

## **CHAPTER 6: TRANSPORTATION AND LAND USE**

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### **INTRODUCTION**

Transportation and land use are interconnected; access to transportation affects land use, and land use affects travel demand. The metropolitan planning area experiences changes in land use due to economic development and/or population increase.

Land use changes, such as new housing developments and business centers, can increase travel demand, creating the need for additional transportation accommodations in all modes. As the metropolitan planning area responds with new supply (new roads, travel lanes, bus routes, bicycle and pedestrian facilities, etc.), demand is addressed, and there is improved access to land. This accessibility results in new land uses, leading to new transportation demand, and the cycle continues.

### **ESTIMATING FUTURE TRANSPORTATION NEEDS**

An accepted process for estimating future transportation needs is to project population, households, employment and other socioeconomic variables at the Traffic Analysis Zone (TAZ) level for input into a travel demand forecast model. The purpose of this process is to identify segments of the transportation network that will be stressed by additional travel demand. Modeling allows for the testing of potential transportation improvements to see which ones best address street and highway deficiencies.

#### **Pre-Modeling Process**

Before traffic could be forecasted, two steps needed to be undertaken: (1) complete a land use inventory of all developed, developable and undevelopable land in Sheboygan County; and (2) forecast control total population, household, employment and other socioeconomic variables at the county level out to 2045. The Bay-Lake Regional Planning Commission conducted an initial land use inventory for Sheboygan County in 2002, and completed updates of this land use inventory for each of the cities, villages and towns in the Sheboygan metropolitan planning area in 2009 and again in 2015. In 2014, the Wisconsin Department of Administration's Demographic Services Center completed population and household projections to 2040, and the Bay-Lake Regional Planning Commission used these projections to develop control total projections for all socioeconomic variables out to 2045. A third step was added to allocate projected population, households, employment and other socioeconomic variables to the nearly 470 TAZs in Sheboygan County under three land use scenarios developed for 2045.

#### **Land Use Inventory**

The land use inventory distinguishes between “developed,” “developable” and “undevelopable” land. Examples of undevelopable lands include water bodies, designated scientific sites or areas, and other natural areas (including wetlands, grasslands, beaches, and other publicly owned natural areas). Developable land includes many agricultural land uses (including open space/fallow fields, croplands/pastures, long-term specialty crops, and vacant agriculture), as well as woodlands. (The term “developable” relates only to the condition of the land in that it has no physical constraints to

preclude development. Categorizing land as “developable” does not mean that it should or will be developed). Developed land includes residential (including mobile homes), commercial, industrial, transportation (including roads), communications/utilities, governmental/institutional, and parks/recreational land uses. Developed land also includes certain agricultural land uses (animal husbandry, fish hatchery/aquaculture, and farm buildings and accessories), and includes land that is under development.

Within Sheboygan County, there was a total of approximately 146,634 acres of total land in the most recent update to the land use inventory (2015). Of this, approximately 41,480 acres (12.5 percent) were developed, 4,596 acres (1.4 percent) were undevelopable, and 285,525 acres (86.1 percent) were considered developable.

Within the Sheboygan metropolitan planning area, there was a total of 69,152 acres of total land in the 2015 update to the land use inventory. Of this, approximately 21,523 acres (31.1 percent) were developed, 936 acres (1.4 percent) were undevelopable, and 46,693 acres (67.5 percent) were considered developable.

Map 6.1 indicates the updated land use inventory as recorded for the Sheboygan metropolitan planning area. Land use information collected for the remainder of Sheboygan County that was used to assist in travel demand forecast model development and air quality conformity analysis in this Update to the *Year 2045 SATP* is available upon request.

### **2045 Control Total Socioeconomic Projections**

Socioeconomic projections are an important component of any urban transportation system plan because they are used as inputs to predict travel demand in an urban area in the long-term future. A relationship between socioeconomic data and travel demand is established early in the planning process when the travel demand forecast model is adjusted to reflect trends in the “base year” of analysis (2010). Socioeconomic parameters which are used in projecting future travel demand in the Sheboygan County model include population, households, employment (including retail, service, and other employment), and school enrollment. These data have been projected both for Sheboygan County and for TAZs.

Socioeconomic projections were prepared for the metropolitan planning area and for all of Sheboygan County, beginning with the base year of 2010 and projecting to the horizon year of 2045. Nearly 470 TAZs were forecasted using data from the 2010 Census, the Wisconsin Department of Administration’s Demographic Services Center, the Wisconsin Department of Workforce Development, the Wisconsin Department of Public Instruction, and local knowledge for input into the travel demand forecast model; nearly 310 of these TAZs were located wholly or partially in the Sheboygan metropolitan planning area. TAZs, which are defined by their geographic, transportation, social, and economic patterns or activities, are reasonably homogenous. Accordingly, TAZs are smaller in areas of higher population density and larger in areas of lower population density. The geographic boundaries for the current TAZs were determined by MPO staff in 2011 and 2012 for use in developing the updated WisDOT Northeast Region travel demand forecast model.

Discussion here focuses solely on county-wide projections. Distribution of socioeconomic data projections among the TAZs is essential to the successful performance of the travel demand forecast model. Table 6.1 summarizes population, household, employment, and school enrollment projections for Sheboygan County through 2045.

Table 6.1: Control Total Socioeconomic Projections for Sheboygan County, 2010-2045

	2010 Census and Estimates	2015 Estimates	2020 Projection	2025 Projection	2030 Projection	2035 Projection	2040 Projection	2045 Projection
Population	115,507	115,915	119,890	123,400	126,160	126,830	125,160	125,897
Total Households	46,390	47,633	49,867	52,016	53,857	54,838	54,620	55,048
Group Quarters Population	3,023	3,013	3,086	3,217	3,404	3,608	3,792	3,970
Persons per Household	2.42	2.37	2.34	2.31	2.28	2.25	2.22	2.21
Total Employment	59,824	62,144	64,554	67,058	69,658	72,360	75,166	78,081
K - 12 School Enrollment	21,884	21,425	21,530	21,911	22,206	22,306	22,211	22,223
Post Secondary School Enrollment	4,068	3,983	4,002	4,073	4,128	4,146	4,129	4,132

