

SEWRPC Planning Report No. 55
VISION 2050: A REGIONAL LAND USE AND
TRANSPORTATION SYSTEM PLAN FOR SOUTHEASTERN WISCONSIN

Volume II, Chapter III

**ALTERNATIVE LAND USE
AND TRANSPORTATION SYSTEM PLANS**

(Tables, figures, and maps are at end of Chapter)

INTRODUCTION

This chapter presents a series of alternative regional land use and transportation system plans prepared as part of the VISION 2050 planning process. The alternatives were developed through refinement of five land use and transportation sketch scenarios, which were the focus of the third step in the VISION 2050 process.¹ The conceptual-level sketch scenarios were developed to allow consideration of the long-term consequences of alternative future paths of developing the Region's land and transportation system. Public input, as well as input from the Commission's Advisory Committees on Regional Land Use Planning and Regional Transportation System Planning, Environmental Justice Task Force, and VISION 2050 Task Forces on key areas of interest, were used to refine the sketch scenarios into detailed alternatives.

Each alternative includes a detailed land use development pattern and transportation system, representing alternative visions for the Region. The alternatives were evaluated using a set of objectives and criteria based on the Guiding Statements that form the initial vision for the Region, which is discussed in Chapter I of this Volume. The preliminary recommended year 2050 regional land use and transportation system plan for Southeastern Wisconsin (documented in Chapter IV of this volume) was prepared based on consideration of this evaluation and public input on the alternatives. The goal of the preliminary recommended plan is to achieve a consensus vision for the regional land use development pattern and its supporting transportation system, which involved considering the most effective elements of the alternatives.

Part I of this chapter describes the land use development pattern and transportation system that constitutes each of the alternatives and Part II sets forth the evaluation of the alternatives, including plan objectives and evaluation

¹ *An overview of the five sketch scenarios and their evaluation is set forth in Chapter II of this Volume.*

criteria. Part III documents public feedback received on the evaluation of the alternatives, which was the focus of the fourth series of VISION 2050 workshops.

PART I: DESCRIPTION OF ALTERNATIVE PLANS

A baseline alternative, referred to as the Trend, and two detailed alternative plans, Alternative Plan I and Alternative Plan II, were developed for evaluation as the fourth step in the VISION 2050 planning process. The Trend is a projection of land use development and transportation investment trends to the year 2050 based primarily on changes experienced from 1990 to 2010, and was used as a comparison for Alternative Plans I and II. Alternative Plans I and II differ from the Trend by including more compact regional land use development patterns and changes in transportation system investments.

Common Elements

The Trend and Alternative Plans I and II differ in land use development pattern and transportation investment; however, they share some common elements. These common elements include:

- Regional population and employment projections
- Land use development and transportation projects that were committed to prior to the development of the alternatives
- Local government comprehensive plans
- Natural and agricultural resources
- Bicycle and pedestrian accommodations

Regional Population and Employment Projections

The alternatives are designed to accommodate the year 2050 regional intermediate-growth population and employment projections developed by the Commission for the VISION 2050 plan.² The Region's population is projected to increase from about 2.02 million persons in 2010 to 2.35 million persons in 2050 (17 percent increase) and employment is projected to increase from about 1.18 million jobs in 2010 to 1.37 million jobs in 2050 (18 percent increase). The number of households is projected to increase from about 0.80 million in 2010 to about 1.06 million 2050 (17 percent). The amount of proposed growth accommodated by county varies between the alternatives, which is discussed under the descriptions of Alternative Plans I and II. Proposed population, household, and employment distribution by county under the Trend and Alternative Plans I and II is shown in Figures III-1, III-2, and III-3, respectively.

² *The year 2050 population, household, and employment projections and their underlying methodology and assumptions are presented in Volume I, Chapter VI.*

Committed Land Use Development and Transportation Projects

Preparing the VISION 2050 plan involved allocating future increments in population, households, and employment to urban and rural areas of the Region controlled to projected regional levels. The allocations incorporated residential, commercial, and industrial developments that were already under construction during development of the alternatives. This information was obtained through meetings with staff or elected officials from each “urban” community in the Region. Committed arterial highway capacity improvement and expansion projects and fixed-guideway transit projects were also incorporated into the Trend and Alternative Plans I and II. This includes projects that were under construction, undergoing final engineering and design, or had a preferred alternative selected as part of preliminary engineering/environmental impact study prior to development of the alternatives. They are shown on Map III-1 and listed in Table III-1.

Local Government Comprehensive Plans

Local government comprehensive plans were an important consideration in developing the land use patterns for the alternatives because of their significance on local land use control decisions under the State comprehensive planning law. Households were allocated to areas designated for residential use or mixed use in local plans and jobs were allocated to areas designated for land uses compatible with employment in local plans, such as commercial, industrial, business park, and mixed use. Background discussion and analyses regarding local government comprehensive plans is presented in Volume I, Chapter II and a companion report documented in Appendix B to Volume I.

Natural and Agricultural Resources

Incremental households and employment were not allocated to areas with significant natural resource features under any of the alternatives, including primary environmental corridors, secondary environmental corridors, and isolated natural resource areas. Incremental households and employment were also excluded from other wetlands, woodlands, natural areas, critical species habitat sites, and park and open space sites outside of environmental corridors. In addition, incremental households and employment were not allocated to farmland preservation areas (identified in county farmland preservation plans) under any of the alternatives.

Bicycle and Pedestrian Accommodations

While the bicycle and pedestrian element differs between the alternatives, all three alternatives envision that on-street bicycle accommodations will be provided throughout the arterial street and highway system, the off-street path system will be significantly expanded, and pedestrian facilities will be designed and constructed consistent with Americans with Disabilities Act (ADA) requirements to accommodate people with disabilities. The differences between the alternatives will be described later in the chapter.

Alternative Plans – Land Use Component

The Trend and Alternative Plans I and II are designed to accommodate the year 2050 regional intermediate-growth population and employment projections through different land use development patterns. The following section provides a description of those development patterns and how they differ between the alternatives and the existing land use pattern of the Region.

Alternative Plan Land Use Categories

The land use development patterns in the Trend and Alternative Plans I and II were developed by allocating households and jobs to the following land use categories, which represent a variety of development densities and mixes of uses.

- ***Mixed-Use City Center***

Mixed-Use City Center is found in the core of the most densely populated areas of the Region, particularly in the City of Milwaukee. Mixed-Use City Center includes offices, stores, services, apartments, condominiums, and homes with small yards. Many of the offices, apartments, and condominiums may be in mid-rise buildings and high-rise towers (particularly in and around downtown Milwaukee). There may also be stores and services located on the ground floors of these buildings. There are fewer homes with yards in Mixed-Use City Center than in other areas of the Region, which makes common open space such as public parks very important.

People can walk to many everyday destinations in Mixed-Use City Center from their homes. In addition, transit access is typically very high, making Mixed-Use City Center particularly suitable for transit-oriented development (TOD). TODs in Mixed-Use City Center typically include a mix of apartments, condominiums, stores, services, and offices. They are found within easy walking distance from a fixed-guideway transit station (bus rapid transit, light rail, or commuter rail). Their locations near transit stations create a high demand for housing and businesses, making TODs denser than other types of development. There are also major employment centers with office and manufacturing jobs in Mixed-Use City Center.



Mixed-Use City Center

- *Mixed-Use Traditional Neighborhood*

Mixed-Use Traditional Neighborhood is also found in the more densely populated areas of the Region, such as in Milwaukee County and in the Cities of Kenosha, Racine, and Waukesha. Mixed-Use Traditional Neighborhood includes stores, services, offices, apartments, and condominiums. Mixed-Use Traditional Neighborhood also includes more homes with small yards than Mixed-Use City Center. The offices, apartments, and condominiums may be in mid-rise and low-rise buildings with stores and



Mixed-Use Traditional Neighborhood

services on the ground floor. Although there are more homes with yards in Mixed-Use Traditional Neighborhood than Mixed-Use City Center, there is still high demand for public open space.

People can walk to many everyday destinations in Mixed-Use Traditional Neighborhood and transit access is very high, similar to Mixed-Use City Center. TODs are also found in Mixed-Use Traditional Neighborhood. There are major employment centers as well.

- *Small Lot Traditional Neighborhood*

Small Lot Traditional Neighborhood is found within and at the edges of cities and villages throughout the Region. These areas typically include a mix of housing types such as homes with small lots (less than a quarter-acre in size) and apartments and condominiums. Small Lot Traditional Neighborhood also includes a mix of stores, services, and offices. The small yards and mix of building types means new development can be served efficiently with public sewer and water. Development can also be served efficiently by public transit. Major employment centers may be found in Small Lot Traditional Neighborhood adjacent to highways. TODs may also be found in Small Lot Traditional Neighborhood. Small Lot Traditional Neighborhood is not as dense as Mixed-Use City Center or Mixed-Use Traditional Neighborhood; however, people can still walk to many destinations from their homes.



Small Lot Traditional Neighborhood showing lots of about 7,000 square feet

- *Medium Lot Neighborhood*

Medium Lot Neighborhood is typically found at the edges of cities and villages throughout the Region. These areas primarily include homes on lots of a quarter-acre to just under a half-acre in size. There may also be a mix of buildings with apartments and condominiums. Stores and services may be found in Medium Lot Neighborhood, with major employment centers along highways. People may be able to walk to some destinations such as parks and schools. It may be more difficult to walk to stores and services.



Medium Lot Neighborhood showing lots of about 15,000 square feet

Medium Lot Neighborhood is served by public sewer and water. Serving these areas with public transit is possible, but may not be as efficient as higher density areas. TODs are not generally located in Medium Lot Neighborhood, with the exception of commuter rail station areas.

- *Large Lot Neighborhood*

Large Lot Neighborhood may be found at the edges of cities and villages, where it is served by public sewer and water, but may also be found outside of cities and villages with private onsite wastewater treatment and wells. Residential development largely includes homes on lots of a half-acre to an acre in size. Productive agricultural land may be consumed because of the lower density and somewhat scattered development pattern. Large Lot Neighborhood



Large Lot Neighborhood showing lots of about 1/2 acre

cannot be efficiently served by public transit, and there would be no TOD. People would find it difficult to walk to destinations such as stores, parks, and schools from their homes.

- *Large Lot Exurban*

Large Lot Exurban is typically found outside of cities and villages with private onsite wastewater treatment and wells, where it may consume productive agricultural land. Large Lot Exurban typically includes homes on lots of 1.5 acres to five acres in size. There are no TODs and public transit cannot efficiently serve Large Lot Exurban. It is difficult for people to walk from their homes to destinations such as stores, parks, and schools.



Large Lot Exurban showing lots of about 1.5 acres

- *Rural Estate*

Rural Estate includes homes found outside of cities and villages with private onsite wastewater treatment and wells. Cluster subdivision design can be used to accommodate a limited amount of rural estate development while retaining “rural character” and reducing consumption of productive agricultural land. Cluster subdivision designs generally involve locating homes on smaller lots in clusters to preserve open space with significant natural features or productive farmland, resulting in an overall density of one home per five acres.



Rural Estate showing one-acre lots using cluster subdivision design

- *Agricultural Land*

Agricultural Land includes land identified for farmland preservation in adopted county farmland preservation plans. Agricultural Land also includes land outside of preservation areas that is covered by National Resource Conservation Service (NRCS) Class I and II soils that are suitable for a wide range of crops, otherwise known as prime agricultural land. Other lands that are farmed and not developed with other uses are included in Agricultural Land. The soils covering these lands may be suitable for a smaller range of crops and require more extensive conservation practices than Class I and II soils.

- *Primary Environmental Corridor*

Primary Environmental Corridor (PEC) includes the most important elements of the Region's natural resource base, such as woodlands, wetlands, prairies, wildlife habitat, and surface waters and related shorelands and floodplains. PEC may also include elements such as park and open space sites, scenic views, natural areas, and critical species habitat sites. The elements found in PEC often occur in linear patterns along major stream valleys, the Lake Michigan shoreline, around major inland lakes, and the Kettle Moraine.

Secondary environmental corridors also contain a variety of resource elements, often remnant resources from primary corridors that were developed for urban or agricultural uses. Secondary corridors are smaller than primary corridors and often connect to primary corridors. Isolated natural resource areas contain natural resource elements that have been separated from the environmental corridors. Secondary corridors and isolated natural resources areas are generally not considered of regional significance and consequently are not shown on the existing and planned land use maps. However, such resources may be important at the local level and should be considered for preservation by local government in the development of local comprehensive plans.

Map III-2 shows the existing development pattern of the Region using the alternative plan land use categories.

Alternative Regional Development Patterns

Maps and tables in this section present new household and job allocations, total planned households and employment, and alternative planned land uses for the Trend and Alternative Plans I and II.³ Household and employment allocations are presented in Tables III-2 and III-3, and shown on Maps III-4 through III-9. Total existing and planned population, households, and employment are presented in Tables III-4 through III-6. Existing and planned land uses by alternative plan land use category are summarized in Table III-7. Incremental households and jobs allocated to the alternative plan land uses categories are presented in Table III-8. In addition, residential structure type data is presented in Table III-9 and allocations to areas with fixed-guideway transit stations are presented in Table III-10.

³ *Several of the tables in this section present data using 44 planning analysis areas (PAA). PAAs were identified to facilitate the data collection and analysis necessary to develop and evaluate the Trend and Alternative Plans. The factors used in determining PAAs include municipal boundaries and census tracts, existing and potential public sewer and water service areas, existing and potential areas served by public transit, travel patterns centered on major commercial and industrial land use concentrations, school district boundaries, soil types, and natural and manmade barriers such as environmental corridors and major transportation corridors. Map III-3 shows the PAAs in relation to counties and communities in the Region.*

Trend

A significant amount of new development under the Trend is at the edges of existing cities and villages. The character of this development is typically a continuation of the adjacent existing development, although the homes and yards may become larger and it may become more difficult for residents to walk to destinations such as businesses, parks, and schools. It also becomes less cost effective to serve new development with public sewer, water, and transit. Businesses located in some of these areas may be difficult to reach by public transit.

Some new development also occurs as infill and redevelopment in existing cities and villages. The infill development and redevelopment can be reached easily by public services and it is easier to walk to different types of destinations. There is less infill and redevelopment under the Trend than either Alternative Plan I or II.

Additional development includes some new homes located outside of cities and villages on larger lots that cannot be reached by public sewer, water, or transit services. Residents of these homes cannot typically walk to other destinations. Some of these homes may be developed at a very low overall density, but clustered on smaller lots. Cluster subdivision design allows for the preservation of rural character and more productive farmland as compared to traditional subdivision design. There is significantly more of this type of large lot or cluster subdivision development under the Trend than Alternatives I and II.

New development under the Trend is accommodated in the following alternative plan land use categories:

- Mixed-Use City Center (5.5 percent of new households, 5.5 percent of new jobs)
- Mixed-Use Traditional Neighborhood (17.7 percent of new households, 22.6 percent of new jobs)
- Small Lot Traditional Neighborhood (7.4 percent of new households, 10.1 percent of new jobs)
- Medium Lot Neighborhood (48.1 percent of new households, 45.1 percent of new jobs)
- Large Lot Neighborhood (4.4 percent of new households, 15.2 percent of new jobs)
- Large Lot Exurban (2.5 percent of new households, 1.4 percent of new jobs)
- Rural Estate (14.4 percent of new households, 0.1 percent of new jobs)

Alternative Plan I

Infill development and redevelopment in existing cities and villages is the focus of Alternative Plan I. Much of the new infill development/redevelopment would be similar in character to existing adjacent development; however, some new development would occur in areas surrounding fixed-guideway transit stations proposed under the Transportation Component of Alternative I. It is widely accepted that fixed-guideway transit service can have a greater impact on land use and economic development than bus service in mixed traffic. Investment in residential, retail, and office development has been linked to investment in higher levels of transit service. Local bus service over existing streets and highways does not provide a long-term commitment, and therefore, is less likely to result in investment in development and redevelopment near bus stops.

Development in the transit station areas of Alternative I is typically denser than existing development, and denser than the development in comparable locations under the Trend. In addition, station area development may occur in the form of TODs (examples are presented in Figure III-4). More households and jobs were allocated to Milwaukee County under Alternative I than the Trend to meet the anticipated demand for housing and employment in fixed-guideway station areas.

Some new development also occurs at the edges of cities and villages throughout the Region. New homes in these areas would have smaller lots than those in comparable locations under the Trend. There may also be a greater mix of apartments and condominiums than under the Trend. These areas are efficiently served by public sewer and water, and businesses can be reached by public transit in service areas. In addition, the compact development pattern of Alternative I consumes less farmland than the Trend development pattern.

New development under Alternative I is accommodated in the following alternative plan land use categories:

- Mixed-Use City Center (8.4 percent of new households, 9.2 percent of new jobs)
- Mixed-Use Traditional Neighborhood (28.1 percent of new households, 30.7 percent of new jobs)
- Small Lot Traditional Neighborhood (51.1 percent of new households, 39.6 percent of new jobs)
- Medium Lot Neighborhood (4.3 percent of new households, 11.7 percent of new jobs)
- Large Lot Neighborhood (2.5 percent of new households, 8.0 percent of new jobs)
- Large Lot Exurban (0.8 percent of new households, 0.8 percent of new jobs)
- Rural Estate (4.7 percent of new households, 0.03 percent of new jobs)

Alternative Plan II

The development pattern of Alternative Plan II is similar to Alternative Plan I with one area of departure. There will be more fixed-guideway transit lines and stations under the Transportation Component of Alternative II, particularly in Milwaukee County. The increase in stations and accessibility to more destinations on the fixed-guideway network are anticipated to increase housing and employment demand in Milwaukee County, which required an additional increase in the allocation of households and jobs to Milwaukee County.

New development would occur in the same alternative plan land use categories as under Alternative I, with more development occurring in Mixed-Use City Center and Mixed-Use Traditional Neighborhood:

- Mixed-Use City Center (10.9 percent of new households, 11.4 percent of new jobs)
- Mixed-Use Traditional Neighborhood (32.7 percent of new households, 33.0 percent of new jobs)
- Small Lot Traditional Neighborhood (46.0 percent of new households, 36.3 percent of new jobs)
- Medium Lot Neighborhood (3.7 percent of new households, 11.5 percent of new jobs)
- Large Lot Neighborhood (2.3 percent of new households, 7.0 percent of new jobs)

- Large Lot Exurban (0.7 percent of new households, 0.8 percent of new jobs)
- Rural Estate (3.6 percent of new households, 0.01 percent of new jobs)

Alternative Plans – Transportation Component

The transportation systems under the Trend and Alternative Plans I and II are associated with each alternative land use development pattern described previously in the chapter. The following section provides a description of those transportation systems and how they differ between the alternatives and the Region’s existing transportation system.

Transportation System Definitions

The transportation systems in the Trend and Alternative Plans I and II are comprised of different types and levels of transportation investment. The following transportation system definitions are useful in understanding these differences.

- *Local transit*
Local transit consists of lower-speed routes with closely spaced stops, primarily with buses operating over arterial and collector streets and in mixed traffic. Local transit could also be provided on a fixed-route basis by streetcar, or on a demand-responsive basis by automobiles or vans (e.g. shared-ride taxi). Stops are typically spaced about one-eighth mile to one-quarter mile apart. Frequencies vary significantly, typically ranging from every 5 to 60 minutes in weekday peak travel periods and every 10 to 120 minutes in weekday off-peak periods and on weekends.
- *Express transit*
Express transit consists of limited-stop, higher-speed routes, with buses operating in mixed traffic or in reserved street lanes. Stops are typically spaced about one-half mile to one mile apart, with one-quarter mile spacing in the central business district. Frequencies are typically every 10 minutes in weekday peak travel periods and every 15 to 30 minutes in weekday off-peak periods and on weekends.
- *Rapid transit*
Rapid transit consists of either bus rapid transit (BRT) or light rail transit lines, operating in a fixed-guideway corridor. Stations for both BRT and light rail are typically spaced about one-half to one mile apart, with closer spacing in the central business district. Rapid transit would operate in the median of a roadway or in transit-only lanes in the center of the roadway, similar to light rail service in Minneapolis or bus rapid transit in Cleveland (as shown in Figure III-5). No matter the technology chosen, rapid transit includes signal priority or preemption at traffic signals and stations with level-boarding and passenger

amenities. Frequencies are typically every 8 to 12 minutes in weekday peak travel periods and every 10 to 15 minutes in weekday off-peak periods and on weekends.

- *Commuter transit*

Commuter transit consists of longer-distance routes or lines, with either buses operating on freeways or rail vehicles operating in a rail corridor (i.e. commuter rail). Stops or stations are typically spaced about three to five miles apart. Frequencies are typically every 10 to 30 minutes in weekday peak travel periods and every 30 to 60 minutes in weekday off-peak periods and on weekends.

- *Fixed-guideway transit*

Fixed-guideway transit refers to either rapid transit (BRT or light rail) or commuter rail. For BRT and light rail, the fixed guideway would typically be the median of a roadway or a dedicated lane. For commuter rail, the fixed guideway would be a rail corridor, most likely an existing freight rail corridor.

- *On-street bicycle facility*

On-street bicycle facilities include accommodations for bicycles that are provided on arterial streets and highways. On-street facilities include enhanced bicycle facilities (defined below), bicycle lanes, paved shoulders, widened outside travel lanes, and separate paths within a roadway's right-of-way.

- *Off-street bicycle path*

Off-street bicycle paths are separate from motor vehicle traffic and are typically developed within former railway rights-of-way and parkway corridors—rather than within a roadway's right-of-way. They are mostly intended for seasonal use.

- *Enhanced bicycle facility*

Enhanced bicycle facilities are on-street bicycle facilities that go beyond the standard bicycle lane, paved shoulder, or widened outside travel lane. Enhanced bicycle facilities are meant to improve safety, define bicycle space on roadways, and provide clear corridors for bicycle usage. Examples of enhanced bicycle facilities include the protected bicycle lane (also referred to as a cycle track or separated bicycle lane), which provides separation between bicyclists and the travel and/or parking lane via a physical barrier; the buffered bicycle lane, which provides a similar separation via a buffer space; and the raised bicycle lane, which is vertically separated from traffic. Figure III-6 presents some examples of enhanced bicycles facilities.

- *Arterial street/highway*

Arterial streets are defined as streets and highways that are principally intended to provide a high degree of travel mobility, serving the through movement of traffic and providing transportation service between major subareas of an urban area or through the area. Together, the arterial streets should form an integrated, areawide system. Access to abutting property may be a secondary function of some types of arterial streets and highways, but it should always be subordinate to the primary function of traffic movement. Arterials are typically spaced about one-half mile apart in Mixed-Use City Center and Mixed-Use Traditional Neighborhood areas, one mile in Small Lot Traditional Neighborhood and Medium Lot Neighborhood areas, two miles in Large Lot Neighborhood, and more than two miles in Large Lot Exurban and Rural Estate areas.

- *Standard arterial street*

Standard arterial streets and highways are arterials with primarily at-grade intersections and may as well provide direct access to abutting property through driveways.

- *Freeway*

A freeway is a special type of arterial—the highest type of arterial—providing the highest degree of mobility and the most limited degree of access. A freeway is defined as a divided arterial highway with full control of access and grade separations (over- and under-passes) at all interchanges.

Alternative Transportation Systems

The transportation system for each alternative is associated with the alternative's land development pattern, described previously in the chapter. Maps and tables in this section present the existing transportation system and the different transportation elements included in the Trend and Alternative Plans I and II. The existing public transit system is shown on Map III-10 and the alternative public transit systems shown on Maps III-11 through III-13. A comparison of the amount of service provided by the existing and alternative public transit systems is presented in Table III-11, while the span of service hours and frequencies are presented in Tables III-12 and III-13, respectively. The existing bicycle and pedestrian network is shown on Map III-14 and the alternative bicycle and pedestrian networks are shown on Maps III-15 and III-16. A comparison of the existing and alternative bicycle and pedestrian networks is presented in Table III-14. Alternative arterial street and highway systems are shown on Maps III-17 through III-19. A comparison of the existing and alternative arterial street and highway systems is presented in Table III-15.

Trend

The Trend is intended to be a baseline against which Alternatives I and II can be compared. The concept for the Trend's transportation system is a continuation of recent trends in transportation investment in the Region. The

Trend's transportation system is to an extent an extrapolation of past events, and as well is based on current and recent past investment levels and priorities, with similar levels and priorities assumed to continue through the year 2050.

The trend in public transit service levels in the Region has been one of significant decline; a loss of nearly 25 percent of service since the early 2000s. Under the Trend, the already reduced transit service levels would be reduced by an additional 22 percent by the year 2050, as shown in Table III-11, Map III-11, and Figure III-7. This further decline is based in part on an extrapolation of service level declines, but primarily is based on consideration of current and expected revenues and current and expected capital, operating, and maintenance costs for the Region's existing transit services. Future decline would particularly affect local bus service, resulting in entire routes being cut, lower service frequencies, reduced service hours, and/or weekend service being eliminated, depending on the transit system. Existing express bus service would be eliminated as well. Passenger fares would increase faster than inflation as transit systems attempt to maintain service levels as high as possible. Existing shared-ride taxi services would continue to operate, but no new shared-ride taxi services would be established.

