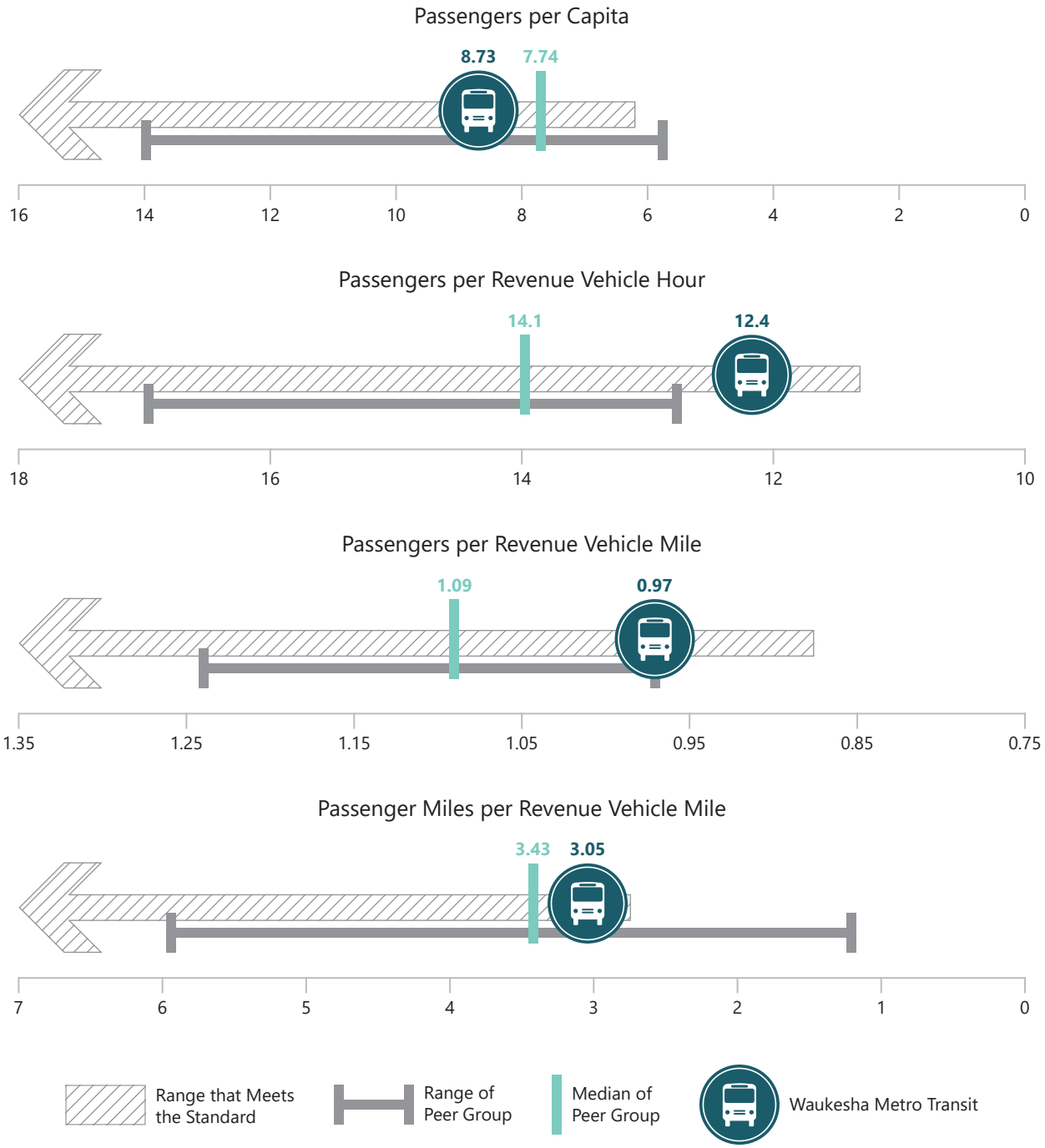
| Route Number | Passengers per Revenue Hour | Morning (5:30 a.m. - 9:00 a.m.) | | Midday (9:00 a.m. - 3:00 p.m.) | | Afternoon (3:00 p.m. - 6:00 p.m.) | | Evening (6:00 p.m. - 10:00 p.m.) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Observed Maximum Passenger Load | Adjusted Maximum Load Factor[a] | Observed Maximum Passenger Load | Adjusted Maximum Load Factor[a] | Observed Maximum Passenger Load | Adjusted Maximum Load Factor[a] | Observed Maximum Passenger Load | Adjusted Maximum Load Factor[a] |
| 1 | 9.8 | 17 | 0.66 | 14 | 0.54 | 24 | 0.93 | 6 | 0.23 |
| 2 | 9.6 | 8 | 0.31 | 8 | 0.31 | 9 | 0.35 | 5 | 0.19 |
| 3 | 12.5 | 4 | 0.15 | 4 | 0.15 | 3 | 0.12 | 4 | 0.15 |
| 4 | 28.6 | 10 | 0.39 | 14 | 0.54 | 16 | 0.62 | 16 | 0.62 |
| 5 | 10.3 | 8 | 0.31 | 16 | 0.62 | 13 | 0.50 | 1 | 0.04 |
| 6 | 7.4 | 7 | 0.27 | 10 | 0.39 | 11 | 0.43 | 8 | 0.31 |
| 7 | 13.2 | 9 | 0.35 | 23 | 0.89 | 15 | 0.58 | 15 | 0.58 |
| 8 | 13.3 | 8 | 0.31 | 7 | 0.27 | 8 | 0.31 | -- | -- |
| 7/8 | 10.4 | N/A | -- | N/A | -- | N/A | -- | 9 | 0.35 |
| 9 | 12.6 | 14 | 0.54 | 12 | 0.46 | 9 | 0.35 | 6 | 0.23 |
| 15 | 9.6 | 7 | 0.27 | 7 | 0.27 | 9 | 0.35 | 5 | 0.19 |
| Performance Standards for Maximum Load Factor[b] Not to Exceed | | -- | 1.25 | -- | 1.00 | -- | 1.25 | -- | 1.00 |

[a] *The maximum load factor is the ratio of the number of passengers on the bus to the number of seats on the bus (assumed to be 31) at the point on the route where the passenger loads are highest. The adjusted maximum load factor was calculated assuming 20 percent more passengers on the bus at the peak times than observed in various weekdays in 2018 and 2019 sampled data. This adjustment accounts for variability in ridership.*

[b] *Under Objective No. 2 and service design and operating standard No. 3, the maximum load factor for local transit service should not exceed 1.25 during peak periods, and 1.00 during off-peak periods.*

*Source: Waukesha Metro Transit and SEWRPC*

**Figure 4.4**
**Ridership and Service Effectiveness Performance Standard: Comparison of Waukesha Metro Transit to Peer Group for Associated Performance Measures**




*Source: National Transit Database, Waukesha Metro Transit, and SEWRPC*

## Table 4.6
## Waukesha Metro Transit and Peer Group Data for the Ridership and Service Effectiveness Performance Standard

| | Performance Measures | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Passengers per Capita | | | Passengers per Revenue Vehicle Hour | | | Passengers per Revenue Vehicle Mile | | | Passenger Miles per Revenue Vehicle Mile | | |
| **Peer System and Metropolitan Area** | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change |
| Gary Public Transportation Corporation (Gary, IN) | 6.86 | 7.30 | 1.62% | 13.26 | 13.33 | 0.17% | 0.96 | 0.97 | 0.37% | 1.23 | 1.22 | -0.13% |
| Cedar Rapids Transit (Cedar Rapids, IA) | 7.90 | 7.46 | -10.42% | 17.45 | 17.22 | -0.12% | 1.25 | 1.24 | 0.21% | 5.78 | 5.95 | 0.93% |
| Sioux Area Metro (Sioux Falls, SD) | 7.10 | 5.79 | -3.55% | 18.44 | 12.84 | -8.41% | 1.42 | 1.06 | -6.87% | 8.31 | 4.45 | -13.80% |
| Altoona Metro Transit (Altoona, PA) | 9.70 | 8.01 | -4.57% | 16.38 | 14.14 | -3.51% | 1.29 | 1.13 | -3.22% | 4.52 | 3.31 | -7.05% |
| La Crosse Municipal Transit Utility (La Crosse, WI) | 16.51 | 14.04 | -3.90% | 21.69 | 17.01 | -5.77% | 1.54 | 1.18 | -6.20% | 4.92 | 3.55 | -7.80% |
| Shoreline Metro (Sheboygan, WI) | 8.76 | 8.90 | 0.44% | 11.96 | 14.06 | 4.18% | 0.89 | 0.97 | 2.35% | 2.37 | 2.43 | 0.71% |
| Waukesha Metro Transit (Milwaukee, WI) | 10.40 | 8.73 | -4.26% | 13.93 | 12.14 | -3.33% | 1.05 | 0.97 | -1.89% | 3.55 | 3.05 | -3.68% |

Note: Cedar Rapids service area changed how it reported service area population starting in 2014. Therefore, the 2014 passengers per capita ratio is provided for comparison purposes. Shoreline Metro did not report passenger miles in 2017, therefore 2016 data were used for passenger miles per revenue vehicle mile in 2017.

*Source: National Transit Database, U.S. Bureau of the Census, Waukesha Metro Transit, and SEWRPC*

Although Waukesha Metro meets the standard, it performs below its peers in regards to passengers per revenue vehicle hour of service and passengers per revenue vehicle mile. This may reflect the efforts made to maximize service to residential areas, major activity centers, and areas with steep inclines within the City on each route while minimizing the overall number of routes needed. By operating along less direct routes, Waukesha Metro increases its coverage, particularly in areas that may be difficult for individuals with limited mobility to traverse. However, providing greater coverage to these areas reduces service effectiveness of the system.

Waukesha Metro also performs below its peers for the passenger miles per revenue vehicle mile measure, which essentially serves as a proxy for the average number of seats filled on a vehicle over the course of its revenue trip. This may reflect the relatively low ridership on certain trips that travel over longer distances to serve outlying commercial areas, such as Routes 2, 6, and 15, which also have relatively low passengers per revenue hour. Waukesha Metro successfully fulfills the Ridership and Service Effectiveness Standard, although this analysis provides useful insight for consideration during the next phase of the process.

***Travel Time Performance Standard***

The Travel Time Performance Standard encourages that travel times and distances be kept reasonable in comparison to travel times and distances by automobiles for similar trips. Table 4.7 compares trip travel distances and time between transit trips and automobile trips. For the travel distance comparison, the automobile routes selected provided a more direct route than that taken by the bus in order to identify routes with less direct alignments. The table also compares travel times utilizing the same alignment as a means to measure how reasonable the travel times on Waukesha Metro Transit service are compared to automobiles.

The comparison of transit and automobile travel times indicates that for all Waukesha Metro routes, transit travel time is about as fast by automobile, with all routes within an acceptable range. As shown in Table 4.7, no routes exceed the ratio of 2.0 for vehicle travel time, which is generally beyond what many riders are willing to accept when determining whether to use transit service.

The comparison of travel distances between transit trips and automobile trips measures the directness of the route alignments. While three routes (Routes 5, 6, and 15) have transit-to-distance ratios that come close to 2.0, reducing the travel distance ratios on these routes would likely require Waukesha Metro to reduce service to certain neighborhoods, thereby reducing the coverage of the transit system. Overall, Waukesha Metro fulfills the Travel Time Performance Standard.

**Objective 3: Utilizing Public Resources Cost-Effectively**

Objective 3 recognizes that public funds are limited, and must be used efficiently. In order to determine if public funds are being spent well, the following analyses compare Waukesha Metro Transit to its peer group using a number of performance measures. The applicable standards and performance measures used to measure how efficiently Waukesha Metro is using public funds are shown in Figure 4.5.

***Fare Structure and Design Standard***

The Fare Structure Standard recommends premium fares for premium services and discounts for priority users, such as seniors and people with disabilities. Waukesha Metro fulfills this standard, with a $2.00 adult cash fare, which is slightly higher than the peer group. Waukesha Metro also offers a discounted fare of $1.00 for seniors and people with disabilities. Furthermore, Waukesha Metro includes free transfers within 90 minutes of the time it was issued, free transfers to MCTS, provides riders the opportunity to purchase a monthly pass, and offers summer youth passes.

***Operating Expenses Performance Standard***

By comparing the annual percent change between 2013 and 2017 in operating expenses per revenue vehicle mile, operating expenses per revenue vehicle hour, operating expenses per total vehicle mile, operating expenses per total vehicle hour, and operating assistance per passenger, the Operating Expenses Performance Standard ensures that the growth in operating costs is comparable to that of peer systems. In order to fulfill the standard, none of the annual percent increases in the five performance measures should exceed the median percentage increases experienced by the peer group. Figure 4.6 compares the annual percent change for each measure between 2013 and 2017 for the range of the peer group's performance to the performance of Waukesha Metro. Table 4.8 provides the detailed data used to develop Figure 4.6.

## Table 4.7
## Comparison of Transit and Automobile Travel Distances and Times for Waukesha Metro Transit Weekday Routes: 2019

| Route Number | Route Termini For Measurements of Travel Distance and Time | Trip Travel Distance (miles)[a] | | | | Vehicle Travel Time (minutes)[b] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Transit | Automobile | Difference (Transit to Automobile) | Ratio (Transit to Automobile) | Transit | Automobile | Difference (Transit to Automobile) | Ratio (Transit to Automobile) |
| 1 | Downtown Transit Center to Brookfield Square Mall | 9.2 | 7.5 | 1.7 | 1.2 | 35.0 | 32.0 | 3.0 | 1.1 |
| 2 | Downtown Transit Center to Target | 6.1 | 5.1 | 1.0 | 1.2 | 27.0 | 21.0 | 6.0 | 1.3 |
| 3 | Downtown Transit Center to Big Bend Road and Sunset Drive | 2.8 | 2.4 | 0.4 | 1.2 | 11.0 | 9.0 | 2.0 | 1.2 |
| 4 | Downtown Transit Center to Walmart Supercenter on S. West Avenue | 3.2 | 2.7 | 0.5 | 1.2 | 12.0 | 11.0 | 1.0 | 1.1 |
| 5 | Downtown Transit Center to Shoppes at Fox River | 5.8 | 3.2 | 2.6 | 1.8 | 24.0 | 19.0 | 5.0 | 1.3 |
| 6 | Downtown Transit Center to Badger Drive via Shoppes at Fox River | 6.5 | 3.7 | 2.8 | 1.8 | 29.0 | 22.0 | 7.0 | 1.3 |
| 7 | Downtown Transit Center to Pendleton Place and South Comanche Lane via Waukesha Memorial Hospital | 3.5 | 3.2 | 0.3 | 1.1 | 16.0 | 13.0 | 3.0 | 1.2 |
| 8 | Downtown Transit Center to UWM at Waukesha | 3.1 | 2.8 | 0.3 | 1.1 | 12.0 | 10.0 | 2.0 | 1.2 |
| 9 | Downtown Transit Center to WCTC | 8.4 | 5.4 | 3.0 | 1.5 | 26.0 | 20.0 | 6.0 | 1.3 |
| 15 | Downtown Transit Center to Meijer on E. Sunset Drive | 5.6 | 3.0 | 2.6 | 1.9 | 22.0 | 20.0 | 2.0 | 1.1 |

[a] *Travel trip distance compared the bus route to a more direct route to the same destination.*

[b] *Auto travel time compared travel time between the bus route during the morning peak and automobile travel along the same route as the bus.*

*Source: Waukesha Metro Transit and SEWRPC*

## Figure 4.5
## Objective 3 and Associated Standards Applicable to the Evaluation of Waukesha Metro Transit

| Objective 3 |
|---|
| **Meet all other objectives at the lowest possible cost. Given limited public funds, this objective seeks to permit elected officials the flexibility to balance the standards associated with Objectives 1 and 2 with the level of public funding required to fully meet those standards.** |

| Associated Public Transit Principle |
|---|
| Given limited public funds, the cost of providing transit at a desired service level should be minimized and revenue gained from the service should be maximized to maintain the financial stability of services. |

| Design and Operating Standards |
|---|
| **1. Fare Structure**<br>Charge premium fares for premium services, and discounted fares for priority population groups and frequent riders. |

| Performance Standards and Associated Performance Measures | |
|---|---|
| **1. Operating Expenses**<br>Minimize the operating expenses per total and revenue vehicle mile, the operating expenses per total and revenue vehicle hour, and the operating assistance per passenger. Annual increases in such costs should not exceed the median percentage increases experienced by comparable transit systems. | **2. Cost Effectiveness**<br>Review transit services with substandard cost effectiveness for potential changes to their routes, runs, service areas, and service periods. Cost effectiveness is considered substandard when the operating expenses per passenger, or operating expenses per passenger mile are more than 20 percent above, or the farebox recovery ratio is more than 20 percent below, the median for comparable transit systems. |

*Source: SEWRPC*

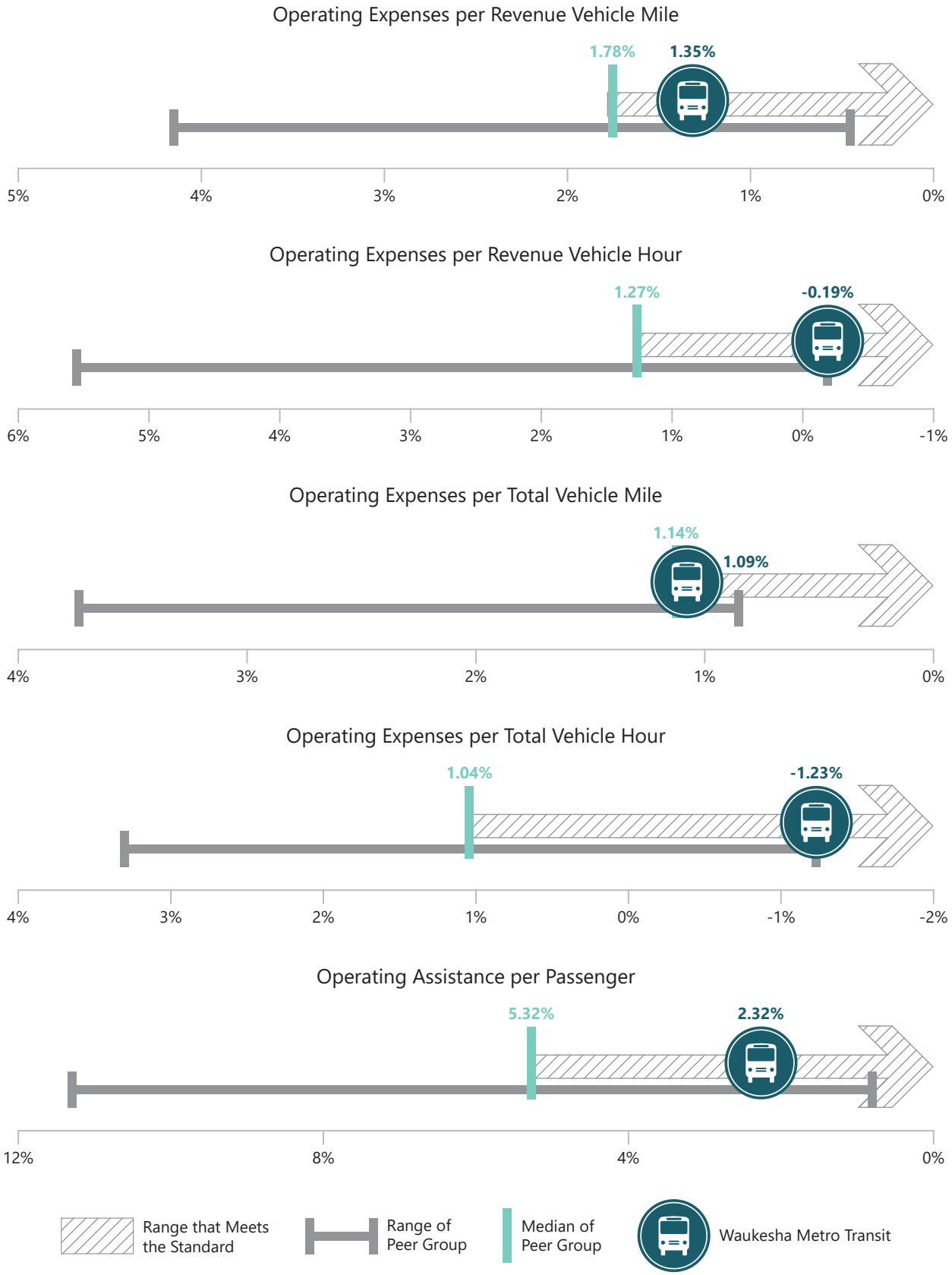
Overall, Waukesha Metro performs well on all five measures, with lower growth rates in operating expenses per unit of service than its peers. However, Waukesha Metro experienced an increase in operating assistance per passenger between 2013 and 2017 with an average annual change of 2.32 percent. This may reflect the decline in ridership between 2013 and 2017, which increased the average subsidy amount per passenger. However, even with this increase, the amount of operating assistance per passenger is still lower than the median of the peer group. Waukesha Metro fulfills the Operating Expenses Performance Standard.

### *Cost Effectiveness Performance Standard*

The Cost Effectiveness Standard recommends that the operating cost per passenger and operating cost per passenger mile should be no greater than 20 percent above the median of the peer group, and that the farebox recovery ratio should not be more than 20 percent below the median of the peer group. If a transit service is substandard under any of these performance measures, it may indicate that changes to routes, runs, service areas, and service periods need to be considered. Figure 4.7 shows the range of the peer group's performance, the median of the peer group's performance, the range of the performance that meets the standard, and the performance of Waukesha Metro for these performance measure. Table 4.9 provides the detailed data used to develop Figure 4.7.