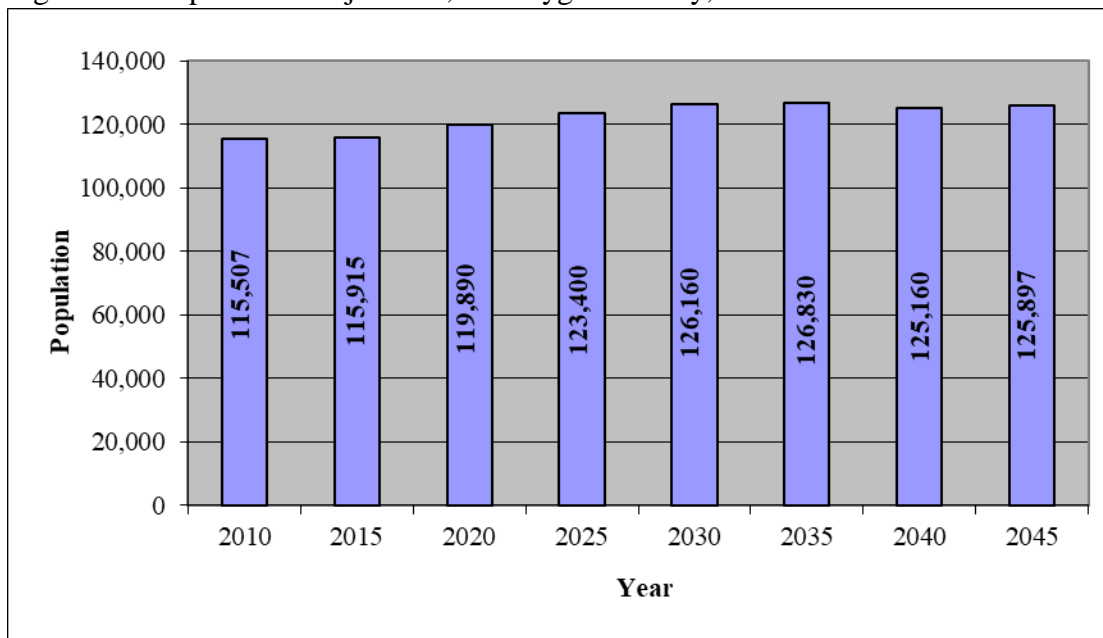
Source: U.S. Bureau of the Census, 2010; Wisconsin Department of Administration, Demographic Services Center, 2013 and 2014; Wisconsin Department of Public Instruction, 2010; SRF Consulting Group, Inc., 2012, 2013 and 2014; and Bay-Lake Regional Planning Commission, 2018.

The horizon year of 2045 selected for the Update to the *Year 2045 SATP* is consistent with FAST Act provisions calling for a minimum twenty-year planning horizon. Milestone years selected for intermediate points of evaluation in this plan are 2028 and 2038. 2018 was the last year for which the Wisconsin Department of Natural Resources (WDNR) established mobile sector emission budgets in the State Implementation Plan (SIP), the *Attainment Plan for the Sheboygan County, Wisconsin, 2008 8-Hour Ozone Nonattainment Area*, which was submitted to USEPA in September 2017, with the budgets being deemed adequate by USEPA in January 2018. The milestone years of 2028 and 2038 are reasonable intermediate years between 2018 and 2045 in accordance with analysis year conformity requirements of the 1990 Clean Air Act Amendments (the 1990 CAAA requires no greater than ten years between analysis years in a conformity analysis).

### ***Population Projections***

The 2010 population for Sheboygan County was 115,507. The 2045 population of Sheboygan County is projected to be 125,897. All population projections from 2015 through 2040 are based on the Wisconsin Department of Administration (WDOA) Demographic Services Center's official population projections for Sheboygan County. The 2045 population projection was calculated for this plan by the consulting team that assisted with the WisDOT Northeast Region model (SRF Consulting Group) based on WDOA projections through 2040; Sheboygan MPO staff concurred with this projection following its refinement. The 2045 projection of 125,897 persons represents nearly a 9.0 percent increase over the period between 2010 and 2045. Figure 6.1 illustrates population projections for Sheboygan County through 2045.

Figure 6.1: Population Projections, Sheboygan County, 2010-2045



Source: U.S. Bureau of the Census, 2010; Wisconsin Department of Administration, Demographic Services Center, 2013 and 2014; and Bay-Lake Regional Planning Commission, 2018.

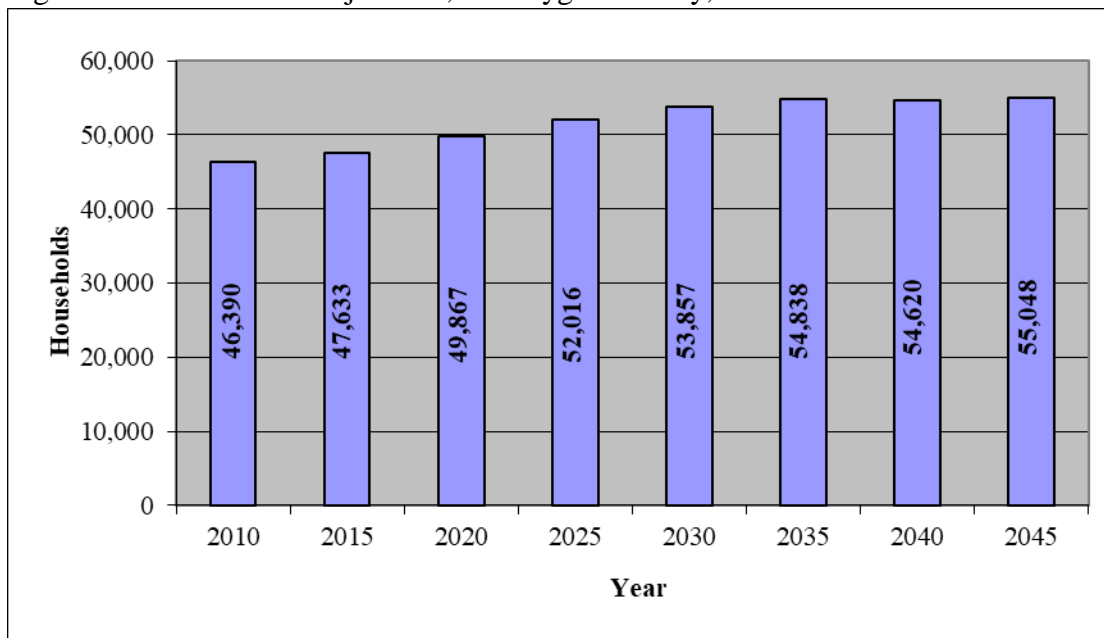
### ***Household Projections***

The number of households in Sheboygan County was 46,390 in 2010. The number of households projected for Sheboygan County in 2045 is 55,048. This represents nearly an 18.7 percent increase in households over the period between 2000 and 2045. All household projections from 2015 through 2040 are based on the Wisconsin Department of Administration (WDOA) Demographic Services Center's official household projections for Sheboygan County. The 2045 household projection was calculated for this plan by the consulting team that assisted with the WisDOT Northeast Region model (SRF Consulting Group) based on WDOA projections through 2040; Sheboygan MPO staff concurred with this projection following its refinement.

About 95.0 percent of all housing units are expected to be occupied by households in 2045; this is higher than the 91.4 percent housing occupancy rate in the 2010 Census. In other words, about 8.6 percent of all housing units were vacant in 2010 (one of the highest vacancy rates in the past several decades), but this rate is expected to decrease to 5.0 percent by 2045.