The trend in providing bicycle and pedestrian facilities has been greatly affected by Federal and State requirements that bicycle and pedestrian accommodations be provided in all new highway construction and reconstruction projects funded with State or Federal funds, unless demonstrated to be prohibitive. While the impact of recent changes to State requirements is currently unknown, these changes will not affect Federally funded projects and it is anticipated that significant expansion of on-street accommodations will continue. Several municipal and county bicycle plans have also been completed in recent years, which have helped to implement both on- and off-street bicycle facilities. Substantial progress has been made to expand the off-street network through construction of additional paths, which is anticipated to continue. As shown in Table III-14 and on Map III-15, the Trend assumes recent trends in bicycle and pedestrian facility construction will continue to the year 2050, so the Trend does not differ substantially from Alternatives I and II in this regard. However, the Trend only assumes bicycle accommodations are provided through basic on-street bicycle facilities on the standard arterial street and highway system, including bicycle lanes, wider outside travel lanes, paved shoulders, and separate paths within the roadway right-of-way. Alternatives I and II, as will be described on the following pages, will include corridors of enhanced bicycle facilities that go beyond these standard accommodations. Under all alternatives, pedestrian facilities are envisioned to be designed and constructed consistent with Americans with Disabilities Act (ADA) requirements, thus accommodating people with disabilities. For the Trend, however, the connectivity of sidewalks is less than under Alternatives I and II due to a development pattern that generally includes lower densities and additional larger homes with larger yards.

The trend in developing the arterial street and highway system has involved segment-by-segment reconstruction of the freeway system, with traffic lanes added on congested arterial street and highway facilities and some new facilities constructed. This would continue under the Trend, with necessary reconstruction occurring to modernize streets and highways to achieve current safety and design standards, and additional traffic lanes and new facilities added to address congestion. The highway capacity additions to address projected congestion under the Trend are shown in Table III-15 and Map III-17.

Alternative Plan I

Alternative Plan I's transportation system represents a measured departure from the Trend. Alternative I includes a significant increase in transit service and enhanced bicycle facilities. Additional traffic lanes and new arterial street and highway facilities are also added to address residual traffic congestion.

Transit service would be significantly expanded, as shown in Table III-11, Map III-12 and Figure III-7, reversing the recent decline in transit service levels and introducing fixed-guideway transit in a few major travel corridors. Transit service improvements include an expansion of the service area and frequency of local bus routes, more express and commuter bus routes, and increased frequency on existing express and commuter bus routes. A shared-ride taxi would be provided in the remainder of the Region where local bus service would not be available. One commuter rail corridor and three rapid transit corridors are included in this alternative.

Bicycle facilities would be significantly improved, as shown in Table III-14 and Map III-16. The improvements include the same off-street path network expansion as the Trend, and on-street bicycle accommodations on the standard arterial street and highway system as it is reconstructed. However, the on-street bicycle accommodations in Alternative I, like Alternative II, include enhanced bicycle facilities. Enhanced bicycle facilities are intended to increase the safety and comfort of bicyclists by creating either physical separation between bicyclists and vehicles or improving the visibility of the bicycle facility. Map III-16 shows these facilities within corridors of regional significance, or arterial corridors that extend through two or more communities or provide connections between off-street facilities. The actual facility could be located on the standard arterial street within the corridor or, if this would be impractical on the arterial, neighborhood greenways (i.e. "bike boulevards") could be implemented on parallel non-arterial streets within about two blocks of the arterial. Standard bicycle facilities—bicycle lanes, wider outside travel lanes, paved shoulders—would then be provided as other arterials are reconstructed. Pedestrian facilities, as under the Trend, would be ADA-compliant. For Alternative I, however, the connectivity of sidewalks is improved due to a focus on a more compact development pattern, with limited lower density development and the introduction of more walkable TOD development around fixed-guideway transit stations.

Segment-by-segment reconstruction of the freeway system would continue under Alternative I, as it would under the Trend, with reconstruction of all arterial streets and highways including modernization to achieve current

safety and design standards. Like the Trend, highway capacity additions, shown in Table III-15 and Map III-18, would be implemented only to address the residual traffic congestion that may not be alleviated by other measures. In developing Alternative I, anticipated traffic congestion on the arterial network without any additional traffic lanes or new arterial facilities was first considered. Additional traffic lanes and some new arterial facilities were then added to mitigate traffic congestion that would not be alleviated by public transit. In the evaluation presented later in the chapter, the arterial element of Alternative I includes capacity expansions, but a secondary evaluation without any expansions beyond those committed is also presented.

Alternative Plan II

The transportation system envisioned under Alternative Plan II represents an even more substantial departure from the Trend than Alternative I. Similar to Alternative I, Alternative II includes a significant increase in transit service, essentially the same bicycle improvements, and is also evaluated both with and without additional traffic lanes and new arterial street and highway facilities. However, Alternative II includes more fixed-guideway transit and highway capacity expansions are limited to the rural and low-density suburban areas not served by fixed-guideway transit lines.

The significant transit service expansion is shown in Table III-11, Map III-13, and Figure III-7. In addition to significant expansion of local bus service, Alternative II includes a significant investment in fixed-guideway transit corridors, including commuter rail and rapid transit. Two commuter rail corridors and ten rapid transit corridors are included. The service area and frequency of local bus routes would be expanded and key corridors without a fixed-guideway investment would see high-frequency express or commuter bus routes. Shared-ride taxi would be provided in the remainder of the Region where local bus service would not be available.

The bicycle facilities under Alternative II, as shown in Table III-14 and Map III-16, would essentially be the same as Alternative I. The improvements include the same off-street path network expansion as the Trend, enhanced bicycle facilities in regional corridors, and standard on-street bicycle accommodations on the other standard arterial streets and highways as they are reconstructed. Pedestrian facilities would also be the same in terms of being ADA-compliant, but Alternative II would have even higher sidewalk connectivity due to extensive TOD development around fixed-guideway transit stations.

Segment-by-segment reconstruction of the freeway system would continue under Alternative II, as it would under the Trend and Alternative I, with reconstruction of all arterial streets and highways including modernization to achieve current safety and design standards. Like the Trend and Alternative I, Alternative II also includes additional traffic lanes and some new arterial street and highway facilities, as shown in Table III-15 and Map III-19, with the capacity additions included to mitigate increases in traffic congestion, which would not be alleviated by public transit. Unlike the Trend and Alternative I, highway capacity improvements under Alternative II would

primarily be limited to the rural and low-density suburban areas not served by the fixed-guideway transit investments included as part of this alternative. This results in fewer capacity additions envisioned under Alternative II compared to Alternative I and the Trend. Like Alternative I, in the evaluation presented later in the chapter, the arterial element of Alternative II includes capacity expansions, but a secondary evaluation without any expansions beyond those committed is also presented.

PART II: EVALUATION OF ALTERNATIVES

The added level of detail included in the alternatives, compared to the more conceptual sketch scenarios from the previous step in the VISION 2050 process (described in Chapter II of this volume), allows a more thorough evaluation using a larger set of criteria than were used to evaluate the sketch scenarios. This evaluation is summarized below, along with the VISION 2050 plan objectives and a series of evaluation criteria. The full evaluation is detailed in Appendix F to this volume.

Plan Objectives and Criteria for Evaluating Alternatives

An important part of any planning effort is formulating objectives to pursue through the implementation of plan recommendations. The plan objectives for VISION 2050 are specific goals, or ends, that guided the preparation and evaluation of the alternatives, and would be the desired outcome of the VISION 2050 recommendations presented in Volume III of this report. The objectives are organized into four important themes for VISION 2050, and no priority is implied by the order of the plan objectives. Associated with each objective are criteria used to evaluate the alternatives. The associated criteria measure the extent to which each alternative meets each objective. The objectives and criteria were developed by staff with guidance from the Commission's Advisory Committees on Regional Land Use Planning and Regional Transportation System Planning, and its Environmental Justice Task Force. The objectives and evaluation criteria are listed below, and descriptions of the criteria are presented in Table III-16.

Healthy Communities Objectives and Criteria

The following objectives and their associated criteria revolve around creating healthy communities within our Region, with active transportation options and environmental preservation serving as cornerstones of this theme.

- **Objective 1.1:** Vibrant, walkable neighborhoods that contribute to the Region's distinct character.
 - **Criterion 1.1.1:** Number of people living in walkable areas
 - **Criterion 1.1.2:** Population density
 - **Criterion 1.1.3:** Employment density
- **Objective 1.2:** Active transportation options that encourage healthy lifestyles.
 - **Criterion 1.2.1:** Bicycle level of service
 - **Criterion 1.2.2:** Bicycle network connectivity

- **Criterion 1.2.3:** Benefits and impacts to public health
- **Objective 1.3:** Compact urban development and limited rural development that maximize open space and productive agricultural land.
 - **Criterion 1.3.1:** Remaining farmland and undeveloped land
 - **Criterion 1.3.2:** Impacts to natural resource areas
- **Objective 1.4:** Environmentally-sustainable development and transportation that minimize the use of nonrenewable resources and adverse impacts on the Region’s natural environment, including biodiversity, air, and water.
 - **Criterion 1.4.1:** Preservation of areas with high groundwater recharge potential
 - **Criterion 1.4.2:** Impervious surface
 - **Criterion 1.4.3:** Energy use
 - **Criterion 1.4.4:** Greenhouse gas emissions and other air pollutants
 - **Criterion 1.4.5:** Impacts to water resources and water quality
 - **Criterion 1.4.6:** Ability to address issues related to climate change
 - **Criterion 1.4.7:** Overall environmental sustainability
- **Objective 1.5:** A transportation system that minimizes disruption of neighborhood and community development, including adverse effects on the property tax base.
 - **Criterion 1.5.1:** Homes, businesses, land, and parkland acquired
- **Objective 1.6:** Safe and secure travel environments that minimize loss of life, injury, and property damage.
 - **Criterion 1.6.1:** Crashes by mode

Equitable Access Objectives and Criteria

The objectives and criteria under this theme focus on providing access to opportunity for all of the Region’s residents.

- **Objective 2.1:** Benefits and impacts of investments in the Region’s transportation system should be shared fairly and equitably and serve to reduce disparities between white and minority populations.
 - **Criterion 2.1.1:** Level of accessibility to jobs and activity centers for minority and low-income populations by mode
 - **Criterion 2.1.2:** Minority and low-income populations served by transit
 - **Criterion 2.1.3:** Transit service quality for minority and low-income populations
 - **Criterion 2.1.4:** Minority and low-income populations benefited and impacted by new and widened arterial street and highway facilities
 - **Criterion 2.1.5:** Transportation-related air pollution impacts on minority and low-income populations

- **Objective 2.2:** Affordable transportation and housing that meet the needs and preferences of current and future generations.
 - **Criterion 2.2.1:** Households with affordable housing + transportation costs
 - **Criterion 2.2.2:** Ability to accommodate demographic shifts
- **Objective 2.3:** Reduce job-worker mismatch.
 - **Criterion 2.3.1:** Areas with a job-worker mismatch

Costs and Financial Sustainability Objectives and Criteria

The following objectives and criteria take into account the need to make wise investment decisions that consider all the direct and indirect costs of developing the Region’s land and transportation system.

- **Objective 3.1:** A land development pattern and transportation system that support economic growth and a globally-competitive economy.
 - **Criterion 3.1.1:** Impact of the distribution of growth on property values
 - **Criterion 3.1.2:** Return on investment
 - **Criterion 3.1.3:** Ability to connect to nearby metro areas and leverage the value of those areas
 - **Criterion 3.1.4:** Potential for attracting residents and businesses
- **Objective 3.2:** A financially-sustainable transportation system that minimizes life-cycle capital and operating transportation costs.
 - **Criterion 3.2.1:** Average annual transportation system investment
- **Objective 3.3:** Transportation options that minimize private transportation costs.
 - **Criterion 3.3.1:** Private transportation costs per capita
 - **Criterion 3.3.2:** Per household cost of delay
 - **Criterion 3.3.3:** Resilience in adapting to changing fuel prices
- **Objective 3.4:** Urban development that can be efficiently served by transportation, utilities, and public facilities.
 - **Criterion 3.4.1:** Supportive infrastructure costs

Mobility Objectives and Criteria

The objectives and criteria under this theme are aimed at achieving a multimodal transportation system that serves the mobility needs of all of the Region’s residents and provides access to important places and services.

- **Objective 4.1:** A balanced, integrated, well-connected transportation system that provides choices among transportation modes.
 - **Criterion 4.1.1:** Trips per day by mode
 - **Criterion 4.1.2:** Vehicle-miles of travel
 - **Criterion 4.1.3:** Impacts of technology changes

- **Objective 4.2:** Reliable, efficient, and universal access to employment centers, educational opportunities, services, and other important places.
 - **Criterion 4.2.1:** Travel time to important places by mode
 - **Criterion 4.2.2:** Access to park-ride facilities
- **Objective 4.3:** Well-maintained transportation infrastructure.
 - **Criterion 4.3.1:** Pavement condition
 - **Criterion 4.3.2:** Transit fleet condition
- **Objective 4.4:** An acceptable level of service on the transportation system.
 - **Criterion 4.4.1:** Congestion on arterial streets and highways
 - **Criterion 4.4.2:** Travel time delay
 - **Criterion 4.4.3:** Average trip times
- **Objective 4.5:** Fast, frequent, and reliable public transit services that maximize the people and jobs served.
 - **Criterion 4.5.1:** Access to transit
 - **Criterion 4.5.2:** Access to fixed-guideway transit
 - **Criterion 4.5.3:** Transit service quality
- **Objective 4.6:** Convenient, efficient, and reliable movement of goods and people.
 - **Criterion 4.6.1:** Transportation reliability
 - **Criterion 4.6.2:** Congestion on the regional freight network
 - **Criterion 4.6.3:** Impacts to freight traffic

Summary of Evaluation Results

Using the criteria above, the Commission staff thoroughly evaluated the alternatives based on their respective abilities to achieve each of the plan objectives. The evaluation also includes a secondary evaluation for select criteria of Alternatives I and II without highway expansions beyond committed projects and freeway modernization.⁴ The evaluation results below are organized into the four themes for VISION 2050 and describe the primary findings of the evaluation. These findings were provided to all participants at the fourth round of workshops, and through the online tool that allowed residents to compare the alternatives and their evaluation. The feedback from the workshops and online tool is described in the next section of this chapter, and was considered in preparing the preliminary recommended plan presented in Chapter IV of this volume. The detailed evaluation results can be found in Appendix F to this volume.

⁴ *The Trend was not evaluated without highway expansion because it is intended to represent a projection of recent transportation system development trends.*

Healthy Communities Evaluation

The potential health of the Region's communities was evaluated based on the degree that the Region's development pattern and transportation options would impact public health and preserve the Region's natural resource base.

Connectivity and Access

Connectivity and access are two critical components to the VISION 2050 alternatives that impact public health. A well connected infrastructure, with bike lanes, off-street paths, and sidewalks, encourages active transportation through biking and walking. Access allows residents to reach various destinations such as parks, schools, retail services, and employment. Increasing the number of destinations one can access by a short walk, bike ride, or public transit trip increases the likelihood that people will incorporate active travel modes into their daily routine, thereby increasing their physical activity. It also increases employment and shopping opportunities for people without personal vehicles, which may result in improved access to healthy foods and ability to afford housing in good condition.

Alternative Plans I and II provide greater connectivity and access to important destinations than the Trend. They include a more compact development pattern, a greater mix of land uses, and a greater variety of transportation and housing options than the Trend. Almost 88 percent of new residential development under Alternative I and almost 90 percent of new residential development under Alternative II would be in walkable, mixed-use neighborhoods that can support high quality public transit, compared to about 31 percent of new residential development under the Trend. As a result, Alternative II would be expected to perform the best, and the Trend would perform the worst, with respect to public health-related evaluation criteria.

Impacts on the Natural Resource Base

The compact development patterns of Alternative Plans I and II would result in less impact on the Region's natural resources, including water resources and air quality, than the Trend. All three of the alternatives perform well with respect to their impact on natural resource areas because incremental households and employment were not allocated to areas with significant natural resources. Alternatives I and II do perform better with respect to their impact on agricultural lands. More than twice as much agricultural land would be converted to urban uses under the Trend (77 square miles) than under Alternative I (32 square miles) or under Alternative II (26 square miles). Potential impacts on natural and agricultural resource areas directly related to the transportation component of the alternatives would also be greater under the Trend than Alternatives I and II due to the greater number of miles of arterial capacity expansion envisioned under the Trend.

Similar to their impact on natural and agricultural resource areas, the compact development patterns of Alternatives I and II would result in greater protection of surface water and groundwater resources than the Trend.

There would be less land converted to urban uses under Alternatives I and II than the Trend, resulting in reduced potential for flooding and greater protection of areas with high groundwater recharge potential. In addition, air pollution emissions from transportation sources, which would fall significantly by the year 2050 regardless of the alternatives due to current Federal fuel and fuel economy standards, would be about 1 to 2 percent lower under Alternatives I and II than the Trend because they encourage walking, biking, and public transit. Emissions would also be reduced under Alternatives I and II because there would be more multifamily housing than under the Trend, which is more energy efficient than single-family housing. About 25 percent of new housing units would be multifamily under the Trend, compared to 39 percent under Alternative I and 46 percent under Alternative II.

The Region would also be better equipped to adapt to climate change under Alternatives I and II than the Trend. The Wisconsin Initiative on Climate Change Impacts (WICCI) has examined potential adaptation strategies for addressing the effects of climate change in the State. Strategies that could be implemented at a regional level involve preserving natural areas, preserving areas with high groundwater recharge potential, minimizing impervious surfaces, and reducing greenhouse gases and other air pollutants. Alternative II would provide somewhat more support for strategies to adapt to climate change than Alternative I. The Trend would provide the least support for these strategies.

Equitable Access Evaluation

VISION 2050 analyses have demonstrated that significant disparities exist between whites and minorities in the Region, particularly in the Milwaukee metropolitan area, and that these disparities are far more pronounced than the disparities in almost all other large metropolitan areas. The alternatives were evaluated based on the degree to which their benefits and impacts would be shared fairly and equitably and serve to reduce disparities between white and minority populations.

Accessibility

One of the primary factors to evaluate the equitability of the alternatives is how well they improve the ability of minority and low-income populations to reach jobs and other important destinations, such as retail centers, major parks, public technical colleges/universities, health care facilities, grocery stores, and other major destinations.

The automobile is the dominant mode of travel in the Region for all population groups. Minority populations use the automobile for 81 to 88 percent of their travel to and from work in Milwaukee County (depending on race and ethnicity), compared to 88 percent of the white population. Similarly, in Milwaukee County about 70 percent of travel by low-income populations to and from work is by automobile, which compares to 89 percent for populations of higher income. Thus, improvements in accessibility by automobile to jobs and other activities would likely benefit a significant portion of minority and low-income populations. The Region would generally be able to maintain existing accessibility via automobile if improvements are made to the arterial street and

highway system under all of the alternatives, but would see a decline in access to jobs and other important destinations using automobiles if no capacity expansions are implemented on the Region's arterial street and highway system under Alternatives I and II. This would be experienced by all population groups, including whites, minorities, and families in poverty.

Although most minority residents use automobiles for their travel, minority residents use public transit (4 to 13 percent in Milwaukee County) at a higher proportion relative to other modes of travel than white residents (3 percent in Milwaukee County). For these individuals, the vast majority of whom are from households with income levels below the poverty threshold, it is essential that they be able to reach jobs and other destinations using public transit. About 734,000 jobs, or about 62 percent of the Region's total jobs, are currently accessible by transit. While the number of jobs accessible by transit would increase to 727,000 under the Trend, it would only be 52 percent of the total jobs in the Region in 2050. This is a result of a 22 percent decrease in transit service from current levels by 2050. Transit service levels would be significantly expanded under Alternative I, resulting in the number of jobs accessible by transit increasing to 967,000, or 70 percent of total jobs in the Region. Alternative II would provide transit accessibility to 1,020,000 jobs, or 74 percent of the total jobs in the Region. Increased accessibility to other important destinations would also occur under Alternatives I and II. Therefore, the substantial increases in transit accessibility under Alternatives I and II provide significant benefits to minority and low-income people, particularly those who may not be able to afford a car and rely on public transit to access jobs and other destinations.

Benefits and Impacts of New and Widened Arterial Street and Highway Facilities

Another factor considered in evaluating the equitability of the alternatives was whether minority and low-income populations in the Region would receive a disproportionate share of the impacts—both cost and benefits—of new and widened arterial street and highway facilities. With respect to surface arterials, the areas that would have the greatest use of these proposed improved arterials are largely adjacent, or near, the proposed new or widened surface arterials. The proposed new and widened surface arterials are largely located outside of areas of minority and low-income populations. With respect to freeways, the segments of freeway proposed to be widened under the alternatives would directly serve areas of minority and low-income population, particularly in Milwaukee County. As a result, it is expected that minority and low-income populations, particularly those residing adjacent to the freeway widenings, would be utilizing and experiencing benefit from the expected improvement in accessibility associated with the proposed widenings. Therefore, benefits from improvements to the arterial street and highway system, such as increased accessibility, reduced congestion, and increased safety, would benefit the majority of minority and low-income residents of the Region.

The locations of highway capacity improvements and freeway widenings in relation to minority and low-income populations were analyzed to evaluate impacts on minority and low-income populations. In general, no area of the

Region, or minority or low-income community, would be expected to disproportionately bear the impact of highway capacity improvements. While some freeway segments, including those proposed to be widened, are located adjacent to minority populations, a vast majority of the freeway system and future widenings under the alternatives are not located adjacent to concentrations of minority and low-income populations. In comparing the alternatives (with freeway widenings under Alternatives I and II), Alternative II would have fewer minorities and families in poverty residing within one-half mile of proposed freeway widenings (27,000 people and 2,800 families) than the Trend and Alternative I (81,800 people and 7,500 families).

Transportation-related air pollutant impacts on the Region's minority and low-income populations are expected to significantly decline from current levels under all three alternatives due primarily to current and future Federal fuel and vehicle fuel economy standards, even with forecast increases in regional travel. A significant decline in transportation-related air pollutants is expected, ranging from about 15 to 30 percent for carbon dioxide, methane, and ammonia and 65 to 90 percent for all other pollutants including ozone-related pollution. Analyses indicate that about 20 percent of the Region's minority population resides within one-half mile of a freeway, slightly more than the 15 percent of the Region's non-minority population that resides within one-half mile of a freeway. Alternative II would have fewer minorities and families in poverty residing near a freeway widening due to the exclusion of some of the freeway widenings proposed in the Trend and Alternative I.

Demographic Shifts

Forecasts prepared for VISION 2050 anticipate continued change in the demographics of the Region, with the number of residents in the Region age 65 and older projected to double by 2050. Access to community amenities and accessible housing will become increasingly important as the Region's population ages. The compact development patterns of Alternatives I and II will support transit service, walkable neighborhoods, and multifamily housing, most of which are required to include basic accessibility features by Federal and State fair housing laws.

The mixed-use, high-density development found under Alternatives I and II, some of which would be in the form of TODs, may also appeal to the young workers that the Region will need to attract and retain to replenish its workforce. Alternatives I and II would have a better match of workers in proximity to jobs and more areas where the combined cost of housing and transportation would be affordable (45 percent or less of median household income) than the Trend.

Costs and Financial Sustainability Evaluation

The costs of the alternative development patterns and transportation systems were evaluated on largely quantifiable measures, such as the cost of extending infrastructure to new development and investment in the regional transportation system. Other factors that would contribute to the financial sustainability of the Region

were also evaluated, such as the potential to attract residents and businesses to the Region and potential impacts on property values.

Costs

Density, building type, and location affect the cost of extending supportive infrastructure, such as sewer, water, and local roads, to new development (often borne by the developer and passed on to the consumer). Infrastructure can be extended to compact development in a more efficient and cost-effective manner than to lower density development. The cost of extending supportive infrastructure to new development is estimated to be the highest under the Trend at \$6.9 billion because almost 70 percent of new residential development would be in areas with large single-family lots that would have wide frontages and deep setbacks.⁵ This increases the length of sewer and water mains, service laterals, and streets. About 12 percent and 10 percent of new residential development would be in these areas under Alternatives I and II, respectively. Alternative II is estimated to have the lowest supportive infrastructure cost at \$5.0 billion because it includes the most infill and redevelopment of the three alternatives. The cost of extending supportive infrastructure to new development under Alternative I is estimated at \$5.5 billion.