Waukesha Metro is within the range that meets the standard for all three performance measures. However, at $6.78, the operating expenses per passenger are significantly higher than the median of the peer group, reflecting the reductions in ridership in recent years, as well as the lower passengers per unit of service noted under Objective 2, Service Effectiveness Performance Standard. In 2017, Waukesha Metro had a higher farebox recovery ratio than its peers at approximately 17 percent, due to Waukesha Metro's comparatively higher fares and relatively stable operating expenses. Overall, Waukesha Metro provides a cost effective service and successfully meets this standard.

**Figure 4.6**
**Operating Expenses Performance Standard: Comparison of Waukesha Metro Tansit to Peer Group for Associated Performance Measures (Percent Annual Change)**




*Source: National Transit Database, Waukesha Metro Transit, and SEWRPC*

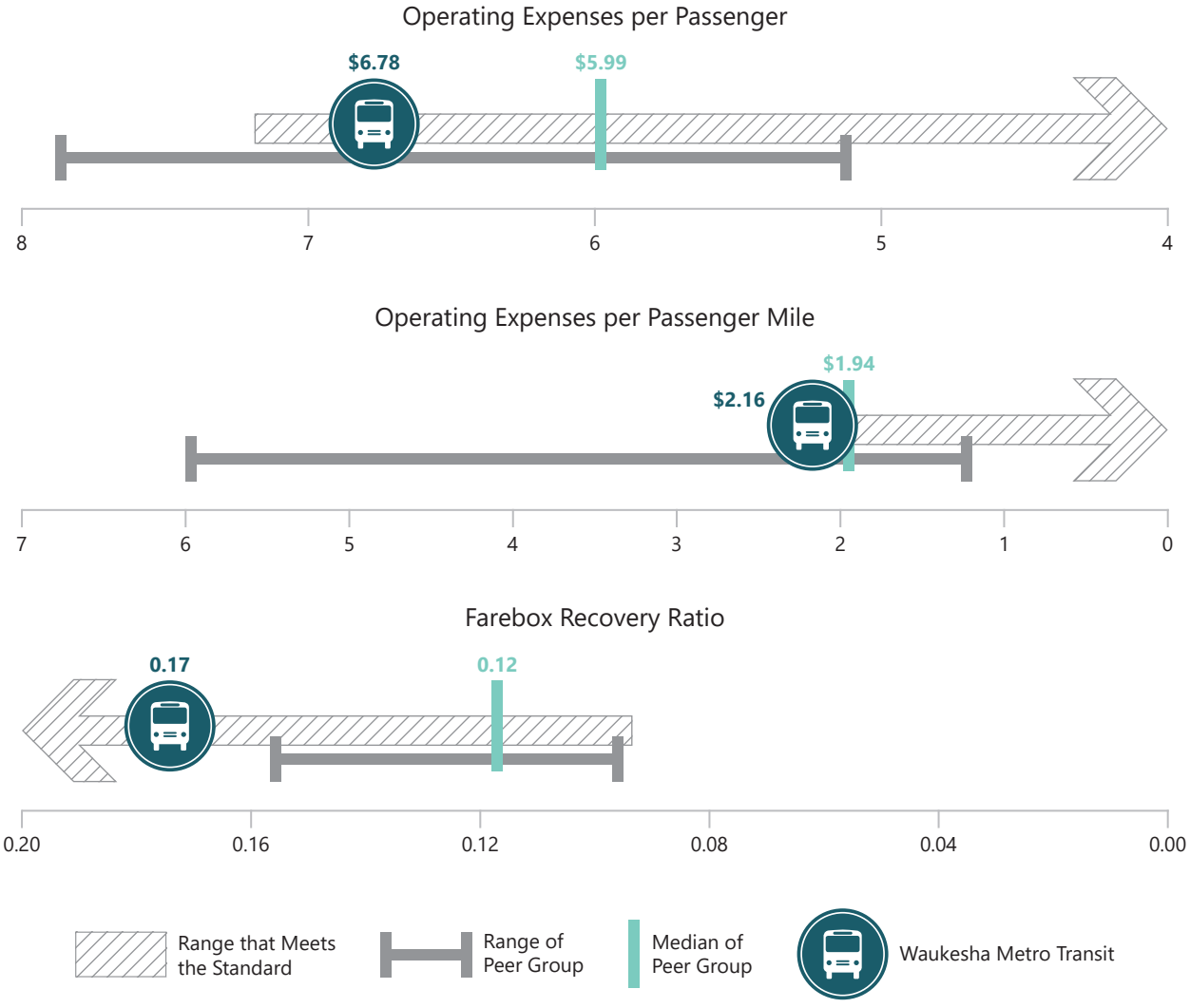
## Table 4.8
## Waukesha Metro Transit and Peer Group Data for the Operating Expenses Performance Standard

| Peer System and Metropolitan Area | Performance Measures | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Operating Expenses per Revenue Vehicle Mile | | | Operating Expenses per Revenue Vehicle Hour | | | Operating Expenses per Total Vehicle Mile | | | Operating Expenses per Total Vehicle Hour | | | Operating Assistance per Passenger | | |
| | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change |
| Gary Public Transportation Corporation (Gary, IN) | $7.09 | $7.27 | 0.89% | $97.83 | $99.60 | 0.71% | $7.09 | $7.27 | 0.87% | $97.83 | $99.60 | 0.69% | $6.33 | $6.66 | 1.52% |
| Cedar Rapids Transit (Cedar Rapids, IA) | $7.32 | $7.46 | 0.49% | $102.58 | $103.41 | 0.21% | $7.05 | $7.32 | 0.97% | $99.04 | $101.78 | 0.69% | $5.22 | $5.31 | 0.86% |
| Sioux Area Metro (Sioux Falls, SD) | $5.57 | $6.08 | 2.20% | $72.52 | $73.41 | 0.42% | $5.53 | $6.00 | 2.08% | $72.08 | $72.85 | 0.38% | $3.37 | $5.17 | 11.35% |
| Altoona Metro Transit (Altoona, PA) | $7.58 | $8.87 | 4.16% | $96.41 | $111.32 | 3.79% | $7.45 | $8.58 | 3.75% | $94.82 | $99.45 | 1.39% | $4.78 | $6.65 | 9.13% |
| La Crosse Municipal Transit Utility (La Crosse, WI) | $5.79 | $6.11 | 1.36% | $81.66 | $87.65 | 1.82% | $5.64 | $5.93 | 1.31% | $76.14 | $85.30 | 2.96% | $3.22 | $4.54 | 9.14% |
| Shoreline Metro (Sheboygan, WI) | $5.08 | $5.82 | 3.66% | $68.29 | $83.95 | 5.55% | $4.93 | $5.10 | 0.92% | $62.98 | $71.41 | 3.31% | $4.90 | $5.10 | 1.15% |
| Waukesha Metro Transit | $6.27 | $6.59 | 1.35% | $83.16 | $82.29 | -0.19% | $6.03 | $6.27 | 1.09% | $76.60 | $72.79 | -1.23% | $5.14 | $5.60 | 2.32% |

Note: Shoreline Metro did not report total vehicle miles or hours in 2017, therefore 2016 data were used for operating expenses per total vehicle mile and total vehicle hour in 2017.

*Source: National Transit Database, U.S. Bureau of the Census, Waukesha Metro Transit, and SEWRPC*

**Figure 4.7**
**Cost Effectiveness Performance Standard: Comparison of Waukesha Metro Transit to Peer Group for Associated Performance Measure**




*Source: National Transit Database, Waukesha Metro Transit, and SEWRPC*

***Performance Evaluation of Individual Routes***

In addition to overall system evaluation in the preceding sections of this chapter, fixed-route urban transit systems should also be analyzed for both service effectiveness (as described under Objective 2) and cost effectiveness (as described under Objective 3) on an individual route basis. This section of the evaluation looks at the ridership and financial performance of the transit system's bus routes in order to identify the routes with the lowest overall performance based on route operating data, including total boarding passengers; passengers per revenue vehicle-hour and per revenue vehicle-mile; total operating cost and operating assistance per passenger; and farebox recovery rate.

Tables 4.10 through 4.12 and Figures 4.8 through 4.9 display the estimated service and cost effectiveness measures for the routes of the transit system. The performance measures presented in these tables and figures are based upon the following data:

- Daily operating characteristics for each route in 2019
- Systemwide cost per vehicle hour and passenger revenue per boarding passenger in 2018
- Boarding passengers per route collected by the transit system on select days in 2018 and 2019

## Table 4.9
## Waukesha Metro Transit and Peer Group Data for the Cost Effectiveness Performance Standard

| | Performance Measures | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Operating Expenses per Passenger | | | Operating Expenses per Passenger Mile | | | Farebox Recovery Ratio | | |
| **Peer System and Metropolitan Area** | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change |
| Gary Public Transportation Corporation (Gary, IN) | $7.38 | $7.47 | 0.48% | $5.77 | $5.95 | 0.98% | 0.14 | 0.11 | -6.01% |
| Cedar Rapids Transit (Cedar Rapids, IA) | $5.88 | $6.01 | 0.85% | $1.27 | $1.25 | 0.02% | 0.11 | 0.12 | 1.19% |
| Sioux Area Metro (Sioux Falls, SD) | $3.93 | $5.72 | 9.84% | $0.67 | $1.37 | 20.39% | 0.14 | 0.10 | -9.61% |
| Altoona Metro Transit (Altoona, PA) | $5.89 | $7.87 | 7.95% | $1.68 | $2.68 | 13.58% | 0.19 | 0.16 | -4.40% |
| La Crosse Municipal Transit Utility (La Crosse, WI) | $3.77 | $5.15 | 8.28% | $1.18 | $1.72 | 9.92% | 0.15 | 0.12 | -5.06% |
| Shoreline Metro (Sheboygan, WI) | $5.71 | $5.97 | 1.22% | $2.15 | $2.15 | 0.16% | 0.14 | 0.15 | 0.73% |
| Waukesha Metro Transit (Milwaukee, WI) | $5.97 | $6.78 | 3.34% | $1.77 | $2.16 | 5.37% | 0.14 | 0.17 | 6.33% |

Note: Shoreline Metro did not report total vehicle miles or hours in 2017, therefore 2016 data were used for operating expenses per total vehicle mile and total vehicle hour in 2017.

*Source: National Transit Database, U.S. Bureau of the Census, Waukesha Metro, and SEWRPC*

## Table 4.10
## Average Weekday Performance Characteristics for Waukesha Metro Transit Routes

| Route Number | Revenue Vehicle Hours[a] | Revenue Vehicle Miles[b] | Boarding Passengers[a] | Service Effectiveness Measures[c] | | Operating Cost ($) | Operating Assistance ($) | Cost Effectiveness Measures[d] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Passengers per Revenue Vehicle Hour | Passengers per Revenue Vehicle Mile | | | Operating Cost per Passenger ($) | Operating Assistance per Passenger ($) | Farebox Recovery Rate (%) |
| 1 | 48.9 | 560.0 | 479 | 9.8 | 0.9 | 4,144.27 | 3,582.99 | 8.65 | 7.48 | 13.5 |
| 2 | 15.4 | 181.1 | 148 | 9.6 | 0.8 | 1,332.33 | 1,158.59 | 8.98 | 7.81 | 13.0 |
| 3 | 7.1 | 101.2 | 89 | 12.5 | 0.9 | 686.25 | 582.26 | 7.73 | 6.56 | 15.2 |
| 4 | 14.5 | 179.1 | 416 | 28.6 | 2.3 | 1,253.66 | 765.89 | 3.01 | 1.84 | 38.9 |
| 5 | 12.5 | 140.1 | 129 | 10.3 | 0.9 | 1,064.52 | 913.65 | 8.26 | 7.09 | 14.2 |
| 6 | 14.4 | 170.7 | 107 | 7.4 | 0.6 | 1,175.83 | 1,050.65 | 11.00 | 9.83 | 10.6 |
| 7 | 7.6 | 99.3 | 100 | 13.2 | 1.0 | 715.54 | 598.53 | 7.16 | 5.99 | 16.4 |
| 8 | 13.4 | 168.2 | 177 | 13.3 | 1.1 | 1,207.63 | 999.79 | 6.81 | 5.63 | 17.2 |
| 7/8[e] | 1.5 | 18.5 | 16 | 10.4 | 0.8 | 121.35 | 103.09 | 7.78 | 6.61 | 15.1 |
| 9 | 22.8 | 378.1 | 286 | 12.6 | 0.8 | 2,006.02 | 1,670.80 | 7.01 | 5.84 | 16.7 |
| 15 | 13.5 | 145.3 | 129 | 9.6 | 0.9 | 1,182.52 | 1,031.00 | 9.14 | 7.97 | 12.8 |
| Bus system Total/Average | 171.6 | 2,141.6 | 2,077 | 12.5 | 1.0 | 1,353.63 | 1,132.47 | 7.78 | 6.61 | 16.7 |
| Minimum/Maximum Acceptable Level[c,d] | N/A | N/A | N/A | 10.0 | 1.0 | N/A | N/A | 9.34 | 7.93 | 12.0 |

Note: Operating cost per route was estimated by applying the year 2018 systemwide average cost per total vehicle hour to the average weekday total vehicle hours for each route. Operating assistance was estimated by applying the year 2018 average fare revenues per boarding passenger to the average weekday boarding passengers per route, and subtracting the estimated fare revenues per route from the estimated operating cost per route.

[a] *Revenue vehicle hours and boarding passengers per route based on 2018 data from Waukesha Metro Transit.*

[b] *Revenue vehicle miles based on the average weekday school day routes effective for January 1, 2019, April 1, 2019 and September 2, 2019.*

[c] *Waukesha Metro has target service effectiveness levels for its bus routes that specify 10 passengers per revenue vehicle hour and 1.0 passenger per revenue vehicle mile, as shown in Figure 4.3. Red text for these measures indicates that a route does not meet the target level for that particular measure.*

[d] *The target performance level specified in the transit service standards presented in Figure 4.5 for cost effectiveness measures is 20 percent above the systemwide median for all routes. The target performance level specified in Figure 4.5 for farebox recovery is 20 percent below the systemwide median for all routes. Red text for these measures indicates that a route does not meet the target level for that particular measure.*

[e] *Operates only between 6:45 p.m. and 9:11 p.m. on weekdays.*

*Source: Waukesha Metro Transit and SEWRPC*

## Table 4.11
## Average Saturday Performance Characteristics for Waukesha Metro Transit Routes

| Route Number | Revenue Vehicle Hours[a] | Revenue Vehicle Miles[b] | Boarding Passengers[a] | Service Effectiveness Measures[c] | | Operating Cost ($) | Operating Assistance ($) | Cost Effectiveness Measures[d] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Passengers per Revenue Vehicle Hour | Passengers per Revenue Vehicle Mile | | | Operating Cost per Passenger ($) | Operating Assistance per Passenger ($) | Farebox Recovery Rate (%) |
| 1 | 39.2 | 474.0 | 346 | 8.8 | 0.7 | 3,351.74 | 2,946.64 | 9.69 | 8.52 | 12.09 |
| 2 | 13.0 | 141.3 | 95 | 7.3 | 0.7 | 1,002.59 | 891.77 | 10.60 | 9.43 | 11.05 |
| 3/15 | 11.3 | 145.9 | 94 | 8.4 | 0.6 | 938.99 | 828.43 | 9.95 | 8.78 | 11.77 |
| 4 | 7.6 | 99.8 | 277 | 36.5 | 2.8 | 663.65 | 339.60 | 2.40 | 1.23 | 48.83 |
| 5/6 | 12.9 | 190.0 | 135 | 10.4 | 0.7 | 1,014.31 | 856.72 | 7.54 | 6.37 | 15.54 |
| 7/8 | 5.5 | 67.9 | 117 | 21.2 | 1.7 | 445.22 | 308.65 | 3.82 | 2.65 | 30.67 |
| 9 | 10.3 | 165.5 | 68 | 6.6 | 0.4 | 892.96 | 812.97 | 13.08 | 11.90 | 8.96 |
| Bus system Total/Average | 99.7 | 1,284.2 | 1,131 | 14.2 | 1.1 | 1,187.07 | 997.83 | 8.15 | 6.98 | 19.84 |
| Minimum/Maximum Acceptable Level[c,d] | N/A | N/A | N/A | 10.0 | 1.0 | N/A | N/A | 11.63 | 10.22 | 9.67 |

Note: Operating cost per route was estimated by applying the year 2018 systemwide average cost per total vehicle hour to the average Saturday total vehicle hours for each route. Operating assistance was estimated by applying the year 2018 average fare revenues per boarding passenger to the average Saturday boarding passengers per route, and subtracting the estimated fare revenues per route from the estimated operating cost per route.

[a] *Revenue vehicle hours and boarding passengers per route based on 2018 data from Waukesha Metro Transit.*

[b] *Revenue vehicle miles based on the average Saturday routes effective for January 1, 2019, April 1, 2019 and September 2, 2019.*

[c] *Waukesha Metro has target service effectiveness levels for its bus routes that specify 10 passengers per revenue vehicle hour and 1.0 passenger per revenue vehicle mile, as shown in Figure 4.3. Red text for these measures indicates that a route does not meet the target level for that particular measure.*

[d] *The target performance level specified in the transit service standards presented in Figure 4.9 for cost effectiveness measures is 20 percent above the systemwide median for all routes. The target performance level specified in Figure 4.9 for farebox recovery is 20 percent below the systemwide median for all routes. Red text for these measures indicates that a route does not meet the target level for that particular measure.*

*Source: Waukesha Metro Transit and SEWRPC*

## Table 4.12
## Average Sunday Performance Characteristics for Waukesha Metro Transit Routes

| Route Number | Revenue Vehicle Hours[a] | Revenue Vehicle Miles[b] | Boarding Passengers[a] | Service Effectiveness Measures[c] | | Operating Cost ($) | Operating Assistance ($) | Cost Effectiveness Measures[d] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Passengers per Revenue Vehicle Hour | Passengers per Revenue Vehicle Mile | | | Operating Cost per Passenger ($) | Operating Assistance per Passenger ($) | Farebox Recovery Rate (%) |
| 1 | 26.9 | 326.3 | 199 | 7.4 | 0.6 | 2,318.18 | 2,084.88 | 11.64 | 10.47 | 10.1 |
| 2 | 9.4 | 115.4 | 58 | 6.2 | 0.5 | 810.11 | 742.62 | 14.06 | 12.89 | 8.3 |
| 4 | 5.1 | 67.1 | 155 | 30.4 | 2.3 | 453.59 | 272.51 | 2.93 | 1.76 | 39.9 |
| 5/6 | 7.9 | 123.0 | 54 | 6.8 | 0.4 | 680.39 | 617.66 | 12.70 | 11.53 | 9.2 |
| 7/8 | 5.0 | 61.7 | 67 | 13.4 | 1.1 | 404.22 | 325.63 | 6.02 | 4.85 | 19.4 |
| Bus system Total/Average | 54.2 | 693.6 | 532 | 12.8 | 1.0 | 933.30 | 808.66 | 9.47 | 8.30 | 17.4 |
| Minimum/Maximum Acceptable Level[c,d] | N/A | N/A | N/A | 10.0 | 1.0 | N/A | N/A | 13.97 | 12.56 | 8.05 |

Note: Operating cost per route was estimated by applying the year 2018 systemwide average cost per total vehicle hour to the average Sunday total vehicle hours for each route. Operating assistance was estimated by applying the year 2018 average fare revenues per boarding passenger to the average Sunday boarding passengers per route, and subtracting the estimated fare revenues per route from the estimated operating cost per route.