A decreasing person per household ratio from 2010 to 2045 means that the number of households is increasing at a faster rate than the population is increasing between 2010 and 2045. Figure 6.2 illustrates household projections for Sheboygan County through 2045.

Figure 6.2: Household Projections, Sheboygan County, 2010-2045



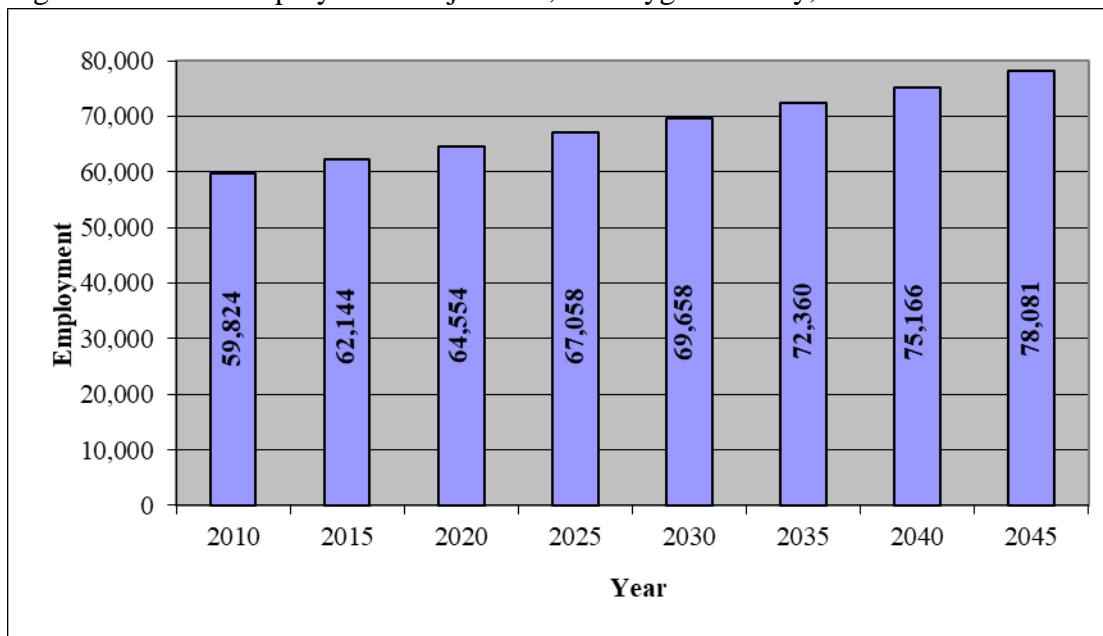
Source: U.S. Bureau of the Census, 2010; Wisconsin Department of Administration, Demographic Services Center, 2013 and 2014; and Bay-Lake Regional Planning Commission, 2018.

### ***Employment Projections***

In 2010, there were 59,824 employees within Sheboygan County; these numbers are based on the site of employment, not the site of residence. Of these, 6,303 were employed in retail activities, 22,755 were employed in the service sector, and 30,766 were employed in other categories of employment (the majority of this being in manufacturing).

A total of 78,081 employees are projected for 2045. This represents a 30.5 percent increase in the number of employees over the period between 2010 and 2045. Retail employment is expected increase by more than 63 percent over the planning period, while service employment is expected to increase by nearly 19 percent between 2010 and 2045. “Other” employment is expected to increase by nearly 33 percent over the planning period; manufacturing employment is not expected to increase at as fast a rate as non-manufacturing employment within that sector. MPO staff utilized employment projections prepared by SRF Consulting Group in the development of the WisDOT Northeast Region model based on various sources, including Wisconsin Department of Workforce Development (DWD) information, second quarter 2010 data from the Quarterly Census of Employment and Wages (QCEW) from the Bureau of Labor Statistics (BLS), 2010 ESRI Business Analyst employment data, and Woods and Poole employment projections, in forecasting employment levels through 2045. Figure 6.3 illustrates total employment projection for Sheboygan County through 2045.

Figure 6.3: Total Employment Projections, Sheboygan County, 2010-2045



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, (QCEW), Second Quarter 2010; Wisconsin Department of Workforce Development, 2010; ESRI Business Analyst, 2010; Woods & Poole, 2013; SRF Consulting Group, Inc., 2012, 2013, and 2014; and Bay Lake Regional Planning Commission, 2018.

### ***School Enrollment Projections***

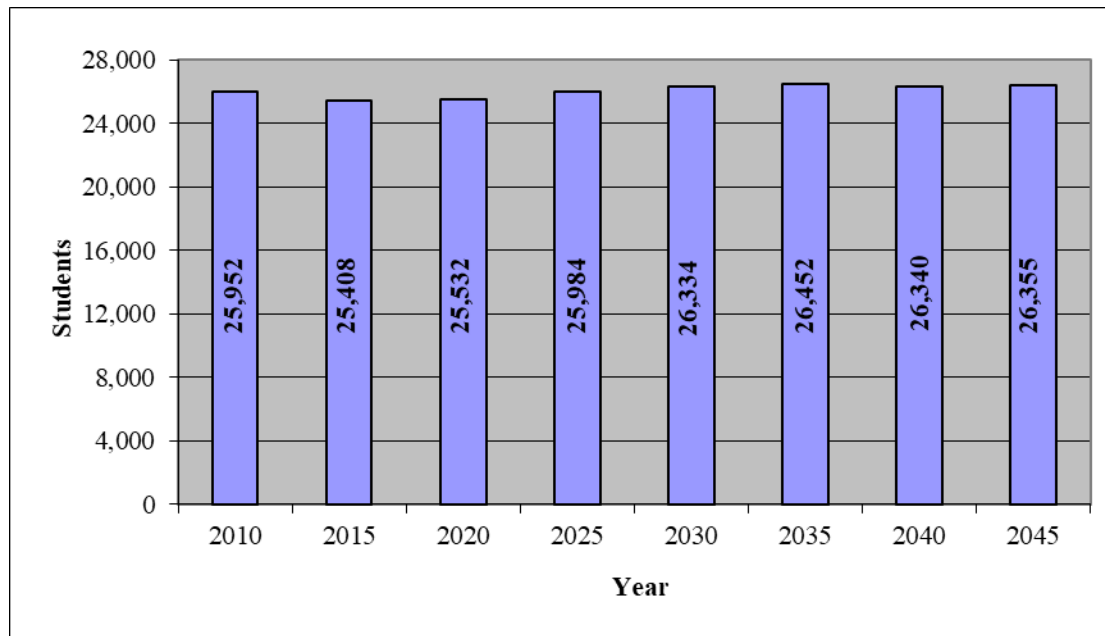
Site-based school enrollment data were compiled for all schools in Sheboygan County (Kindergarten through 12<sup>th</sup> Grade as well as post-secondary institutions) for the third Friday of the 2010 – 2011 school year. In addition, site-based school enrollment data were compiled for elementary and secondary schools in the county for the third Friday of the 2010 – 2011 school year.