The Trend is less costly than Alternatives I and II when considering annual public investment in the transportation system. Alternative II would require the most public investment of the alternatives at about \$1.2 billion annually because it includes significantly increased investment in transit and bicycle facilities, while still adding arterial street and highway capacity primarily in the rural and suburban parts of the Region. Alternative I would be the second most costly of the alternatives with about \$1.1 billion in annual public investment. The Trend would require the least public investment at about \$808 million annually, which reflects a continuing decline in public transit service. Implementing Alternatives I or II without highway improvements would save about \$45 million in annual public investment.

It is also important to consider the money that residents would spend directly on transportation in addition to measuring public expenditures. These personal expenditures would include the costs of owning and operating a private vehicle and the fares to ride public transportation. The average vehicle in Southeastern Wisconsin costs its owner approximately \$5,500 per year, while an annual transit pass in Southeastern Wisconsin ranges from \$300 to \$1,000 depending on the transit system and whether or not the rider qualifies for discounted fares. Therefore, the availability of convenient transit service can have a significant impact on the amount of money residents of the Region spend on transportation. The combined average annual private transportation cost per capita would be the highest under the Trend at \$3,147 and lowest under Alternative II at \$3,068. The per capita cost under Alternative I would be \$3,091.

⁵ *The cost of installing private onsite wastewater treatment systems and private well for lots outside of urban service areas were included in the supportive infrastructure cost calculations.*

Financial Sustainability

There are many factors that affect where a business decides to locate or expand and where an individual or family decides to make their home. Transportation and housing are the primary attraction factors impacted by the alternatives. Many businesses in particular consider transportation access and housing opportunities as critical location factors, whether that means locating near a freeway interchange or locating in an area with robust transit and housing options available to their employees. Individuals and families also tend to consider how they would commute to work or school, or make trips to stores and restaurants.

Alternative I would perform slightly better in terms of traffic congestion than the Trend and Alternative II because Alternative I includes additional capacity to address congestion on the arterial street and highway system compared to Alternative II and significant improvements in the transit system compared to the Trend. Despite the most significant improvement to transit in Alternative II, congestion would be slightly higher than under Alternative I because highway capacity expansion would primarily be limited to the rural and low-density suburban areas not served by fixed-guideway transit. The additional traffic congestion under the Trend and Alternative II would result in slightly longer travel times. The additional congestion would also result in a higher chance of crashes that would reduce travel time reliability, which is particularly important to businesses that need to ship their goods.

Alternative II would perform the best for people looking to avoid the need to drive, and for businesses looking for robust transit service and housing options for their employees. More people would have access to transit under Alternative II than the Trend or Alternative I, including fixed-guideway transit. Alternative II would also have the most walkable areas, providing prospective residents with the opportunity to walk to many destinations, and the greatest variety of housing options of the alternatives.

Alternative II may also have the greatest impact on property values of the alternatives because of the extensive fixed-guideway transit system and walkable areas. A number of previous studies in metropolitan areas with fixed-guideway transit networks have shown a range of property value increases in station areas, including 2 to 8 percent for condominiums (San Diego), 15 percent for office development (Santa Clara County), and 30 percent for retail development (Dallas). Studies have also found that walkable neighborhoods have a positive impact on residential property values. A study of 15 metropolitan areas found that homes in areas with above average walkscores sell for \$4,000 (Dallas) to \$34,000 (Sacramento) more than comparable homes in areas with average walkscores.

Mobility Evaluation

The ability of residents, visitors, and freight to travel throughout the Region in an efficient manner was evaluated by measuring changes in mode share, transit service quality, congestion, and travel time under each alternative, and assessing the impacts of these changes on the ability of freight to move quickly throughout the Region.

Changes in Travel

As previously stated, the vast majority of personal travel by residents of the Region would continue to be by car in the future—regardless of the alternative. However, the additional transit service and more compact development patterns of Alternatives I and II would significantly increase the number of people that use alternative modes of transportation, with 211,000 transit trips (62 percent more than the Trend) and 597,000 bicycle and pedestrian trips (5 percent more than the Trend) under Alternative II, and 191,000 transit trips (47 percent more than the Trend) and 587,000 bicycle and pedestrian trips (3 percent more than the Trend) under Alternative I.

Despite the increased use of alternative modes of transportation, automobile trips and vehicle miles traveled (VMT) would still increase under Alternatives I and II compared to existing numbers, largely because of the increase in households and population expected by the year 2050. Approximately 6.46 million daily automobile trips (1.7 percent fewer than the Trend) producing 17.3 billion annual VMT by 2050 (3.0 percent fewer than the Trend) are projected under Alternative II. Approximately 6.50 million daily automobile trips (1.2 percent fewer than the Trend) producing 17.4 billion annual VMT by 2050 (2.2 percent fewer than the Trend) are projected under Alternative I. VMT per capita is projected to be approximately 7,600 annually under the Trend, and approximately 7,400 annually under Alternatives I and II. Although automobile trips, VMT, and VMT per capita are higher in 2050 than in 2011 under all three alternatives—with an average annual growth in VMT of 0.6 percent—much of this may be attributable to projected future increases in commercial travel, rather than increases in personal travel by the Region’s residents.

Transit Service

The significant expansion of transit service under Alternatives I and II would result in 60.4 percent of the Region’s residents having access to transit under Alternative II (compared to 44.3 percent under the Trend) and 56.4 percent of the Region’s residents having access to transit under Alternative I. Approximately 73.5 percent of the Region’s jobs would be accessible via transit under Alternative II (compared to 52.4 percent under the Trend), while 69.7 percent would be accessible under Alternative I. Transit access has many proven benefits, including lower employee turnover for businesses served by transit; congestion relief and alternatives in mid- to large-sized metropolitan areas; a decreased likelihood that patients will forgo follow-up healthcare appointments and therefore lowered overall healthcare costs; and decreased household transportation costs caused by allowing residents to live with fewer or no personal automobiles. In addition, about 1 in 10 households in the Region do not

have any cars, and for the residents of those households, access to transit means access to jobs, healthcare, education, retail centers, and recreation.

In addition to greatly increasing access to transit, Alternatives I and II also increase the speed, reliability and frequency of transit services in the Region. This is best shown by comparing the number of jobs accessible within 30 minutes under each alternative, which not only shows employment accessibility, but can be considered a proxy for accessibility to many other activities as well. Under the Trend, only about 2 percent of the Region's residents have access to at least 100,000 jobs in under 30 minutes via transit, mainly those who live in a directly adjacent to downtown Milwaukee. In contrast, Alternative I would provide 8 percent of the Region's residents with access to 100,000 jobs or more in under 30 minutes via transit, and that increases further to 14 percent under Alternative II.

Congestion

Congestion on the arterial street and highway system increases the time it takes for automobiles, buses, and trucks to travel within Southeastern Wisconsin. Compared to other Midwest metro areas and metro areas across the nation, congestion and associated travel time delays in the Region are relatively low, and have increased slower than nearly all other peer metro areas over the last 30 years. Even with relatively low levels of congestion, however, efforts to decrease congestion in the Region would contribute to a range of benefits, including reduced vehicle emissions, reduced travel time delay for personal vehicles and public transit, reduced energy use, improved connectivity to nearby metropolitan areas, and reduced freight shipping travel times and costs.

Due to its combination of a more compact development pattern, improved bicycle facilities, significantly enhanced transit service, and increases in highway capacity to address residual congestion, Alternative I would result in the least congested arterial street and highway system in the Region, with 6.6 percent (242.3 miles) of the system operating over its design capacity (moderate, severe, or extreme congestion) at some point during an average weekday. This congestion level under Alternative I would be about 0.1 percent less than the Trend (244.5 miles) and 0.7 percent less than Alternative II (264.7 miles). Not including highway improvements (except for currently committed highway expansion projects and freeway modernization) under Alternatives I and II would increase the percentage of congested arterial street and highway miles under these alternatives by about 3.5 percent (an additional 119.9 miles) and 3.0 percent (an additional 103.1 miles), respectively.

Travel Time

Due to increased highway capacity under all of the alternatives, travel times by car in 2050 are projected to be about the same as they are currently. However, the more compact development patterns and improved transit services under Alternatives I and II would result in significantly more of the Region's population living within a reasonable travel time by transit to a major activity center or regional destination. As an example, due to the declines in transit service levels expected under the Trend, approximately 60,000 fewer residents (22 percent)

would be within a 30-minute transit trip of a major retail center compared to today, despite a projected increase in the Region's total population of nearly 340,000 (17 percent). Compared to the Trend, Alternative I would provide transit service within 30 minutes of a major retail center to about 460,000 additional residents (207 percent more) and under Alternative II about 680,000 additional residents (304 percent more) would be within 30 minutes via transit of a major retail center.

Impacts on Freight Movement

The safe and efficient movement of raw materials and finished goods to, from, and within Southeastern Wisconsin is essential for maintaining and growing the Region's economy. Freight shipments in the Region—including shipments involving ships, airplanes, and trains—rely heavily on trucks using the Region's arterial street and highway system. Congestion on the parts of the Region's arterial street and highway network that are intended to carry a higher percentage of truck traffic would affect the movement of freight throughout the Region, negatively impacting businesses and manufacturers in the Region. Alternative I would result in the least congested regional freight network, with 10.7 percent (180.7 miles) of the network operating over its design capacity (moderate, severe, or extreme congestion) for at least part of an average weekday. The congested regional freight network miles under Alternative I would be about 0.3 percent less than the Trend (185.7 miles) and 0.9 percent less than Alternative II (196.1 miles).

PART III: PUBLIC FEEDBACK ON ALTERNATIVE PLANS

[to be completed following fourth round of public workshops]

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Table III-1

CURRENTLY COMMITTED ARTERIAL HIGHWAY CAPACITY IMPROVEMENT AND EXPANSION PROJECTS AND FIXED-GUIDEWAY TRANSIT PROJECTS TO BE INCLUDED IN THE TREND AND ALTERNATIVE PLANS I AND II

County	Improvement Type	Facility	Termini	Description
Kenosha	Widening	CTH K (60th Street) IH 94 STH 50	CTH H to Union Pacific Railway STH 142 to CTH KR IH 94/USH 41 to 39th Avenue	Widen from two to four traffic lanes Widen from six to eight traffic lanes Widen from four to six traffic lanes
Milwaukee	Fixed-Guideway Transit	Milwaukee Streetcar Phase 1 Milwaukee Streetcar Lakefront Extension (on E. Michigan Street and E. Clybourn Street)	Milwaukee Intermodal Station to Burns-Commons N. Broadway to N. Lincoln Memorial Drive	Construct streetcar line Construct streetcar expansion
	Expansion	Elm Road extension IH 94	27th Street to IH 94 Elm Road Interchange	Construct two lanes on new alignment Construct new interchange
	Widening	STH 241 (27th Street) IH 43 IH 94 IH 94 IH 94 (Zoo Interchange) IH 894 (Zoo Interchange) USH 45 (Zoo Interchange) Port Washington Road USH 45/STH 100 USH 45/STH 100 USH 45/STH 100 (Ryan Road)	College Avenue to Drexel Avenue Silver Spring Drive to STH 60 CTH G to College Avenue 70 th Street to 16 th Street 124 th Street to 70 th Street Zoo Interchange to Lincoln Avenue Zoo Interchange to Burleigh Street Bender Road to Daphne Road Rawson Avenue to Drexel Avenue Drexel Avenue to STH 36 STH 36 (Loomis Road) to 60th Street	Widen from four to six traffic lanes Widen from four to six traffic lanes Widen from six to eight traffic lanes Widen from six to eight traffic lanes Widen from six to eight traffic lanes Widen from six to eight traffic lanes Widen from six to eight traffic lanes Widen from two to four traffic lanes Widen from four to six traffic lanes Widen from two to four traffic lanes Widen from two to four traffic lanes
Ozaukee	Expansion	IH 43 IH 43	Highland Road Interchange County Line Road Interchange	Construct new interchange Conversion of half to full interchange
Racine	Widening	IH 94 IH 94	CTH K to CTH G CTH KR to CTH K	Widen from six to eight traffic lanes Widen from six to eight traffic lanes
Waukesha	Expansion	Waukesha West Bypass	CTH X to Sunset Drive	Construct four lanes on new alignment
	Widening	CTH VV (Silver Spring Drive) CTH M (North Avenue) CTH M (North Avenue) CTH TT CTH TT (Meadowbrook Road) STH 67 (Summit Avenue) STH 83	CTH Y (Lannon Road) to Jackson Drive Lilly Road to 124th Street Pilgrim Road to 147th Street Sunset Drive (CTH D) to USH 18 Northview Road to USH 18 IH 94 to Summit Avenue USH 18 (High Meadow Lane) to CTH DE	Widen from two to four traffic lanes Widen from two to four traffic lanes Widen from two to four traffic lanes Widen from two to four traffic lanes Widen from two to four traffic lanes Widen from four to five/six traffic lanes Widen from two to four traffic lanes

NOTE: THE PROJECTS INCLUDED IN THIS TABLE REPRESENT CAPACITY IMPROVEMENT AND EXPANSION PROJECTS THAT ARE CURRENTLY UNDER CONSTRUCTION, UNDERGOING FINAL ENGINEERING AND DESIGN, OR HAVE A PREFERRED ALTERNATIVE SELECTED AS PART OF PRELIMINARY ENGINEERING/ENVIRONMENTAL IMPACT STUDY.

Source: SEWRPC

Table III-2

INCREMENTAL HOUSEHOLDS BY VISION 2050 ALTERNATIVE

County/Planning Analysis Area	Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region
1	1,050	0.6	1,110	0.6	900	0.5
2	2,390	1.4	2,280	1.3	1,990	1.2
3	4,380	2.5	4,390	2.5	3,640	2.1
4	2,460	1.4	1,870	1.1	1,670	1.0
Ozaukee County	10,280	6.0	9,650	5.6	8,200	4.8
5	2,640	1.5	1,470	0.9	1,180	0.7
6	5,310	3.1	6,820	4.0	5,980	3.5
7	1,760	1.0	900	0.5	720	0.4
8	2,630	1.5	2,700	1.6	2,220	1.3
9	5,380	3.1	5,550	3.2	4,760	2.8
10	2,770	1.6	3,710	2.2	3,060	1.8
11	2,230	1.3	620	0.4	570	0.3
Washington County	22,720	13.2	21,770	12.6	18,490	10.7
12	1,300	0.8	1,290	0.8	1,560	0.9
13	2,220	1.3	2,200	1.3	2,840	1.6
14	2,510	1.5	3,630	2.1	5,990	3.5
15	2,150	1.2	3,550	2.1	4,120	2.4
16	750	0.4	2,270	1.3	3,010	1.7
17	1,190	0.7	2,080	1.2	2,600	1.5
18	1,020	0.6	1,630	0.9	2,050	1.2
19	1,360	0.8	1,560	0.9	4,930	2.9
20	1,240	0.7	1,010	0.6	1,880	1.1
21	2,750	1.6	2,430	1.4	2,870	1.7
22	1,510	0.9	1,830	1.1	1,860	1.1
23	5,010	2.9	4,370	2.5	4,780	2.8
24	2,970	1.7	2,620	1.5	2,620	1.5
Milwaukee County	25,980	15.1	30,470	17.7	41,110	23.9
25	3,400	2.0	3,970	2.3	3,860	2.2
26	3,170	1.8	5,280	3.1	5,470	3.2
27	3,360	1.9	3,270	1.9	3,150	1.8
28	3,280	1.9	3,040	1.8	2,880	1.7
29	4,230	2.5	3,210	1.9	3,020	1.8
30	2,300	1.3	3,200	1.9	3,310	1.9
31	5,030	2.9	6,980	4.1	6,900	4.0
32	10,160	5.9	8,960	5.2	8,660	5.0
33	5,850	3.4	2,870	1.7	2,520	1.5
34	2,340	1.4	890	0.5	660	0.4
Waukesha County	43,120	25.0	41,670	24.2	40,430	23.5
35	1,760	1.0	2,030	1.2	2,060	1.2
36	10,690	6.2	11,010	6.4	10,550	6.1
37	4,160	2.4	3,580	2.1	3,380	2.0
38	1,490	0.9	1,470	0.9	1,400	0.8
Racine County	18,100	10.5	18,090	10.5	17,390	10.1
39	4,410	2.6	5,130	3.0	5,190	3.0
40	15,330	8.9	15,930	9.2	15,950	9.3
41	13,080	7.6	11,760	6.8	10,390	6.0
Kenosha County	32,820	19.1	32,820	19.0	31,530	18.3
42	2,760	1.6	2,310	1.3	1,860	1.1
43	3,850	2.2	2,800	1.6	2,500	1.5
44	12,680	7.4	12,730	7.4	10,800	6.3
Walworth County	19,290	11.2	17,840	10.3	15,160	8.8
Region	172,310	100.0	172,310	100.0	172,310	100.0

Source: SEWRPC.

Table III-3

INCREMENTAL EMPLOYMENT (JOBS) BY VISION 2050 ALTERNATIVE

County/Planning Analysis Area	Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region
1	1,790	0.9	2,080	1.0	1,610	0.8
2	3,960	1.9	4,150	2.0	3,270	1.6
3	7,090	3.4	5,550	2.6	4,740	2.3
4	3,940	1.9	3,990	1.9	3,280	1.6
Ozaukee County	16,780	8.0	15,770	7.5	12,900	6.1
5	1,310	0.6	900	0.4	730	0.3
6	5,750	2.7	7,500	3.6	6,100	2.9
7	1,680	0.8	770	0.4	620	0.3
8	790	0.4	1,000	0.5	820	0.4
9	5,800	2.8	6,280	3.0	5,100	2.4
10	5,100	2.4	4,730	2.2	4,040	1.9
11	3,080	1.5	1,320	0.6	1,230	0.6
Washington County	23,510	11.2	22,500	10.7	18,640	8.9
12	2,430	1.2	1,690	0.8	1,980	0.9
13	2,250	1.1	1,490	0.7	2,820	1.3
14	2,230	1.1	3,580	1.7	7,170	3.4
15	870	0.4	2,600	1.2	3,060	1.5
16	3,530	1.7	8,220	3.9	8,370	4.0
17	2,660	1.3	3,890	1.9	4,580	2.2
18	2,510	1.2	3,120	1.5	4,200	2.0
19	2,760	1.3	2,920	1.4	4,990	2.4
20	2,990	1.4	2,330	1.1	4,230	2.0
21	2,970	1.4	1,940	0.9	2,530	1.2
22	1,450	0.7	1,620	0.8	1,640	0.8
23	3,750	1.8	2,790	1.3	3,830	1.8
24	3,110	1.5	2,380	1.1	2,930	1.4
Milwaukee County	33,510	15.9	38,570	18.3	52,330	24.9
25	7,490	3.6	8,180	3.9	7,690	3.7
26	7,920	3.8	11,200	5.3	11,070	5.3
27	6,750	3.2	5,830	2.8	5,540	2.6
28	3,530	1.7	2,730	1.3	2,590	1.2
29	4,120	2.0	3,510	1.7	3,340	1.6
30	6,820	3.2	6,670	3.2	6,910	3.3
31	9,250	4.4	10,190	4.8	9,840	4.7
32	12,920	6.1	11,460	5.5	10,820	5.1
33	9,120	4.3	6,920	3.3	6,490	3.1
34	1,570	0.7	780	0.4	740	0.4
Waukesha County	69,490	33.1	67,470	32.1	65,030	30.9
35	3,250	1.5	4,820	2.3	4,640	2.2
36	9,750	4.6	10,090	4.8	9,700	4.6
37	7,790	3.7	4,610	2.2	4,370	2.1
38	3,160	1.5	3,420	1.6	3,240	1.5
Racine County	23,950	11.4	22,940	10.9	21,950	10.4
39	6,900	3.3	7,990	3.8	7,860	3.7
40	8,010	3.8	8,860	4.2	8,750	4.2
41	11,470	5.5	9,530	4.5	9,120	4.3
Kenosha County	26,380	12.5	26,380	12.5	25,730	12.2
42	3,180	1.5	2,660	1.3	2,150	1.0
43	2,520	1.2	2,230	1.1	1,840	0.9
44	10,910	5.2	11,710	5.6	9,660	4.6
Walworth County	16,610	7.9	16,600	7.9	13,650	6.5
Region	210,230	100.0	210,230	100.0	210,230	100.0

Source: SEWRPC.

Table III-4

EXISTING AND PLANNED POPULATION BY VISION 2050 ALTERNATIVE

County/ Planning Analysis Area	Existing		Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region
1	7,990	0.4	10,370	0.4	10,650	0.5	10,110	0.4
2	18,680	0.9	24,010	1.0	23,790	1.0	23,090	1.0
3	32,870	1.6	42,390	1.8	42,620	1.8	40,850	1.7
4	26,860	1.3	32,320	1.4	31,110	1.3	30,630	1.3
Ozaukee County	86,390	4.3	109,090	4.6	108,170	4.6	104,680	4.4
5	9,070	0.4	15,240	0.6	12,310	0.5	11,600	0.5
6	44,380	2.2	54,950	2.3	58,600	2.5	56,660	2.4
7	5,660	0.3	9,690	0.4	7,440	0.3	7,030	0.3
8	10,830	0.5	16,440	0.7	16,510	0.7	15,420	0.7
9	26,890	1.3	38,510	1.6	39,010	1.7	37,140	1.6
10	20,000	1.0	25,890	1.1	28,190	1.2	26,610	1.1
11	15,050	0.7	19,770	0.8	15,820	0.7	15,710	0.7
Washington County	131,890	6.5	180,490	7.7	177,880	7.6	170,170	7.2
12	65,450	3.2	66,210	2.8	66,090	2.8	66,720	2.8
13	58,540	2.9	61,920	2.6	61,770	2.6	63,380	2.7
14	229,170	11.3	227,420	9.7	229,780	9.8	235,650	10.0
15	76,000	3.8	78,810	3.3	82,080	3.5	83,510	3.5
16	10,480	0.5	12,380	0.5	16,060	0.7	17,830	0.8
17	91,230	4.5	91,110	3.9	93,100	4.0	94,430	4.0
18	118,120	5.8	116,470	4.9	117,740	5.0	118,840	5.0
19	48,360	2.4	49,860	2.1	50,200	2.1	57,390	2.4
20	69,990	3.5	70,220	3.0	69,620	3.0	71,480	3.0
21	59,930	3.0	63,740	2.7	62,960	2.7	63,930	2.7
22	49,070	2.4	50,680	2.2	51,290	2.2	51,390	2.2
23	34,820	1.7	45,380	1.9	43,790	1.9	44,790	1.9
24	36,580	1.8	42,470	1.8	41,560	1.8	41,590	1.8
Milwaukee County	947,730	46.9	976,670	41.5	986,040	41.9	1,010,930	42.9
25	38,580	1.9	45,110	1.9	46,510	2.0	46,280	2.0
26	49,620	2.5	55,450	2.4	60,640	2.6	61,140	2.6
27	39,590	2.0	46,110	2.0	45,710	1.9	45,440	1.9
28	24,140	1.2	31,490	1.3	30,930	1.3	30,560	1.3
29	23,020	1.1	32,460	1.4	29,910	1.3	29,460	1.3
30	20,160	1.0	24,630	1.0	26,690	1.1	26,950	1.1
31	80,000	4.0	89,920	3.8	94,510	4.0	94,370	4.0
32	67,440	3.3	90,040	3.8	87,070	3.7	86,360	3.7
33	35,800	1.8	49,200	2.1	41,550	1.8	40,710	1.7
34	11,550	0.6	16,960	0.7	13,310	0.6	12,740	0.5
Waukesha County	389,890	19.3	481,370	20.4	476,830	20.3	474,010	20.1
35	74,170	3.7	74,250	3.2	74,900	3.2	75,020	3.2
36	65,010	3.2	86,700	3.7	87,470	3.7	86,450	3.7
37	39,260	1.9	47,270	2.0	45,850	1.9	45,380	1.9
38	16,970	0.8	19,520	0.8	19,450	0.8	19,300	0.8
Racine County	195,410	9.7	227,740	9.7	227,670	9.7	226,150	9.6
39	97,410	4.8	102,190	4.3	104,970	4.5	105,200	4.5
40	30,520	1.5	66,860	2.8	69,000	2.9	69,100	2.9
41	38,490	1.9	68,960	2.9	66,340	2.8	62,850	2.7
Kenosha County	166,430	8.2	238,010	10.1	240,310	10.2	237,150	10.1
42	15,040	0.7	20,600	0.9	19,520	0.8	18,450	0.8
43	22,170	1.1	29,760	1.3	27,200	1.2	26,560	1.1
44	65,020	3.2	90,270	3.8	90,380	3.8	85,900	3.6
Walworth County	102,230	5.1	140,630	6.0	137,100	5.8	130,910	5.6
Region	2,019,970	100.0	2,354,000	100.0	2,354,000	100.0	2,354,000	100.0

