Final Report

Northeast Regional Travel Demand Model Development and Validation Report

prepared for

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SECTION 1.0 – 2005 Socio-economic Data Development

1.1 BACKGROUND

The Northeast Regional Travel Demand Model was developed to provide a decision making tool for the Wisconsin Department of Transportation's (WisDOT) Northeast Region. This computerized model assigns vehicle trips to the street and road network by identifying the optimal route between two points considering travel time and the effects of congestion. Socioeconomic data provides the basis for estimating the number of trips made in the region, and their origin and destination points.

The Lakeshore component of the model covers the counties of Sheboygan, Manitowoc, Kewaunee, Door, and the eastern portion of Calumet County. The identification of the Lakeshore model component boundaries and Transportation Analysis Zones (TAZs) was completed and the new roadway network was linked to the Fox Valley model component. The Fox Valley component was developed earlier and includes the counties of Brown, Calumet, Fond du Lac, Outagamie, Winnebago and portions of Oconto, Waupaca, Shawano and Dodge. Each model component was developed separately before being linked, but each used similar methodology to maintain consistency. This section of the report discusses the model structure and the development of the base year 2005 data for the sub-regional Lakeshore component.

This section (and Section 2) addresses the following questions:

1. What are the basic elements of the model structure?
2. What methods and data sources were used to collect the data for the model?
3. In what ways did the local communities represented in the model have input in the data collection process?

The regional travel demand model will provide WisDOT with annual average daily traffic forecasts for 2020 and 2035 for segments of the functionally classified road network. This includes the state highway network as well as local roads classified as collectors and higher.

Previously, WisDOT developed the Wisconsin Multi-Modal Statewide Travel Demand Model (2005) to predict large-scale traffic flows on the state's highway network. Integrated regional models, such as the Northeast model, provide the means to identify mobility deficiencies using the level-of-service metric on particular highway segments, something that the Statewide Model does less

effectively, given its scale. The subarea model will also forecast traffic levels on additional local roads that are included in the regional network, but not in the Statewide Model's network.

1.2 MODEL STRUCTURE

One of the first steps in model development is selection of the road network. Networks control the overall pattern of trip-making, and the type of road tends to be a determining factor in the traffic volumes to be found on each segment. In general, the model's highway network was developed by using the existing network from the Statewide Model with additional local roads of significance. GIS shapefiles (spatial datasets) from the Wisconsin Information System for Local Roads (WISLR) were obtained to provide greater detail. The network links added from WISLR include attributes contained within WISLR's database, including: Name, Linkclass, Lanes, Count, Area Type and Cross Type. It should be noted that the Sheboygan Metropolitan Planning Area also currently has a computer travel demand model that encompasses the entire County. The transportation network used in this model was incorporated into the Lakeshore model.

The foundation for travel forecasting is the location of dwelling units (households) and jobs (employment) within the region. TAZ's are aggregated geographic entities that are created to summarize homogeneous land uses by these and other area characteristics in order to estimate trip origins and destinations. New TAZ's were developed for Door, Kewaunee, Manitowoc and the eastern periphery of Calumet County. The original zone structure in the Statewide Model was not used because the town/city/village structure in that model was not conducive to the smaller zones require for regional modeling. Each new zone was established by delineating US Census blocks and block groups to form relatively homogenous land uses bordered by built barriers such as the highway network or natural barriers such as rivers. Upon completion of the TAZ structure, each zone was assigned an attribute that indicated in which Statewide Model TAZ it was predominantly contained, or nested within. The nesting of the Statewide Model TAZ data was used to calculate household and employment data based upon information available from the Statewide Model. For Sheboygan County, the model used the TAZ structure that was developed for the Sheboygan County travel demand model.

The allocation of household and employment data to the TAZ's is discussed below. Details about the database variables can be found in Section 1.5 of this report, Definition of Socio-economic Database Variables.

1.3 HOUSEHOLD DATA

Census data from 2000 was used as a starting point for the development of household data for Door, Kewaunee, Calumet and Manitowoc Counties.