In 2010, there were 25,952 students enrolled at school sites throughout Sheboygan County; this included all grade levels at public and private elementary and secondary schools, plus students enrolled full-time or part-time in post-secondary courses at three institutions located in Sheboygan County (UW Green Bay Sheboygan campus, Lakeland College, and Lakeshore Technical College sites within Sheboygan County). A total of 26,355 enrolled students are projected for 2045. This represents a nearly 1.6 increase in the number of enrolled students over the period between 2010 and 2045. Projections decrease from 2010 to 2015, increase from 2015 to 2035, decrease from 2035 to 2040, and increase slightly from 2040 to 2045. Projected county-level variability in population over time in the age cohorts which feed elementary and secondary schools and colleges, universities and technical colleges (supplied by the Wisconsin Department of Administration Demographic Services Center) are the cause of the projected variation, even though increases in all other socioeconomic projections are generally anticipated. This variation demonstrates the cyclical nature of age cohort population projections.

Figure 6.4 illustrates school enrollment projections for Sheboygan County through 2045.

Update to the *Year 2045 Sheboygan Area Transportation Plan*

Figure 6.4: School Enrollment Projections, Sheboygan County, 2010-2045



Source: Wisconsin Department of Public Instruction, 2010; Sheboygan Area Post-Secondary Institutions (UW Green Bay Sheboygan campus, Lakeland College and Lakeshore Technical College), 2010; Wisconsin Department of Administration, Demographic Services Center, 2013 and 2014; and Bay-Lake Regional Planning Commission, 2018.

### Allocation of Socioeconomic Projections to TAZs Under Land Use Scenarios

Three growth scenarios were developed for the Sheboygan metropolitan planning area to spatially simulate potential development projections for the long-range future (2045). These growth scenarios were tested by the travel demand forecast model in terms of their impacts on the transportation network, and were based on the socioeconomic projections discussed in the previous section. The growth scenarios examined for the metropolitan planning area were as follows:

- **Scenario 1** involved the “**continuation of existing trends**,” and assumed that new development would follow the traditional development pattern of low-density, fragmented, noncontiguous development (Map 6.2);
- **Scenario 2** involved “**compact/infill development**,” and assumed that development would take place in a more compact fashion at higher densities; and
- **Scenario 3** involved “**corridor development**,” and assumed that development would take place at low to medium densities along major transportation corridors.

These growth scenarios were conceptually developed by the MPO Technical and Policy Advisory Committees in early 2013, and were quantitatively developed by MPO staff in much of 2013 and in the first quarter of 2014. *Development and quantification of growth scenarios is only done once each decade, following the completion of a decennial census.*

Table 6.2 shows that differences between the three land use scenarios were fairly small. Average daily vehicle miles traveled (VMT) and vehicle hours traveled (VHT) were minimized under Scenario 2, but there was only a small difference in VMT and VHT between the alternative land use scenarios. Table 6.2 also indicates that average speed was maximized under Scenario 2, but again, there was only a miniscule difference in average speed between the scenarios. Finally, Table 6.2 illustrates that there was little difference in the primary or secondary level of service (LOS) of streets and highways across the scenarios.

Table 6.2: Systemwide Transportation Impacts of 2045 Land Use/Development Scenarios, Sheboygan County

	2045 Scenario 1 Continuation of Existing Trends	2045 Scenario 2 Compact/Infill Development	2045 Scenario 3 Corridor Development
Average Daily Vehicle Miles Traveled (VMT)	3,433,570	3,411,823	3,445,255
Average Daily Vehicle Hours Traveled (VHT)	74,078	73,469	74,401
Average Speed (Miles per Hour)	46.35	46.44	46.31
<u>Level of Service (Percent of System):</u>			
A, B or C (Not Congested)	97.36%	97.36%	97.49%
D (Moderately Congested)	2.19%	2.19%	2.05%
E (Severely Congested)	0.18%	0.18%	0.19%
F (Breakdown Conditions)	0.27%	0.27%	0.27%

Notes:

- (1) The 2045 systemwide transportation impact data are based on model assignments made to the existing plus committed street and highway network under each land use scenario.
- (2) The congestion status of lane miles on the street and highway network was determined through a "level of service" (LOS) analysis. "Primary LOS" only measures LOS at locations on the network that have WisDOT traffic counts. "Secondary LOS" includes primary LOS, and also forecasts traffic levels at locations on the network where there have been no WisDOT traffic counts. This analysis uses secondary LOS to determine the congestion status of facilities. Table 5.28 can assist in determining whether a congested facility has intolerable congestion or if spot improvements are appropriate at such a facility.
- (3) The percentage of the system at the various levels of service was calculated based on lane miles on the street and highway network in Sheboygan County.

Source: Wisconsin Department of Transportation, 2015; and Bay-Lake Regional Planning Commission, 2018.

Land taken (county-wide) for development (for both residential and economic development) involved about 6,347 acres for Scenario 1, 5,825 acres under Scenario 2, and 6,928 acres under Scenario 3. Most of the land taken under each scenario was for residential development.

### Selection of a "Preferred" Development Scenario

The Sheboygan MPO Technical and Policy Advisory Committees deliberated over the selection of one of the three land use scenarios to carry forward in the remaining development of the *Year 2045 SATP* at its November 2014 joint meeting; this deliberation included evaluation of the benefits, costs and impacts of the scenarios. At the November 2014 meeting, members of both committees in attendance selected Scenario 1 (Continuation of Existing Trends) as the preferred Update to the *Year 2045 Sheboygan Area Transportation Plan*



development vision, primarily due to its conformity with locally adopted comprehensive plans in cities, villages and towns in the metropolitan planning area and throughout Sheboygan County. It was acknowledged that all three proposed scenarios were projected to have fairly similar transportation impacts. Selection of a “preferred” growth scenario is typically only done once each decade, following the completion of decennial census.

All statements made from this point forward in this Update to the *Year 2045 SATP* assume implementation of Scenario 1 over the planning period.

### **Travel Demand Forecast Modeling Process**

#### **Background**

The travel demand forecast modeling process began with a base model for 2010. The model used traffic counts from 2008, which best reflected traffic as it existed during the 2010 Census. The model estimated traffic in 2010 by inputting demographic and employment data from the 2010 Census, from various employment data sources, as well as local school enrollment data from the Wisconsin Department of Public Instruction, for the year 2010. The model was then calibrated to the traffic counts taken in 2008.