Table III-5

EXISTING AND PLANNED HOUSEHOLDS BY VISION 2050 ALTERNATIVE

County/ Planning Analysis Area	Existing (2010)		Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region
1	3,000	0.4	4,050	0.4	4,120	0.4	3,900	0.4
2	7,650	1.0	10,040	1.0	9,930	1.0	9,640	1.0
3	13,170	1.6	17,550	1.8	17,560	1.8	16,820	1.7
4	10,400	1.3	12,860	1.3	12,280	1.3	12,070	1.2
Ozaukee County	34,220	4.3	44,500	4.6	43,890	4.5	42,430	4.4
5	3,440	0.4	6,080	0.6	4,920	0.5	4,620	0.5
6	17,750	2.2	23,060	2.4	24,570	2.5	23,730	2.4
7	2,080	0.3	3,840	0.4	2,980	0.3	2,790	0.3
8	4,320	0.5	6,950	0.7	7,020	0.7	6,540	0.7
9	10,580	1.3	15,960	1.6	16,130	1.7	15,340	1.6
10	7,860	1.0	10,630	1.1	11,570	1.2	10,920	1.1
11	5,580	0.7	7,810	0.8	6,190	0.6	6,140	0.6
Washington County	51,610	6.5	74,330	7.6	73,380	7.5	70,080	7.2
12	28,430	3.6	29,730	3.1	29,730	3.1	29,990	3.1
13	22,350	2.8	24,560	2.5	24,540	2.5	25,190	2.6
14	84,930	10.6	87,430	9.0	88,560	9.1	90,920	9.4
15	34,560	4.3	36,710	3.8	38,110	3.9	38,680	4.0
16	4,830	0.6	5,580	0.6	7,110	0.7	7,840	0.8
17	31,280	3.9	32,470	3.3	33,360	3.4	33,880	3.5
18	47,710	6.0	48,730	5.0	49,340	5.1	49,760	5.1
19	21,340	2.7	22,700	2.3	22,900	2.4	26,270	2.7
20	31,180	3.9	32,420	3.1	32,180	3.3	33,050	3.4
21	26,850	3.4	29,600	3.0	29,280	3.0	29,730	3.1
22	21,760	2.7	23,270	2.4	23,590	2.4	23,620	2.4
23	14,200	1.8	19,220	2.0	18,570	1.9	18,980	2.0
24	14,180	1.8	17,150	1.8	16,800	1.7	16,800	1.7
Milwaukee County	383,600	47.9	409,570	42.1	414,070	42.6	424,710	43.7
25	15,940	2.0	19,340	2.0	19,910	2.0	19,800	2.0
26	19,610	2.5	22,780	2.3	24,890	2.6	25,080	2.6
27	16,290	2.0	19,650	2.0	19,560	2.0	19,440	2.0
28	9,070	1.1	12,350	1.3	12,110	1.2	11,950	1.2
29	8,520	1.1	12,750	1.3	11,730	1.2	11,540	1.2
30	8,790	1.1	11,090	1.1	11,990	1.2	12,110	1.2
31	31,750	4.0	36,790	3.8	38,740	4.0	38,660	4.0
32	25,450	3.2	35,610	3.7	34,420	3.5	34,110	3.5
33	13,120	1.6	18,970	2.0	15,980	1.6	15,640	1.6
34	4,120	0.5	6,450	0.7	5,000	0.5	4,770	0.5
Waukesha County	152,660	19.1	195,780	20.1	194,330	20.0	193,100	19.9
35	28,620	3.6	30,380	3.1	30,650	3.2	30,680	3.2
36	25,790	3.2	36,480	3.8	36,800	3.8	36,340	3.7
37	14,490	1.8	18,650	1.9	18,080	1.9	17,870	1.8
38	6,750	0.8	8,240	0.8	8,210	0.8	8,140	0.8
Racine County	75,650	9.5	93,750	9.6	93,740	9.6	93,030	9.6
39	36,710	4.6	41,120	4.2	41,840	4.3	41,900	4.3
40	11,420	1.4	26,750	2.8	27,340	2.8	27,370	2.8
41	14,520	1.8	27,610	2.8	26,280	2.7	24,920	2.6
Kenosha County	62,650	7.8	95,480	9.8	95,460	9.8	94,190	9.7
42	5,840	0.7	8,600	0.9	8,140	0.8	7,690	0.8
43	8,460	1.1	12,310	1.3	11,260	1.2	10,970	1.1
44	25,400	3.2	38,080	3.9	38,130	3.9	36,200	3.7
Walworth County	39,700	5.0	58,990	6.1	57,530	5.9	54,860	5.6
Region	800,090	100.0	972,400	100.0	972,400	100.0	972,400	100.0

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

Table III-6

EXISTING AND PLANNED EMPLOYMENT (JOBS) BY VISION 2050 ALTERNATIVE

County/ Planning Analysis Area	Existing (2010)		Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region	Number	Percent of Region
1	2,840	0.2	4,630	0.3	4,920	0.4	4,450	0.3
2	11,280	1.0	15,240	1.1	15,430	1.1	14,550	1.0
3	16,540	1.4	23,620	1.7	22,080	1.6	21,270	1.5
4	21,720	1.8	25,650	1.9	25,700	1.9	24,990	1.8
Ozaukee County	52,380	4.5	69,140	5.0	68,130	4.9	65,260	4.7
5	2,370	0.2	3,680	0.3	3,270	0.2	3,100	0.2
6	21,670	1.8	27,420	2.0	29,170	2.1	27,770	2.0
7	2,550	0.2	4,230	0.3	3,320	0.2	3,170	0.2
8	3,640	0.3	4,430	0.3	4,640	0.3	4,460	0.3
9	15,830	1.3	21,630	1.6	22,110	1.6	20,930	1.5
10	14,230	1.2	19,320	1.4	18,950	1.4	18,260	1.3
11	3,610	0.3	6,690	0.5	4,930	0.4	4,840	0.3
Washington County	63,900	5.4	87,400	6.3	86,390	6.2	82,530	6.0
12	43,700	3.7	46,120	3.3	45,380	3.3	45,670	3.3
13	38,450	3.3	40,700	2.9	39,940	2.9	41,270	3.0
14	72,150	6.1	74,380	5.4	75,730	5.5	79,320	5.7
15	44,280	3.8	45,150	3.3	46,880	3.4	47,340	3.4
16	70,280	6.0	73,810	5.3	78,500	5.7	78,650	5.7
17	55,050	4.7	57,710	4.2	58,940	4.3	59,630	4.3
18	53,230	4.5	55,740	4.0	56,350	4.1	57,430	4.1
19	56,910	4.8	59,670	4.3	59,830	4.3	61,900	4.5
20	48,530	4.1	51,520	3.7	50,860	3.7	52,760	3.8
21	28,850	2.5	31,820	2.3	30,790	2.2	31,380	2.3
22	22,410	1.9	23,860	1.7	24,030	1.7	24,050	1.7
23	23,280	2.0	27,030	1.9	26,070	1.9	27,110	2.0
24	19,230	1.6	22,340	1.6	21,610	1.6	22,160	1.6
Milwaukee County	576,350	49.0	609,850	44.0	614,910	44.4	628,670	45.3
25	41,250	3.5	48,740	3.5	49,430	3.6	48,940	3.5
26	55,630	4.7	63,550	4.6	66,830	4.8	66,700	4.8
27	27,140	2.3	33,890	2.4	32,970	2.4	32,680	2.4
28	7,730	0.7	11,260	0.8	10,460	0.8	10,320	0.7
29	9,420	0.8	13,540	1.0	12,930	0.9	12,760	0.9
30	29,020	2.5	35,840	2.6	35,690	2.6	35,930	2.6
31	48,470	4.1	57,720	4.2	58,660	4.2	58,310	4.2
32	35,040	3.0	47,960	3.5	46,500	3.4	45,860	3.3
33	12,160	1.0	21,280	1.5	19,080	1.4	18,650	1.3
34	2,930	0.2	4,500	0.3	3,710	0.3	3,670	0.3
Waukesha County	268,790	22.9	338,280	24.4	336,260	24.3	333,820	24.1
35	37,450	3.2	40,700	2.9	42,270	3.0	42,090	3.0
36	25,000	2.1	34,750	2.5	35,090	2.5	34,700	2.5
37	15,050	1.3	22,840	1.6	19,660	1.4	19,420	1.4
38	10,550	0.9	13,710	1.0	13,970	1.0	13,790	1.0
Racine County	88,050	7.5	112,000	8.1	110,990	8.0	110,000	7.9
39	44,830	3.8	51,730	3.7	52,820	3.8	52,690	3.8
40	17,770	1.5	25,780	1.9	26,630	1.9	26,520	1.9
41	11,640	1.0	23,110	1.7	21,170	1.5	20,760	1.5
Kenosha County	74,240	6.3	100,620	7.3	100,620	7.3	99,970	7.2
42	4,590	0.4	7,770	0.6	7,250	0.5	6,740	0.5
43	10,640	0.9	13,160	0.9	12,870	0.9	12,480	0.9
44	37,330	3.2	48,240	3.5	49,040	3.5	46,990	3.4
Walworth County	52,560	4.5	69,170	5.0	69,160	5.0	66,210	4.8
Region	1,176,270	100.0	1,386,460	100.0	1,386,460	100.0	1,386,460	100.0

Source: U.S. Bureau of Economic Analysis and SEWRPC.

Table III-7

PLANNED LAND USE BY VISION 2050 ALTERNATIVE

Alternative Plan Land Use Category ^a	Existing (square miles)	Trend		Alternative Plan I		Alternative Plan II	
		Increment (square miles)	Total (square miles)	Increment (square miles)	Total (square miles)	Increment (square miles)	Total (square miles)
Mixed Use City Center ^b	12.0	0.6	12.6	0.7	12.7	0.8	12.8
Mixed Use Traditional Neighborhood ^c	103.4	7.1	110.5	10.2	113.6	10.5	113.9
Small Lot Traditional Neighborhood ^d	95.6	6.9	102.5	51.7	147.3	46.4	142.0
Medium Lot Neighborhood ^e	184.9	67.3	252.2	5.8	190.7	5.3	190.2
Large Lot Neighborhood ^f	267.7	18.1	285.8	10.6	278.3	9.9	277.6
Large Lot Exurban ^g	41.6	19.3	60.9	6.4	48.0	5.6	47.2
Rural Estate ^h	74.0	36.8	110.8	10.7	84.7	7.9	81.9
Agricultural Land ⁱ	1,155.5	-77.3	1,078.2	-31.9	1,123.6	-25.8	1,129.7
Primary Environmental Corridor	487.3	9.1	496.4	9.1	496.4	9.1	496.4
Other Open Land ^j	267.7	-87.9	179.8	-73.3	194.4	-69.7	198.0
Total	2,689.7	0.0	2,689.7	0.0	2,689.7	0.0	2,689.7

^aAlternative plan land use categories include applicable land uses such as residential; commercial; industrial; governmental and institutional; transportation, communication, and utilities; and recreational lands.

^bResidential and other urban land – 18.0 or more dwelling units per net residential acre.

^cResidential and other urban land – 7.0 to 17.9 dwelling units per net residential acre.

^dResidential and other urban land – 4.4 to 6.9 dwelling units per net residential acre.

^eResidential and other urban land – 2.3 to 4.3 dwelling units per net residential acre.

^fResidential and other urban land – 0.7 to 2.2 dwelling units per net residential acre.

^g0.2 to 0.6 dwelling unit per net residential acre.

^hNo more than 0.2 dwelling unit per acre.

ⁱIncludes farmland preservation areas identified in county farmland preservation plans, prime agricultural land, and other agricultural land.

^jIncludes wetlands, woodlands, and surface water outside primary environmental corridors, landfill sites, quarries, and other unused lands.

Source: SEWRPC.

Table III-8

INCREMENTAL HOUSEHOLDS AND EMPLOYMENT BY LAND USE CATEGORY

HOUSEHOLDS

Land Use Category	Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent	Number	Percent	Number	Percent
Mixed Use City Center	9,447	5.5	14,407	8.3	18,799	10.9
Mixed Use Traditional Neighborhood	30,503	17.7	48,589	28.2	56,420	32.8
Small Lot Traditional Neighborhood	12,827	7.4	88,187	51.2	79,311	46.0
Medium Lot Neighborhood	82,911	48.1	7,353	4.3	6,387	3.7
Large Lot Neighborhood	7,591	4.4	4,282	2.5	4,033	2.3
Large Lot Exurban	4,237	2.5	1,333	0.8	1,167	0.7
Rural Estate	24,794	14.4	8,159	4.7	6,193	3.6
Total	172,310	100.0	172,310	100.0	172,310	100.0

EMPLOYMENT (JOBS)

Land Use Category	Trend		Alternative Plan I		Alternative Plan II	
	Number	Percent	Number	Percent	Number	Percent
Mixed Use City Center	11,595	5.5	19,340	9.2	23,961	11.4
Mixed Use Traditional Neighborhood	47,403	22.6	64,564	30.7	69,490	33.0
Small Lot Traditional Neighborhood	21,196	10.1	83,187	39.6	76,300	36.3
Medium Lot Neighborhood	94,707	45.1	24,554	11.7	24,073	11.5
Large Lot Neighborhood	32,043	15.2	16,898	8.0	14,757	7.0
Large Lot Exurban	3,021	1.4	1,634	0.8	1,635	0.8
Rural Estate	265	0.1	53	<0.1	14	<0.1
Total	210,230	100.0	210,230	100.0	210,230	100.0

Source: SEWRPC.

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Table III-9

**INCREMENTAL RESIDENTIAL
STRUCTURE TYPE BY VISION 2050 ALTERNATIVE**

Alternative	Single-Family Housing Units		Multifamily Housing Units	
	Number	Percent	Number	Percent
Trend	128,952	74.8	43,357	25.2
Alternative Plan I	105,502	61.2	66,807	38.8
Alternative Plan II	93,247	54.1	79,062	45.9

Source: SEWRPC.

Table III-10

**INCREMENTAL HOUSEHOLD AND EMPLOYMENT
 ALLOCATIONS TO FIXED-GUIDEWAY STATION AREAS BY VISION 2050 ALTERNATIVE**

Trend				
County	Households		Employment (jobs)	
	Number	Percent of Total Allocation	Number	Percent of Total Allocation
Kenosha	379	1.2	432	1.6
Milwaukee	1,098	4.2	3,356	10.0
Racine	--	--	--	--
Waukesha	--	--	--	--
Region	1,477	0.9	3,788	1.8

Alternative Plan I				
County	Households		Employment (jobs)	
	Number	Percent of Total Allocation	Number	Percent of Total Allocation
Kenosha	1,406	4.3	1,375	5.2
Milwaukee	11,676	38.3	19,761	51.2
Racine	595	3.3	809	3.5
Waukesha	3,311	7.9	6,385	9.5
Region	16,988	9.9	28,330	13.5

Alternative Plan II				
County	Households		Employment (jobs)	
	Number	Percent of Total Allocation	Number	Percent of Total Allocation
Kenosha	1,475	4.7	1,376	5.2
Milwaukee	31,759	77.3	32,092	83.2
Racine	1,237	7.1	1,490	6.5
Waukesha	6,661	16.5	13,962	20.7
Region	41,132	23.9	48,920	23.3

Source: SEWRPC.

Table III-11

FIXED-ROUTE PUBLIC TRANSIT SERVICE LEVELS BY VISION 2050 ALTERNATIVE

Average Weekday Transit Service Characteristics	Existing (2013)	Trend	Alternative Plan I	Alternative Plan II
Revenue Vehicle-Hours				
Rapid Transit.....	--	--	420	1,260
Commuter Rail.....	0	0	70	140
Commuter Bus.....	260	100	940	660
Express Bus.....	500	--	1,530	820
Local Transit.....	3,980	3,600	7,640	8,680
Total	4,740	3,700	10,600	11,560
Revenue Vehicle-Miles				
Rapid Transit.....	--	--	8,100	24,900
Commuter Rail.....	100	100	3,900	7,100
Commuter Bus.....	5,900	3,200	26,600	17,700
Express Bus.....	6,300	--	22,800	12,300
Local Transit.....	48,600	44,600	90,400	103,700
Total	60,900	47,900	151,800	165,700

Source: SEWRPC.

Table III-12

TRANSIT SERVICE HOURS BY VISION 2050 ALTERNATIVE

Service Type	Existing Year 2015	Trend	Alternative Plan I	Alternative Plan II
Rapid Transit	<u>Weekdays</u> No service	<u>Weekdays</u> No service	<u>Weekdays</u> 4 a.m. – 2 a.m.	<u>Weekdays</u> 4 a.m. – 2 a.m.
	<u>Weekends</u> No service	<u>Weekends</u> No service	<u>Weekends</u> 5 a.m. – 3 a.m.	<u>Weekends</u> 5 a.m. – 3 a.m.
Commuter Rail	<u>Weekdays</u> 6 a.m. – 2 a.m.	<u>Weekdays</u> 6 a.m. – 2 a.m.	<u>Weekdays</u> 4 a.m. – 2 a.m.	<u>Weekdays</u> 4 a.m. – 2 a.m.
	<u>Weekends</u> 7 a.m. – 2 a.m.	<u>Weekends</u> 7 a.m. – 2 a.m.	<u>Weekends</u> 7 a.m. – 3 a.m.	<u>Weekends</u> 7 a.m. – 3 a.m.
Commuter Bus	<u>Weekdays</u> 5 a.m. - 10 a.m. 12 p.m. – 8 p.m. many services peak direction only	<u>Weekdays</u> 5 a.m. – 9 a.m. 3 p.m. – 7 p.m. peak direction only	<u>Weekdays</u> 4 a.m. – 11 p.m. both directions	<u>Weekdays</u> 4 a.m. – 11 p.m. both directions
	<u>Weekends</u> 8 am – 11 p.m. KRM Bus only	<u>Weekends</u> No service	<u>Weekends</u> 7 a.m. – 11 p.m. both directions	<u>Weekends</u> 7 a.m. – 11 p.m. both directions
Express Bus	<u>Weekdays</u> 4 a.m. – 2 a.m.	<u>Weekdays</u> No service	<u>Weekdays</u> 4 a.m. – 2 a.m.	<u>Weekdays</u> 4 a.m. – 2 a.m.
	<u>Weekends</u> 5 a.m. – 2 a.m.	<u>Weekends</u> No service	<u>Weekends</u> 5 a.m. – 2 a.m.	<u>Weekends</u> 5 a.m. – 3 a.m.
Local Service	<u>Weekdays</u> 4 a.m. – 2 a.m.	<u>Weekdays</u> 5 a.m. – 1 a.m.	<u>Weekdays</u> 4 a.m. – 2 a.m.	<u>Weekdays</u> Up to 24 hours/day
	<u>Weekends</u> 5 a.m. – 2 a.m.	<u>Weekends</u> 5 a.m. – 11 p.m.	<u>Weekends</u> 5 a.m. – 2 a.m.	<u>Weekends</u> Up to 24 hours/day

Table III-13

TRANSIT SERVICE HEADWAYS BY VISION 2050 ALTERNATIVE

Service Type	Existing Year 2015	Trend	Alternative Plan I	Alternative Plan II
Rapid Transit	<u>Weekdays</u> No service	<u>Weekdays</u> No service	<u>Weekdays</u> 10 – 12 minutes	<u>Weekdays</u> 8 – 15 minutes
	<u>Weekends</u> No service	<u>Weekends</u> No service	<u>Weekends</u> 10 – 15 minutes	<u>Weekends</u> 10 – 15 minutes
Commuter Rail	<u>Weekdays</u> 30 – 360 minutes	<u>Weekdays</u> 30 – 360 minutes	<u>Weekdays</u> 15 – 30 minutes	<u>Weekdays</u> 15 – 30 minutes
	<u>Weekends</u> 60 – 480 minutes	<u>Weekends</u> 60 – 480 minutes	<u>Weekends</u> 30 – 60 minutes	<u>Weekends</u> 30 – 60 minutes
Commuter Bus	<u>Weekdays</u> 10 – 225 minutes, many services peak direction only	<u>Weekdays</u> 20 – 240 minutes, peak direction only	<u>Weekdays</u> 10 – 60 minutes, both directions	<u>Weekdays</u> 10 – 60 minutes, both directions
	<u>Weekends</u> 90 – 240 minutes, KRM Bus only	<u>Weekends</u> No service	<u>Weekends</u> 20 – 60 minutes, both directions	<u>Weekends</u> 20 – 60 minutes, both directions
Express Bus	<u>Weekdays</u> 10 – 60 minutes	<u>Weekdays</u> No service	<u>Weekdays</u> 10 – 30 minutes	<u>Weekdays</u> 10 – 30 minutes
	<u>Weekends</u> 20 – 45 minutes, no service on Western Kenosha County Transit	<u>Weekends</u> No service	<u>Weekends</u> 10 – 30 minutes	<u>Weekends</u> 10 – 20 minutes
Local Service	<u>Weekdays</u> 10 – 70 minutes	<u>Weekdays</u> 13 – 90 minutes	<u>Weekdays</u> 10 – 60 minutes	<u>Weekdays</u> 10 – 60 minutes
	<u>Weekends</u> 12 – 100 minutes	<u>Weekends</u> 15 – 120 minutes	<u>Weekends</u> 10 – 60 minutes	<u>Weekends</u> 10 – 60 minutes

Table III-14

MILES OF BICYCLE FACILITIES BY VISION 2050 ALTERNATIVE

Bicycle Facility	Estimated Mileages		
	Existing	Trend	Alternatives I and II
On-street Accommodations			
Standard	879.1	3,370.3	3,071.9
Enhanced	2.7	2.7	301.1
Off-street Paths	286.0	708.0	708.0

Source: SEWRPC

Table III-15

**CENTERLINE MILES OF SURFACE ARTERIAL AND FREEWAY
 FUNCTIONAL IMPROVEMENTS BY VISION 2050 ALTERNATIVE**

Surface Arterial and Freeway Functional Improvements	Existing and Committed (Miles)	Trend (Miles)	Alternative Plan I (Miles)	Alternative Plan II (Miles)
Facilities Resurfaced/Reconstructed to Existing Capacity				
Surface Arterials	--	3,112.6	3,133.0	3,157.9
Freeways	--	159.2	159.2	174.6
Subtotal	--	3,271.8	3,292.2	3,332.5
Facilities Reconstructed with Additional Traffic Lanes				
Surface Arterials	30.3	193.0	172.6	147.6
Freeways	47.0	115.7	115.7	100.3
Subtotal	77.3	308.7	288.3	247.9
New Facilities				
Surface Arterials	2.9	60.8	60.8	54.4
Freeways	0.0	12.5	12.5	12.5
Subtotal	2.9	73.3	73.3	66.9
Total	-- ^a	3,653.8	3,653.8	3,647.3

^a The existing arterial street and highway system, including 2.9 miles of committed new facilities, totals 3,579.4 miles.

Table III-16

DESCRIPTION OF CRITERIA FOR EVALUATING ALTERNATIVES

Healthy Communities

No.	Criterion	Criterion Description
1.1.1	Number of people living in walkable areas	Estimates of the number of residents and the proportion of the Region in walkable areas in 2050. The walkability of an area is scored on a scale of 0 to 100, with greater than 50 considered "walkable." Scores are based on pedestrian friendliness metrics (such as population density, block length, and intersection density) and walking distance to amenities (such as schools, parks, retail services, and employment).
1.1.2	Population density	Estimates of total population per square mile of residential land for the Region in 2010 and 2050 and of population per square mile of new residential development in the Region through 2050.
1.1.3	Employment density	Estimates of total jobs per square mile of employment-supporting land for the Region in 2010 and 2050 and of jobs per square mile of new employment-supporting development in the Region through 2050.
1.2.1	Bicycle level of service	An estimate of bicyclist comfort and existing/perceived operational conditions on bicycle facilities in the Region in 2050.
1.2.2	Bicycle network connectivity	Assessment of the connectivity of the Region's bicycle network, including identification of potential gaps.
1.2.3	Benefits and impacts to public health	Assessment of the potential benefits and impacts of each alternative on public health in the Region through 2050.
1.3.1	Remaining farmland and undeveloped land	Estimates of the land that would remain as total farmland, unused and other open land, and farmland or unused and other open land with Class I or Class II soils in 2050.
1.3.2	Impacts to natural resource areas	Estimates of the land with natural resource features that would potentially be impacted by transportation projects in the Region through 2050. Lands include wetlands, primary and secondary environmental corridors, isolated natural areas, critical species habitats, Wisconsin Department of Natural Resources managed lands and land legacy places, lands protected by land trusts and other non-profit natural resource conservation organizations, and prime farmland (Class I and II soils).
1.4.1	Preservation of areas with high groundwater recharge potential	An estimate of areas with very high and high groundwater recharge potential that would potentially be impacted by the alternatives.
1.4.2	Impervious surface	An estimate of the total impervious surface in the Region in 2050.
1.4.3	Energy use	Estimates of the average annual amounts of energy used by residential buildings and transportation in the Region in 2050.
1.4.4	Greenhouse gas emissions and other air pollutants	Estimates of annual greenhouse gas emissions and other air pollutants produced in the Region from transportation and residential buildings in 2050.
1.4.5	Impacts to water resources and water quality	Assessment of potential impacts of each alternative on the existing water resources and the quality of water in the Region.
1.4.6	Ability to address issues related to climate change	Assessment of how each alternative may perform related to climate change impacts, primarily related to impacts on infrastructure due to flooding associated with more frequent heavy storm events.
1.4.7	Overall environmental sustainability	Assessment of the expected environmental sustainability of the alternatives based on multiple environmental criteria. Includes discussion on sustainable building practices.
1.5.1	Homes, businesses, land, and parkland acquired	Estimates of the number of homes and businesses and the amount of land and parkland that would potentially be acquired for transportation projects in the Region through 2050.
1.6.1	Crashes by mode	Estimates of average annual crashes by severity (including fatalities and injuries) and by mode (including vehicle, and bicycle/pedestrian crashes) in the Region in 2050.