[a] *Revenue vehicle hours and boarding passengers per route based on 2018 data from Waukesha Metro.*

[b] *Revenue vehicle miles based on the average Sunday routes effective for January 1, 2019, April 1, 2019 and September 2, 2019.*

[c] *Waukesha Metro has target service effectiveness levels for its bus routes that specify 10 passengers per revenue vehicle hour and 1.0 passenger per revenue vehicle mile, as shown in Figure 4.3. Red text for these measures indicates that a route does not meet the target level for that particular measure.*

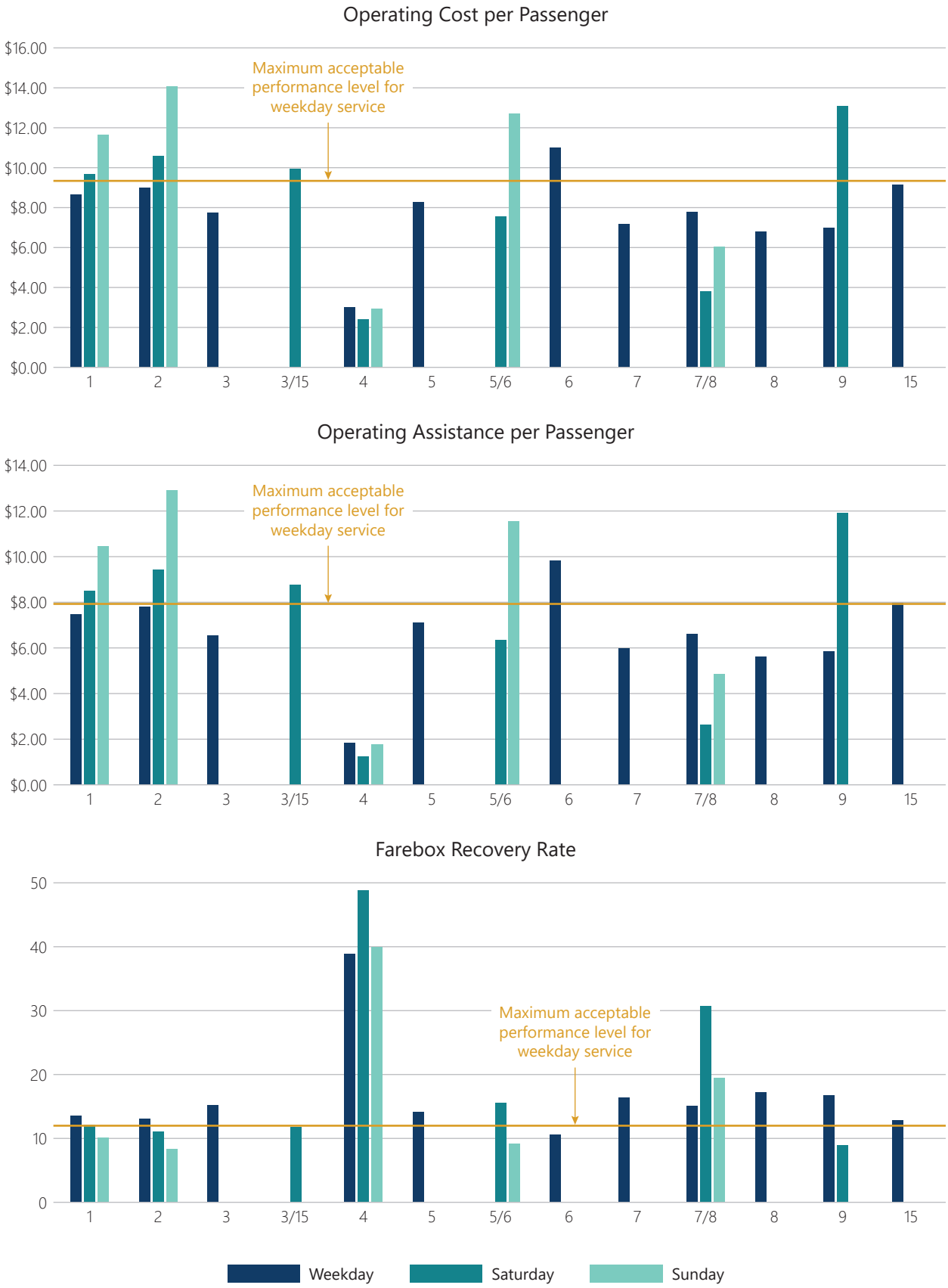
[d] *The target performance level specified in the transit service standards presented in Figure 4.5 for cost effectiveness measures is 20 percent above the systemwide median for all routes. The target performance level specified in Figure 4.9 for farebox recovery is 20 percent below the systemwide median for all routes. Red text for these measures indicates that a route does not meet the target level for that particular measure.*

*Source: Waukesha Metro Transit and SEWRPC*

**Figure 4.8**
**Service Effectiveness Measures for Waukesha Metro Transit Routes**


*Source: Waukesha Metro Transit and SEWRPC*

**Figure 4.9**
**Cost Effectiveness Measures for Waukesha Metro Transit Routes**




*Source: Waukesha Metro Transit and SEWRPC*

Waukesha Metro has target service effectiveness levels for its bus routes specifying 10 passengers per revenue vehicle hour and 1.0 passengers per revenue vehicle mile. In addition, minimum (or maximum) performance targets for cost efficiency were identified by Commission staff under the transit service standards for this study, presented in Figure 4.3. For each of the performance measures used in the evaluation, routes that have service effectiveness or cost efficiency measures that do not meet the target levels specified in the service effectiveness goals for the transit system or in the Commission's service standards are identified as below average performers with red text. The following observations may be drawn from the information in the tables and figures:

Weekday Route Performance

Routes 4, 5, 7, and 8 have weekday performance levels that generally meet or exceed both the target service effectiveness levels for the transit system and the minimum (or maximum) performance targets specified under the service standards. Of these four routes, Routes 4 and 8 are the best performers, as they rank in the top tier for nearly all the service effectiveness and cost effectiveness measures. Routes 1, 3, 7/8, and 9 have weekday performance that is generally within acceptable levels.

The remaining routes—2, 6, and 15—have lower performance levels and fail to meet the minimum or maximum acceptable levels for service effectiveness and cost effectiveness. Of these three routes, the performance levels observed for Route 6 are most problematic as it does not meet the target level for any measure. These three routes merit further study to determine if changes to improve their performance should be considered.

Saturday Route Performance

On Saturdays, Routes 4 and 7/8 have the best performance levels, while Routes 1, 2, 3/15, and 5/6 have mixed performance, meeting the cost effectiveness measures but not the performance targets for service effectiveness. Route 9 does not meet any of the performance targets for service effectiveness or cost effectiveness. The routes that fail to meet a majority of the performance targets require further study to determine if changes to improve their performance should be considered.

Sunday Route Performance

As with the Saturday performance levels, Routes 4 and 7/8 are the best performers on Sundays. The remaining routes (1, 2, and 5/6) have mixed performance, meet some, but not all of the service effectiveness or cost effectiveness measures. The routes not meeting the targets require further study to determine if potential changes to these routes should be considered to improve their performance.

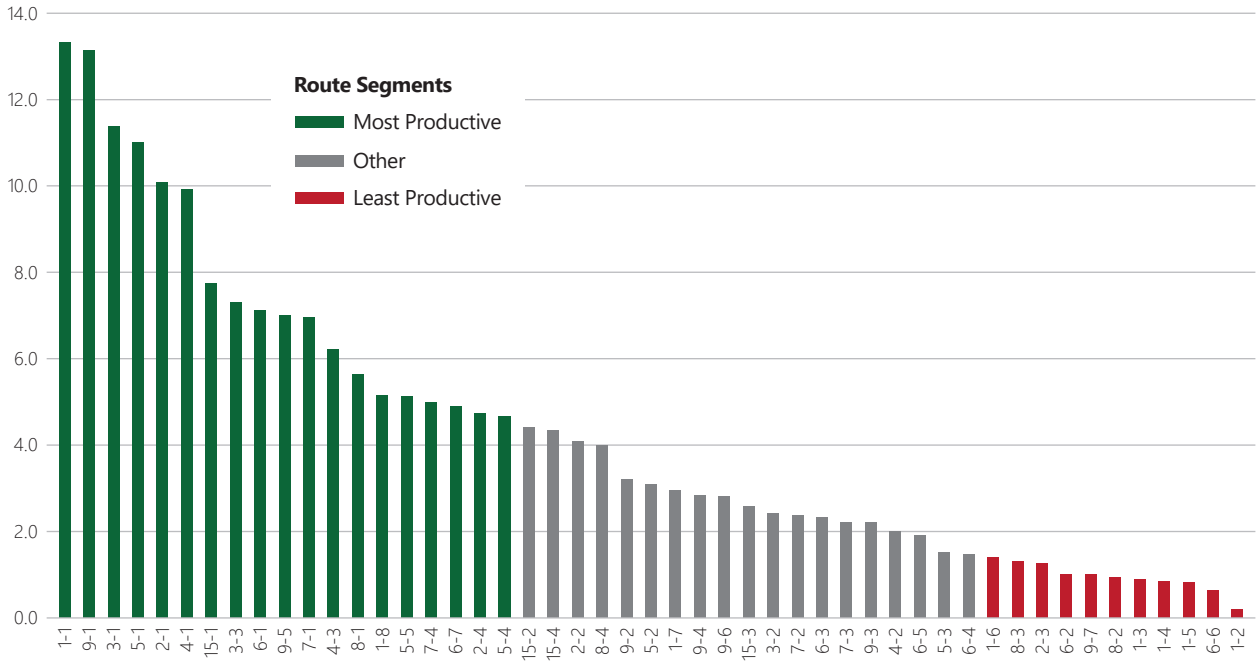
***Ridership by Route Segment***

To supplement the route-level service effectiveness and cost effectiveness measures, Commission staff examined the boarding and alighting passenger activity along each weekday bus route to help identify route segments with the highest and lowest utilization. Commission staff used passenger counts provided by Waukesha Metro for weekdays in 2018 and 2019 that included weekday boardings and alightings by stop for each bus route during every trip. It should be noted that the weekday boardings and alightings data utilized for this analysis was generated from only one to five days' worth of counts, and therefore, provides a limited perspective into passenger activity. However, patterns do emerge from the analysis that were further reviewed and considered as part of the transit service recommendations chapter of this report.

Commission staff conducted the route segment analysis utilizing ridership per scheduled bus trip and ridership by miles traveled. As a first step, Commission staff divided all weekday bus routes into segments that match major intersections or time points. Second, the boardings and alightings were calculated for each route segment. Third, the passenger activity by segment was divided by either the total scheduled bus trips operated over the segment or the number of miles per segment. Boarding and alightings by trip provides a measure of the utilization of each route segment relative to the amount of service provided, while boarding and alightings per mile provides insight into the overall utilization of each route segment.

Figure 4.10 displays the 49 routes segments designated for the transit system, ordered by passenger activity per bus trip. The route segments that rank in the top one-third are considered the "most productive" segments of the transit system, and the route segments ranking in the bottom third are considered the "least productive" segments. The most productive and least productive route segments by bus trip are shown for each route on Map 4.7.

**Figure 4.10**
**Average Weekday Boardings and Alightings per Scheduled Bus Trip Over Segments of Waukesha Metro Transit Routes**




*Source: Waukesha Metro Transit and SEWRPC*

As noted above, Commission staff calculated the boardings and alightings per segment mile, including both inbound and outbound mileage. This comparison demonstrates how well each segment performs relative to only boardings and alightings. By dividing the passenger activity by segment mileage, additional route segments are emphasized as requiring review and potential adjustment. In some cases, segments that performed poorly utilizing the per trip method, due to the relatively high amount of service provided, showed improved performance when comparing only boardings and alightings. Map 4.8 provides the most and least productive route segments per mile and Figure 4.11 includes each route segment, ordered by passenger activity per mile.

The following observations may be drawn from the figures and the maps regarding passenger activity along route segments:

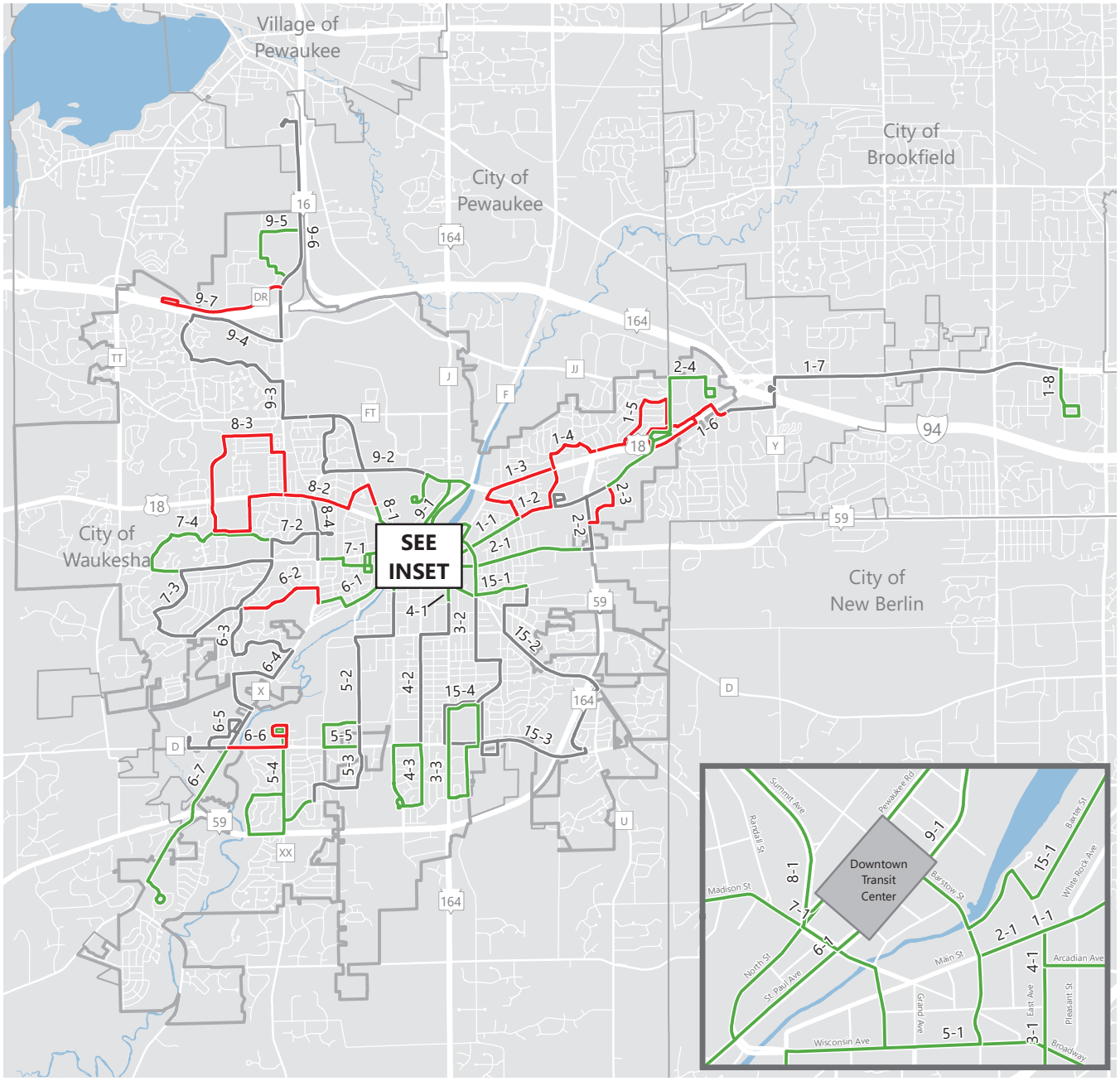
- Generally, those segments with the highest passenger activity per bus trip and per mile are those that serve major commercial areas or that pass through the Downtown Transit Center, which reflects the high number of passengers going to downtown Waukesha or transferring between routes.

- When comparing performance based on passenger activity per trip and per mile, a number of segments that performed relatively well on a per trip basis perform worse on a per mile basis. Generally, the routes that perform worse by comparison include segments with limited service trips, such as segments along Routes 5, 6, and 7.

- All routes of the system had at least one highly productive segment based on passenger activity per trip and per mile, with the exception of Route 15 that does not include a highly productive segment based on per mile activity. Two of the routes (Routes 3 and 4) had no unproductive segments based on either comparison.

- Route 1, which carries the most passengers, has the most segments with low productivity per bus trip for two reasons: First, many of the passengers use Route 1 to travel from the City of Waukesha to Brookfield Square Mall, meaning that few passengers board or alight along some route segments on Bluemound Road or in neighborhoods adjacent to Moreland Boulevard. Second, it has the highest number of bus trips that operate over the route, which results in a lower value for the passenger activity per trip.

## Map 4.7
## Waukesha Metro Transit Route Productivity per Scheduled Bus Trip Over Segments




**ROUTE SEGMENTS**

- MOST PRODUCTIVE ROUTE SEGMENTS
- LEAST PRODUCTIVE ROUTE SEGMENTS
- OTHER ROUTE SEGMENTS

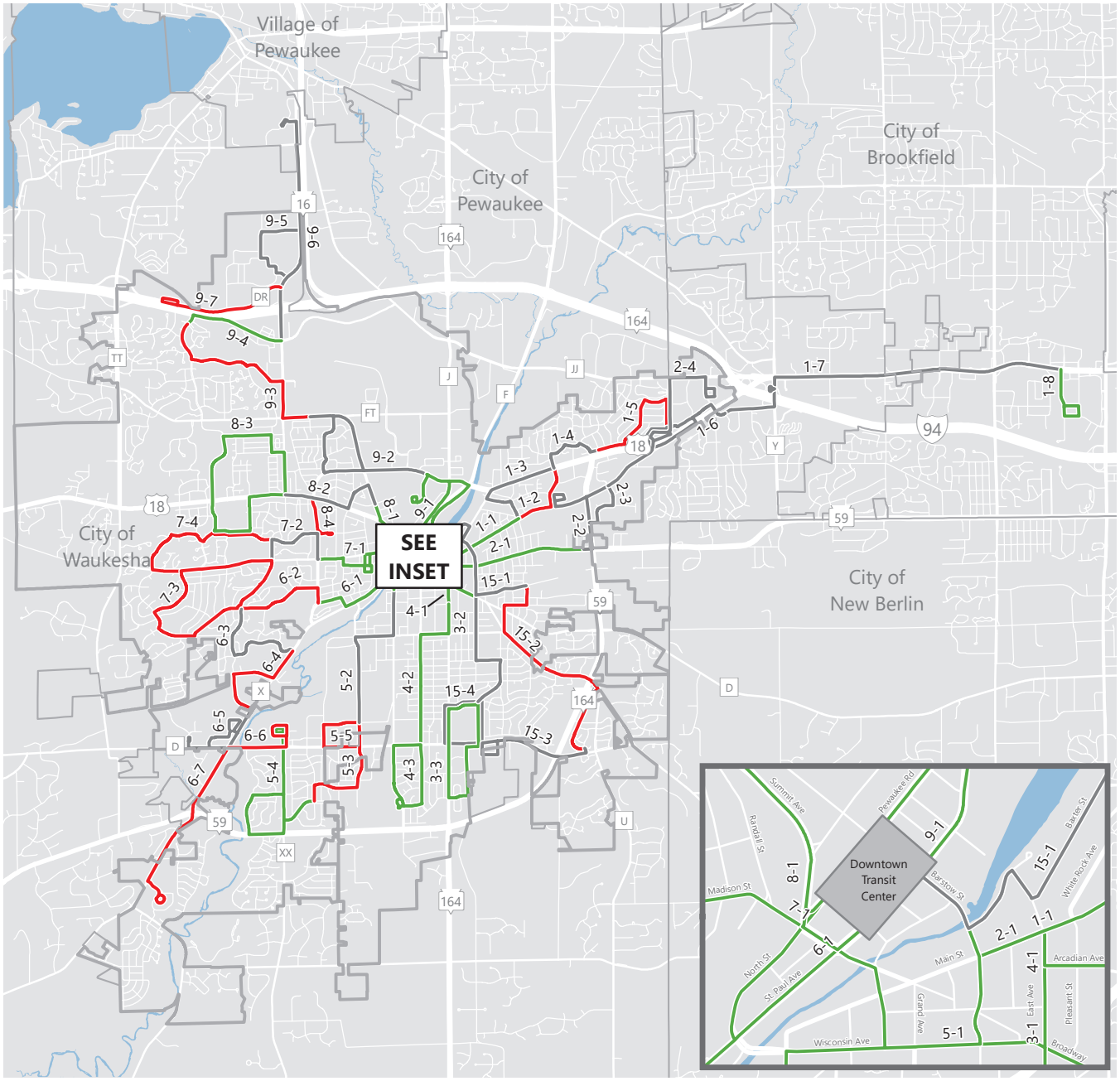
Note: Route segment numbers correspond to the route segments displayed in Figure 4.10.

N

0 0.5 1 1.5 Miles

*Source: Waukesha Metro Transit, and SEWRPC*

## Map 4.8
## Waukesha Metro Transit Route Productivity per Mile Over Segments



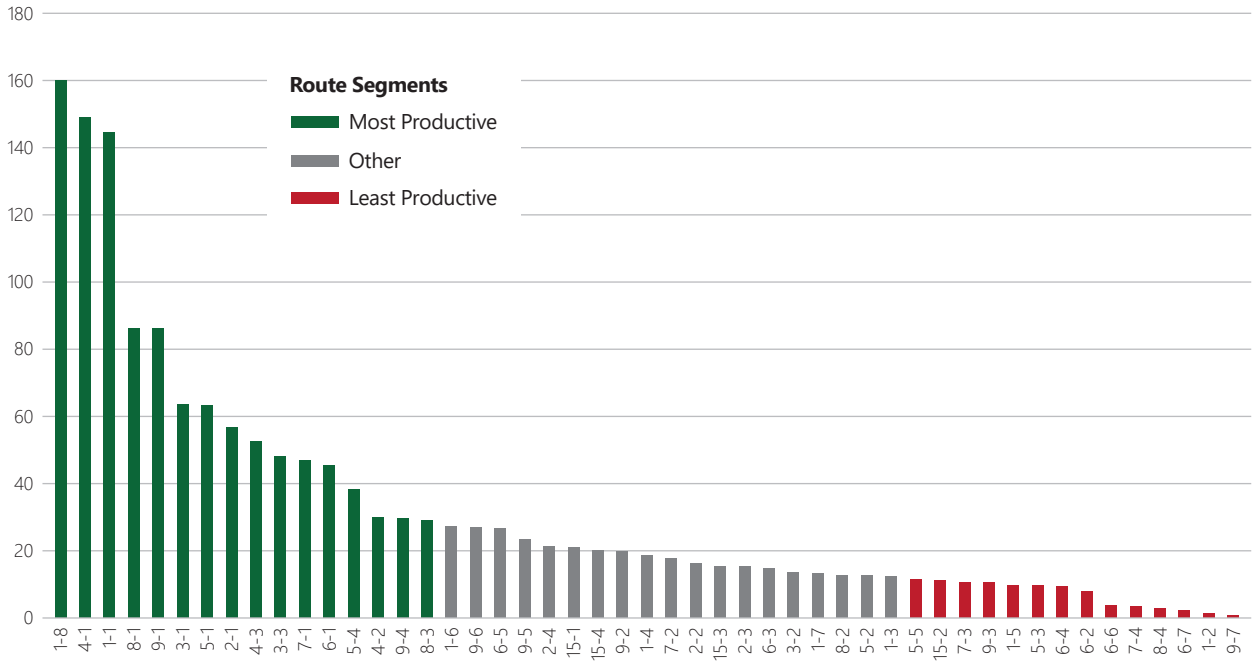

**ROUTE SEGMENTS**

- MOST PRODUCTIVE ROUTE SEGMENTS
- LEAST PRODUCTIVE ROUTE SEGMENTS
- OTHER ROUTE SEGMENTS

Note: Route segment numbers correspond to the route segments displayed in Figure 4.11.