Socioeconomic projections produced by the MPO were inputted into the calibrated travel demand forecast model to identify roadway deficiencies in 2045. Based on the deficiencies, a package of possible capacity modifying projects was developed by MPO staff, the Sheboygan MPO Technical and Policy Advisory Committees, and with input from the public. These projects were tested by the model, and projects deemed to be effective were advanced to the recommended plan approved by the MPO. The recommended plan is a set of multimodal, policy-based and roadway capacity improvement actions designed to address projected deficiencies.

Preliminary modeling of the countywide roadway network in 2045 within the Sheboygan metropolitan planning area identified potential and actual deficiencies as: State Highway 28 (14<sup>th</sup> Street) from Indiana Avenue to State Highway 23/Erie Avenue; State Highway 42 (North 14<sup>th</sup> Street and Calumet Drive) from Superior Avenue to North 15<sup>th</sup> Street; State Highway 28 from the Deer Trace Shopping Center entrance to South Taylor Drive; and County Highway OK/South Business Drive from Moenning Road to Indian Meadows Mobile Home Park (although the center turn lane present in much of this corridor, which could not be coded in the model, probably allows County Highway OK to function more efficiently than indicated).

Preliminary modeling also identified several links as being worthy of monitoring but not necessarily deficient, including: State Highway 28 (South 14<sup>th</sup> Street) between Georgia Avenue and Indiana Avenue; State Highway 42 (North 14<sup>th</sup> Street) from State Highway 23/Erie Avenue to Superior Avenue; State Highway 28 between County Highway EE and the Deer Trace Shopping Center entrance and between South Taylor Drive and South 32<sup>nd</sup> Street; the roundabout intersection of State Highways 28 and 32; State Highway 32 between County Highway C/Fond du Lac Avenue and State Highway 23; State Highway 42 between County Highway Y and County Highway A; County Highway OK/South Business Drive from Thielman Drive to Moenning Road; County Highway O/Superior Avenue from Mapledale Drive to North 40<sup>th</sup> Street/Wilgus Avenue;

Update to the *Year 2045 Sheboygan Area Transportation Plan*

County Highway DL/North 40<sup>th</sup> Street from State Highway 42 to Heather Valley Road; Union Avenue in the vicinity of South Taylor Drive; North Taylor Drive between State Highway 23/Kohler Memorial Drive and Wilgus Avenue; the intersection of State Highway 28/South Business Drive with Union Avenue and South 17<sup>th</sup> Street; and the intersection of Highland Drive and Greenfield Drive. It should be noted that the center turn lanes on the affected segments of County Highway OK/South Business Drive and County Highway O/Superior Avenue, which could not be coded in the model, probably allow these facilities to function more efficiently than indicated.

In early 2019, Wisconsin Department of Transportation travel forecasting staff completed modeling for seven roadway improvement projects involving capacity modifications in the metropolitan planning area based on input from the public, local municipalities, WisDOT staff, and the MPO committees and staff. The MPO Technical and Policy Advisory Committees reviewed the results of the modeling, and were asked to consider the merits and impacts of the modeled projects. The MPO Technical and Policy Advisory Committees advanced all seven of these projects to inclusion in the Update to the *Year 2045 SATP*.

### **Requirements and Guidance**

Essentially, the MPO is required to identify roadways in the area that will exceed a standard level of service in the year 2045 and to recommend actions designed to bring forecasted traffic volumes within acceptable thresholds. These actions can be a combination of operational, policy-based, intermodal, and roadway improvements. Inclusion of this planning process in the long-range transportation plan ensures the continuation of Federal transportation funding in the area.

### ***Federal***

The Federal Highway Administration (FHWA) Wisconsin Division office issued guidance regarding “Metropolitan Transportation Plan Capacity Analysis” in March 2015. The following narrative relates to such analysis in the context of planning requirements and their application; project development requirements are also addressed in this guidance, but are not being incorporated into this discussion.

Federal planning regulations require that the metropolitan transportation plan include both long-range and short-range strategies and/or actions that lead to the development of an integrated multimodal transportation system to facilitate the safe and efficient movement of people and goods in addressing current and future transportation demand. The plan shall include an assessment of capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure, and provide for multimodal capacity increases based on regional priorities and needs. The metropolitan transportation plan may consider projects and strategies that address areas or corridors where current or projected congestion threatens the efficient functioning of key elements of the metropolitan area’s transportation system. Design concept and design scope descriptions of all existing and proposed transportation facilities shall be provided in sufficient detail to develop cost estimates and determine air quality impacts.

Federal planning requirements do not specify procedures or thresholds for purposes of identifying acceptable levels of roadway congestion. For continuity between planning and project development, the WisDOT LOS thresholds are incorporated into the MPO travel demand forecast models to determine locations on area roadways that exceed or are expected to exceed acceptable levels of congestion during the plan period. Flexibility exists for an MPO to establish a more congested LOS for purposes of evaluating capacity in developing the long-range transportation plan. However, the level of analysis performed at the regional plan level will not in itself support an exception to the National Highway System (NHS) capacity requirement when projects are advanced for development.