Table III-16 (continued)

Equitable Access

No.	Criterion	Criterion Description
2.1.1	Level of accessibility to jobs and activity centers for minority and low-income populations by mode	An assessment of whether minority and low-income populations would be expected to have improved accessibility to jobs and major activity centers by automobile and by transit. Includes a comparison of increases in transit accessibility to increases in highway accessibility.
2.1.2	Minority and low-income populations served by transit	An assessment of the minority and low-income populations residing within walking distance to fixed-route transit service.
2.1.3	Transit service quality for minority and low-income populations	An assessment of the minority and low-income populations that would be served by higher quality transit service. Transit quality determined based on the amount, frequency, and speed of the transit service accessible from a particular area.
2.1.4	Minority and low-income populations benefited and impacted by new and widened arterial street and highway facilities	An assessment of the location of any new or widened arterial street/highway facilities to areas of minority and low-income populations. Includes analysis of: the extent to which areas would receive any potential benefits from the facilities; whether any area would disproportionately bear any potential impacts from the facilities (including possible property acquisition); and whether there is an over-representation of minority and low-income populations along any freeways that would be widened.
2.1.5	Transportation-related air pollution impacts on minority and low-income populations	An assessment of whether there would be an expected disproportionate impact on minority and low-income populations with respect to transportation-related air pollution.
2.2.1	Households with affordable housing + transportation costs	An estimate of the total number of housing units in the Region in 2050 that are affordable at the household median income, based on combined transportation costs and housing costs (45 percent of income or less is considered affordable).
2.2.2	Ability to accommodate demographic shifts	Assessment of the ability to accommodate expected demographic shifts based on land development and travel patterns in the Region in 2050. Includes discussion on accessibility for people with disabilities.
2.3.1	Areas with a job-worker mismatch	An estimate of the ratio of jobs to households in areas throughout the Region in 2050.

Costs and Financial Sustainability

No.	Criterion	Criterion Description
3.1.1	Impact of the distribution of growth on property values	Evaluation of the potential change in property values for various areas in the Region under different land development patterns based on national examples. Includes discussion of how compact development in built out areas can increase property tax revenues.
3.1.2	Return on investment	Assessment of the various benefits and impacts associated with certain types of investment in each alternative in relation to the expected costs of those investments. Benefits and impacts expressed as estimated dollar amounts where appropriate.
3.1.3	Ability to connect to nearby metro areas and leverage the value of those areas	Assessment of how each alternative may provide better connections to nearby metro areas, such as Chicago, Madison, and the Fox Valley.
3.1.4	Potential for attracting residents and businesses	Assessment of how each well each alternative would make the Region more attractive to potential residents and businesses based on multiple quality of life-related criteria.
3.2.1	Average annual transportation system investment	Estimates of operating, maintenance, and capital costs (annualized and in year 2015 dollars) of arterial streets/highways, transit, and bicycle facilities in 2050.
3.3.1	Private transportation costs per capita	Estimates of the typical costs (annualized and in year 2015 dollars) to individuals of driving and using transit in the Region in 2050.

Table III-16 (continued)

Costs and Financial Sustainability (continued)

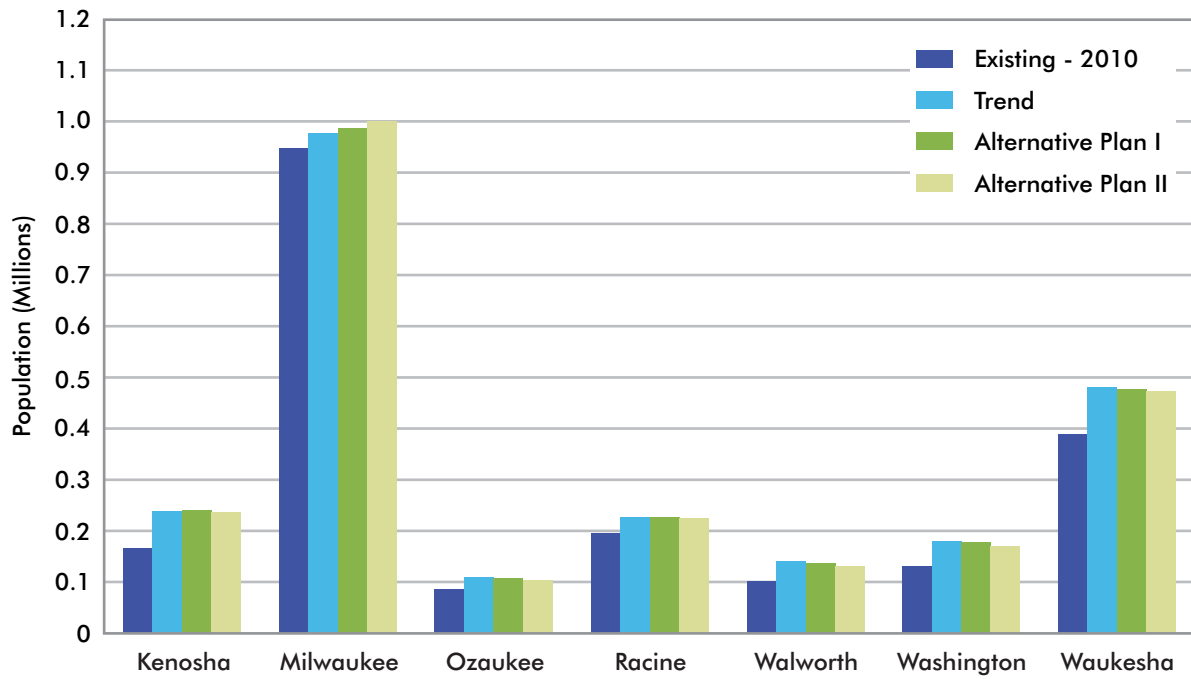
No.	Criterion	Criterion Description
3.3.2	Per household cost of delay reduction	Estimates of the cost of travel time delay (average annual and average weekday) for personal and commercial travel as a result of lost time in congested roadway conditions in the Region in 2050.
3.3.3	Resilience in adapting to changing fuel prices	Assessment of how each alternative may perform under different future fuel price assumptions.
3.4.1	Supportive infrastructure costs	Capital cost estimate (in year 2014 dollars) of extending public sewer, water, and roads to new development in the Region through 2050 by density type and location.

Mobility

No.	Criterion	Criterion Description
4.1.1	Trips per day by mode	Estimates of personal vehicle, transit, and non-motorized person trips on an average weekday in 2050.
4.1.2	Vehicle-miles of travel	An estimate of the average annual vehicle-miles of travel in the Region in 2050 (total and per capita).
4.1.3	Impacts of technology changes	Assessment of the potential for new technologies to impact travel in the Region by 2050. Includes identification of the likelihood and challenges related to implementing certain technologies.
4.2.1	Travel time to important places by mode	Estimates of the average travel times in 2050 to major activity centers by automobile and by transit.
4.2.2	Access to park-ride facilities	An estimate of the accessibility of park-ride facilities in 2050.
4.3.1	Pavement condition	An estimate of the cost to maintain or improve the condition of the arterial street and highway system through 2050.
4.3.2	Transit fleet condition	An estimate of the percentage of transit vehicles in the Region exceeding expected useful life in 2050.
4.4.1	Congestion on arterial streets and highways	Estimates of the degree of traffic congestion on arterial streets and highways (including freeways) in the Region in 2050, measured in centerline miles experiencing moderate, severe, or extreme congestion.
4.4.2	Travel time delay	Estimates of system-wide travel time delay (average annual and average weekday) for all modes and by mode in 2050.
4.4.3	Average trip times	Estimates of the average trip times in 2050 for various geographies and trip types.
4.5.1	Access to transit	Estimates of the total number of residents with access to fixed-route transit and the total number of jobs accessible by fixed-route transit in the Region in 2050.
4.5.2	Access to fixed-guideway transit	Estimates of the total number of residents with access to fixed-guideway transit and the total number of jobs accessible by fixed-guideway transit in the Region in 2050. Transit service is considered to be fixed-guideway if it has its own right-of-way (bus rapid transit, light rail, or commuter rail).
4.5.3	Transit service quality	An estimate of transit quality in the Region based on the amount, frequency, and speed of the transit service accessible from a particular area.
4.6.1	Transportation reliability	Estimates of the level of variability in travel times for personal vehicles and by transit for various geographies in 2050.
4.6.2	Congestion on the regional freight network	Estimates of the degree of traffic congestion on the regional freight network in 2050, measured in centerline miles experiencing moderate, severe, or extreme congestion.
4.6.3	Impacts to freight traffic	Assessment of impacts to freight travel of the alternatives based on multiple travel-related criteria.

Figure III-1

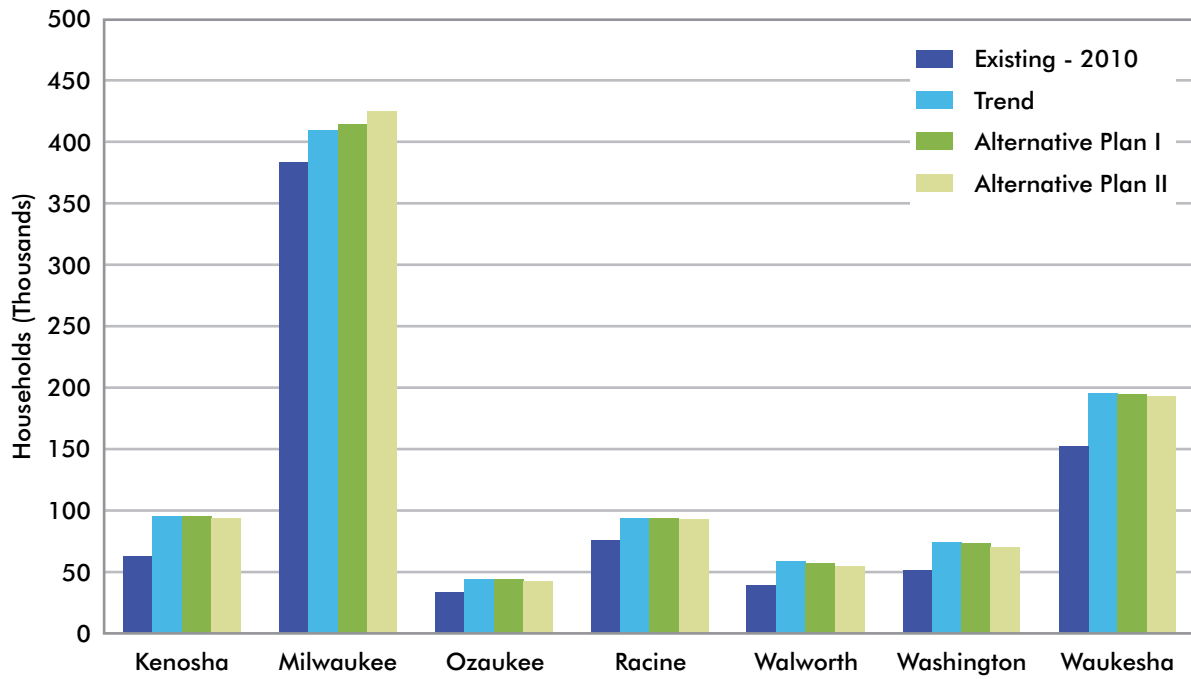
EXISTING AND PLANNED POPULATION BY VISION 2050 ALTERNATIVE



Source: SEWRPC

Figure III-2

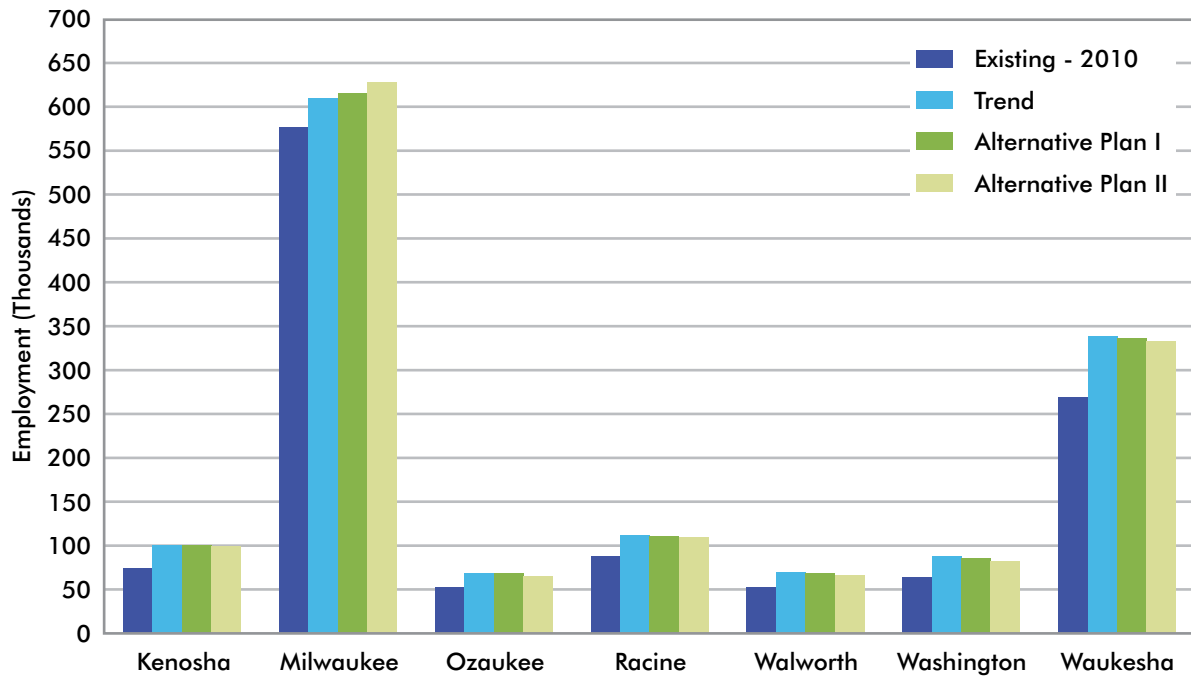
EXISTING AND PLANNED HOUSEHOLDS BY VISION 2050 ALTERNATIVE



Source: SEWRPC

Figure III-3

EXISTING AND PLANNED EMPLOYMENT BY VISION 2050 ALTERNATIVE



Source: SEWRPC

Figure III-4

TRANSIT-ORIENTED DEVELOPMENT (TOD) EXAMPLES



Pearl District in Portland, Oregon. Source: Google Images



The Baltimore Fitzgerald TOD Project, Baltimore, Maryland. Source: Richard Greenhouse.

Figure III-4 (continued)



Tampa, Florida. Source: City of Tampa website.



San Leandro, California. Source: Page Architecture and Engineering.

Figure III-5

EXAMPLES OF RAPID TRANSIT: BUS RAPID TRANSIT AND LIGHT RAIL



Cleveland Healthline. Source: Greater Cleveland Regional Transit Authority



MetroTransit Green Line, Minneapolis, Minnesota. Source: Flickr user: Michael Hicks

Figure III-6

EXAMPLES OF ENHANCED BICYCLE FACILITIES



A one-way protected lane utilizing bollards to create separation for bicyclists on Kinzie St. in Chicago, IL. Source: People for Bikes



A buffered bike lane that utilizes a buffer zone on both the travel lane and parking lane sides in Kansas City, KS. Source: Bike Walk KC

Figure III-6 (continued)



A raised bike lane on Bay St. in Milwaukee, WI. Source: Michael Sears



A two-way protected bike lane utilizing bollards in Washington, DC. Source: People for Bikes

Figure III-6 (continued)



A contra-flow bike lane in Boise, ID. Source: NACTO



A buffered left-side bike lane in Portland, OR. Source: Bike Portland

Figure III-6 (continued)



A neighborhood greenway utilizing a mini traffic circle to slow auto speeds on the corridor in Tucson, AZ. Source: NACTO



An intersection in Portland, OR utilizing a bike box at the head of a traffic lane. Source: Otrec

Figure III-6 (continued)

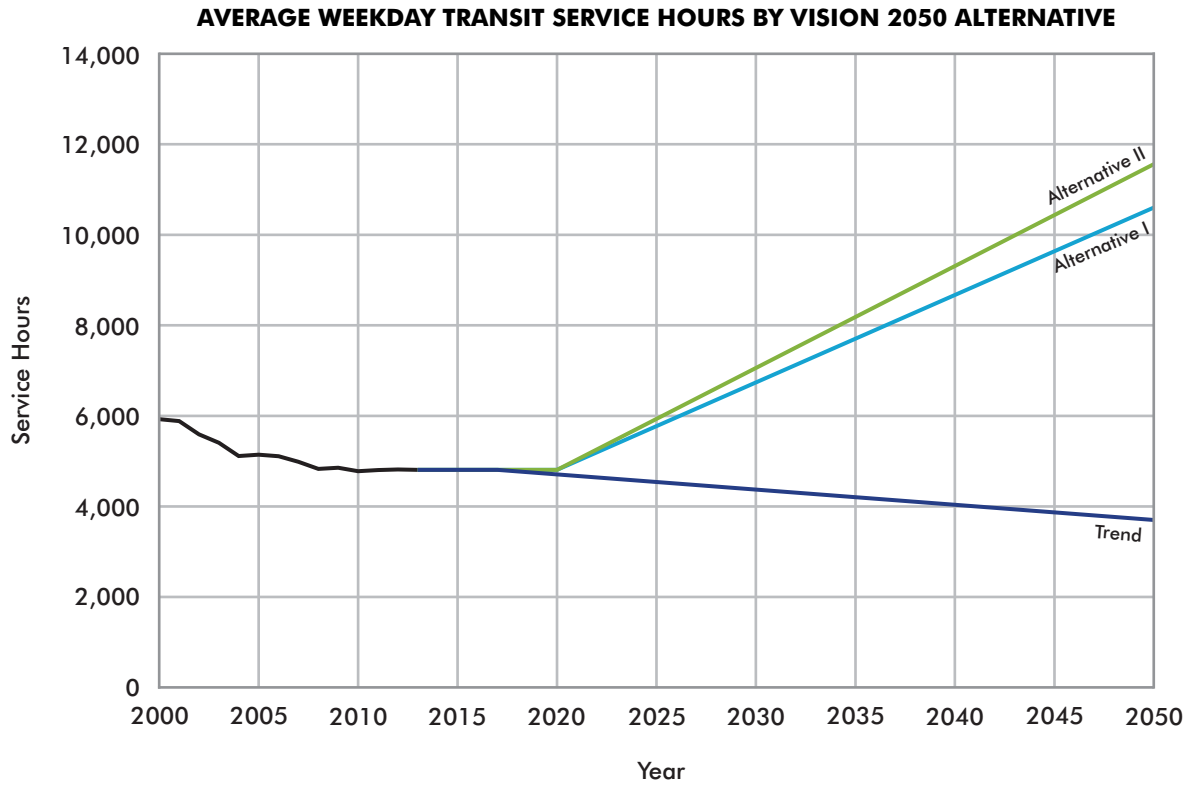


A view from a cyclist perspective at an intersection in San Francisco, CA treated to accommodate drivers and bicyclists when a protected bike lane is present. Source: San Francisco Bicycle Coalition



Intersection crossing markings implemented in Washington, DC. Source: Greater Greater Washington

Figure III-7



Source: National Transit Database and SEWRPC

Map III-1

CURRENTLY COMMITTED ARTERIAL HIGHWAY CAPACITY IMPROVEMENT AND EXPANSION AND FIXED-GUIDEWAY TRANSIT PROJECTS TO BE INCLUDED IN ALL VISION 2050 ALTERNATIVES

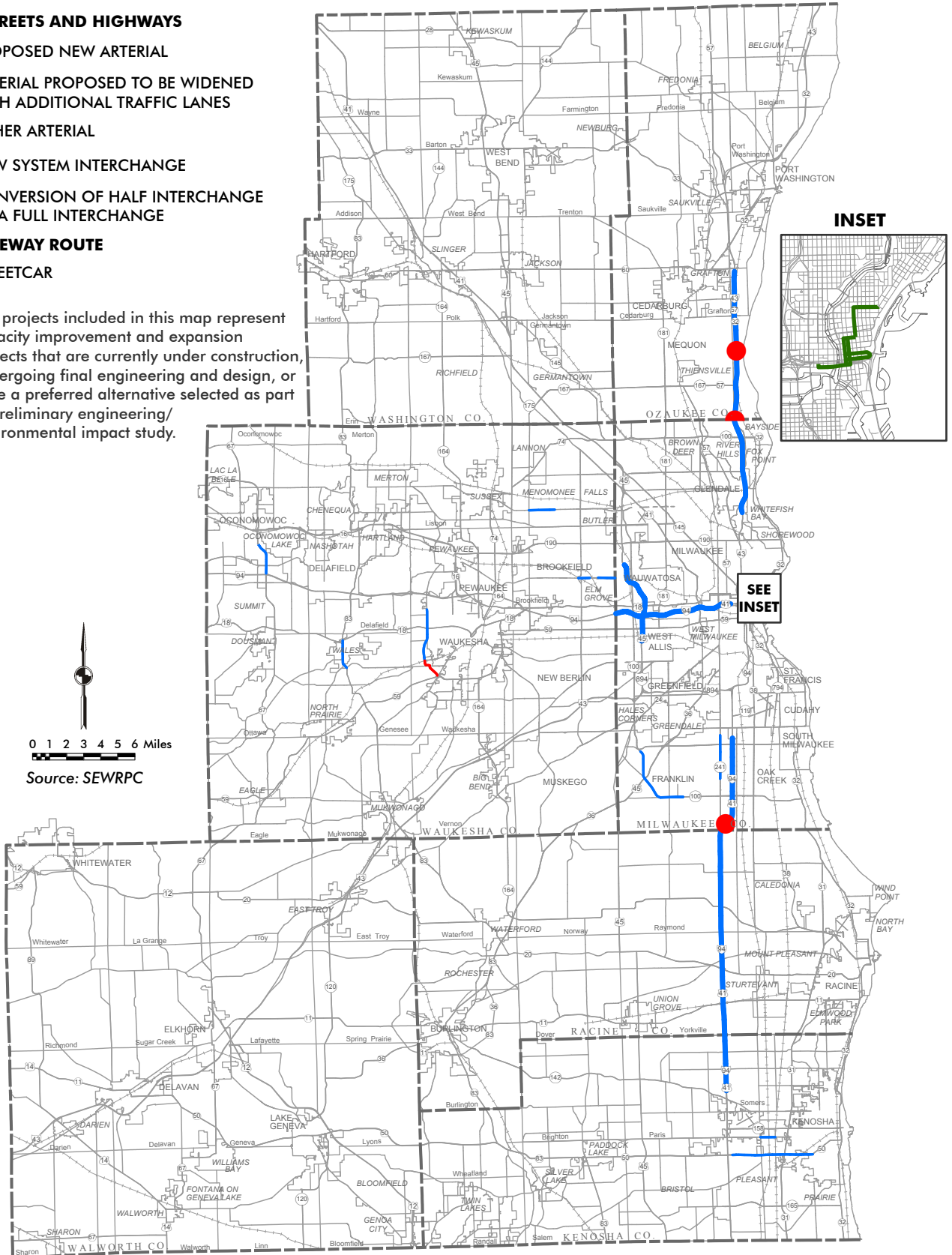
ARTERIAL STREETS AND HIGHWAYS

- PROPOSED NEW ARTERIAL
- ARTERIAL PROPOSED TO BE WIDENED WITH ADDITIONAL TRAFFIC LANES
- OTHER ARTERIAL
- NEW SYSTEM INTERCHANGE
- ◐ CONVERSION OF HALF INTERCHANGE TO A FULL INTERCHANGE

FIXED-GUIDEWAY ROUTE

- STREETCAR

Note: The projects included in this map represent capacity improvement and expansion projects that are currently under construction, undergoing final engineering and design, or have a preferred alternative selected as part of preliminary engineering/ environmental impact study.