*Source: Waukesha Metro Transit, and SEWRPC*

**Figure 4.11**
**Average Weekday Boardings and Alightings per Mile Over Segments of Waukesha Metro Transit Routes**




*Source: Waukesha Metro Transit and SEWRPC*

- Unproductive route segments indicate where routing changes should be considered, particularly if the unproductive segments include circuitous route alignments that increase travel time and make transit travel less attractive. These unproductive route segments, particularly those that are identified in both maps, are revisited under the transit service improvements analyzed in the next chapter. However, some of the route segments with the lowest passenger activity occur where bus routes pass through areas with few activity centers and land uses unsupportive of transit, on their way to activity centers or land uses that generate more substantial ridership. Further, not all unproductive route segments can be completely eliminated if the transit system is to continue to provide extensive coverage of the City of Waukesha. Alternative methods of continuing to serve the areas generating lower ridership could be considered, such as flexible shuttles or partnership with ride-hailing companies, such as Lyft or Uber.

## 4.4 PERFORMANCE EVALUATION OF WAUKESHA COUNTY TRANSIT SERVICE

This section details the performance evaluation of existing Waukesha County Transit services, utilizing performance standards selected by the Advisory Committee for the Waukesha Area Transit Development Plan and identified in Chapter 3 of this report to determine well how existing transit services fulfill the standards. The performance evaluations provide insights that will help inform potential transit service changes to address unmet transportation needs and improve or expand existing transit services. Figure 4.1 provides a brief summary of the results of the performance evaluation.

### Objective 1: Meet the Need and Demand for Service

In order to determine if the Waukesha County Transit System effectively serves travel patterns, meeting the demand and need for transit services between Waukesha County and Milwaukee County, each applicable standard and associated performance measure(s) were individually evaluated. These individual evaluations were collectively considered to determine how effectively the current service meets the overall objective. Figure 4.12 contains the full text of Objective 1, the applicable design and performance standards, and associated performance measures used to evaluate Waukesha County Transit's fulfillment of the objective.

## Figure 4.12
## Objective 1 and Associated Standards Applicable to the Evaluation of Waukesha County Transit

**Objective 1**

**Public transit should efficiently serve the travel needs of residents and employers within the City of Waukesha, connecting to major activity centers, population centers, and areas of employment, which are fully developed or planned to be developed to medium or high densities.**

**Associated Public Transit Principle**

Transit services can increase mobility for all segments of the population in urban and rural areas, particularly for people residing in low-to-middle income households, students, seniors, and people with disabilities. Fixed-route public transit services are generally best suited for operating within and between large and medium-sized urban areas, serving the mobility needs of the population and the labor needs of employers.

**Design and Operating Standards**

**1. Local Bus Service**

Provide local fixed-route transit service to connect areas of urban development to the largest major activity centers within the City.

**2. Commuter Bus Service**

Serve major travel corridors with commuter bus service by connecting major activity centers and concentrations of significant urban development within the County and Region.

**3. Paratransit Service**

Paratransit service should be available within the transit service area to meet the needs of people with disabilities who are unable to use fixed-route bus service.

**Performance Standards and Associated Performance Measures**

**1. Major Activity Centers**

Maximize the number of major activity centers and facilities for transit-dependent people served by transit. This is measured by the number of activity centers within one-quarter mile of a local bus or shuttle route, or within one-half mile of a commuter bus route. Major activity centers include the following:[a]

a. Commercial areas
b. Educational institutions
c. Medical centers
d. Employers
e. Facilities serving transit-dependent populations
f. Libraries, government centers, and cultural facilities

**2. Population**

Maximize the population served by transit, particularly the transit dependent population. Residents are considered served if they are within the following distances of a fixed-route transit service:

| | Distance from Bus Stop | |
|---|---|---|
| Service Type | Walking | Driving |
| Commuter Bus | ½ Mile | 3 Miles |
| Local Bus or Shuttle | ¼ Mile | -- |

**3. Employment**

Maximize the number of jobs served by transit. This is measured by the total employment at businesses located within one-quarter mile of local bus or shuttle routes, or within one-half mile of a commuter bus route.

**4. Density**

Maximize the transit-supportive land area accessible by public transit. Land area is considered transit-supportive if it has a density of at least 4 dwelling units per net residential acre, or at least 640 jobs per quarter section. This is measured by the proportion of the total transit-supportive land area within one-quarter mile of a local bus or shuttle route, or within one-half mile of a commuter bus route.

[a] *In order to be considered a major activity center, the following definitions must apply:*

- *Commercial areas are concentrations of retail and service establishments that typically include a department store or a discount store along with a supermarket on 15 to 60 acres, totaling 150,000 or more square feet of gross leasable floor space*
- *Educational institutions are the main campus of traditional four-year institutions of higher education, public technical colleges, and public and private middle schools and high schools*
- *Medical centers are all hospitals and clinics with 10 or more physicians*
- *Employers are all employers with more than 100 employees, or clusters of adjacent employers with collectively more than 100 employees such as in business or industrial parks*
- *Facilities serving transit-dependent populations are senior centers, senior meal sites, residential facilities for seniors and/or people with disabilities, residential facilities for low-income individuals, and government facilities that provide significant services to members of transit-dependent population groups*
- *Libraries include all local public libraries in Waukesha County*
- *Government and public institutional centers include all major government offices, city halls, civic centers, and Department of Motor Vehicles offices*
- *Cultural facilities include those that hold significant public arts events and have prominence within the State*

*Source: SEWRPC*

***Local Bus Service Operating Standard***

As described in greater detail in Chapter 2, Waukesha County funds portions of local transit services that provide connections between Waukesha County and Milwaukee County, including the Route 1 extension between Goerke's Corners in the Town of Brookfield and Brookfield Square Mall and the Gold Line connection that runs along Bluemound Road between Brookfield Square Mall and 124th Street. Both of these transit routes operate along a major travel corridor and connect areas with high density employment, substantial residential development, and major activity centers in the Region. Therefore, Waukesha County fulfills the Local Bus Service Operating Standard.

***Commuter Bus Service and Paratransit Design and Operating Standard***

Overall, transit service provided by Waukesha County fulfills the Commuter Bus Service Standard as the commuter routes serve major travel corridors and connect major activity centers and concentrations of significant urban development within the Region. Waukesha County's paratransit service also fulfills the operating standard as the County provides paratransit service to origins and destinations within 0.75 miles of the Route 901.

***Major Activity Centers Performance Standard***

The Major Activity Centers Performance Standard encourages maximizing the number of major activity centers used by transit-dependent people served by transit. Determining how many major activity centers are served by Waukesha County Transit requires looking at different types of activity centers in Waukesha County and Milwaukee County. In Waukesha County, the analysis considers how accessible the commuter routes are for transit-dependent individuals that reside in the County and wish to travel to Milwaukee County. For those who travel to Milwaukee County, a second analysis considers how many activity centers are accessible by the commuter routes for those walking from a bus stop and those individuals making a connecting trip on local transit service.

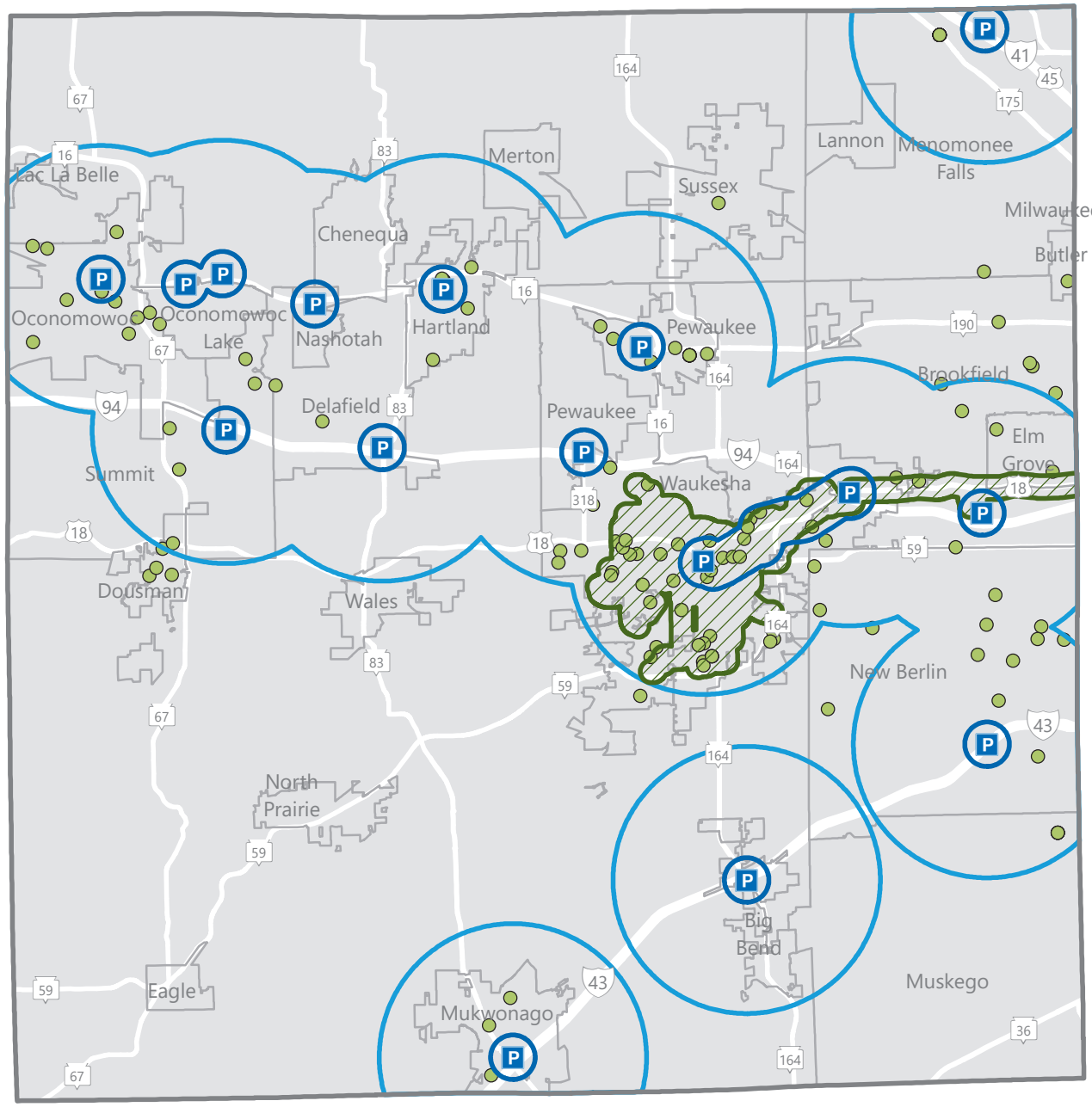
To analyze access to major activity centers for individuals commuting into Milwaukee County, Map 4.9 displays the location of residential facilities for transit-dependent populations in Waukesha County, while Table 4.13 quantifies the number and percentage of these facilities within a half-mile or less, three miles or less, and within a 15-minute connecting trip on local transit. As shown in Table 4.13, 14 percent of residential facilities for transit-dependent individuals can access a Waukesha County commuter bus stop with up to a half-mile walk, whereas 30 percent of transit-dependent individuals can access a commuter bus stop with a half-mile walk and a 15-minute ride on a connecting local bus service provided by Waukesha Metro.

Map 4.10 shows the Milwaukee County major institutions of higher education, major medical facilities, and major economic activity centers, and also displays the areas within one-half mile from a Waukesha Commuter Bus route and within one-quarter mile of a 15-minute ride on a connecting local bus service provided by MCTS. Table 4.13 shows that nearly 30 percent of the major employers in Milwaukee County are served by Waukesha County Commuter routes and connecting local bus service. Over half of the major institutions of higher education and about 27 percent of the major economic activity centers are accessible via Waukesha County Commuter Bus routes or a connecting local service.

Waukesha County Transit Route 901 provides reverse commute service from the Downtown Transit Center in the City of Waukesha to downtown Milwaukee, with limited service to the UW-Milwaukee campus in the City of Milwaukee during fall and spring semesters. In order to evaluate the number of activity centers in Milwaukee County and Waukesha County served by the Route 901's reverse commute, Map 4.11 displays major activity centers within one-half mile of Route 901 and within one-quarter mile of a 15-minute ride on a connecting local bus service. Table 4.14 quantifies the number and percentage of the activity centers in Milwaukee County and Waukesha County that are served by the Route 901's reverse commute trips. As shown in Table 4.14, approximately 1 percent of residential facilities for transit dependent populations in Milwaukee County are within walking distance of the Route 901, whereas nearly 14 percent of transit- dependent individuals can access a bus stop with a half-mile walk and a 15-minute ride on a connecting local bus service.

Table 4.14 also shows the major activity centers served in Waukesha County for those bus riders taking the Route 901 from Milwaukee County to Waukesha County. Specifically, Table 4.14 shows that about 33 percent of major economic activity areas and 24 percent of major employers in Waukesha County are served by the Route 901 and a 15-minute ride on a connecting local bus service. The Route 901 also serves approximately

## Map 4.9
## Waukesha County Residential Facilities Served by Waukesha County Transit




**MAJOR ACTIVITY CENTERS**

- RESIDENTIAL FACILITIES FOR SENIORS, PEOPLE WITH DISABILITIES, AND LOW-INCOME HOUSEHOLDS

**WAUKESHA COUNTY TRANSIT SERVICE AREA**

- ONE-QUARTER TO ONE-HALF MILE FROM BUS ROUTES
- THREE MILE DRIVE RADIUS
- ONE-QUARTER MILE FROM CONNECTING LOCAL BUS ROUTES
- PARK-RIDE LOT

N

0 1 2 3 4 Miles

*Source: SEWRPC*

**Table 4.13**
**Major Activity Centers Served by Waukesha County Transit for Traditional Commuters**

| In Waukesha County | | | |
|---|---|---|---|
| **Major Activity Center Type** | **Distance from Bus Stop Served by Waukesha County Transit** | **Number of Activity Centers Served** | **Percent of All Activity Centers of Type Within County** |
| Residential Facilities for Transit-Dependent Populations | Half-mile or Less | 19 of 136 | 14.0 |
| | Within 15 Minutes on a Connecting Local Transit Service | 41 of 136 | 30.1 |
| | 3 Miles or Less | 120 of 136 | 88.2 |

| In Milwaukee County | | | | |
|---|---|---|---|---|
| | **Within Walking Distance of a Bus Stop Served by Waukesha County Transit** | | **Within 15 Minutes on a Connecting Local Transit Service** | |
| **Major Activity Center Type** | Number | Percent | Number | Percent |
| Major Employers | 81 of 514 | 15.8 | 153 of 514 | 29.8 |
| Major Economic Activity Center | 2 of 15 | 13.3 | 4 of 15 | 26.7 |
| Job Resource Centers | 0 of 2 | -- | 1 of 2 | 0.5 |
| Major Medical Facilities | 1 of 45 | 2.2 | 13 of 45 | 28.9 |
| Major Institutions of Higher Education | 5 of 9 | 55.6 | 5 of 9 | 55.6 |

*Source: SEWRPC*

67 percent of institutions of higher education and 11 percent of major medical facilities with a 15-minute connecting trip on local transit. However, no job resources centers in Waukesha County are accessible from the Route 901.

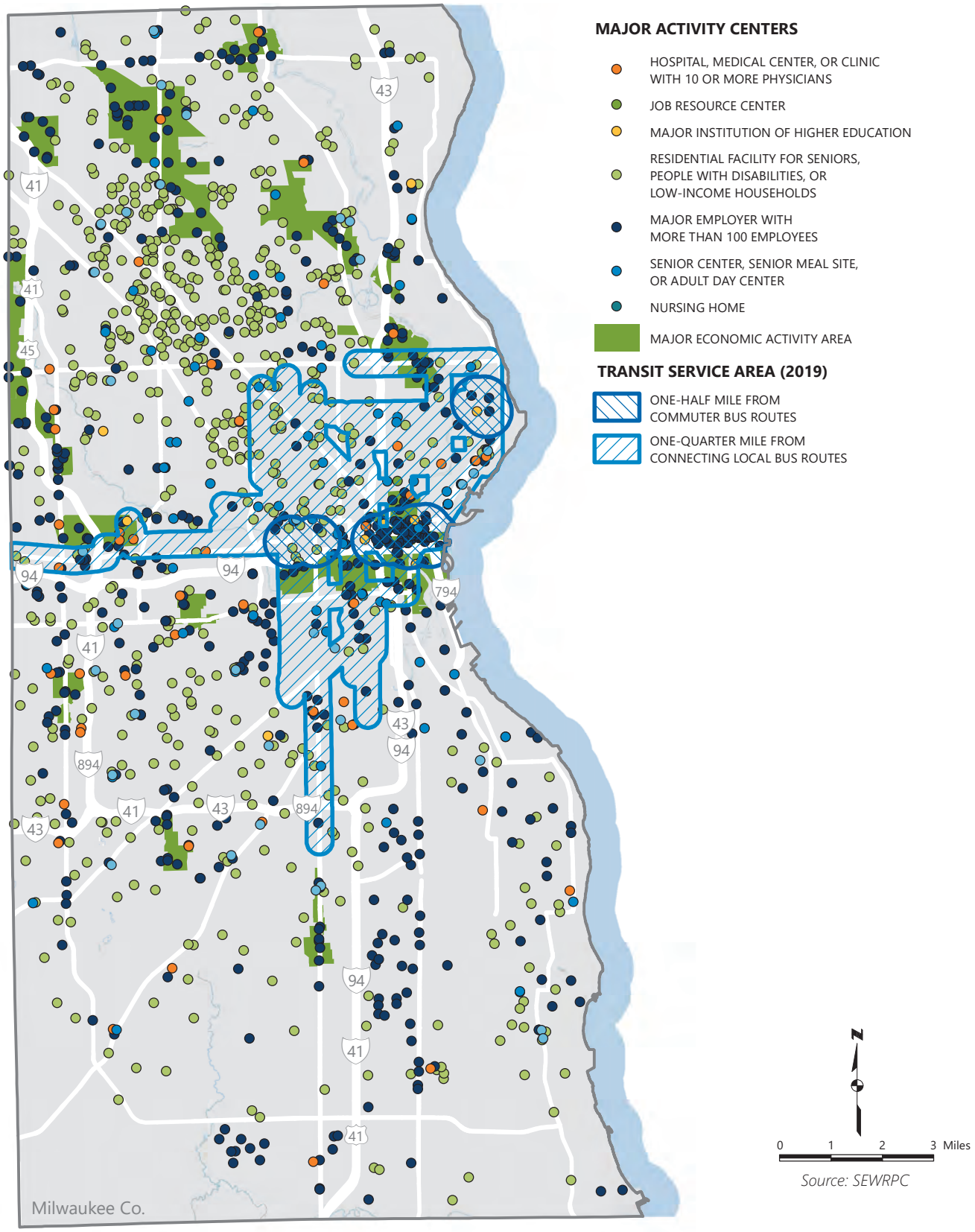
Table 4.15 quantifies those major activity centers in Waukesha County that are served by Waukesha County Transit's local service, including the Route 1 extension and the Gold Line connection. The Route 1 extension includes the segment between the Goerke's Corners Park & Ride Lot and the Brookfield Square Mall, providing service every 30 minutes on weekdays, Saturday, and Sunday. The Gold Line connection provides service along Bluemound Road, between Brookfield Square Mall and 124th Street and operates seven days a week with 15 minute frequencies during peak commute times, connecting to Waukesha Metro Route 1 at Brookfield Square Mall. The local services provided by Waukesha County Transit provide somewhat limited accessibility to major activity centers in Waukesha County. Specifically, approximately 24 percent of major employers are accessible with a connecting ride on local bus service provided by Waukesha Metro, while approximately 68 percent of institutions of higher education are served with a connecting local bus service. Based on these data, Waukesha County Transit partially fulfills this standard.

***Population Performance Standard***

The Population Performance Standard recommends maximizing the number of residents with access to transit. This is evaluated by measuring the number of people that are within a half-mile walk radius of park-ride lots served by Waukesha County Commuter Bus routes, the number of people within a quarter-mile walk radius of a 15-minute ride on a connecting local bus service provided by Waukesha Metro or MCTS, and within a three-mile driving distance of a park-ride lot with a bus stop. Map 4.12 displays the residential population density by quarter section in Waukesha County, with the half-mile, three-mile and walking plus transit access distance from each park-ride lot served by Waukesha County Transit overlaid on top. As of the 2010 U.S. Census, approximately 36,500 residents (9 percent of all County residents) lived within a half-mile of a park-ride lot served by Waukesha County Commuter routes, approximately 73,100 residents lived within a quarter-mile walk of a Waukesha Metro or MCTS route that connects to the commuter routes, and approximately 275,000 residents (70 percent of all County residents) lived within a three-mile drive of a park-ride lot served by Waukesha County Commuter routes.