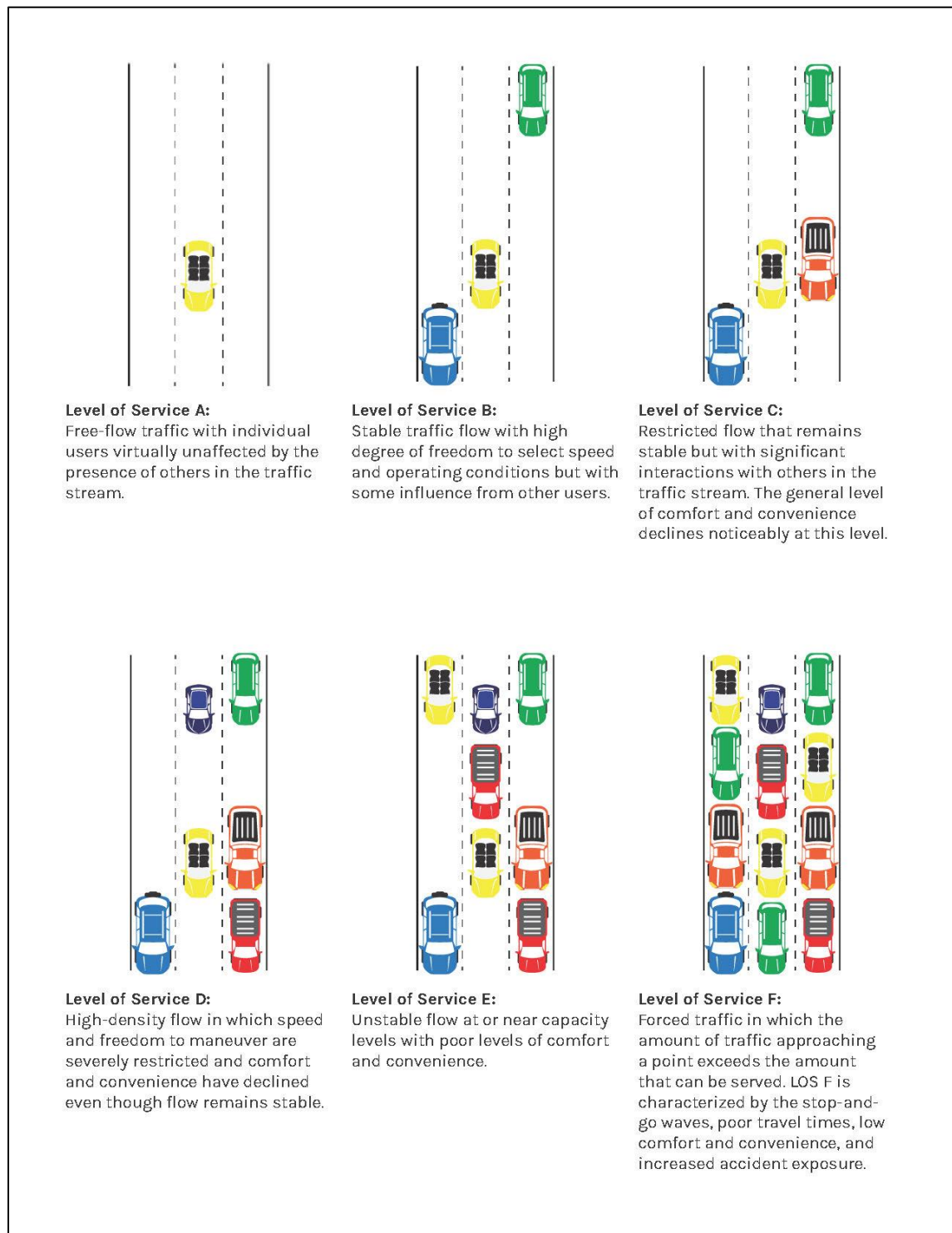
It is expected that MPOs will evaluate capacity needs identified in the planning process and recommend cost-effective strategies and improvements necessary to maintain acceptable levels of service on the regional transportation system. Strategies may include operational improvements, system management, demand management, expansion of other travel modes, capacity expansion and new facilities. MPO long-range transportation plan recommendations are subject to fiscal constraint. The extent of major improvement recommendations and schedule for implementation should be coordinated with project sponsors and funding authorities to ensure consistency with anticipated funding programs and priorities. The plan should also acknowledge that capacity expansion recommendations will be thoroughly evaluated in more detailed planning or project National Environmental Policy Act (NEPA) studies to account for environmental and community factors in determining if expansion is a prudent alternative.

### *State*

Projected LOS ratings (from “A” to “F”) are determined by running the travel demand forecast model for the year 2045. Average daily traffic (ADT) volumes are assigned by the model for each roadway segment. Volumes are calibrated based on existing counts (where available), and are compared to a table which assigns an LOS rating. This rating is based on various roadway characteristics, including speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The LOS ratings are then compared to a threshold set by the Wisconsin Department of Transportation (see Table 5.28).

This Update to the *Year 2045 SATP* addresses the following roadways with LOS ratings that exceed LOS “D:” Corridors 2030 Backbone routes (such as Interstate 43), Corridors 2030 Connectors (such as State Highway 23 west of Interstate 43), and NHS Principal Arterials (portions of State Highways 23, 28, 32, and 42). Additionally, this Update to the *Year 2045 SATP* addresses all the following roadways with LOS ratings that exceed mid-LOS “E:” Non-NHS Principal Arterials and Minor Arterials (such as Taylor Drive, County Highway PP, and Superior Avenue), and Collectors and Local Function Roads (such as County Highway A, North 25<sup>th</sup> Street, and South 18<sup>th</sup> Street). Figure 6.5 illustrates level of service on urban roadways.

Figure 6.5: Illustration of Level of Service (LOS) Ratings



Source: University of South Florida, 2010; and Bay-Lake Regional Planning Commission, 2019.

## **Model Testing**

The travel demand forecast model is “calibrated” to current conditions. This means that the base year traffic volumes assigned by the model are statistically equivalent to actual traffic counts. This calibration, as well as the comparing and adjusting of projected volumes to actual traffic counts in the base year, helps to determine the most accurate LOS ratings.

### ***Scenario 1 (Continuation of Existing Trends) in 2045 with the Existing + Committed Network***

The travel demand forecast model includes committed roadway projects expected to be completed by 2045. “Committed” projects are those projects that are included in WisDOT region plans, work plans, and/or Statewide Transportation Improvement Programs (STIPs). The list of projects is based on input from WisDOT and from local municipalities in the metropolitan planning area. The existing plus committed (E + C) model, with the socioeconomic projections allocated to the TAZ level, models the selected growth scenario (Scenario 1, Continuation of Existing Trends).

The following committed project has an impact on the 2045 traffic network, and has been modeled as part of the E + C network:

- Reconstruction of State Highway 23 from Plymouth to the Fond du Lac County line with an increase from 2 to 4 lanes (to be completed over the next several years).

In addition, although it cannot be modeled, one roundabout has been committed for construction at the following location:

- Intersection of State Highway 28 and County Highway EE (boundary of multiple jurisdictions – committed for 2020).

### ***Projected Deficiencies***

The current conditions model is compared to the 2045 model (assuming implementation of the Continuation of Existing Trends scenario) to determine the effects of increased development and traffic on the street and highway network.

The base year model indicates potential or actual deficiencies on the following links in 2010:

- State Highway 28/14<sup>th</sup> Street between Indiana Avenue and State Highway 23/Erie Avenue; and
- State Highway 28 between the west entrance to Deer Trace Shopping Center and South Taylor Drive (including the Interstate Highway 43 interchange area).

The base year model also identified the following links as being worthy of monitoring but not necessarily deficient in 2010:

- State Highway 28/South 14<sup>th</sup> Street between Alabama Avenue and Indiana Avenue;
- State Highway 42/North 14<sup>th</sup> Street/Calumet Drive between State Highway 23/Erie Avenue and North 15<sup>th</sup> Street;

- State Highway 28 from County Highway EE/Broadway Street to the west entrance to Deer Trace Shopping Center;
- The roundabout intersection of State Highways 28 and 32; and
- State Highway 32/North Main Street between Forest Avenue and State Highway 23.

The horizon year “Continuation of Existing Trends” model indicates potential or actual deficiencies on the following links in 2045:

- State Highway 28 (14<sup>th</sup> Street) from Indiana Avenue to State Highway 23/Erie Avenue;
- State Highway 42 (North 14<sup>th</sup> Street and Calumet Drive) from Superior Avenue to North 15<sup>th</sup> Street;
- State Highway 28 from the Deer Trace Shopping Center entrance to South Taylor Drive; and
- County Highway OK/South Business Drive from Moenning Road to Indian Meadows Mobile Home Park (although the center turn lane present in much of this corridor, which could not be coded in the model, probably allows County Highway OK to function more efficiently than indicated).