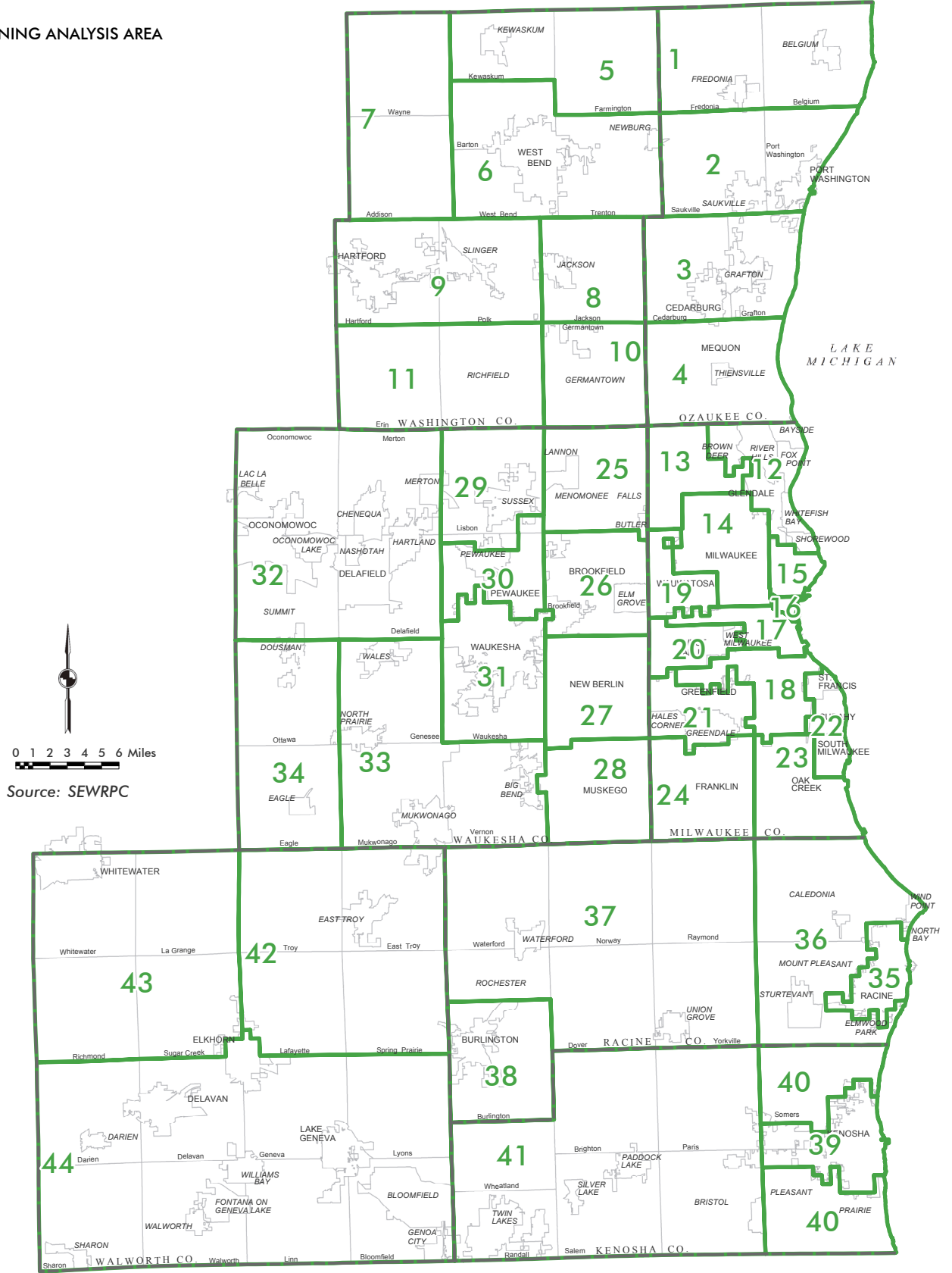


Source: SEWRPC

Map III-3

VISION 2050 PLANNING ANALYSIS AREAS

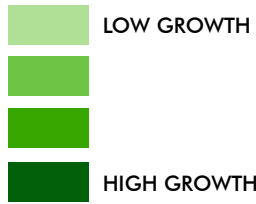
44 PLANNING ANALYSIS AREA



Map III-4

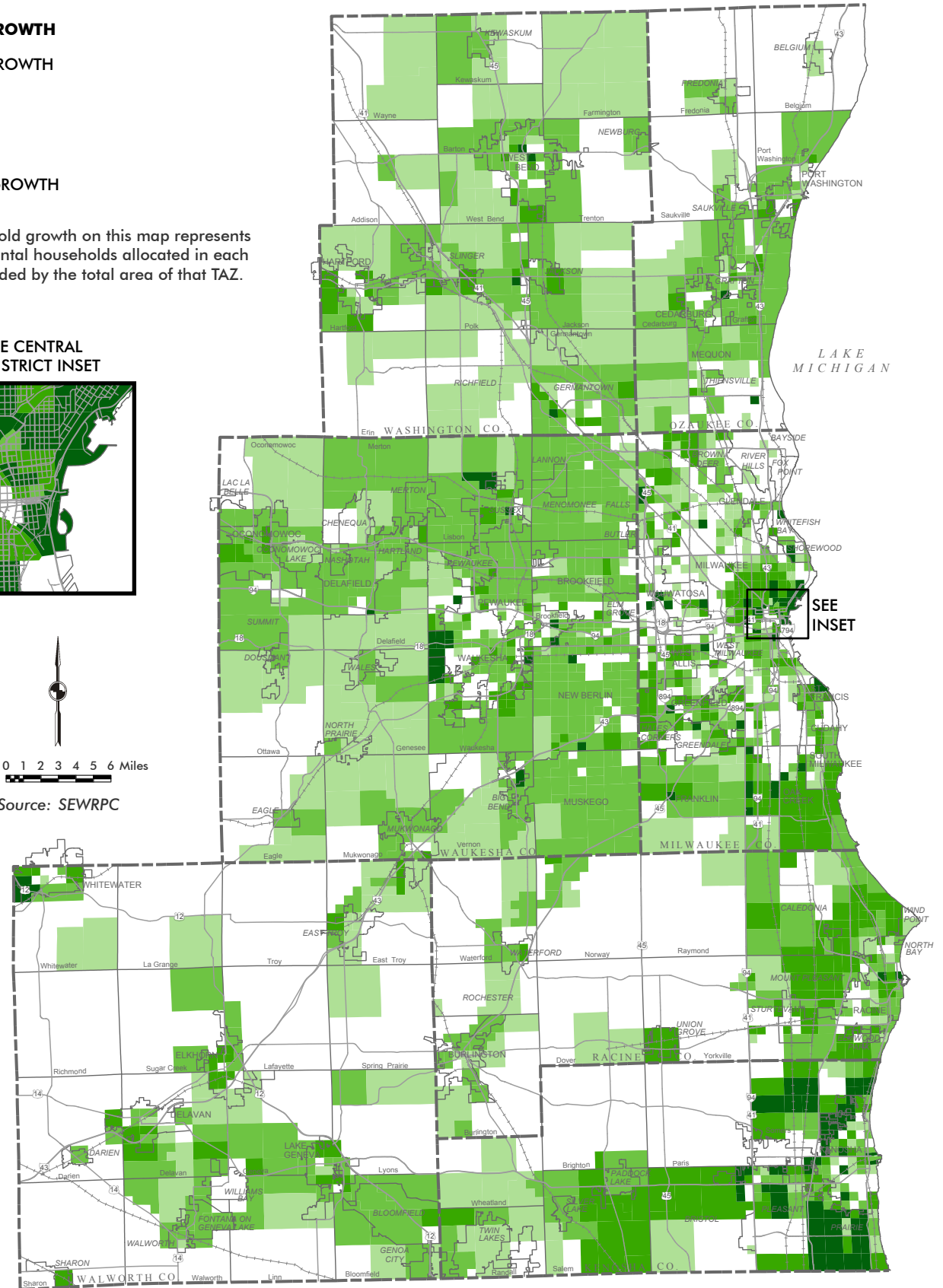
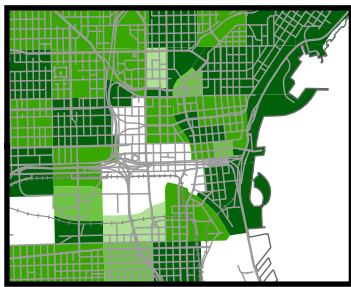
INCREMENTAL HOUSEHOLDS: TREND

HOUSEHOLD GROWTH



Note: Household growth on this map represents incremental households allocated in each TAZ divided by the total area of that TAZ.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



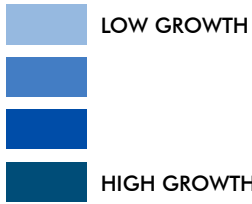
0 1 2 3 4 5 6 Miles

Source: SEWRPC

Map III-5

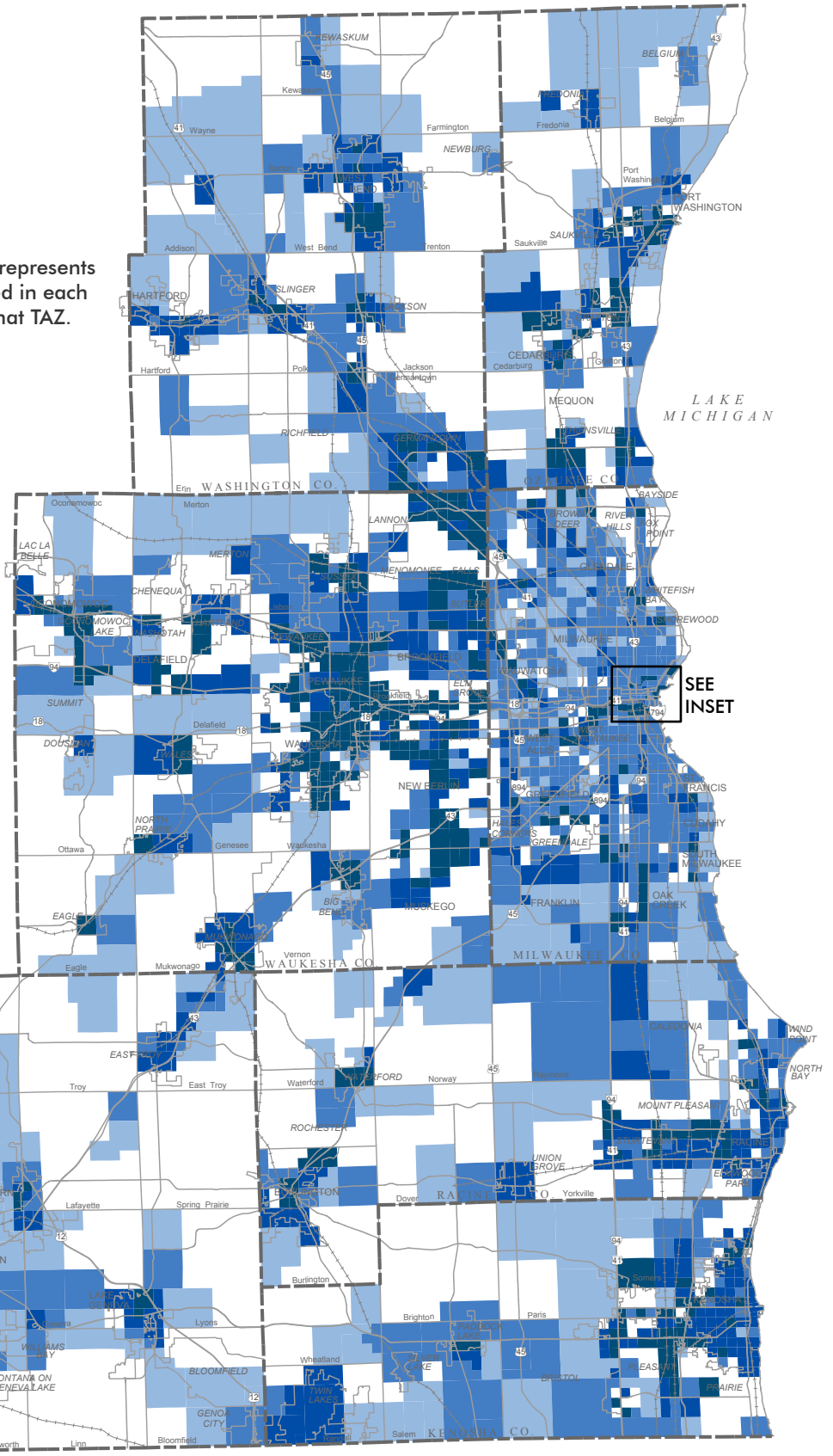
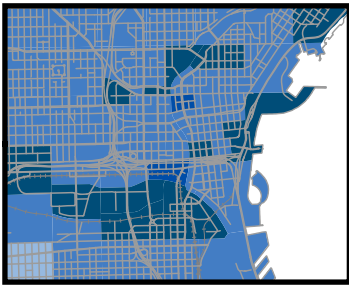
INCREMENTAL JOBS: TREND

EMPLOYMENT GROWTH



Note: Employment growth on this map represents incremental employment allocated in each TAZ divided by the total area of that TAZ.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



0 1 2 3 4 5 6 Miles

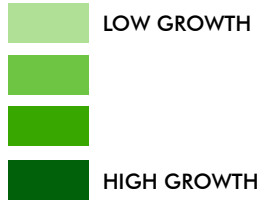
Source: SEWRPC

SEE INSET

Map III-6

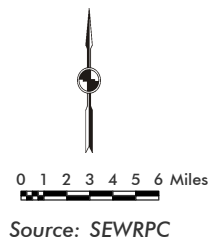
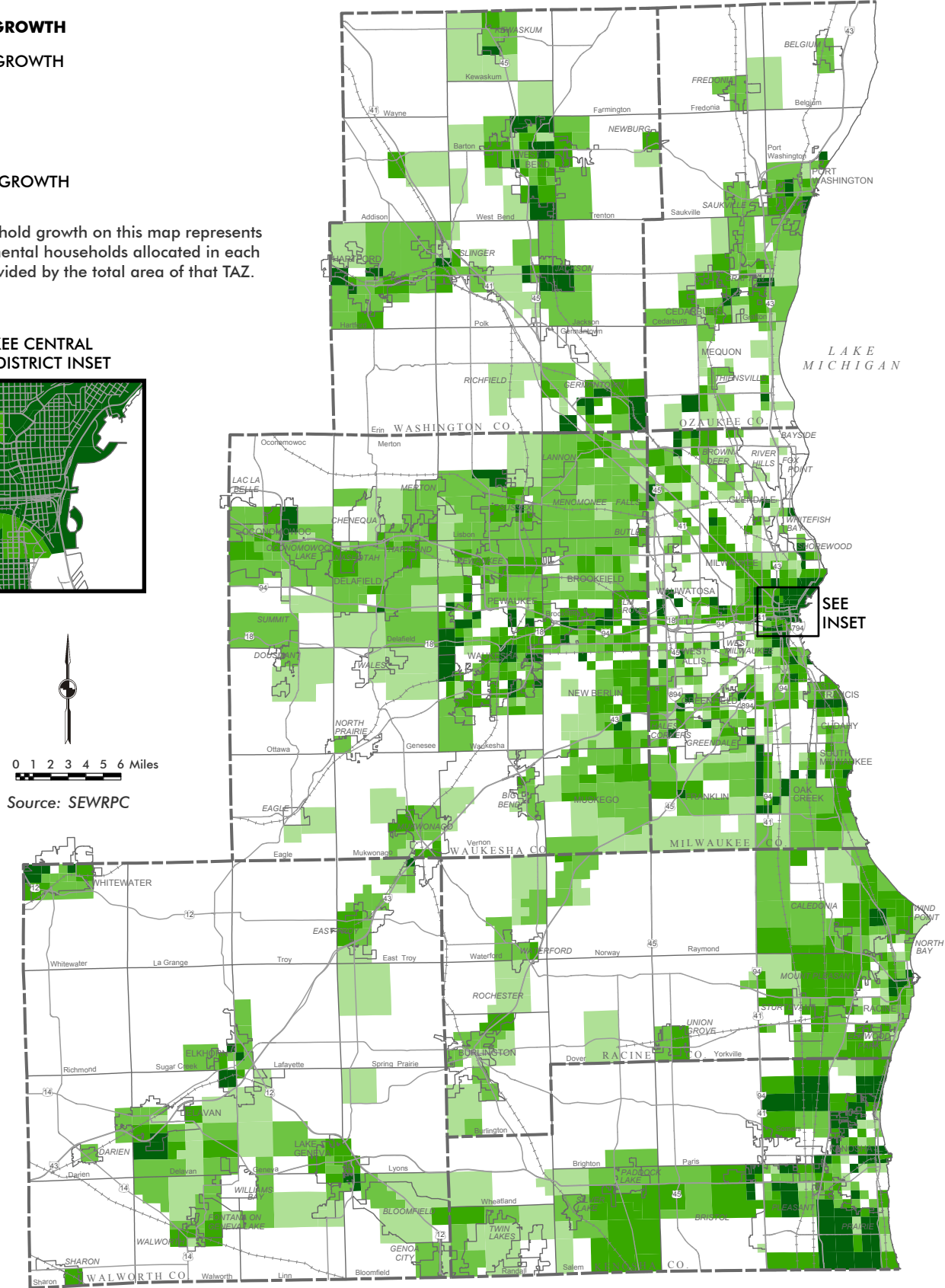
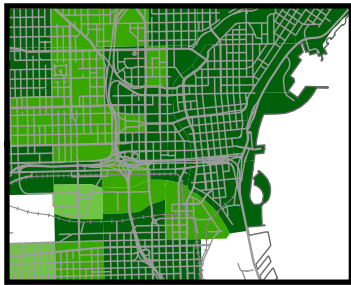
INCREMENTAL HOUSEHOLDS: ALTERNATIVE PLAN I

HOUSEHOLD GROWTH



Note: Household growth on this map represents incremental households allocated in each TAZ divided by the total area of that TAZ.

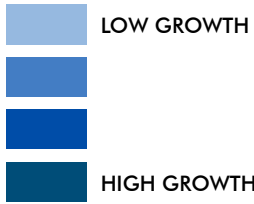
MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



Map III-7

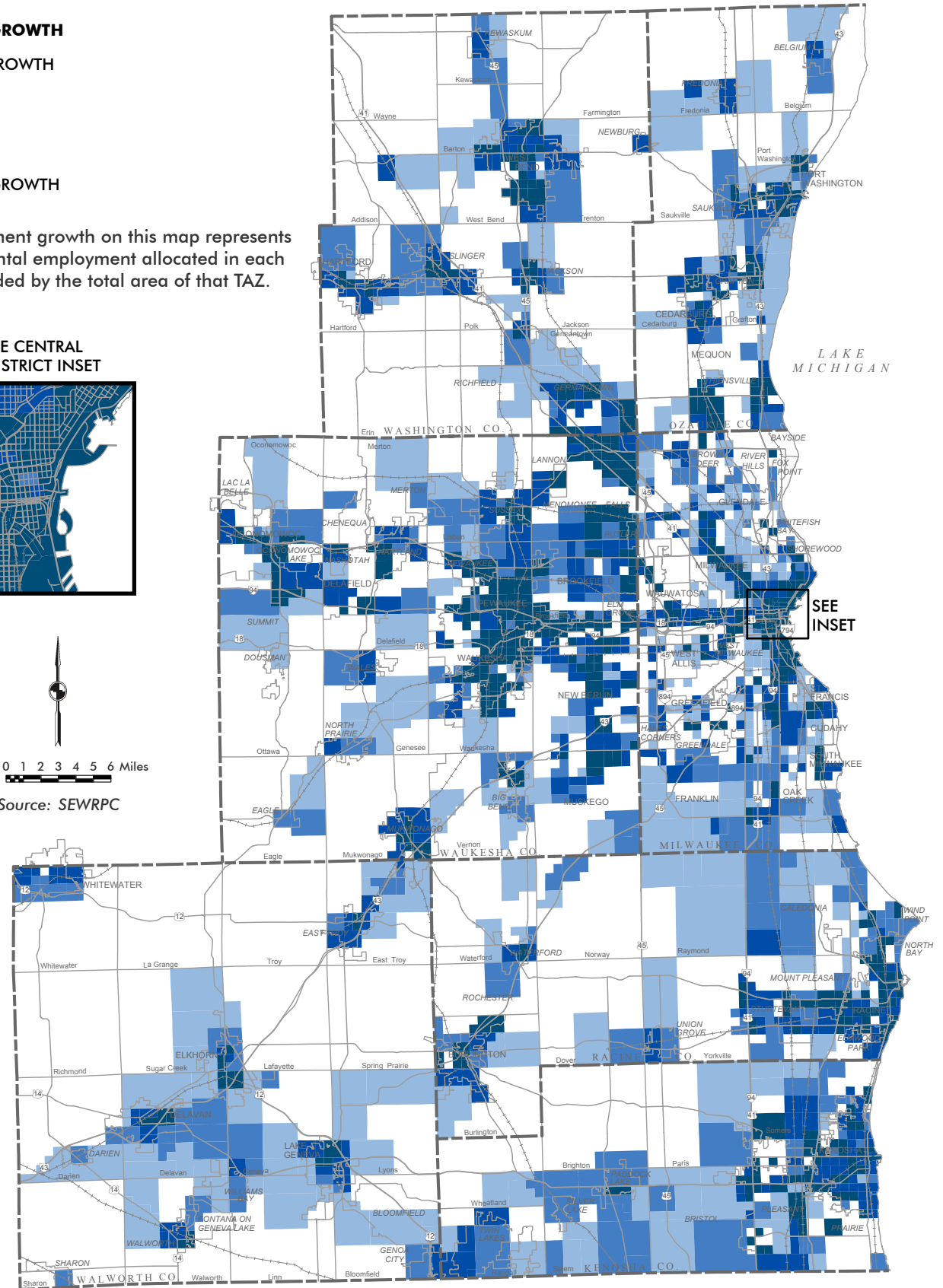
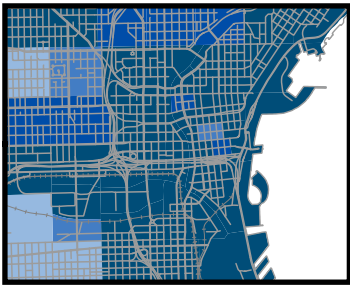
INCREMENTAL JOBS: ALTERNATIVE PLAN I

EMPLOYMENT GROWTH



Note: Employment growth on this map represents incremental employment allocated in each TAZ divided by the total area of that TAZ.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