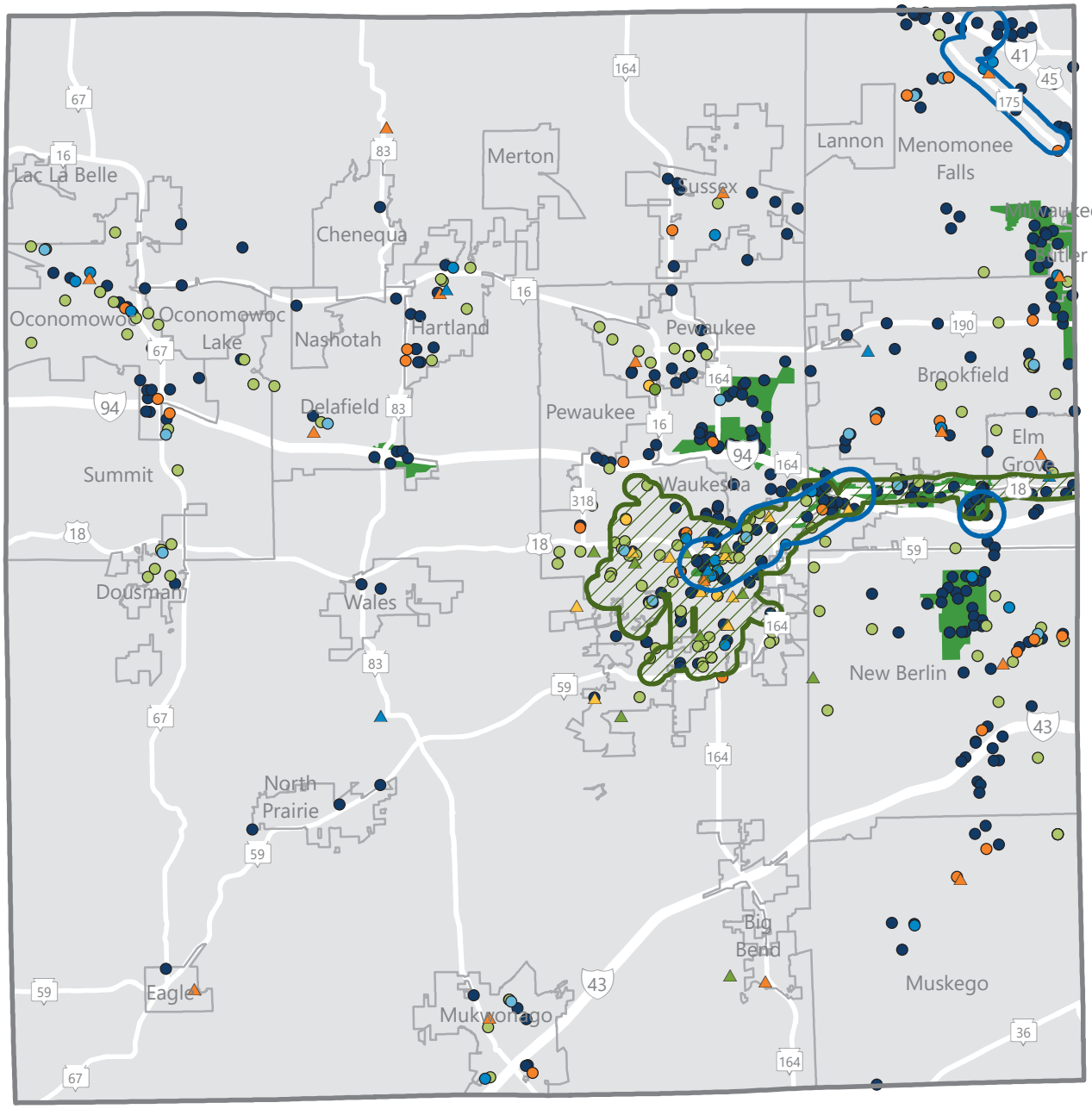
To measure access to transit for individuals commuting to a job in Waukesha County, Map 4.13 displays the residential population density by quarter-section in Milwaukee County, with a one-half mile walking distance

## Map 4.10
## Major Activity Centers in Milwaukee County Served by Waukesha County Transit




*Source: SEWRPC*

## Map 4.11
## Waukesha County Activity Centers Served by Waukesha County Transit Route 901 Reverse Commute




**MAJOR ACTIVITY CENTERS**

- HOSPITAL, MEDICAL CENTER, OR CLINIC WITH 10 OR MORE PHYSICIANS
- RESIDENTIAL FACILITY FOR SENIORS, PEOPLE WITH DISABILITIES, OR LOW-INCOME HOUSEHOLDS
- SENIOR CENTER, SENIOR MEAL SITE, OR ADULT DAY CENTER
- JOB RESOURCE CENTER
- MAJOR EMPLOYER WITH MORE THAN 100 EMPLOYEES
- MAJOR INSTITUTION OF HIGHER EDUCATION
- NURSING HOME
- GOVERNMENTAL OR INSTITUTIONAL CENTER
- PUBLIC LIBRARY
- CULTURAL CENTER
- PUBLIC COMMUNITY OR REGIONAL PARK
- PUBLIC OR PRIVATE MIDDLE OR HIGH SCHOOL
- MAJOR ECONOMIC ACTIVITY AREA

**WAUKESHA COUNTY TRANSIT SERVICE AREA**

- ONE-QUARTER TO ONE-HALF MILE FROM BUS ROUTES
- ONE-QUARTER MILE FROM CONNECTING LOCAL BUS ROUTES

N

0 1 2 3 4 Miles

*Source: SEWRPC*

## Table 4.14
## Major Activity Centers Served by Waukesha County Transit for Reverse Commuters

| In Milwaukee County | | | | |
|---|---|---|---|---|
| | Within Walking Distance of a Bus Stop Served by Waukesha County Transit | | Within 15 Minutes on a Connecting Local Transit Service | |
| **Major Activity Center Type** | Number | Percent | Number | Percent |
| Residential Facilities for Transit-Dependent Populations | 8 of 613 | 1.3 | 84 of 613 | 13.7 |
| Senior Center | 4 of 65 | 6.2 | 25 of 65 | 38.5 |
| Nursing Home | 1 of 33 | 3.0 | 7 of 33 | 21.2 |

| In Waukesha County | | | | |
|---|---|---|---|---|
| | Within Walking Distance of a Bus Stop Served by Waukesha County Transit | | Within 15 Minutes on a Connecting Local Transit Service | |
| **Major Activity Center Type** | Number | Percent | Number | Percent |
| Major Economic Activity Areas | 2 of 6 | 33.3 | 2 of 6 | 33.3 |
| Institutions of Higher Education | 0 of 3 | -- | 2 of 3 | 66.7 |
| Major Medical Facilities | 2 of 27 | 7.4 | 3 of 27 | 11.1 |
| Major Employers | 42 of 332 | 12.7 | 79 of 332 | 23.8 |
| Job Resource Centers | 0 of 1 | -- | 0 of 1 | -- |

*Source: SEWRPC*

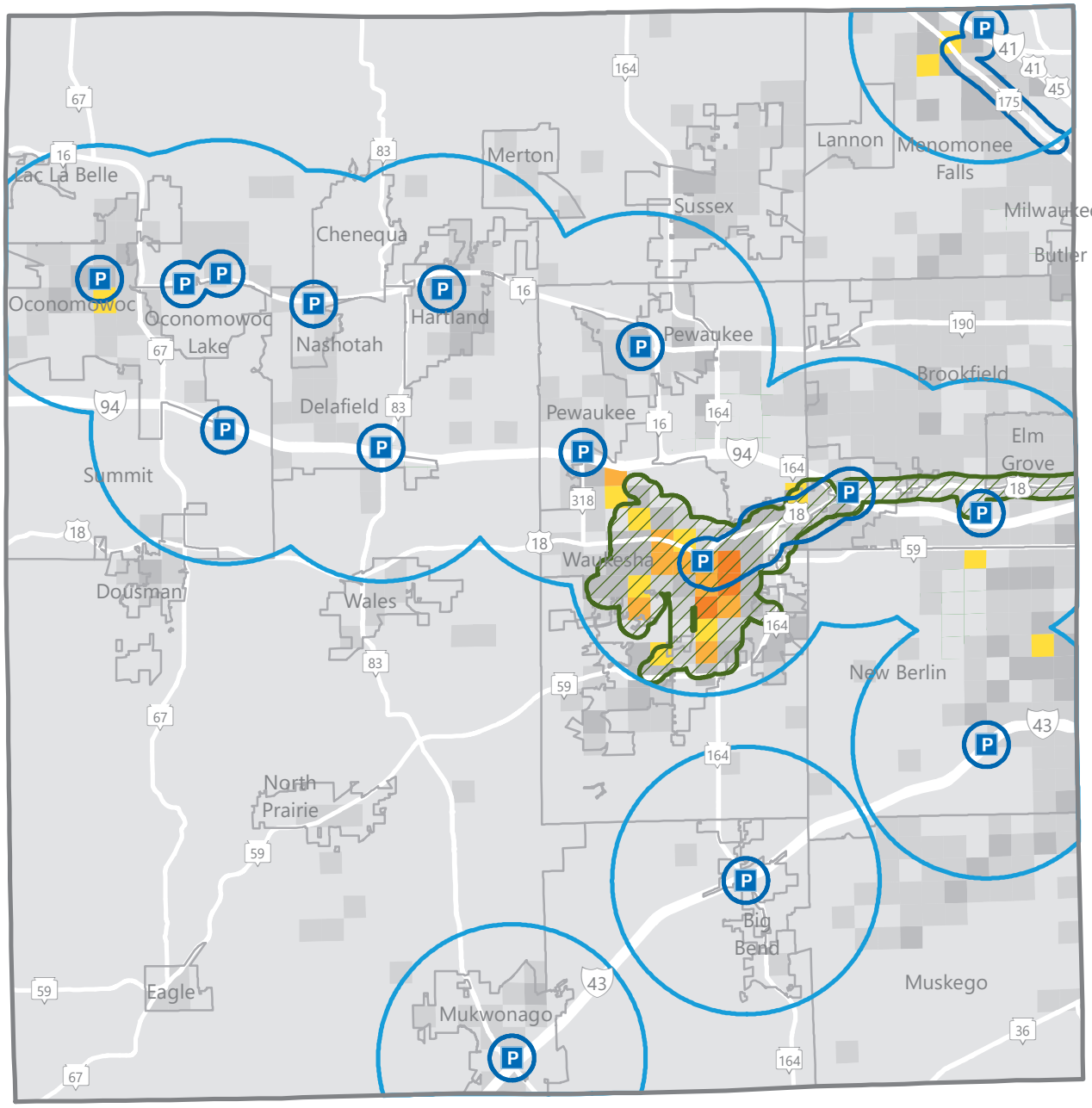
## Table 4.15
## Major Activity Centers Served by Waukesha County Transit Local Service on the Route 1 Extension and the Gold Line Connection

| In Waukesha County | | | | |
|---|---|---|---|---|
| | Within Walking Distance of a Bus Stop Served by Waukesha County Transit | | Within 15 Minutes on a Connecting Local Transit Service | |
| **Major Activity Center Type** | Number | Percent | Number | Percent |
| Major Economic Activity Areas | 2 of 6 | 33.3 | 2 of 6 | 33.3 |
| Institutions of Higher Education | 0 of 3 | -- | 2 of 3 | 66.7 |
| Middle Schools and High Schools | 6 of 15 | 40.0 | 13 of 15 | 86.7 |
| Hospitals, Medical Centers, and Major Clinics | 1 of 27 | 3.7 | 3 of 27 | 11.1 |
| Major Employers | 37 of 332 | 11.1 | 79 of 332 | 23.8 |
| Senior Centers, Senior Meal Sites, and Adult Day Centers | 8 of 23 | 34.8 | 10 of 23 | 43.5 |
| Residential Facilities for Seniors, People with Disabilities, and Low-Income Households | 12 of 136 | 8.8 | 35 of 136 | 25.7 |
| Nursing Homes | 1 of 16 | 6.3 | 4 of 16 | 25.0 |
| Job Resource Centers | 0 of 1 | -- | 0 of 1 | -- |
| Libraries | 1 of 16 | 6.3 | 1 of 16 | 6.3 |
| Governmental and Public Institutional Centers | 0 of 1 | -- | 1 of 1 | 100.0 |
| Community or Regional Park | 3 of 10 | 30.0 | 6 of 10 | 60.0 |
| Cultural Centers | 1 of 5 | 20.0 | 1 of 5 | 20.0 |

*Source: SEWRPC*

of a Commuter Bus route and a one-quarter mile walking distance of a 15-minute ride on a connecting local bus service overlaid on top. As of the 2010 U.S. Census, approximately 38,400 residents (4 percent of all Milwaukee County residents) live within a one-half mile walk from a bus stop served by Waukesha County Commuter Bus routes and 257,800 residents (27 percent of all Milwaukee County residents) live within one quarter-mile walk of a local route that connects to Waukesha County Commuter Bus routes in 15 minutes or less, including Waukesha County Transit's Gold Line connection. Overall, Waukesha County Transit largely fulfills the Population Performance Standard, with a majority of Waukesha County residents within a three-mile drive of a park-ride lot served and a significant number of Milwaukee County residents that can connect to Waukesha County Transit via a local bus route.

## Map 4.12
## Population in Waukesha County Served by Waukesha County Transit




**POPULATION BY QUARTER SECTION (2010)**

| | |
|---|---|
| 0 - 250 | 1,195 - 1,500 |
| 251 - 750 | 1,501 - 2,000 |
| 751 - 1,194 | 2,001 - 2,329 |

**WAUKESHA COUNTY TRANSIT SERVICE**

- ONE-QUARTER TO ONE-HALF MILE FROM BUS ROUTES
- THREE MILE DRIVE RADIUS
- ONE-QUARTER MILE FROM CONNECTING LOCAL BUS ROUTES
- PARK-RIDE LOT

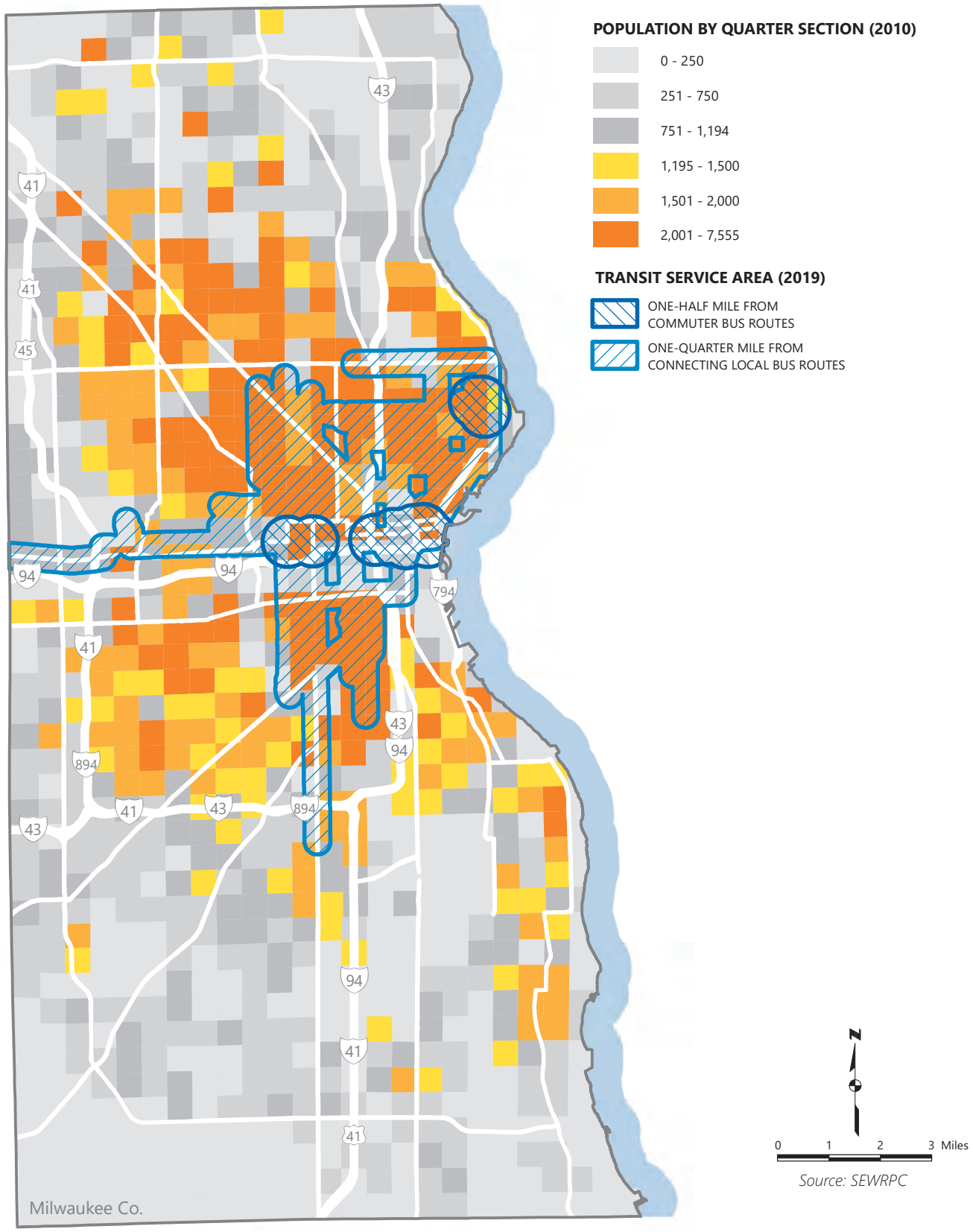
N

0 1 2 3 4 Miles

Note: Population threshold (1,195+) based on the minimum residential density (3 units per gross acre) determined to support transit service as identified in TCRP 165: Transit Capacity and Quality of Service Manual, 3rd Edition (2013). Persons per unit (2.49) based on U.S. Census, American Community Survey, 2013-2017.

*Source: SEWRPC*

## Map 4.13
## Population in Milwaukee County Served by Waukesha County Transit




*Source: SEWRPC*

Areas with High Transit Needs Served

Commission staff developed a transit needs index using population data to identify areas of greatest potential transit needs in Waukesha County, including the Waukesha Metro service area, as shown on Map 4.3. U.S. Census block groups within Waukesha County were ranked according to percent of population falling into each of these "transit dependent" categories: school-age children (ages 10 through 17), seniors (ages 75 and older), persons in low-income households, people with disabilities, and households with no vehicle available. Each block group was then scored according to rank, with those block groups with the lowest percentage of a transit-dependent category given a score of "1," while groups with the highest percentage were given a score of "4." The resulting scores were summed for each block group and created an index ranging from 5 to 20. The transit needs were separated into four levels; low (5 through 8), marginal (9 through 12), moderate (13 through 16), and high (17 through 20). Although this methodology does not quantify the potential transit demand, it does indicate where transit needs may be greatest based on resident population characteristics. Waukesha County provides service to areas with the greatest potential transit needs, including 5 of 22 Census block groups with high transit needs and 17 of 123 Census block groups designated as having moderate transit needs.

***Employment Performance Standard***

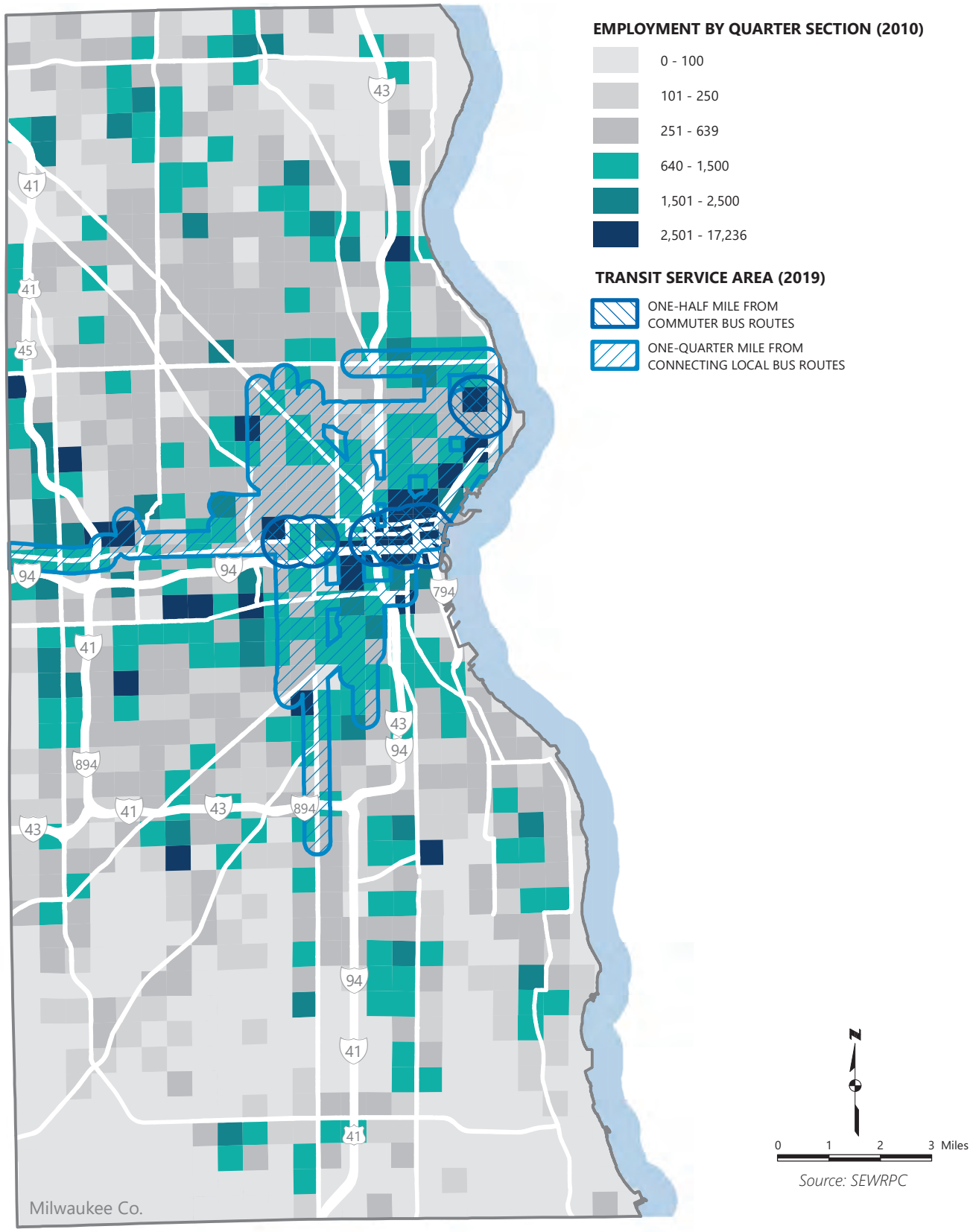
The Employment Performance Standard recommends maximizing the number of jobs accessible by transit. The total employment within walking distance of a Waukesha County Commuter bus stop or a 15-minute ride on a connecting local bus service was measured to determine how well Waukesha County fulfills the Employment Standard. Map 4.14 displays the employment density by quarter section in Milwaukee County with transit service walk access distances overlaid on top. Many of the highest employment density areas in the region are served by Waukesha County Transit with approximately 95,700 jobs (17 percent of all Milwaukee County jobs in 2010) within a one-half mile walk of a bus stop served by Waukesha County Transit. In addition, approximately 210,900 jobs, or 37 percent of all Milwaukee County jobs in 2010, are within a one-quarter mile walk of a local route that connects to Waukesha County routes in 15 minutes or less. This is not intended to indicate that all of the jobs are served, as service hours and frequency on Waukesha County Transit are unlikely to align with every job within walking distance of a bus stop.