In addition, the horizon year “Continuation of Existing Trends” model also identified several links as being worthy of monitoring but not necessarily deficient in 2045, including the following:

- State Highway 28 (South 14<sup>th</sup> Street) between Georgia Avenue and Indiana Avenue;
- State Highway 42 (North 14<sup>th</sup> Street) from State Highway 23/Erie Avenue to Superior Avenue;
- State Highway 28 between County Highway EE and the Deer Trace Shopping Center entrance;
- State Highway 28 (Washington Avenue) between South Taylor Drive and South 32nd Street;
- The roundabout intersection of State Highways 28 and 32;
- State Highway 32 between County Highway C/Fond du Lac Avenue and State Highway 23;
- State Highway 42 between County Highway Y and County Highway A;
- County Highway OK/South Business Drive from Thielman Drive to Moenning Road (although the center turn lane present in much of this corridor, which could not be coded in the model, probably allows County Highway OK to function more efficiently than indicated);
- County Highway O/Superior Avenue from Mapledale Drive to North 40<sup>th</sup> Street/Wilgus Avenue (although the center turn lane present in much of this corridor, which could not be

coded in the model, probably allows County Highway O to function more efficiently than indicated);

- County Highway DL/North 40<sup>th</sup> Street from State Highway 42 to Heather Valley Road;
- Union Avenue in the vicinity of South Taylor Drive;
- North Taylor Drive between State Highway 23/Kohler Memorial Drive and Wilgus Avenue;
- The intersection of State Highway 28/South Business Drive with Union Avenue/South 17<sup>th</sup> Street; and
- The intersection of Highland Drive and Greenfield Drive.

Map 6.3 illustrates the deficiencies forecasted in 2045 in the metropolitan planning area.

### ***Projects Tested with the Model***

Several projects were tested by the travel demand forecast model for the horizon year of 2045. The projects were proposed for testing by the MPO Technical and Policy Advisory Committees at their joint meeting in December 2018. WisDOT travel forecasting staff tested the projects with the model in early 2019. The following projects were tested:

- (1) South Taylor Drive  
Racetrack Road to Southpointe Drive (Including addition of Horizon Drive and Southpointe Drive to meet County Highway OK/South Business Drive)  
New 2 Lane Facility
- (2) South 18<sup>th</sup> Street  
County Highway EE/Weeden Creek Road to County Highway V  
New 2 Lane Facility
- (3) State Highway 23  
Western Boundary of the Sheboygan Metropolitan Planning Area to State Highway 32  
Various Projects (from the Corridor Preservation and Freeway Designation Study, Including an Interchange at State Highway 23 and County Highway TT)
- (4) County Highway TT  
County Highway PP to State Highway 28  
New 2 Lane Facility
- (5) Interstate Highway 43  
At County Highway FF  
New Full Interchange

- (6) Interstate Highway 43  
At County Highway PP/Lower Falls Road/Indiana Avenue  
New Half Interchange (to serve traffic coming to and from the south)
- (7) State Highway 42  
County Highway Y to County Highway A/Howards Grove  
Reconstruction with an Increase from 2 to 4 Lanes

These projects are illustrated in Map 7.1 in Chapter 7 (Recommended Transportation Plan).

One additional partial project was recommended for testing by the MPO advisory committees even though it is located outside the metropolitan planning area. This project involved various improvements to State Highway 23 immediately west of County Highway C in the Plymouth area and between State Highway 57 and the western boundary of the Sheboygan metropolitan planning area. These improvements have been recommended in the State Highway 23 Corridor Preservation and Freeway Designation Study conducted by the Wisconsin Department of Transportation. Improvements between State Highways 67 and 57 in the Plymouth area have not been tested at this time because WisDOT and the local affected communities (the City and Town of Plymouth) have not come to agreement as to the preferred alignments in this area.

All tested projects either improved traffic conditions or at least did not harm traffic conditions in 2045.

Roundabouts were significant elements of several of the projects that were tested by the model. However, as was stated earlier in this chapter, roundabouts cannot be directly tested by the model.

### **Final Decisions by the MPO Technical and Policy Advisory Committees on Capacity Modifying Projects to be Included in this Update to the *Year 2045 SATP***

The Sheboygan MPO Technical and Policy Advisory Committees agreed to advance all of the above noted capacity modifying projects that were tested with the model to inclusion in this Update to the *Year 2045 SATP* (see Map 7.1 in Chapter 7).

The recommended interchanges will need to involve further study. Certain conditions will need to be considered in such studies, including: (1) fulfillment of the requirements of an Interstate Access Justification Report (IAJR); and (2) determination that the proposed interchanges would not worsen traffic conditions on Interstate Highway 43. In the case of the half interchange on Interstate Highway 43 at County Highway PP/Lower Falls Road/Indiana Avenue, there would also need to be a determination that the proposed improvement will not adversely impact the natural environment at its proposed location (the Sheboygan River valley is located in the area proposed for this interchange).