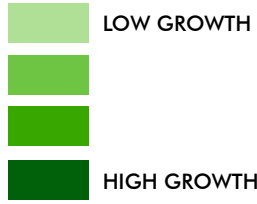
0 1 2 3 4 5 6 Miles

Source: SEWRPC

Map III-8

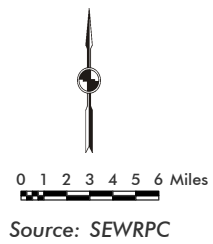
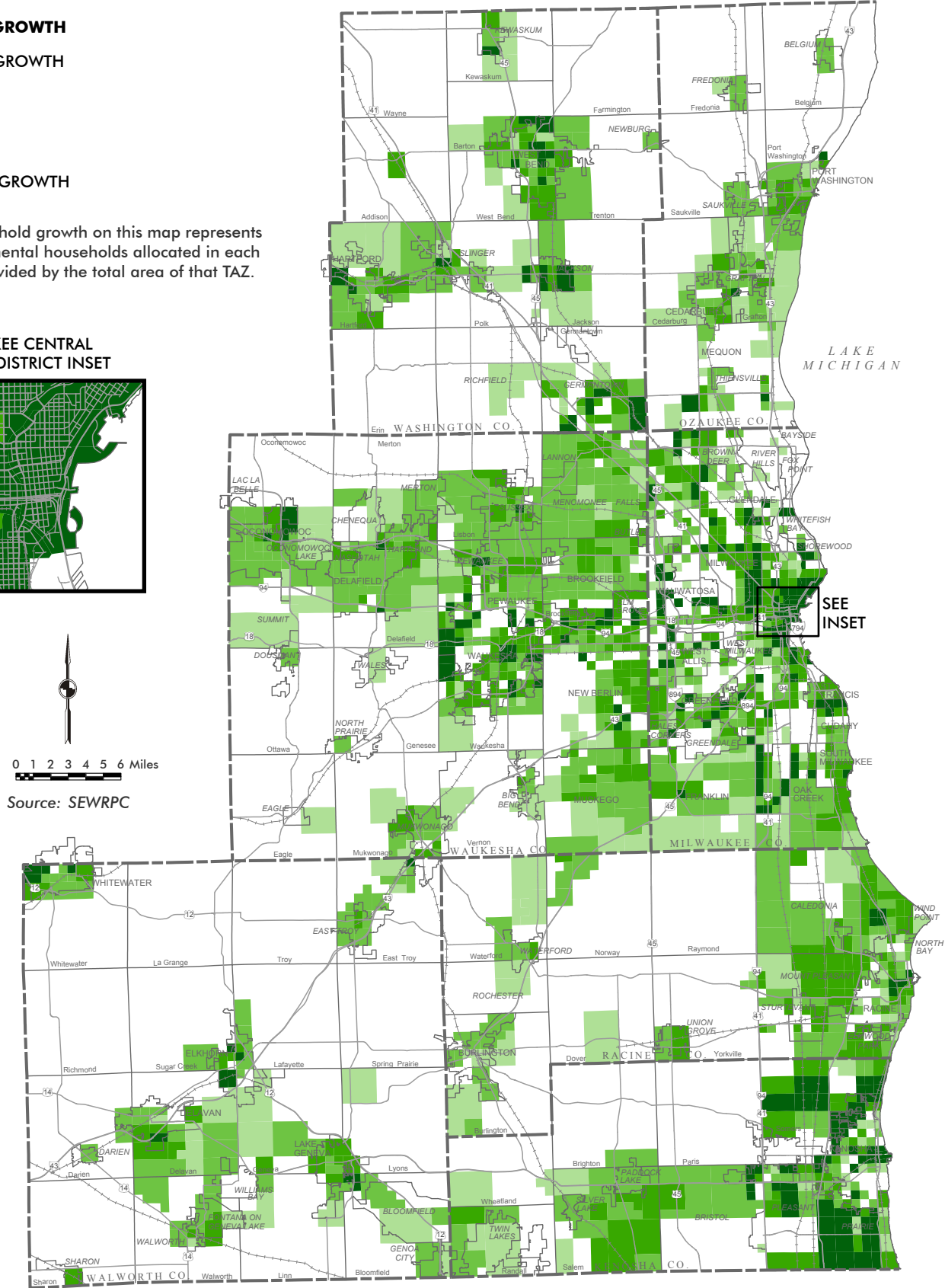
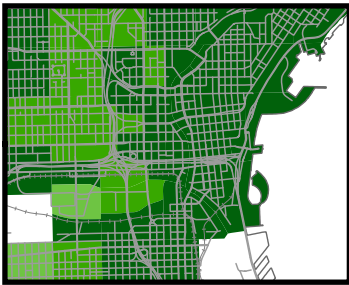
INCREMENTAL HOUSEHOLDS: ALTERNATIVE PLAN II

HOUSEHOLD GROWTH



Note: Household growth on this map represents incremental households allocated in each TAZ divided by the total area of that TAZ.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET

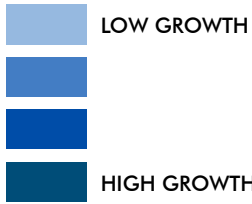


SEE INSET

Map III-9

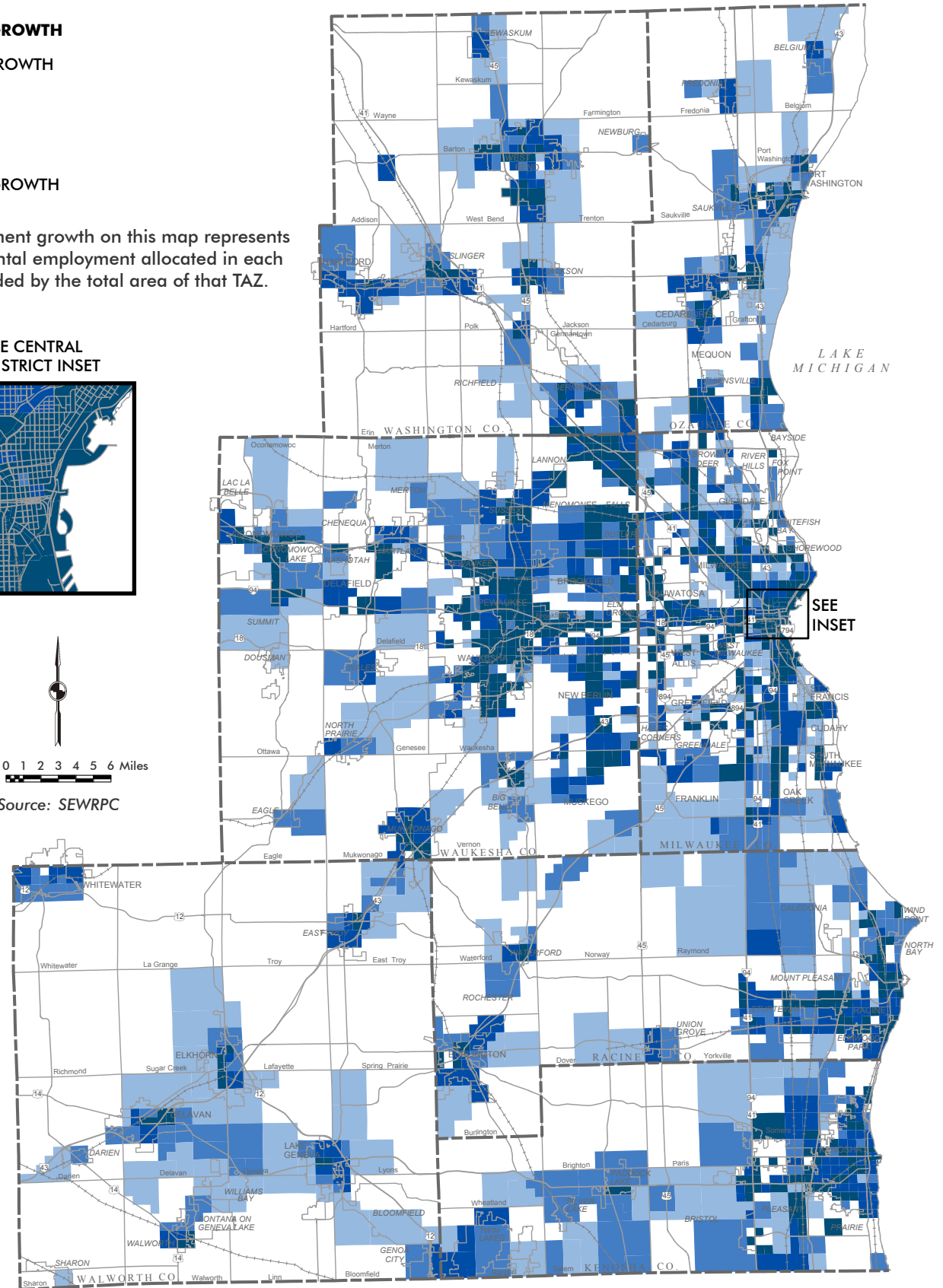
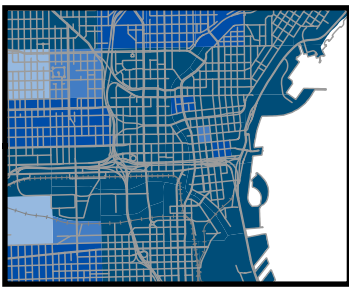
INCREMENTAL JOBS: ALTERNATIVE II

EMPLOYMENT GROWTH



Note: Employment growth on this map represents incremental employment allocated in each TAZ divided by the total area of that TAZ.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET








SEE INSET

Source: SEWRPC

Map III-10

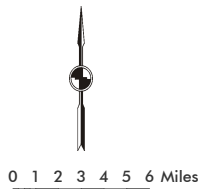
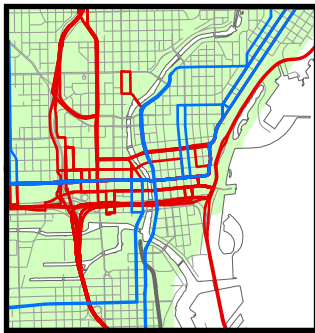
TRANSIT SERVICES: EXISTING

TRANSIT SERVICES

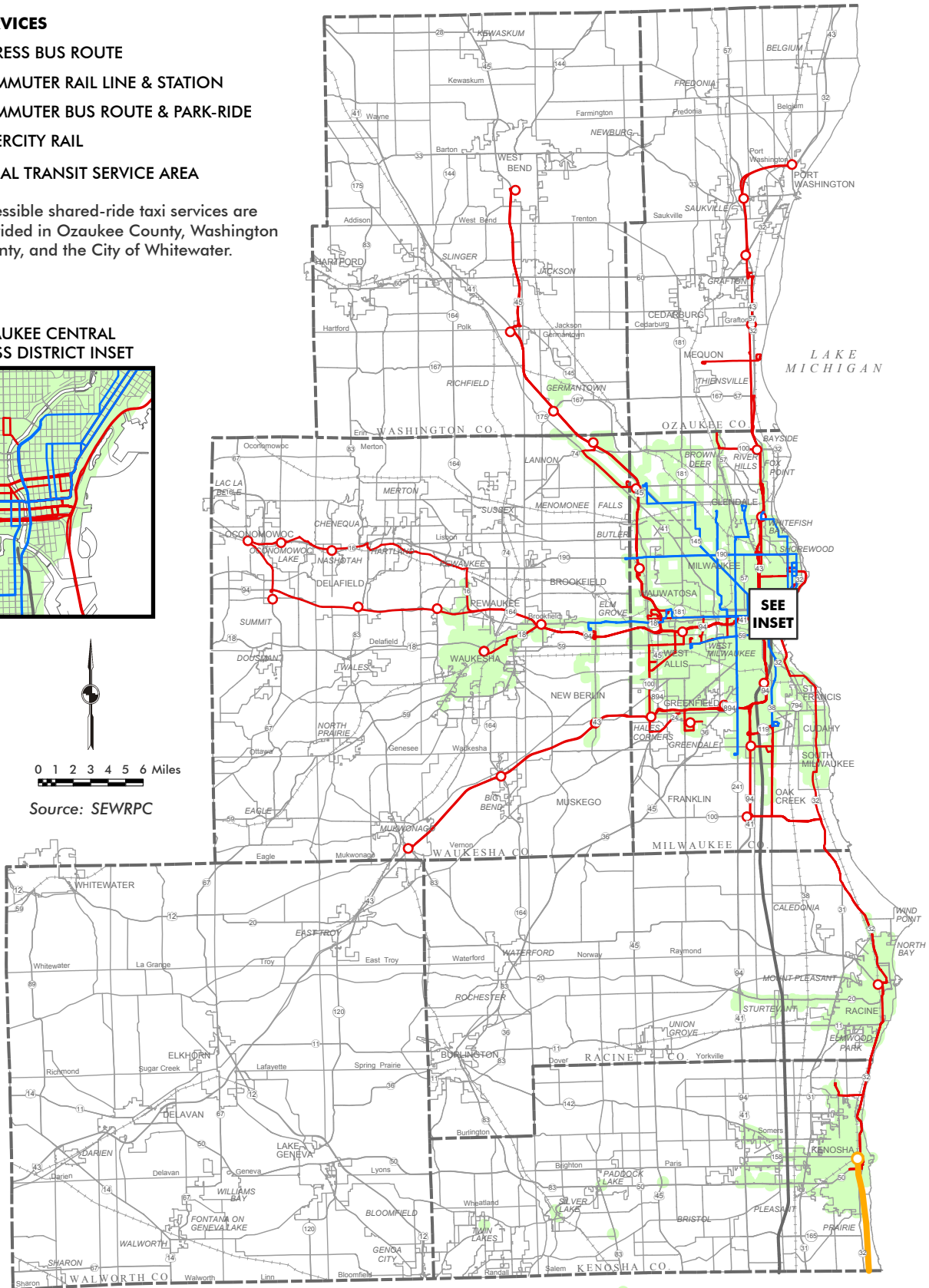
-  EXPRESS BUS ROUTE
-  COMMUTER RAIL LINE & STATION
-  COMMUTER BUS ROUTE & PARK-RIDE
-  INTERCITY RAIL
-  LOCAL TRANSIT SERVICE AREA

Note: Accessible shared-ride taxi services are provided in Ozaukee County, Washington County, and the City of Whitewater.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET







Source: SEWRPC



Map III-11

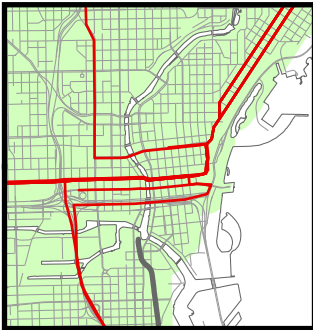
TRANSIT SERVICES: TREND

TRANSIT SERVICES

-  COMMUTER RAIL LINE & STATION
-  COMMUTER BUS ROUTE & PARK-RIDE
-  INTERCITY RAIL
-  LOCAL TRANSIT SERVICE AREA

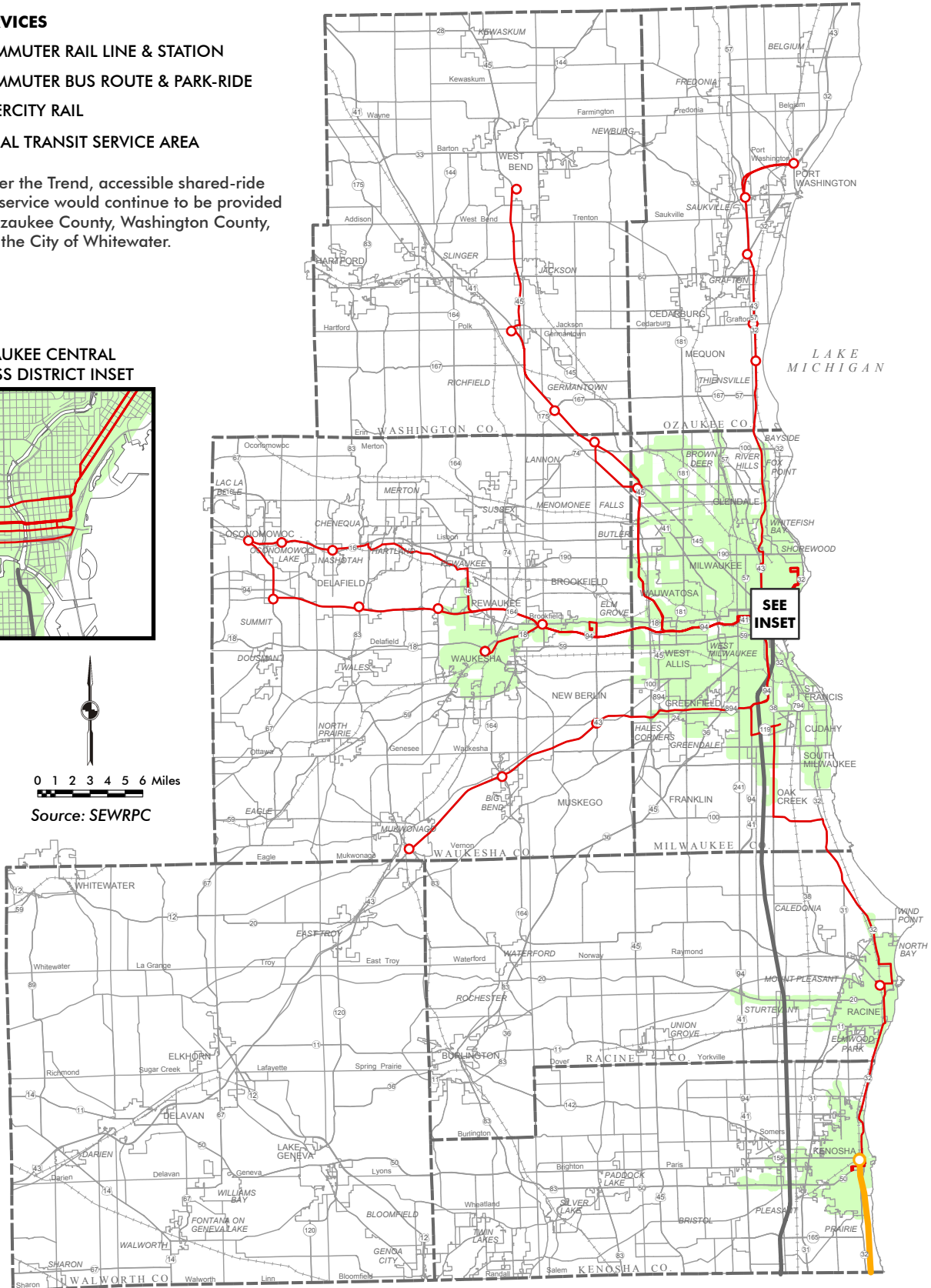
Note: Under the Trend, accessible shared-ride taxi service would continue to be provided in Ozaukee County, Washington County, and the City of Whitewater.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



0 1 2 3 4 5 6 Miles

Source: SEWRPC



Map III-12

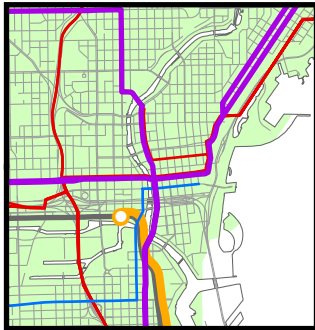
TRANSIT SERVICES: ALTERNATIVE PLAN I

TRANSIT SERVICES

- RAPID TRANSIT LINE
- EXPRESS BUS ROUTE
- ○ COMMUTER RAIL LINE & STATION
- ○ COMMUTER BUS ROUTE & PARK-RIDE
- INTERCITY RAIL
- LOCAL TRANSIT SERVICE AREA

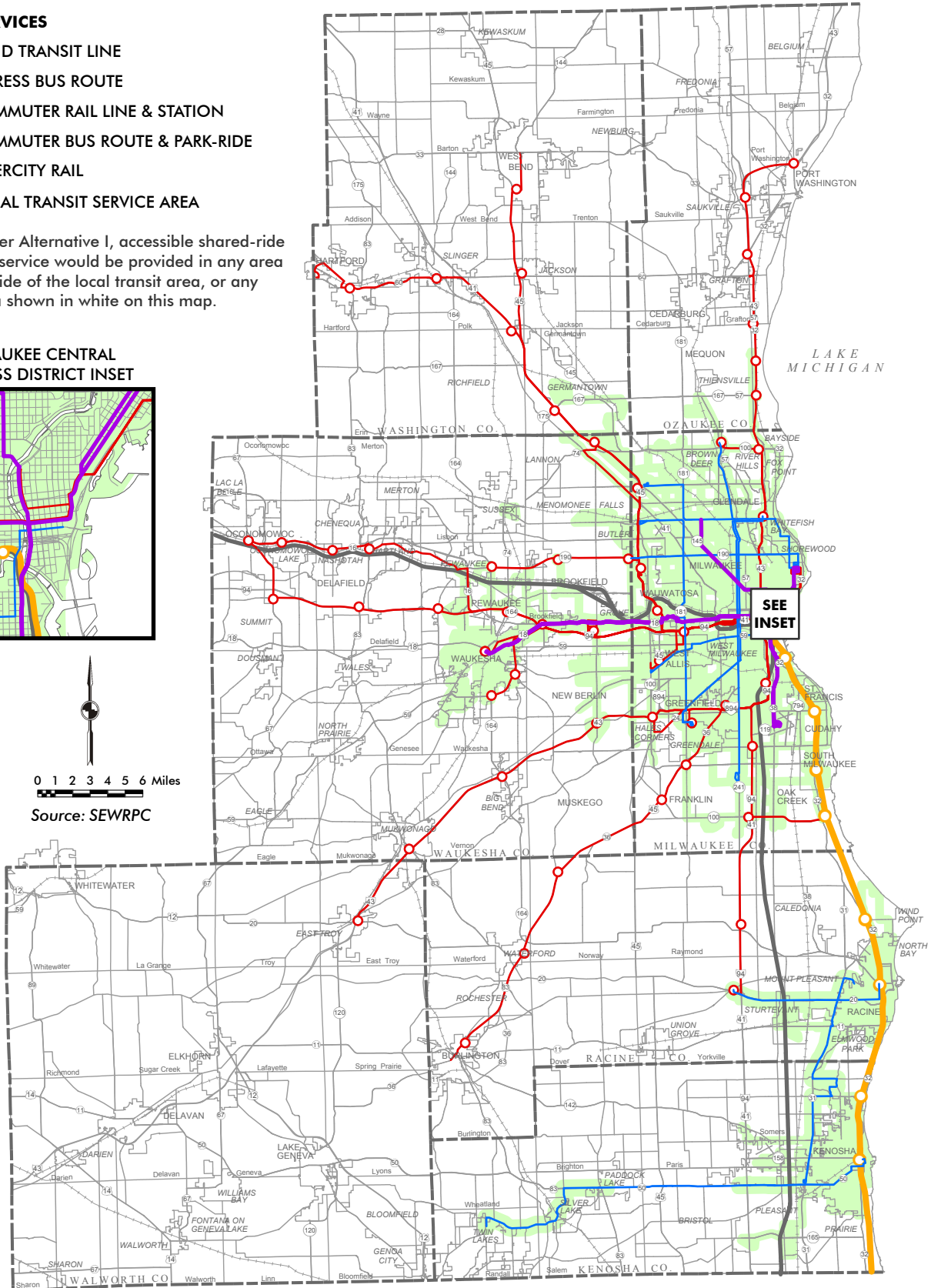
Note: Under Alternative I, accessible shared-ride taxi service would be provided in any area outside of the local transit area, or any area shown in white on this map.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



0 1 2 3 4 5 6 Miles

Source: SEWRPC



Map III-13

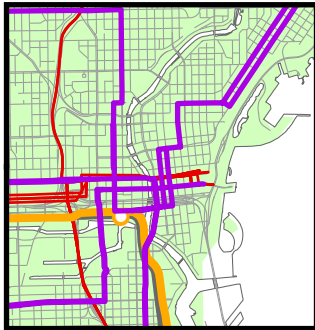
TRANSIT SERVICES: ALTERNATIVE PLAN II

TRANSIT SERVICES

-  RAPID TRANSIT LINE
-  EXPRESS BUS ROUTE
-  COMMUTER RAIL LINE & STATION
-  COMMUTER BUS ROUTE & PARK-RIDE
-  INTERCITY RAIL
-  LOCAL TRANSIT SERVICE AREA

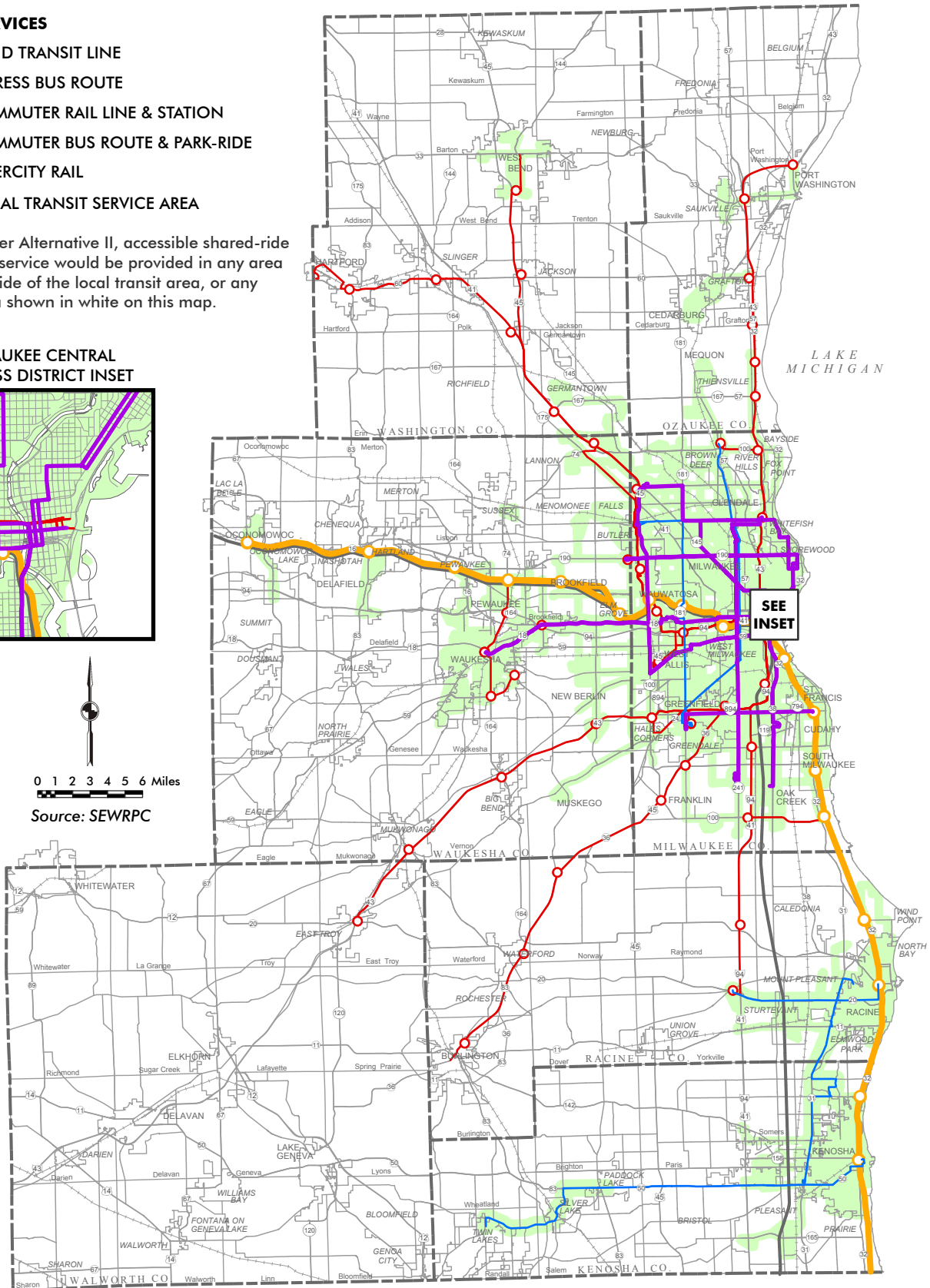
Note: Under Alternative II, accessible shared-ride taxi service would be provided in any area outside of the local transit area, or any area shown in white on this map.