To measure access to transit for individuals commuting to a job in Waukesha County, Map 4.15 displays the employment density by quarter-section in Waukesha County, with a half-mile walk radius from Waukesha County bus stops and areas that are within a one-quarter mile walk of a connecting local route operated by Waukesha Metro displayed. Approximately 32,600 jobs (12 percent of all Waukesha County jobs in 2010) are within a one-half mile walk distance of a bus stop served by Waukesha County Transit and approximately 64,700 jobs (24 percent of all Waukesha County jobs in 2010) are within a one-quarter mile walk of a local route that connects to Waukesha County Transit in 15 minutes or less. As with the map of Milwaukee County, this is not intended to indicate that all of those jobs are served, as service hours and frequency on Waukesha County Transit are unlikely to align with every job within that buffer. Although Waukesha County Transit serves many of the highest employment density areas in Milwaukee County, the percentage of Waukesha County jobs served by Waukesha County Transit is relatively low. In addition, only Route 901 offers reverse commute service, which limits the number of jobs served due to the restricted service hours and frequency. The number of jobs accessible in Waukesha County could be increased by potential partnerships with ride-hailing services or providing flexible shuttles to areas with a concentration of jobs. The Gold Line connection provides more frequent all-day service between the City of Waukesha and Milwaukee County along Bluemound Road, although the trip from the Milwaukee Regional Medical Center to the Downtown Transit Center can be lengthy, with trip times over one hour, which can be over twice the travel time by automobile. As a result, Waukesha County Transit partially fulfills the Employment Performance Standard.

***Density Performance Standard***

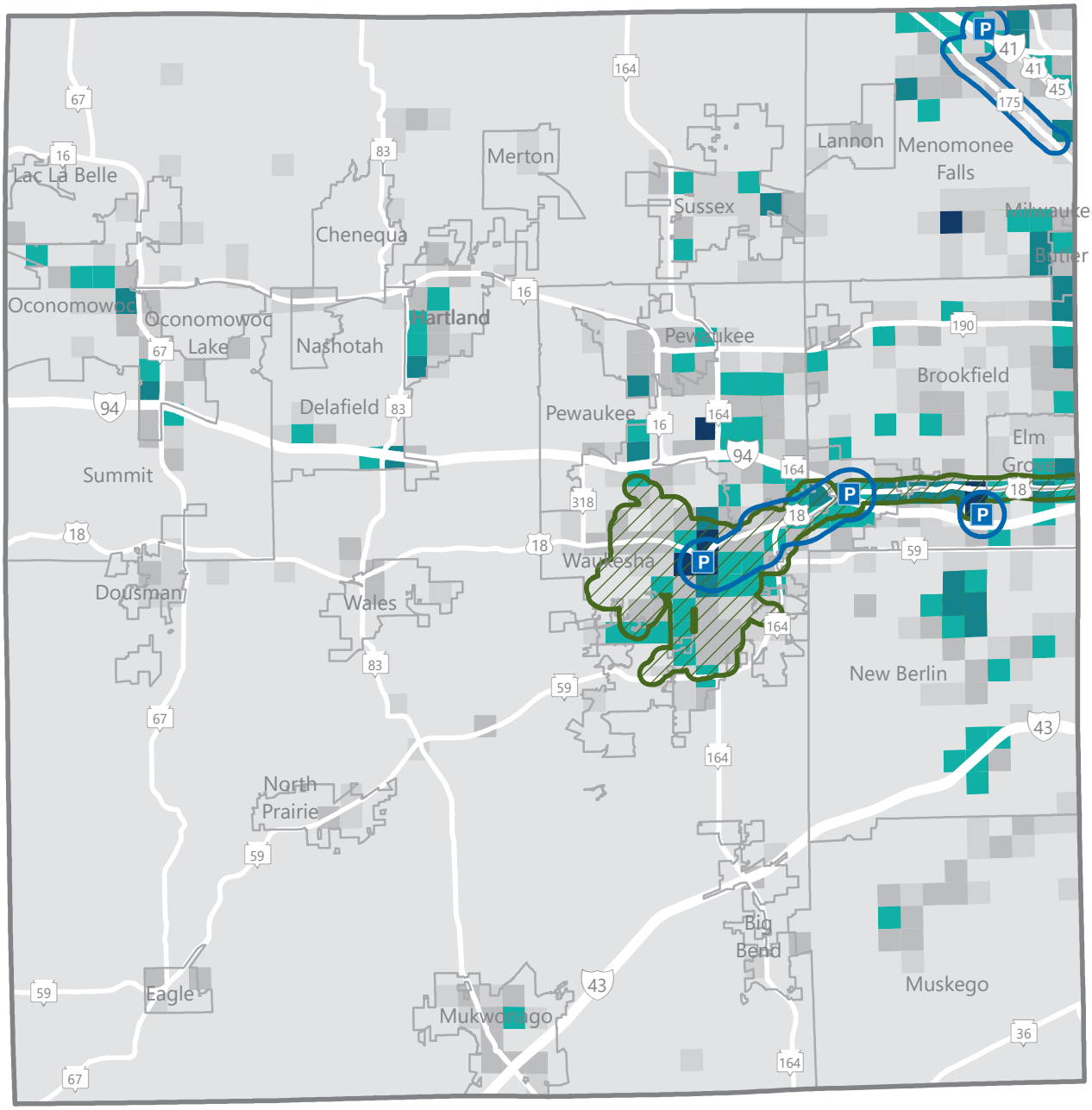
The Density Performance Standard seeks to maximize the transit-supportive land area accessible by public transit. Based on National Standards established by the *Transit Cooperative Research Program Report 165: Transit Capacity and Quality of Service Manual*, land area is considered transit-supportive if it has a density of four jobs per gross acre and a household density of three units per gross acre. The population and employment density was initially identified using quarter section data provided by the U.S. Census American Community Survey and from SEWRPC's 2010 employment survey. The density thresholds were converted to quarter section areas to match the data available, resulting in a minimum of 640 jobs per quarter section and 1,195 people per quarter section.

## Map 4.14
## Employment in Milwaukee County Served by Waukesha County Transit




*Source: SEWRPC*

## Map 4.15
## Employment in Waukesha County Served by Waukesha County Transit




**EMPLOYMENT BY QUARTER SECTION (2010)**

| | |
|---|---|
| 0 - 100 | 640 - 1,500 |
| 101 - 250 | 1,501 - 2,500 |
| 251 - 639 | 2,501 - 5,329 |

**WAUKESHA COUNTY TRANSIT SERVICE**

- ONE-QUARTER TO ONE-HALF MILE FROM BUS ROUTES
- ONE-QUARTER MILE FROM CONNECTING LOCAL BUS ROUTES
- PARK-RIDE LOT

Note: Employment threshold (640+) based on the minimum employment density (4 jobs per acre) determined to support transit service as identified in TCRP 165: Transit Capacity and Quality of Service Manual, 3rd Edition (2013).

N

0 1 2 3 4 Miles

*Source: SEWRPC*

The Density Performance Standard described in this section compares quarter sections that could be considered transit supportive based on population and employment densities either individually or combined. Map 4.16 identifies those quarter sections that have employment and population densities that exceed thresholds considered appropriate to support transit service based on National standards.

When combining the existing population and jobs present by quarter section to determine if transit-supportive densities are present, a scoring metric was developed to equate the value of each person or job in terms of generating transit ridership. On a scale of 0 to 100, a point was given to a quarter section for each 11.95 people or 6.4 jobs. A quarter section was then considered transit supporting if it reached 100 or more points. Those quarter sections that scored a total of 100 points or above are displayed on Map 4.16 as either a shade of orange or hatched lines. The differing shades of orange or shades of hatching indicate the population and employment score for each quarter section meeting the jobs plus population transit-supportive threshold. Map 4.16 shows areas that have both high population and employment densities that are not currently served by transit, including locations in the Village of Sussex along STH 164, the City of Menomonee Falls including Kohl's Corporate Headquarters and nearby businesses, and portions of the City of New Berlin that are comprised of manufacturing facilities and higher density housing. Although these locations are not currently served by fixed-route transit, other mobility options could be considered, such as flexible shuttles or partnerships with ride-hailing services, such as Uber or Lyft. Overall, Waukesha County partially fulfills the Density Performance Standard.

**Objective 2: Operating Safely, Reliably, Conveniently, Comfortably, and Efficiently**

Figure 4.13 contains the applicable standards that were used to determine if Waukesha County Transit is providing a service that is safe, reliable, convenient, comfortable, and efficient.

***Route Design and Operating Standard***

Waukesha County Transit routes provide direct alignments with a limited number of turns or duplicative services, and minimizes unnecessary transfers. Waukesha Metro Transit provides a collector-distributor function generally as appropriate at the ends of the routes.

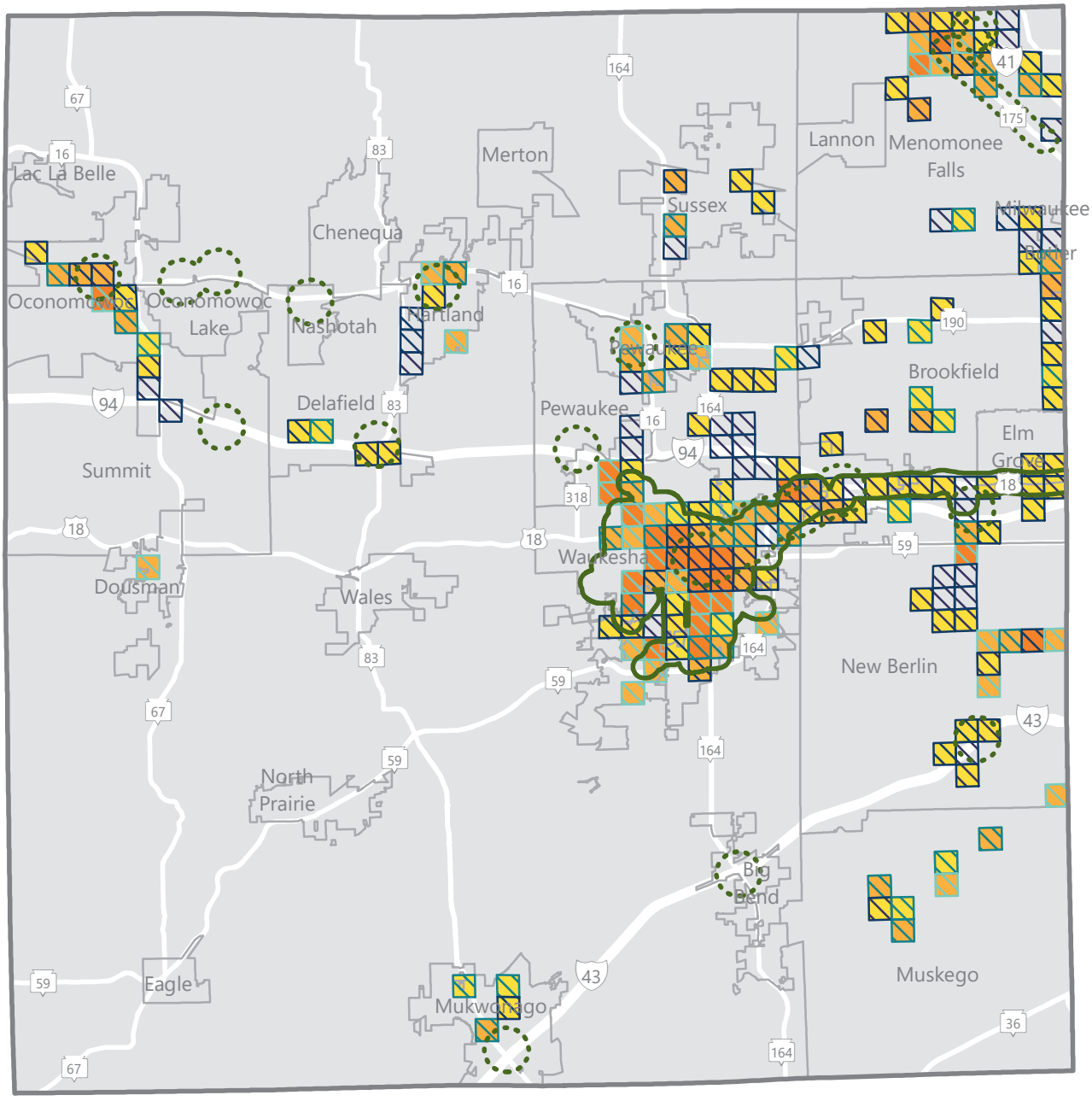
***Bus Stop and Park-Ride Lot Design Standard***

At the request of the Advisory Committee, Commission staff collected and analyzed amenities for 12 bus stop locations served by Waukesha County Transit's 900-series routes. The bus stops served by both Waukesha Metro Transit and Waukesha County Transit are included in the evaluation for Waukesha Metro Transit. Data collected included the presence of signage, a bus pad, curb ramps, and detectable warning surfaces. The inventory also considered the presence of lighting, bus shelters, and if there was noticeable damage to any amenities at the site. The inventory results indicate that some of the 12 bus stop locations served only by Waukesha County Transit are missing signage and curb ramps, as recommended in the bus stop design standard. The bus stop deficiencies include seven bus stop locations requiring signage, two requiring bus pads, nine locations needing detectable warning surfaces, and three locations needing nearby lighting. Table 4.16 summarizes the number and percentage of Waukesha County Transit bus stop locations with deficiencies, including example photos of bus stops without the amenity.

Locations that currently do not include signage include the park-ride lots at STH 16 and CTH P in the Village of Oconomowoc Lake and at STH 16 and CTH C in the Village of Nashotah. In addition, the following locations do not include signage stops: at the intersection of E. Wisconsin Avenue and Shady Lane in the Town of Oconomowoc, stops at the intersection of Capitol Drive and Goodwin Avenue in the Village of Hartland, and the parking lot in the Village of Pewaukee. Signage for bus service can notify current and potential future passengers that commuter service is available and therefore signage improvements are encouraged, along with other improvements to improve the access, comfort, and safety of transit passengers.

The park-ride lots served by Waukesha County Transit are appropriately spaced, well-located, and easy to access by driving, largely due to their accessibility by arterials with quick access to IH 94 and STH 16. However, based on the inventory of bus stop locations served by Waukesha County Transit, some deficiencies exist that reduce the convenience, comfort, and safety of passengers. As a result, Waukesha County Transit partially fulfills the Bus Stop and Park-Ride Lot Design Standard. The County could pursue Federal Transit Administration Enhanced Mobility for Seniors and Individuals with Disabilities Program (Section 5310)

## Map 4.16
## Waukesha County Relative Population Plus Employment Score for Transit Supportive Land Uses by Quarter Section and Existing Transit Service Areas




**POPULATION SCORE**

- 1 - 49
- 50 - 99
- 100 - 195

**EMPLOYMENT SCORE**

- 10 - 49
- 50 - 99
- 100 - 833

**TRANSIT SERVICE AREA**

- LOCAL TRANSIT (ONE-QUARTER MILE FROM BUS ROUTES)
- COMMUTER ROUTES (ONE-HALF MILE FROM BUS ROUTES)

Note: Population + Employment Density Score was calculated by identifying a minimum transit threshold for both population and employment and equalizing them on a weighted scoring scale. Any quarter section scoring 100 or above meets the minimum threshold for transit service. Only quarter sections scoring 100 or above are shown, and the range of weighted scores are provided in the legend.

N

0 1 2 3 4 Miles

*Source: SEWRPC*

## Figure 4.13
## Objective 2 and Associated Standards Applicable to the Evaluation of the Waukesha County Transit System

### Objective 2

**Provide efficient, safe,[a] reliable, convenient, and comfortable transit services in the City of Waukesha**

### Associated Public Transit Principle

The benefits to the entire public of a transit service are directly related to the level of utilization—measured by ridership—of that service. Ridership is influenced by the level of access the public has to services that are reliable and provide for quick, convenient, comfortable, and safe travel. Riders view transit services with these attributes as an effective and attractive alternative to the private automobile.

### Design and Operating Standards

**1. Route Design**

Extend commuter bus routes as needed or pair them with a local shuttle to perform a collection-distribution function at the ends of the route. Public transit routes should have direct alignments with a limited number of turns and should be arranged to minimize duplication of services and unnecessary transfers.

**2. Bus Stop and Park-Ride Lot Design**

Clearly mark bus stops and park-ride lots with easily recognizable signs or shelters and locate them so as to minimize the walking or driving distance over an accessible path to and from residential areas and major activity centers, and to facilitate connections with other transit services where appropriate. For local routes, place stops approximately every three blocks and provide accessible paths and crosswalks to bus stops.[b] For express transit routes, place stops at intersecting transit routes, signalized intersections, and major activity centers. Place park-ride lots at least one mile apart on commuter bus routes. Within business parks, stop spacing may need to differ from standard local route stop spacing based on the spacing between businesses and the presence or lack of sidewalks and crosswalks.

**3. Passenger Demand**

The maximum load factor for each route, measured as the ratio of passengers to seats at that point where passenger loads are highest, should not exceed the following:

| Service Type | Peak Periods | All Other Times |
|---|---|---|
| Local | 1.25 | 1.00 |
| Commuter | 1.00 | 1.00 |

**4. Service Frequency and Availability**

Operate all fixed-route transit services, as noted in the table below.

| | Maximum Headway (minutes) | |
|---|---|---|
| Service Type | Weekday Peak Periods | Off-Peak Periods/ Weekends/Holidays |
| Rapid | 15 | 15 |
| Commuter | 30 | 120 |
| Express | 15 | 30 |
| Local/Shuttle | 30 | 60 |

**5. Service Travel Speeds**

Operate transit services such that average travel speeds are not less than 10 miles per hour for local fixed-route services, and not less than 25 miles per hour for commuter bus services.

### Performance Standards and Associated Performance Measures

**1. Ridership and Service Effectiveness**

Maximize ridership on and the effectiveness of transit services. This is measured using passengers per capita, total passengers per vehicle hour, total passengers per vehicle mile, and passenger miles per vehicle mile, which will be compared to similar transit systems.

Transit services with service effectiveness measures more than 20 percent below the median of the peer comparison group, with less than 10 passengers per revenue vehicle hour, or less than one passenger per revenue vehicle mile should be reviewed for potential changes to their routes, runs, service areas, and service periods.

**2. Travel Time**

Keep travel times on transit services reasonable in comparison to travel time by automobiles for similar trips. This standard is measured using the ratio of transit to automobile distance and the ratio of transit to automobile travel time.

[a] *The Federal Transit Administration published the Public Transportation Agency Safety Rule (49 CFR part 673) on July 19, 2018, requiring transit operators to develop safety plans, including safety performance measures by July 20, 2020. Waukesha Metro and Waukesha County Transit have good safety records and are in compliance with the Safety Rule.*

[b] *This standard encourages that accessible sidewalks and crosswalks be provided to bus stops and that all pedestrian facilities be designed and constructed in accordance with the Federal American with Disabilities Act (ADA) and its implementing regulations.*

*Source: SEWRPC*

## Table 4.16
## Waukesha County Transit Bus Stop Deficiencies Summary

| Number of Bus Stop Locations with Deficiency | Percentage of Bus Stop Locations with Deficiency | Definition | Photo of Deficiency |
|---|---|---|---|
| | | No Signage | |
| 7 | 58.3 | Missing signage that indicates where the bus will stop |  *Village Parking Lot* *(Village of Pewaukee)* |
| | | No Bus Pad | |
| 2 | 16.7 | No paved waiting area with access to and from the stop |  *Collins and Cross Parking Lot* *(City of Oconomowoc)* |
| | | No Detectable Warning Surface | |
| 9 | 75.0 | Walking surface with small truncated domes to provide a tactile cue for pedestrian with visual impairments |  *STH 16 and CTH C* *(Village of Nashotah)* |

**Table continued on next page.**

**Table 4.16 (Continued)**

| Number of Bus Stop Locations with Deficiency | Percentage of Bus Stop Locations with Deficiency | Definition | Photo of Deficiency |
|---|---|---|---|
| No Nearby Lighting | | | |
| 3 | 25.0 | Bus stops without nearby light poles and lacking light sources that could provide adequate ambient lighting |  *STH 16 and CTH P (Village of Oconomowoc Lake)* |

*Source: Waukesha County Transit and SEWRPC*

funding, which would reimburse 80 percent of the cost of construction of many of the missing bus stop amenities. Additional information on specific improvement recommendations and costs can be found in Chapter 5, Recommended Transit Services.