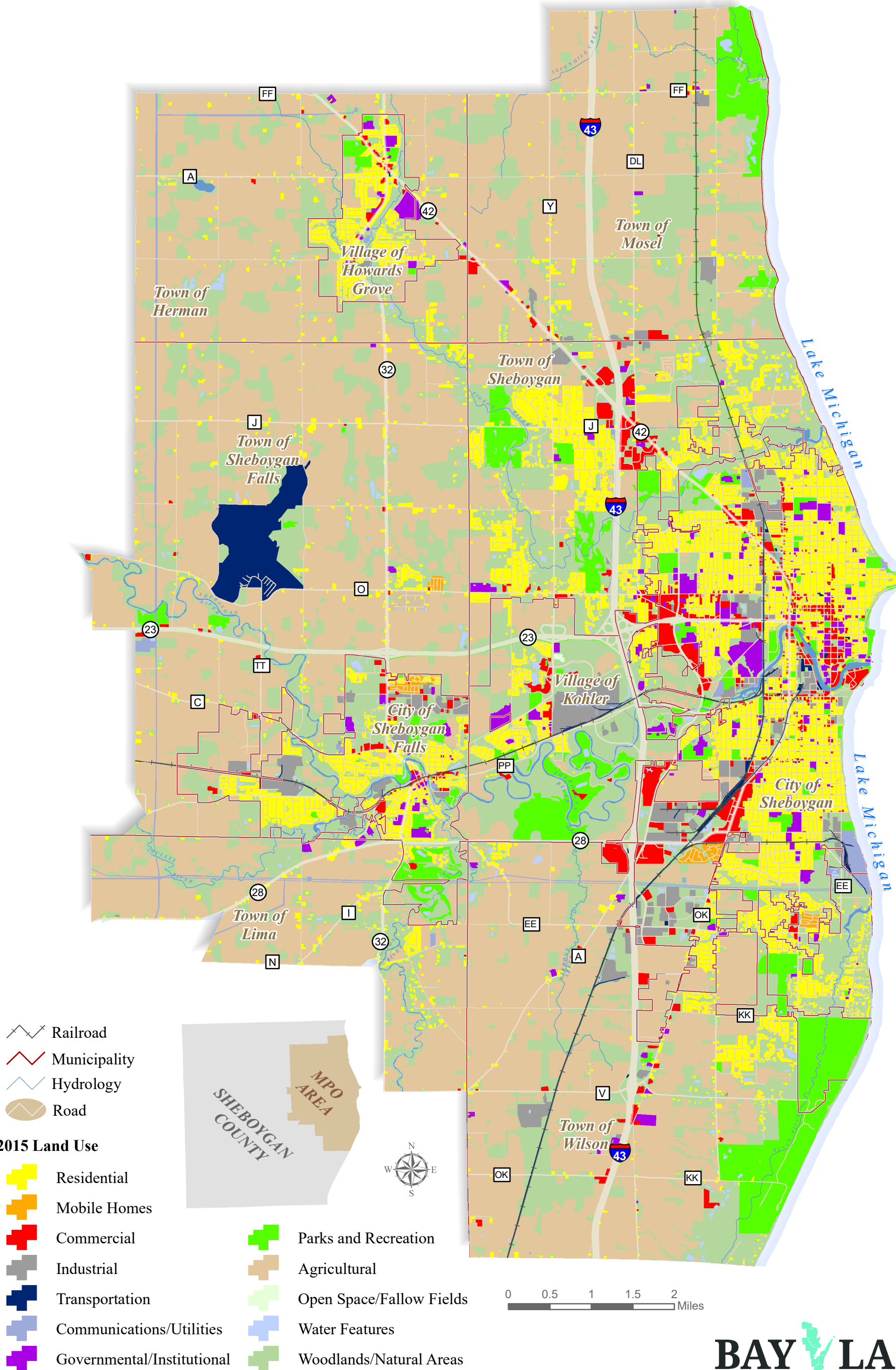
One additional partial project was recommended for implementation (from 2019 through 2028) even though it is located outside the metropolitan planning area. This involved various improvements to State Highway 23 immediately west of County Highway C in the Plymouth area and between State Highway 57 and the western boundary of the Sheboygan metropolitan planning

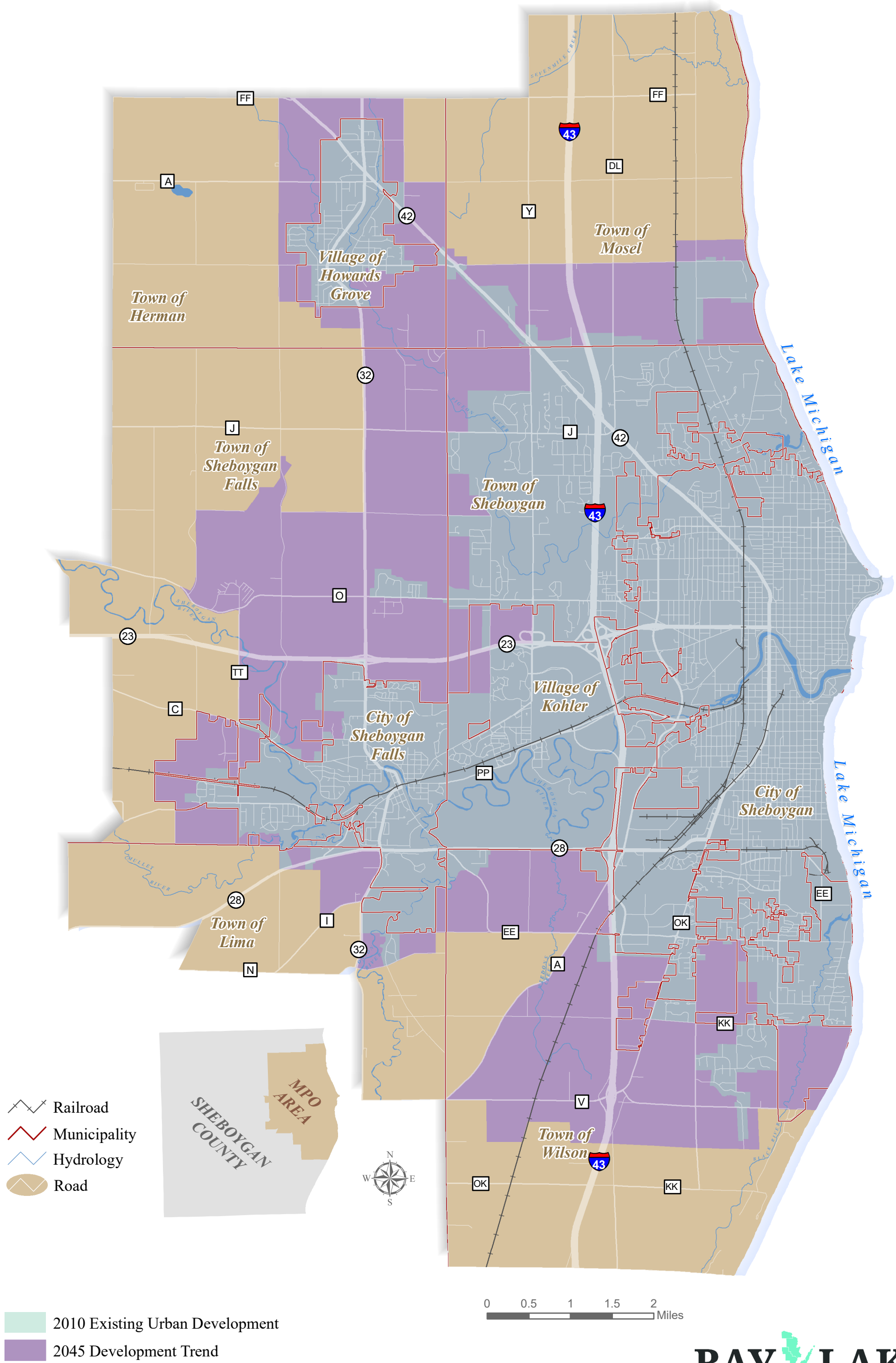
Update to the *Year 2045 Sheboygan Area Transportation Plan*



area. These improvements have been recommended in the State Highway 23 Corridor Preservation and Freeway Designation Study conducted by the Wisconsin Department of Transportation. Improvements between State Highways 67 and 57 in the Plymouth area are not being modeled at this time because WisDOT and the local affected communities (City and Town of Plymouth) have not come to agreement as to the preferred alignments in this area.

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Congestion Status of Streets and Highways in 2045

Sheboygan Metropolitan Planning Area

Update to the Year 2045 Sheboygan Area Transportation Plan (SATP)

Map 6.3