MILWAUKEE CENTRAL BUSINESS DISTRICT INSET



0 1 2 3 4 5 6 Miles

Source: SEWRPC

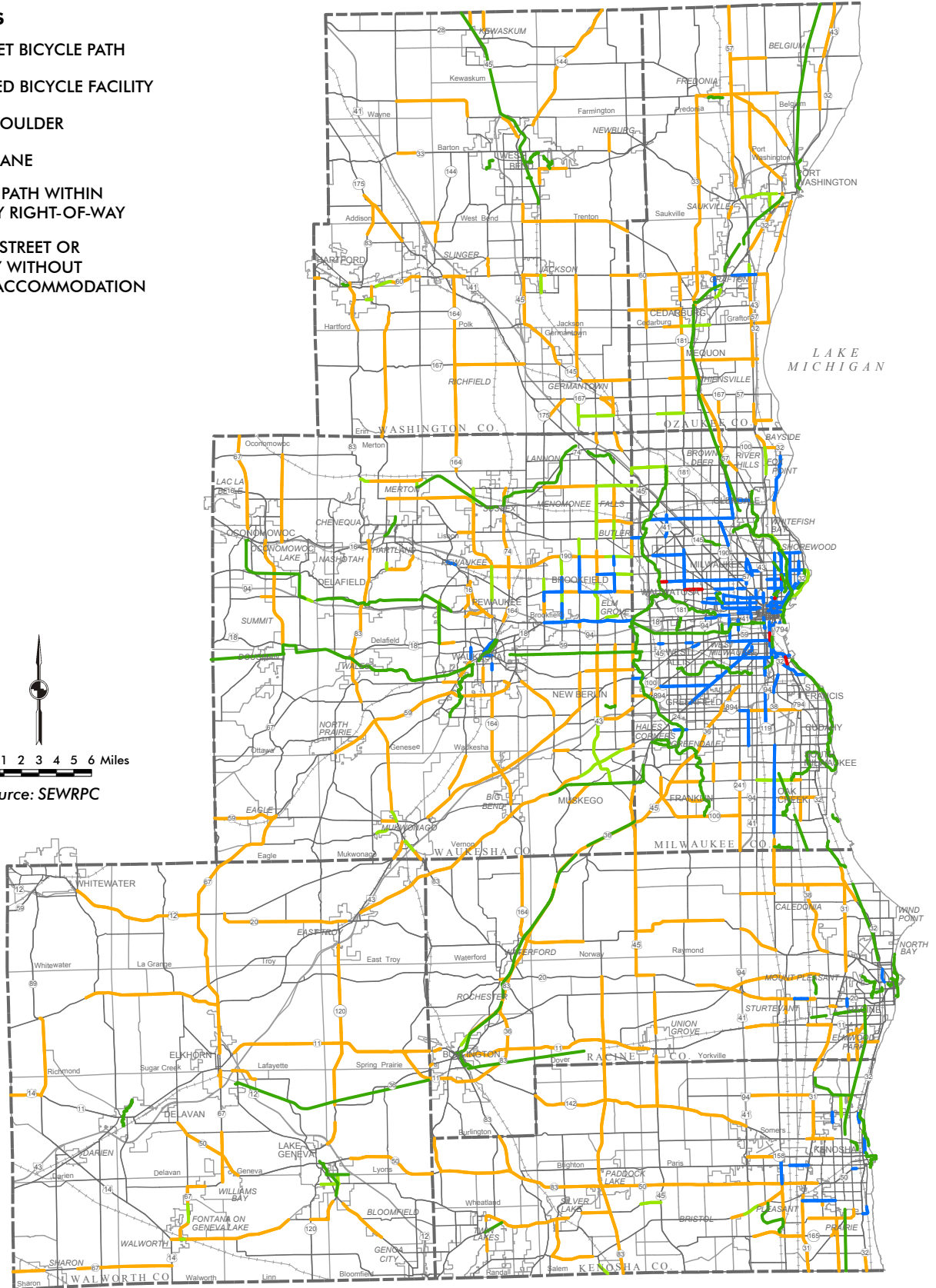
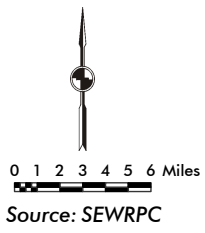


Map III-14

BICYCLE NETWORK: EXISTING

BICYCLE FACILITIES

- OFF-STREET BICYCLE PATH
- ENHANCED BICYCLE FACILITY
- PAVED SHOULDER
- BICYCLE LANE
- SEPARATE PATH WITHIN ROADWAY RIGHT-OF-WAY
- ARTERIAL STREET OR HIGHWAY WITHOUT BICYCLE ACCOMMODATION

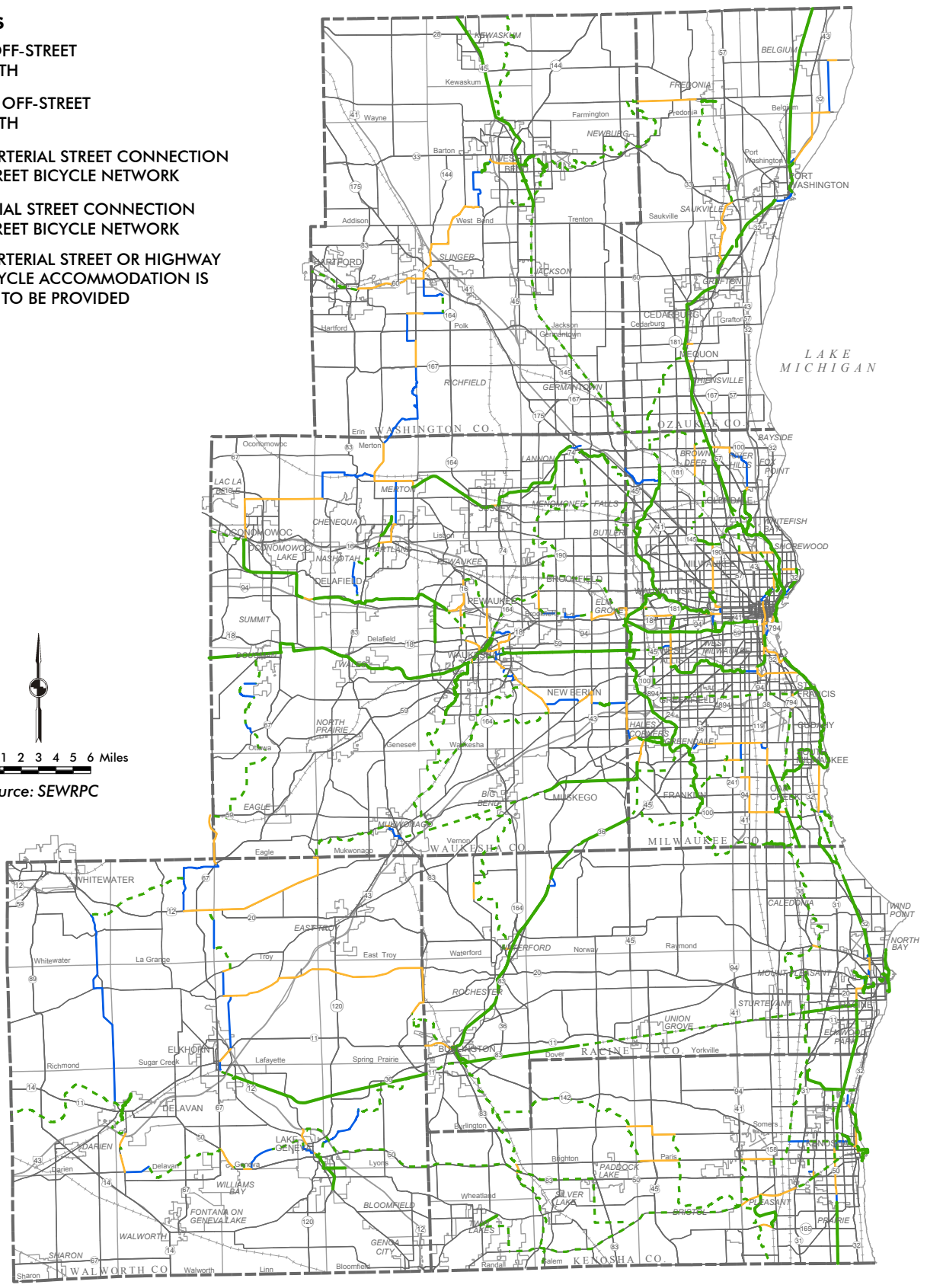
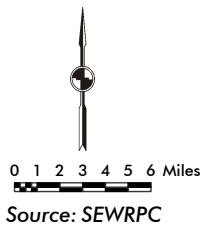


Map III-15

BICYCLE NETWORK: TREND

BICYCLE FACILITIES

- EXISTING OFF-STREET BICYCLE PATH
- - - PROPOSED OFF-STREET BICYCLE PATH
- SURFACE ARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK
- NONARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK
- SURFACE ARTERIAL STREET OR HIGHWAY WHERE BICYCLE ACCOMMODATION IS PROPOSED TO BE PROVIDED



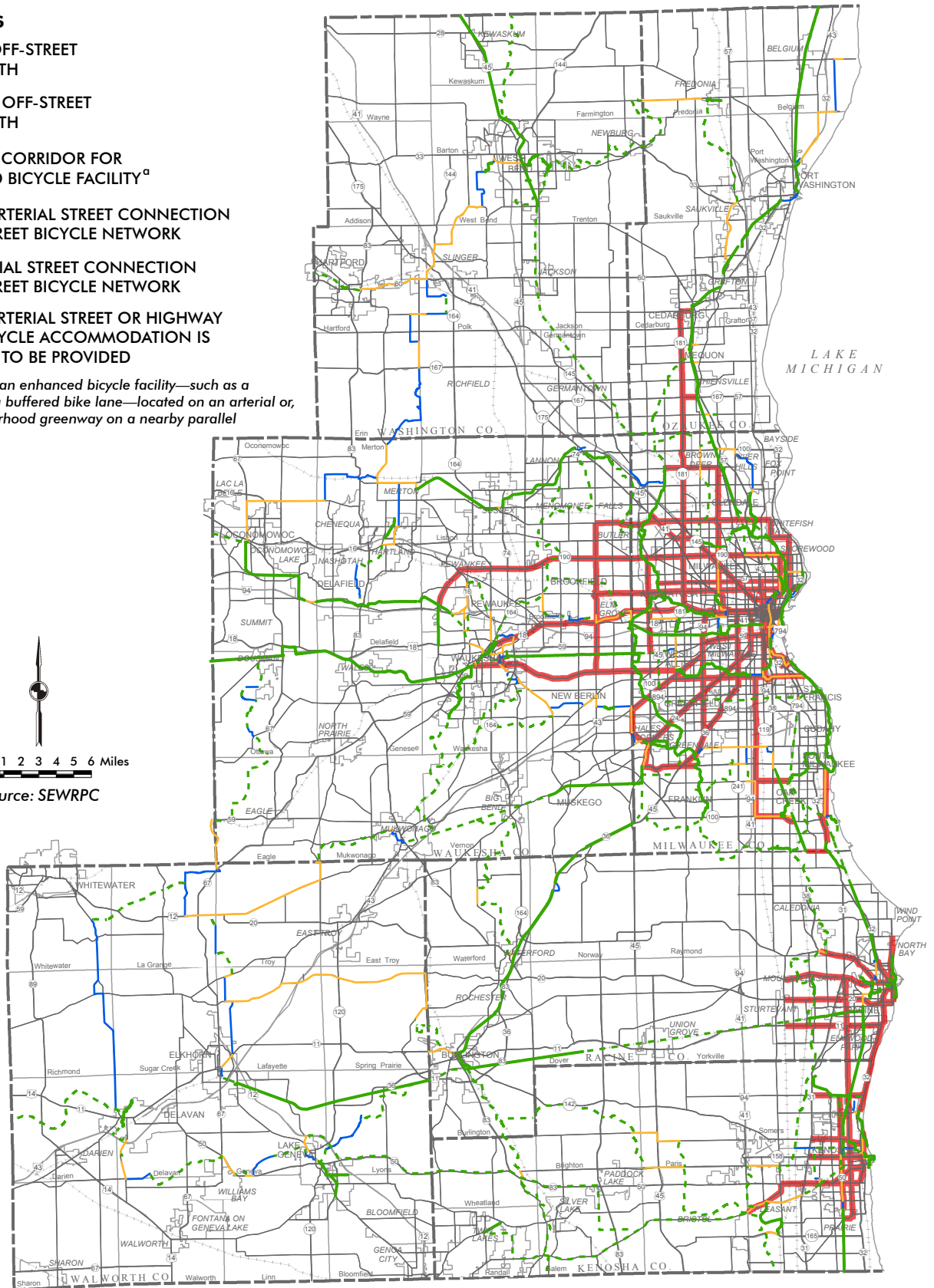
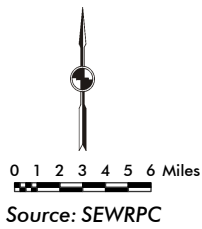
Map III-16

BICYCLE NETWORK: ALTERNATIVE PLANS I AND II

BICYCLE FACILITIES

- EXISTING OFF-STREET BICYCLE PATH
- - - PROPOSED OFF-STREET BICYCLE PATH
- POTENTIAL CORRIDOR FOR ENHANCED BICYCLE FACILITY^a
- SURFACE ARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK
- NONARTERIAL STREET CONNECTION TO OFF-STREET BICYCLE NETWORK
- SURFACE ARTERIAL STREET OR HIGHWAY WHERE BICYCLE ACCOMMODATION IS PROPOSED TO BE PROVIDED

^a Corridor would include an enhanced bicycle facility—such as a protected bike lane or a buffered bike lane—located on an arterial or, alternatively, a neighborhood greenway on a nearby parallel nonarterial.

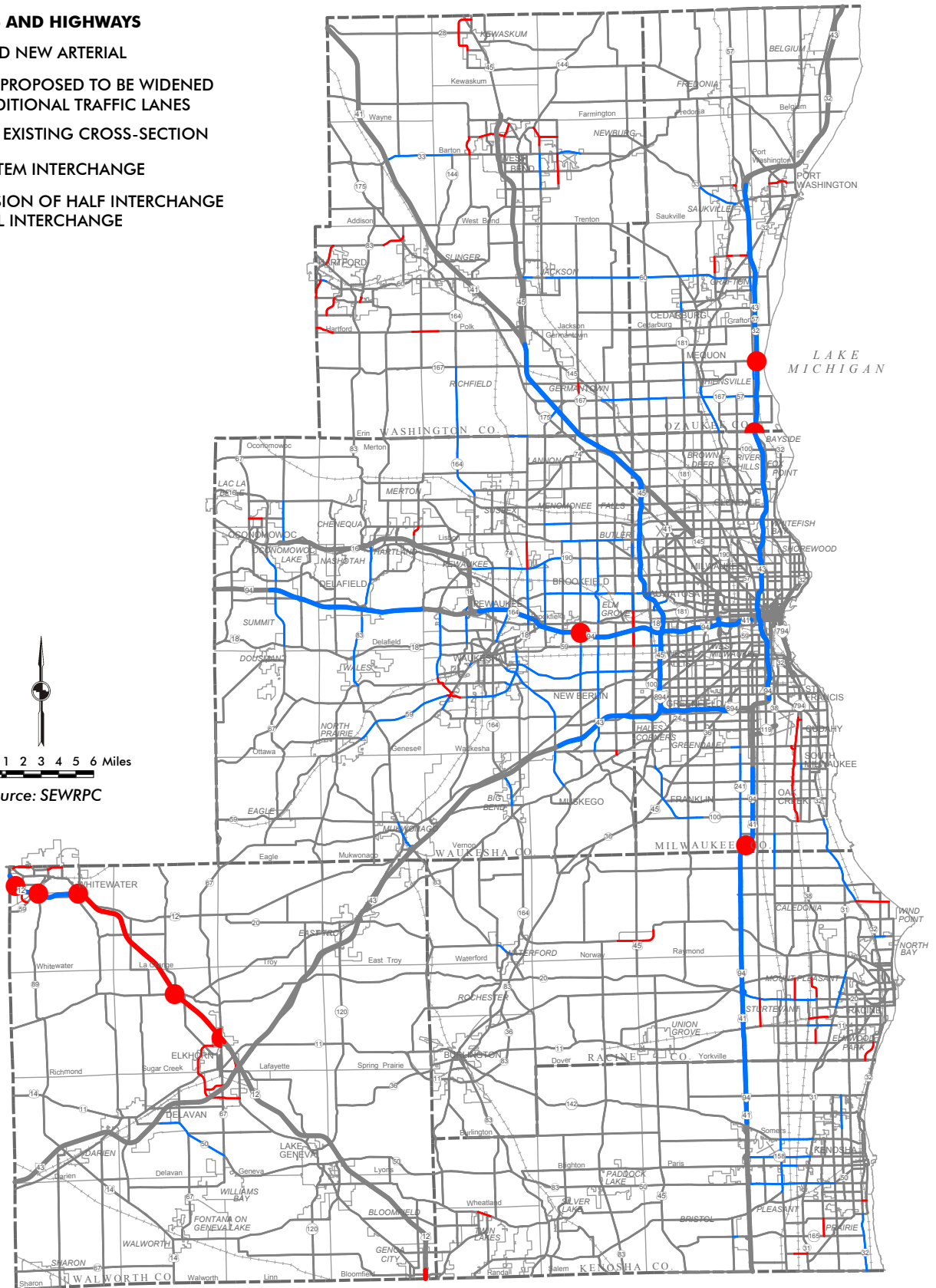
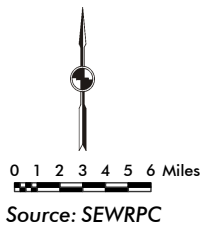


Map III-17

ARTERIAL STREET AND HIGHWAY ELEMENT: TREND

ARTERIAL STREETS AND HIGHWAYS

- PROPOSED NEW ARTERIAL
- ARTERIAL PROPOSED TO BE WIDENED WITH ADDITIONAL TRAFFIC LANES
- PRESERVE EXISTING CROSS-SECTION
- NEW SYSTEM INTERCHANGE
- ◐ CONVERSION OF HALF INTERCHANGE TO A FULL INTERCHANGE

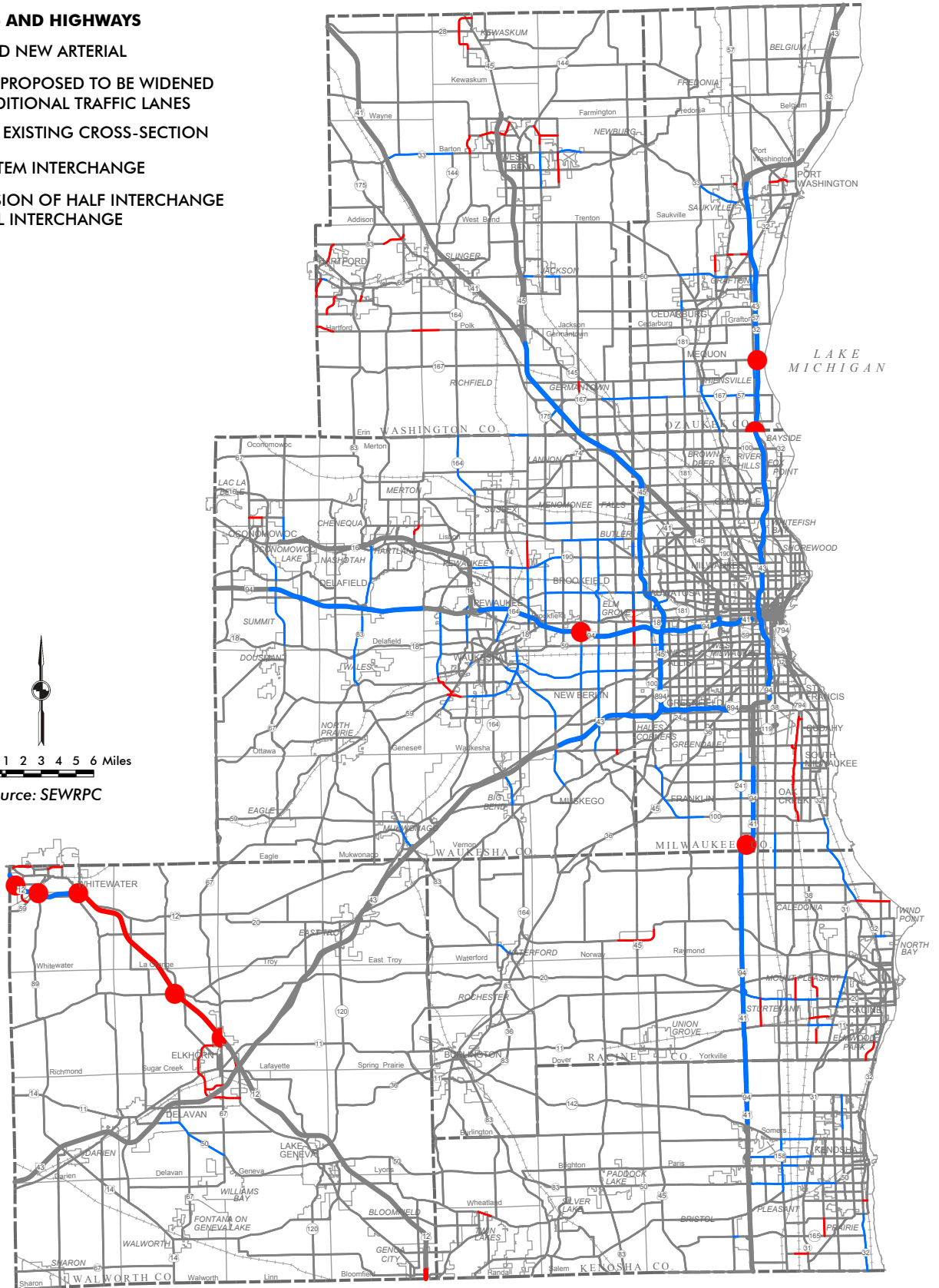
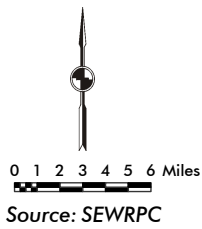


Map III-18

ARTERIAL STREET AND HIGHWAY ELEMENT: ALTERNATIVE PLAN I

ARTERIAL STREETS AND HIGHWAYS

- PROPOSED NEW ARTERIAL
- ARTERIAL PROPOSED TO BE WIDENED WITH ADDITIONAL TRAFFIC LANES
- PRESERVE EXISTING CROSS-SECTION
- NEW SYSTEM INTERCHANGE
- ◐ CONVERSION OF HALF INTERCHANGE TO A FULL INTERCHANGE



Map III-19

ARTERIAL STREET AND HIGHWAY ELEMENT: ALTERNATIVE PLAN II

ARTERIAL STREETS AND HIGHWAYS

- PROPOSED NEW ARTERIAL
- ARTERIAL PROPOSED TO BE WIDENED WITH ADDITIONAL TRAFFIC LANES
- PRESERVE EXISTING CROSS-SECTION
- NEW SYSTEM INTERCHANGE
- ◐ CONVERSION OF HALF INTERCHANGE TO A FULL INTERCHANGE