***Passenger Demand***

This standard recommends that the average ratio of peak passengers to seats on the Waukesha County Transit Commuter Routes not exceed 1.00. The vehicles used on the 900 series commuter bus routes have 46 seats. During the sample data provided by Waukesha Metro for dates in April 2019 and March 2018, the peak load on any route and any run was 31, which occurred on the first morning eastbound Route 905.

Passenger data provided by Waukesha Metro indicates that passenger loads for the Route 1 Extension between Goerke's Corners Park & Ride Lot and the Brookfield Square Mall do not exceed the maximum standard of 1.25 during peak operating hours or 1.00 during all other operating times. For the portion of the Gold Line connection operating in Waukesha County, the stop at the Brookfield Square Mall has the highest amount of boardings and alightings, while the other stops along Bluemound Road in Waukesha County have significantly less ridership. The vehicles operated by MCTS for the Gold Line connection have 32 seats. Based on boarding and alighting data by stop collected by MCTS in the of Fall 2018, there were approximately 71 boardings and alightings (64 boardings and 7 alightings) during the peak afternoon commute period. As a result, passenger loads likely exceed the maximum standard of 1.25 during the afternoon peak at the Brookfield Square Mall transfer point. In summary, the 900-series routes meet the Passenger Demand Standard, while the Gold Line connection likely exceeds the standard during the afternoon peak commute times. Therefore, Waukesha County Transit largely fulfills the Passenger Demand Standard.

***Service Frequency and Availability Operating Standard***

Fulfilling the Service Frequency and Availability Standard requires that service be provided every 30 minutes during weekday peak periods. Waukesha County Transit service meets this standard for the 900 series routes. In addition, commuter bus routes 901 and 905 exceed this standard for trips arriving and departing from the Goerke's Corners Park & Ride Lot, with frequencies of 20 minutes during weekday peak periods. Route 904 provides one trip in the morning peak travel period and one trip in the afternoon peak travel period. MCTS Route 79 also meets this standard, with service approximately every 30 during the peak periods.

The Gold Line connection operates seven days a week, with 15 minute frequencies during peak commute times, and frequencies between 15 and 30 minutes during all other times. The Route 1 extension operates seven days a week and provides frequencies of 30 minutes during all service times. Therefore, Waukesha County Transit fulfills the Service Frequency and Availably Standard.

***Service Travel Speeds Operating Standard***

The Service Travel Speeds Standard requires that commuter bus services achieve average travel speeds not less than 25 miles per hour over the duration of the route. As currently scheduled, all Waukesha County 900-series routes meet or exceed this standard, with the exception of Route 901, which has an approximate speed of 20 miles per hour during the peak morning run at 6:35 a.m. The average speed for all Waukesha County 900-series routes is approximately 27 miles per hour.

The MCTS Financial and Statistical Report for October 2019 includes average speeds for the portions of Route 79 and the Gold Line operated in Waukesha County. Based on these data, Route 79 had an average speed of approximately 20 miles per hour and the Gold Line connection had an average speed of 22 miles per hour. The Route 1 extension between Goerke's Corners Park & Ride Lot and the Brookfield Square Mall has an average speed of approximately 24 miles per hour. As a result, Waukesha County fulfills the Service Travel Speed Operating Standard.

***Ridership and Service Effectiveness Performance Standard***

The Ridership and Service Effectiveness Standard uses four performance measures (passengers per capita, passengers per revenue vehicle hour, passengers per revenue vehicle mile, and passenger miles per revenue vehicle mile) to compare the service effectiveness of Waukesha County to seven peer transit systems from around the Nation. If the service effectiveness measures are more than 20 percent below the median of the peer comparison group, this standard encourages modifying routes, runs, service area, or service periods. Figure 4.14 shows the results of this comparison of Waukesha County Transit to its peers by displaying the range of the peer group's performance, the median of the peer group's performance, the range of performance that meets the standard, and the performance of Waukesha County Transit for each measure. The data for each peer system is presented in Table 4.17.

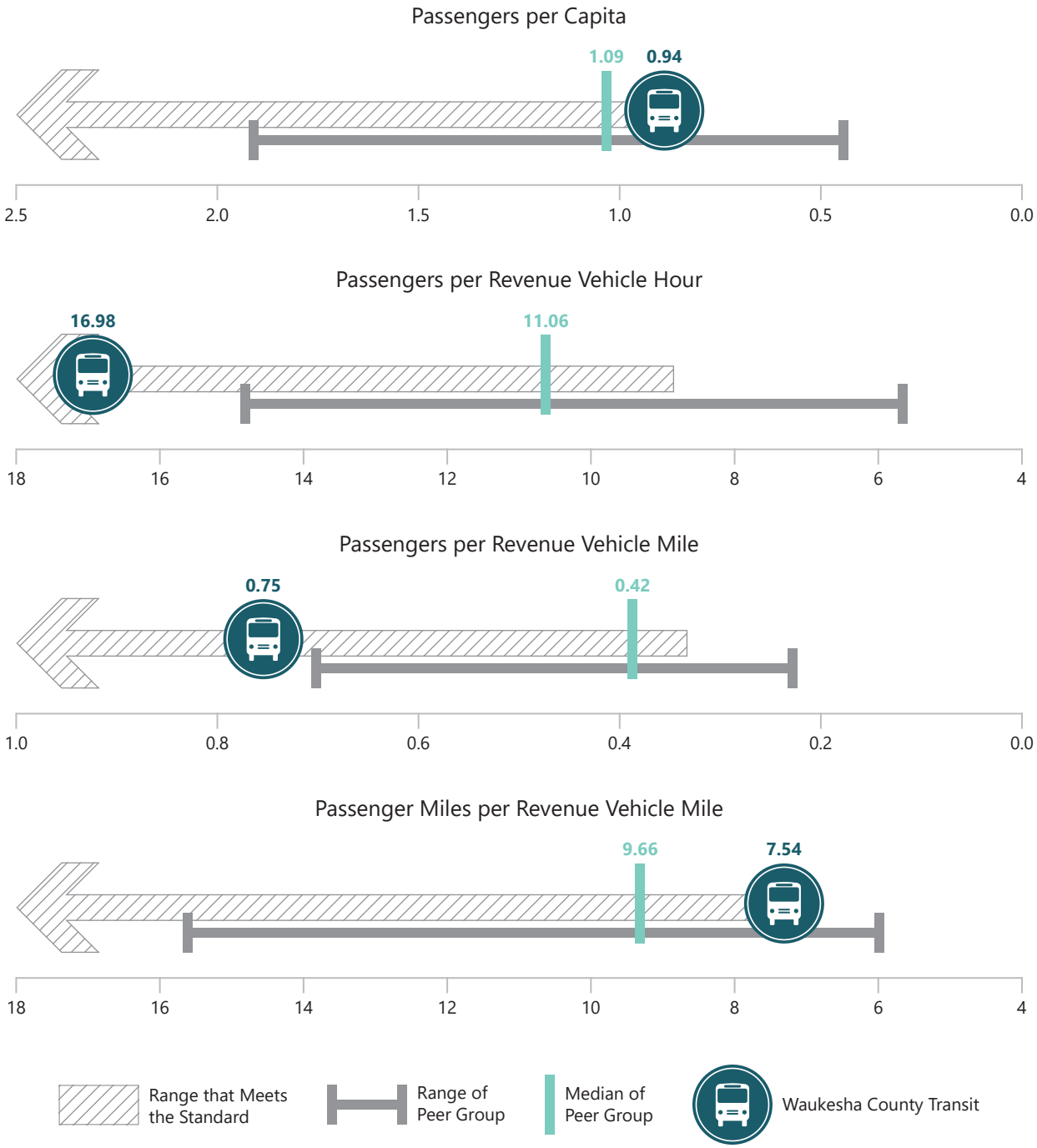
Figure 4.14 indicates that Waukesha County Transit is outside the range that meets the standard for one of the four performance measures, but meets the remaining standards. Passenger miles per revenue vehicle miles serves as a proxy for the average number of seats filled on a vehicle over the course of its revenue trip. Some of the runs have few riders boarding at bus stops prior to Goerke's Corners, which results in a low number of passengers on board for a relatively long distance of the trip. Passengers per capita is dependent upon the attractiveness of a transit system's service to the residents within its service area. This attractiveness can be influenced by many factors, some within a transit system's control (such as frequency of service or fare levels) and some outside a system's control (such as land use density and community demographics). Waukesha County is just within the acceptable range for passengers per capita, which indicates that the transit system provides relatively good coverage but that there are opportunities for improvement that could make the transit system more attractive, such as greater service frequencies. Waukesha County performs better than its peers for passengers per revenue vehicle hour and passengers per revenue vehicle mile, which may be the result of lower levels of congestion on segments of the IH 94 and STH 16 in Waukesha County and the robust performance of the local routes within the Waukesha County Transit System. In general, Waukesha County largely fulfills this standard, meeting the standard under three of the four associated measures.

***Travel Time Performance Standard***

The Travel Time Performance Standard encourages that travel times be kept reasonable in comparison to travel times by automobiles for similar trips. Table 4.18 compares average trip travel times between transit trips and automobile trips during the peak-period travel, and shows the ratios between transit travel times and automobile travel times are generally reasonable. However, a few trips exceed a ratio of 2.0, which is generally beyond what many riders are willing to accept when determining whether to use a transit service. Reducing this ratio on those trips that exceed 2.00 would likely require that Waukesha County Transit have a reliable way to avoid congestion during peak periods.

Table 4.18 also includes the combined travel time along the Bluemound Road corridor between the Goerke's Corners Park & Ride Lot and 124th Street. The combined Route 1 extension and Gold Line connection meet the Travel Time Performance Standard with a ratio between transit travel times and automobile travel times of 1.50. However, the transit travel time includes an average transfer time of nine minutes at the Brookfield Square transfer point, while maximum transfer times can be as much as 29 minutes during the evening hours, making transit travel less attractive to potential riders. Overall, Waukesha County Transit services largely fulfills the Travel Time Performance Standard.

**Figure 4.14**
**Ridership and Service Effectiveness Performance Standard: Comparison of Waukesha County Transit to Peer Group for Associated Performance Measures**




*Source: National Transit Database, Waukesha County Transit, and SEWRPC*

## Table 4.17
## Waukesha County Transit and Peer Group Data for the Ridership and Service Effectiveness Performance Standard

| | Performance Measures | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Passengers per Capita | | | Passengers per Revenue Vehicle Hour | | | Passengers per Revenue Vehicle Mile | | | Passenger Miles per Revenue Vehicle Mile | | |
| **Peer System and Metropolitan Area** | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change |
| Johnson County Transit (Kansas City, MO) | 1.36 | 1.09 | -5.40% | 10.02 | 7.35 | -7.40% | 0.43 | 0.33 | -6.42% | 8.30 | 6.11 | -7.32% |
| Yuba-Sutter Transit Authority (Sacramento, CA) | 1.32 | 0.92 | -8.65% | 18.18 | 15.50 | -3.84% | 0.49 | 0.42 | -4.13% | 20.24 | 16.37 | -5.13% |
| Laketran (Cleveland, OH) | 2.18 | 2.02 | -1.97% | 11.32 | 9.48 | -4.28% | 0.64 | 0.55 | -3.88% | 7.68 | 6.48 | -4.07% |
| Gwinnett County Transit (Atlanta, GA) | 2.26 | 1.54 | -9.14% | 18.03 | 14.33 | -5.39% | 0.86 | 0.75 | -3.25% | 18.55 | 9.66 | -14.14% |
| Racine-Kenosha Commuter Bus (Racine, WI) | 0.70 | 0.47 | -9.70% | 11.01 | 5.81 | -13.87% | 0.37 | 0.25 | -9.22% | 9.49 | 6.21 | -10.05% |
| Ozaukee County Express (Milwaukee, WI) | 1.35 | 1.19 | -2.34% | 16.58 | 13.77 | -3.87% | 0.64 | 0.53 | -3.82% | 12.39 | 11.45 | -1.78% |
| Washington County Commuter Express (Milwaukee, WI) | 0.88 | 0.60 | -8.92% | 12.81 | 11.06 | -3.34% | 0.47 | 0.38 | -5.29% | 14.52 | 11.74 | -4.99% |
| Waukesha Metro Transit (Milwaukee, WI) | 1.12 | 0.94 | -4.34% | 19.96 | 16.98 | -3.92% | 0.92 | 0.75 | -4.90% | 9.80 | 7.54 | -6.30% |

*Source: National Transit Database, U.S. Bureau of the Census, Waukesha County Transit, and SEWRPC*

## Table 4.18
## Travel Time Comparison Between Waukesha County Transit Routes and Automobiles

| Operator | Route Number | Trip Origin | Trip Destination | One-Way Travel Time (minutes)[a] | | | |
|---|---|---|---|---|---|---|---|
| | | | | Transit | Automobile | Difference (Transit to Automobile) | Ratio (Transit to Automobile) |
| Waukesha County Transit | 901 | Downtown Waukesha Transit Center | Wisconsin Avenue & 35th Street | 43 | 34 | 9 | 1.26 |
| | | | Wisconsin Avenue & Cass Street | 55 | 39 | 16 | 1.41 |
| | | | UW-Milwaukee Campus | 47 | 35 | 12 | 1.34 |
| | | Wisconsin Avenue & 34th Street | Downtown Waukesha Transit Center | 35 | 29 | 6 | 1.21 |
| | | Wisconsin Avenue & Cass Street | | 53 | 32 | 21 | 1.66 |
| | | UW-Milwaukee Campus | | 68 | 38 | 30 | 1.79 |
| | 904 | Collins & Cross Parking Lot | Wisconsin Avenue & Cass Street | 72 | 35 | 37 | 2.06 |
| | | Wisconsin Avenue & Cass Street | Collins & Cross Parking Lot | 76 | 45 | 31 | 1.69 |
| | 905 | Nagawaukee Park & Ride Lot | Wisconsin Avenue & 10th Street | 47 | 28 | 19 | 1.68 |
| | | | Wisconsin Avenue & Cass Street | 60 | 30 | 30 | 2.00 |
| | | Wisconsin Avenue & Cass Street | Nagawaukee Park & Ride Lot | 64 | 40 | 24 | 1.60 |
| | | Wisconsin Avenue & 9th Street | | 52 | 36 | 16 | 1.44 |
| | 906 | Mukwonago I-43 & STH 83 Park & Ride Lot | Michigan Street & Vel R. Phillips Avenue | 55 | 34 | 21 | 1.62 |
| | | Wells & 6th Street | Mukwonago I-43 & STH 83 Park & Ride Lot | 55 | 40 | 15 | 1.38 |
| Milwaukee County Transit System and Waukesha Metro Transit System | 79 | Pilgrim Road Park & Ride Lot | Wisconsin Avenue & Cass Street | 63 | 32 | 31 | 1.97 |
| | | Watertown Plank Park & Ride Lot | | 30 | 15 | 15 | 2.00 |
| | Route 1 Extension and Gold Line Connection[b] | Goerke's Corners Park & Ride Lot | 124th Street & Bluemound Road | 30 | 20 | 10 | 1.50 |
| | | | Systemwide Average | 53 | 33 | 20 | 1.62 |

[a] *Based on average morning and afternoon peak-period travel times between points identified.*

[b] *Includes an additional nine minutes, which is the average transfer time between the Route 1 Extension and the Gold Line Connection at Brookfield Square Mall*

*Source: Waukesha County Transit, Milwaukee County Transit, and SEWRPC*

**Objective 3: Utilizing Public Resources Cost-Effectively**

Objective 3 recognizes that public funds are limited, and must be used efficiently. In order to determine if public funds are being spent well, the following analyses compare Waukesha County Transit to its peer group using a number of performance measures. The applicable standards and performance measures used to measure how efficiently Waukesha County Transit is using public funds are shown in Figure 4.15.

***Fare Structure and Design Standard***

The Fare Structure Standard recommends premium fares for premium services and discounts for priority users, such as seniors or people with disabilities. Waukesha County Transit fulfills this standard, with $3.50 base fare if the trip begins or ends east of the Meadowbrook Park & Ride Lot, and $4.25 if the trip begins or ends west of the Meadowbrook Park & Ride Lot. The fares are within the range of similar commuter bus services in the Region. In addition, Waukesha County Transit offers half-priced fares for seniors and people with disabilities. Frequent riders can also purchase a commuter book at a 10 percent discount. Adult cash fares are $2.00 for the Route 1 extension and $3.50 for Route 79. The higher base fare charged for the 900-series transit services and Route 79 reflect premium services, with additional amenities and higher service speeds. Therefore, Waukesha County Transit fulfills the Fare Structure and Design Standard.

***Operating Expenses Performance Standard***

By comparing the annual percent change between 2013 and 2017 in operating expenses per revenue vehicle mile, operating expenses per revenue vehicle hour, operating expenses per total vehicle mile, operating expenses per total vehicle hour, and operating assistance per passenger, the Operating Expenses Performance Standard ensures that the growth in operating costs is comparable to that of peer systems. In order to fulfill the standard, none of the annual percent increases in the five performance measures should exceed the median percentage increases experienced by the peer group. Figure 4.16 compares the annual percent change for each measure between 2013 and 2017 for the range of the peer group's performance, the range of the performance that meets the standard, the median of the peer group's performance, and the performance of Waukesha County Transit. Table 4.19 provides the detailed data used to develop Figure 4.16.

Waukesha County Transit generally performs well for the standards that compare growth in operating expenses per various measures of amounts of service provided. Specifically, the average annual operating expenses per revenue vehicle mile, total vehicle mile, and total vehicle hour meet the corresponding standard, with the growth rate of operating expenses per unit of service for Waukesha County Transit less than the median of the peer systems. Waukesha County does not meet the standard comparing operating expenses per revenue vehicle hour. However, the services measured in this standard are dictated by the cost of services contained within the County's operating contracts with its transit providers, and therefore are not easily addressed through transit service changes.

Waukesha County Transit meets the standard comparing the annual percent change in operating assistance per passenger, with the annual percent increasing below those of the peer systems. However, the peer systems included as part of the analysis have experienced even more significant annual increases in operating assistance per passenger than Waukesha County, largely due to reductions in ridership in 2015 and 2016. Overall, Waukesha County Transit performs relatively well on this standard, with generally stable operating costs per unit of service between 2013 and 2017.

***Cost Effectiveness Performance Standard***

The Cost Effectiveness Standard recommends that the operating cost per passenger and operating cost per passenger mile should not be greater than 20 percent above the median of the peer group, and that the farebox recovery ratio should not be more than 20 percent below the median of the peer group. If a transit system is substandard under any of these performance measures, it may indicate that changes to routes, runs, service areas, and service periods need to be considered. Figure 4.17 shows the range of the peer group's performance, the median of the peer group's performance, the range of performance that meets the standard, and the performance of Waukesha County Transit for these measures. Table 4.20 provides the detailed data used to develop Figure 4.17.

## Figure 4.15
## Objective 3 and Associated Standards Applicable to the Evaluation of Waukesha County Transit

| Objective 3 |
|---|
| **Meet all other objectives at the lowest possible cost. Given limited public funds, this objective seeks to permit elected officials the flexibility to balance the standards associated with Objectives 1 and 2 with the level of public funding required to fully meet those standards.** |

| Associated Public Transit Principle |
|---|
| Given limited public funds, the cost of providing transit at a desired service level should be minimized and revenue gained from the service should be maximized to maintain the financial stability of services. |

| Design and Operating Standards |
|---|
| **1. Fare Structure**<br>Charge premium fares for premium services, and discounted fares for priority population groups and frequent riders. |

| Performance Standards and Associated Performance Measures | |
|---|---|
| **1. Operating Expenses**<br>Minimize the operating expenses per total and revenue vehicle mile, the operating expenses per total and revenue vehicle hour, and the operating assistance per passenger. Annual increases in such costs should not exceed the median percentage increases experienced by comparable transit systems. | **2. Cost Effectiveness**<br>Review transit services with substandard cost effectiveness for potential changes to their routes, runs, service areas, and service periods. Cost effectiveness is considered substandard when the operating expenses per passenger, or operating expenses per passenger mile are more than 20 percent above, or the farebox recovery ratio is more than 20 percent below, the median for comparable transit systems. |

*Source: SEWRPC*

Waukesha County Transit fulfills the Cost Effectiveness Standard for two out of the three performance measures, including the operating expenses per passenger and the farebox recovery ratio. The operating expenses per passenger mile of $1.01 does not meet the standard, which as mentioned previously, is largely a function of the cost per unit of service negotiated as part of the contracts with transit operators. In 2017, Waukesha County Transit's farebox recovery ratio of 18 percent was the same as the median of the peer group, meeting the standard. Overall, Waukesha County Transit largely fulfills the Cost Effectiveness Standard, but has experienced declines in ridership, combined with fixed costs as part of the operating contract, that have impacted its overall performance.

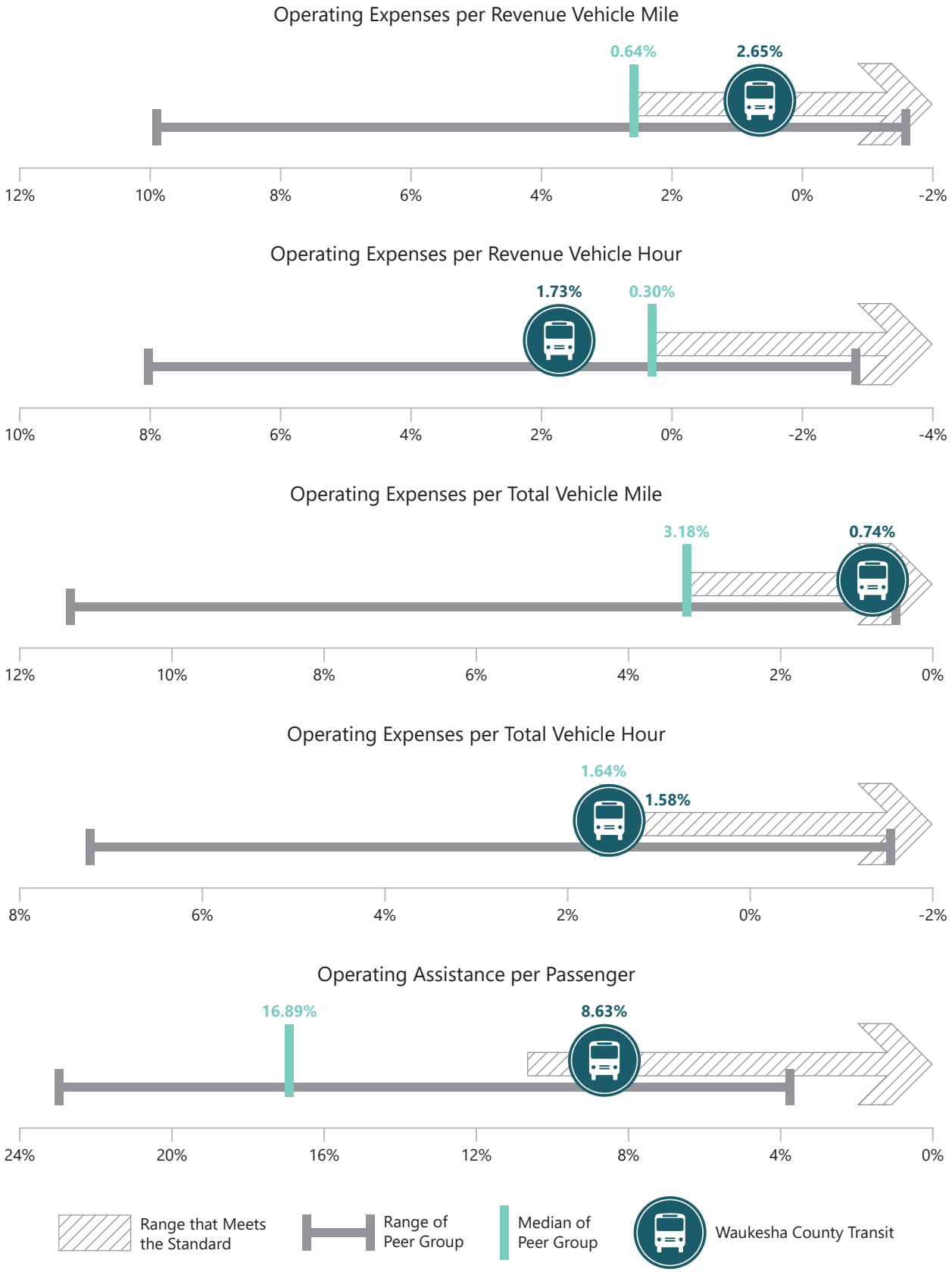
### *Route Performance Evaluation*

This section of the evaluation looks at the ridership and financial performance of the Waukesha County Transit System's bus routes in order to identify the routes with the lowest overall performance based on route operating data, including total boarding passengers; passengers per revenue vehicle-hour and per revenue vehicle-mile; total operating cost and operating assistance per passenger; and farebox recovery rate.

Table 4.21 and Figures 4.18 and 4.19 display the estimated service and cost effectiveness measures for the routes of the transit system. The performance measures presented in the table and figures are based upon Waukesha County operating statistics for 2018.

Waukesha County has target service effectiveness levels for its bus routes specifying at least 10 passengers per revenue vehicle hour and at least 1.0 passenger per revenue vehicle mile, as shown in Figure 4.13. In addition, the County's Cost Effectiveness Standard recommends that the operating cost per passenger and operating cost per passenger mile should be not greater than 20 percent above the median, and that the farebox recovery ratio should not be more than 20 percent below the median, as shown in Figure 4.15. If a transit system is substandard under any of these performance measures, it may indicate that changes to routes, runs, service areas, and service periods need to be considered.

**Figure 4.16**
**Operating Expenses Performance Standard: Comparison of Waukesha County Transit to Peer Group for Associated Performance Measures (Percent Annual Change)**




*Source: National Transit Database, Waukesha County Transit, and SEWRPC*

## Table 4.19
## Waukesha County Transit and Peer Group Data for the Operating Expenses Performance Standard

| Peer System and Metropolitan Area | Performance Measures | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Operating Expenses per Revenue Vehicle Mile | | | Operating Expenses per Revenue Vehicle Hour | | | Operating Expenses per Total Vehicle Mile | | | Operating Expenses per Total Vehicle Hour | | | Operating Assistance per Passenger | | |
| | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change |
| Johnson County Transit (Kansas City, MO) | $5.26 | $5.28 | 0.29% | $121.86 | $117.01 | -0.84% | $3.74 | $3.79 | 11.28% | $91.20 | $89.28 | -0.32% | $9.70 | $14.50 | 11.32% |
| Yuba-Sutter Transit Authority (Sacramento, CA) | $2.80 | $3.15 | 2.98% | $103.29 | $117.33 | 3.25% | $1.86 | $2.04 | 2.38% | $65.29 | $73.54 | 3.05% | $1.36 | $3.09 | 23.08% |
| Laketran (Cleveland, OH) | $5.79 | $5.94 | 0.72% | $101.63 | $102.54 | 0.30% | $4.02 | $4.37 | 2.12% | $79.17 | $84.26 | 1.64% | $7.18 | $8.99 | 6.01% |
| Gwinnett County Transit (Atlanta, GA) | $5.95 | $8.27 | 9.89% | $124.22 | $158.44 | 7.32% | $4.50 | $2.86 | 9.95% | $99.23 | $128.72 | 7.32% | $4.13 | $9.03 | 22.35% |
| Racine-Kenosha Commuter Bus (Racine, WI) | $4.39 | $4.88 | 2.65% | $132.17 | $114.20 | -2.88% | $4.21 | $4.77 | 3.18% | $118.29 | $110.55 | -1.50% | $8.52 | $16.62 | 18.33% |
| Ozaukee County Express (Milwaukee, WI) | $6.42 | $5.98 | -1.59% | $167.45 | $155.12 | -1.19% | $4.12 | $4.18 | 0.44% | $117.27 | $114.90 | -0.42% | $7.75 | $8.75 | 3.89% |
| Washington County Commuter Express (Milwaukee, WI) | $4.41 | $5.45 | 5.80% | $119.77 | $159.68 | 8.03% | $2.28 | $2.78 | 5.31% | $71.13 | $88.74 | 6.35% | $6.02 | $11.19 | 16.89% |
| Waukesha County Transit (Milwaukee, WI) | $7.46 | $7.64 | 0.64% | $161.76 | $172.59 | 1.73% | $5.38 | $5.52 | 0.74% | $118.09 | 125.20 | 1.58% | $6.74 | $8.97 | 8.63% |

*Source: National Transit Database, Waukesha County Transit, and SEWRPC*

**Figure 4.17**
**Cost Effectiveness Performance Standard: Comparison of Waukesha County Transit to Peer Group for Associated Performance Measure**


*Source: National Transit Database, Waukesha County Transit, and SEWRPC*

For each of the performance measures used in the evaluation, routes that have service effectiveness or cost efficiency measures that do not meet the target levels specified in the service effectiveness goals for the transit system are identified as below average performers with red text. The following observations may be drawn from the information in Table 4.21 and Figures 4.18 and 4.19:

- Routes 901/904/905 fail to meet the majority of the service effectiveness and cost effectiveness performance measures
- Route 906 meets the passengers per revenue vehicle hour measures but does not meet the remaining service effectiveness or cost effectiveness measures
- Route 79 does not meet the passengers per revenue vehicle mile standard but meets all other measures
- The Route 1 extension and Gold Line connection exceed both the service effectiveness and cost effectiveness measures

## Table 4.20
## Waukesha County Transit and Peer Group Data for the Cost Effectiveness Performance Standard

| Peer System and Metropolitan Area | Performance Measures | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Operating Expenses per Passenger | | | Operating Expenses per Passenger Mile | | | Farebox Recovery Ratio | | |
| | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change | 2013 | 2017 | Average Annual Change |
| Johnson County Transit (Kansas City, MO) | $12.16 | $15.91 | 7.30% | $0.63 | $0.86 | 8.47% | 0.20 | 0.09 | -16.43% |
| Yuba-Sutter Transit Authority (Sacramento, CA) | $5.68 | $7.57 | 7.54% | $0.14 | $0.19 | 8.60% | 0.76 | 0.59 | -6.06% |
| Laketran (Cleveland, OH) | $8.98 | $10.82 | 4.89% | $0.75 | $0.92 | 5.30% | 0.20 | 0.17 | -3.94% |
| Gwinnett County Transit (Atlanta, GA) | $6.89 | $11.06 | 13.21% | $0.32 | $0.86 | 29.52% | 0.40 | 0.18 | -17.44% |
| Belle Urban Systems (Racine, WI) | $12.01 | $19.67 | 13.21% | $0.46 | $0.79 | 14.19% | 0.29 | 0.15 | -14.39% |
| Ozaukee County Express (Milwaukee, WI) | $10.10 | $11.26 | 3.25% | $0.52 | $0.52 | 0.47% | 0.23 | 0.22 | -0.17% |
| Washington County Commuter Express (Milwaukee, WI) | $9.35 | $14.44 | 11.56% | $0.30 | $0.46 | 11.23% | 0.36 | 0.22 | -10.71% |
| Waukesha County Transit (Milwaukee, WI) | $8.10 | $10.16 | 6.05% | $0.76 | $1.01 | 7.58% | 0.25 | 0.18 | -7.82% |

*Source: National Transit Database, Waukesha County Transit, and SEWRPC*

## Table 4.21
## Average Weekday Performance Characteristics for Waukesha County Commuter Bus Routes

| Route Number | Revenue Vehicle Hours[a] | Revenue Vehicle Miles | Boarding Passengers | Service Effectiveness Measures | | Operating Cost ($) | Operating Assistance ($) | Cost Effectiveness Measures | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Passengers per Revenue Vehicle Hour | Passengers per Revenue Vehicle Mile | | | Operating Cost per Passenger ($) | Operating Assistance per Passenger ($) | Farebox Recovery Rate (%) |
| 901/904/905 | 45.7 | 1,037.5 | 357.5 | 7.8 | 0.3 | 7,103.13 | 5,963.12 | 19.87 | 16.68 | 0.16 |
| 906 | 5.7 | 198.0 | 80.6 | 14.1 | 0.4 | 1,904.67 | 1,625.39 | 23.63 | 20.17 | 0.15 |
| 79 | 8.2 | 186.5 | 121.8 | 14.9 | 0.7 | 1,374.88 | 1,054.64 | 11.28 | 8.66 | 0.23 |
| Route 1 Extension[a] | 22.7 | 267.8 | 436.4 | 19.2 | 1.6 | 403.43 | 403.43 | 0.92 | 0.92 | -- |
| Gold Line Extension | 25.8 | 493.2 | 863.4 | 33.5 | 1.8 | 3,152.60 | 2,082.04 | 3.65 | 2.41 | 0.34 |
| Bus system Total/Average | 108.1 | 2,183.0 | 1,859.8 | 17.9 | 1.0 | 2,787.74 | 2,225.73 | 11.87 | 9.77 | 0.22 |
| Minimum/Maximum Acceptable Level[b,c] | N/A | N/A | N/A | 10.0 | 1.0 | N/A | N/A | 13.54 | 10.39 | 0.16 |

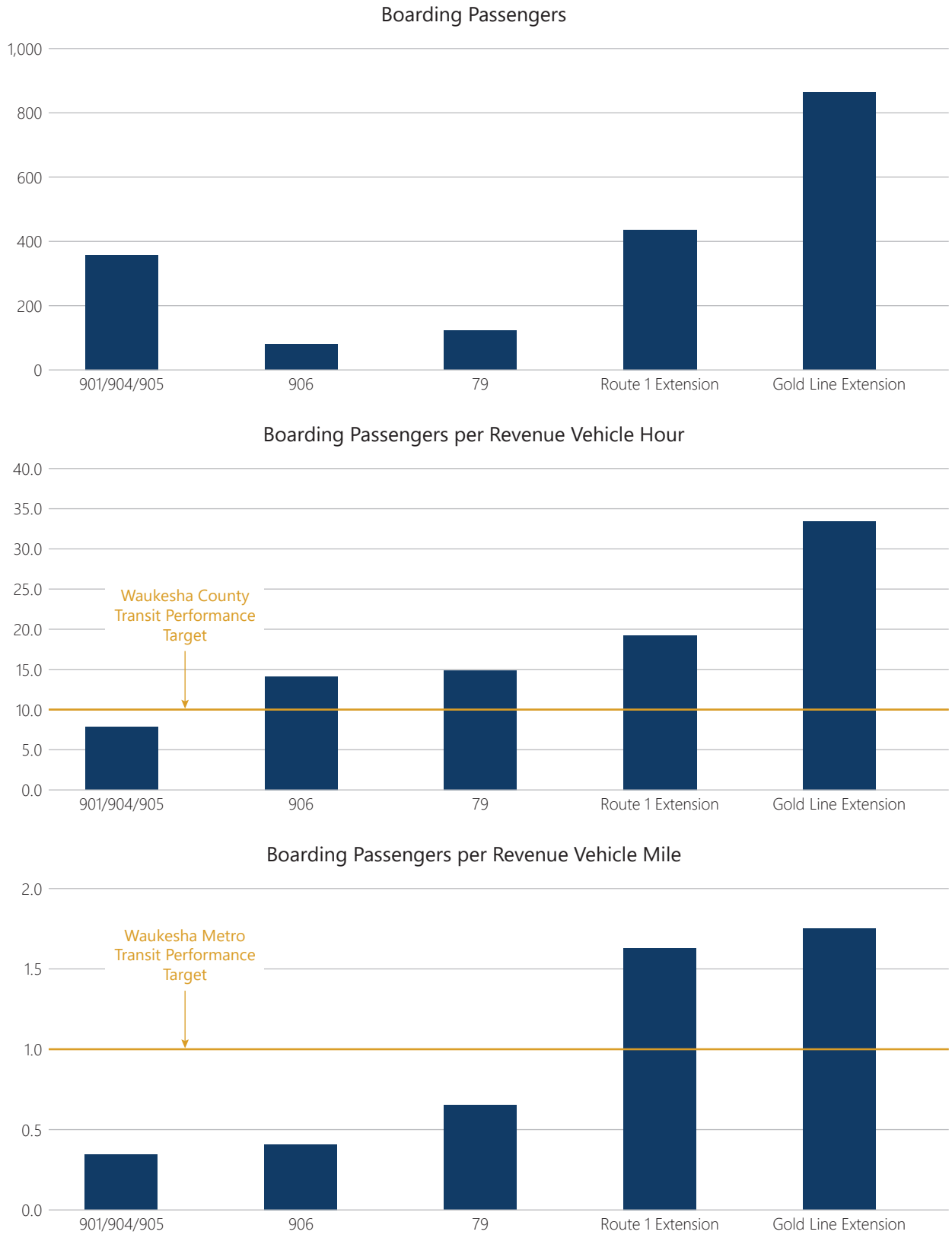
[a] *Waukesha County only pays the local share for the Route 1 extension and does not receive a farebox revenue credit.*

[b] *Waukesha County Transit has target service effectiveness levels for its bus routes that specify 10 passengers per revenue vehicle hour and at least 1.0 passenger per revenue mile.*

[c] *The target performance level specified in the transit service standards presented in Figure 4.19 for cost effectiveness measures is 20 percent above the systemwide median for all routes. The target performance level specified in Figure 4.19 for farebox recovery is 20 percent below the systemwide median for all routes. Red text for these measures indicates that a route does not meet the target for that particular measure.*

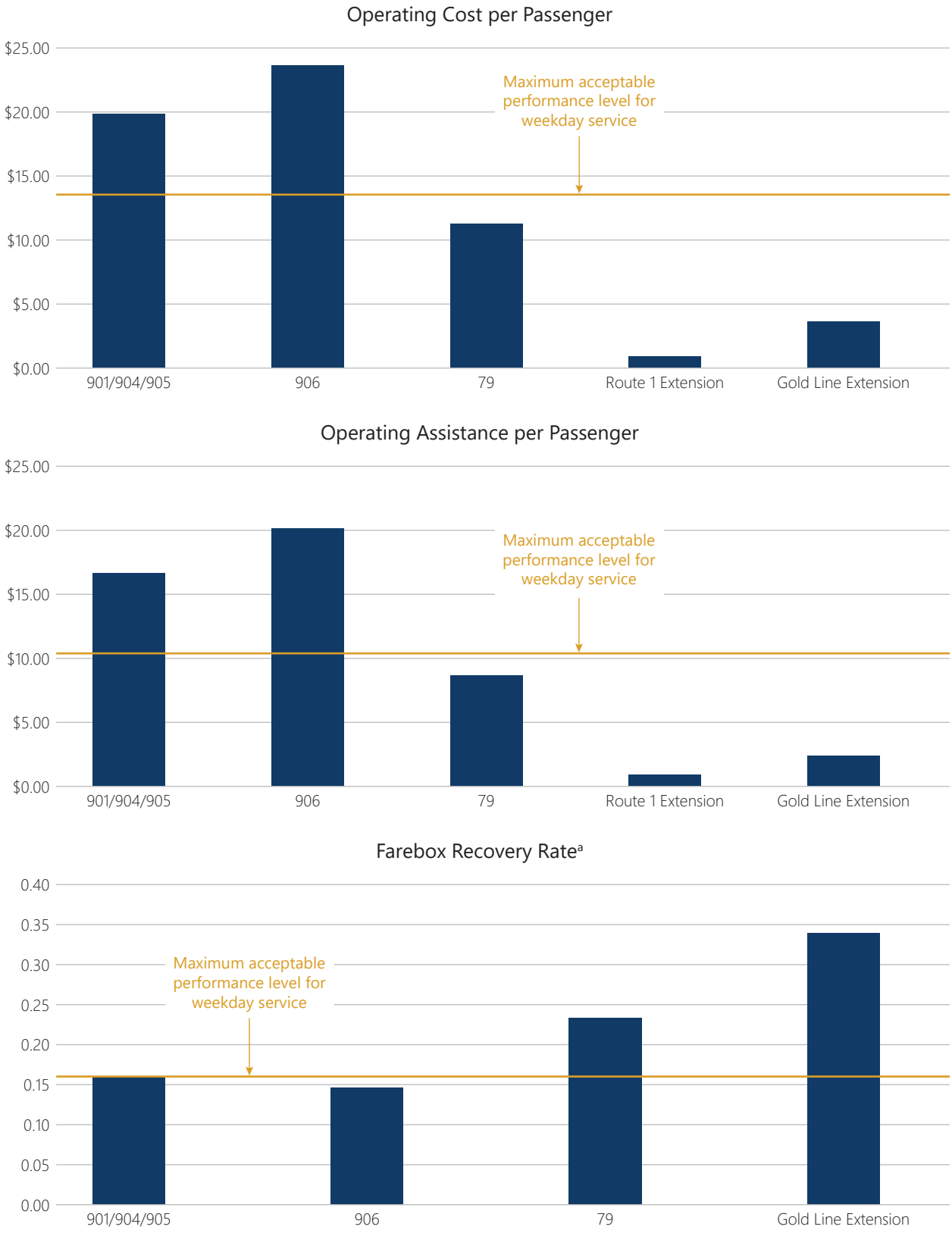
*Source: Waukesha County Transit and SEWRPC*

**Figure 4.18**
**Service Effectiveness Measures for Waukesha County Transit Routes**




*Source: Waukesha County Transit and SEWRPC*

**Figure 4.19**
**Cost Effectiveness Measures for Waukesha County Transit Routes**




[a]*Waukesha County only pays the local share for the Route 1 extension and does not receive a farebox revenue credit.*

*Source: Waukesha County Transit and SEWRPC*

- The 900-series routes do not meet the standard for any of the three cost effectiveness measures, including the operating cost per passenger, operating assistance per passenger, and the farebox recovery rate, whereas Route 79 and the Gold Line Extension meet the cost effectiveness measures

Given the poor performance of the 900-series commuter bus routes for both service effectiveness and cost effectiveness, these four routes merit further study to determine if service changes could improve their performance.

## 4.5 CONCLUSION

This chapter's evaluation of Waukesha Metro and Waukesha County Transit services indicates potential areas for service changes to help the systems better fulfill the objectives and standards laid out in Chapter 3 of this report. Improvements to routes, runs, service areas, and service periods could increase Waukesha Metro's and Waukesha County Transit's performance under various standards. In addition, the number of jobs accessible in Waukesha County could be increased through potential partnerships with ride-hailing services or providing flexible shuttles to areas with a concentration of jobs. Chapter 5 of this report will present potential service improvements and analyze their costs and influence on the performance of each transit system.