Households were allocated to the TAZ's according to the Census block data and supplemented with the use of aerial photographs.

For Sheboygan County, the project team used the 2005 household data from the Sheboygan County travel demand model. This model was prepared for all of Sheboygan County, using data from the 2000 Census Transportation Planning Package, the Wisconsin Department of Administration, the Wisconsin Department of Workforce Development, and quality checked with local knowledge of development plans and trends.

The project team held meetings with local officials from all Lakeshore region counties and the incorporated communities of 1,000 or larger to discuss the development of the base and future year socioeconomic data. Sections 3-7 document the scheduling and results of each local officials meeting. Local official review was very helpful in identifying areas where significant changes occurred between 2000 and 2005, such as new housing developments. The 2000 data was then brought up to 2005 using projection data prepared by the Wisconsin Department of Administration (WisDOA). Growth was allocated to each TAZ based upon the DOA's forecasted 30 year growth rate (2000-2030) to develop the new 2005 base year data. WisDOA creates projections for households by municipality; therefore, each TAZ was assigned the growth rate to the municipality it was primarily contained within (Appendix D). The historical growth rate was applied to account for growth between 2000 and 2005, with adjustments made based upon local official input to help improve the accuracy of the 2005 forecasts.

1.4 EMPLOYMENT DATA

For Door, Kewaunee, Calumet and Manitowoc Counties, the primary source for employment data was the Wisconsin Multi-Modal Statewide Travel Model. This model provided retail, service and manufacturing employment data for 2000 using the TAZ structure from that model. This data was allocated to each corresponding TAZ in the Lakeshore model, supplemented by the use of aerial imagery and local planning documents. For Sheboygan County, the project team used 2000 employment data from the Sheboygan County travel demand model.

As with the household data, study team members sought information from local officials from the counties and the incorporated communities of at least 1,000 persons. The local officials reviewed the base year estimates and determined if any changes of significance had occurred between 2000 and 2005. In several communities, local officials identified businesses where employment had declined due to the closing of industrial plants or other significant job losses. There were also some locations where employment centers had expanded or relocated to other areas of the region during this time period.

The project team used the year 2000 employment estimates to develop the Lakeshore region base year estimate for 2005 by considering growth trends and other information provided by local officials.

1.5 DEFINITION OF SOCIO-ECONOMIC VARIABLES

Below are definitions of each variable used in the socio-economic database.

Households	Total occupied primary dwelling units, not including group quarters (US Census 2000)
Retail Employment	Total persons employed in the retail sector, NAICS 44-45 (US Census 2000, Wisconsin Department of Workforce Development, InfoUSA, aerial imagery, local plans/officials)
Service Employment	Total persons employed in the service sector, NAICS 51, 54, 56, 61, 62, 71, 72, 81(US Census 2000, Wisconsin Department of Workforce Development, InfoUSA, aerial imagery, local plans/officials)
Total Employment	Total employment regardless of sector (US Census 2000, Wisconsin Department of Workforce Development, InfoUSA, aerial imagery, local plans/officials)
School Enrollment	Total K-12 school enrollment (Wisconsin Department of Public Instruction, 2005)
SV_xx	Household size (persons) is designated by the first number and vehicles per household is designated as the second number (Census 2000 Transportation Planning Package)
WV_xx	Workers per household is designated as the first number and vehicles per household is designated as the second number (Census 2000 Transportation Planning Package)

SECTION 2.0 – 2020/2035 Socio-economic Data Development

2.1 BACKGROUND

The 2020/2035 socio-economic data will serve as the foundation of traffic forecasts for the Northeast Regional Travel Demand Model. This model will be able to provide WisDOT with annual average daily traffic forecasts for 2020 and 2035 for segments of the functionally classified road network. The results of the socio-economic data forecasts will be directly correlated to the traffic forecasts for 2020 and 2035.

Section 1.0 - 2005 Socio-economic Data Development provides information regarding the methodology and development of the model structure, as well as documentation of the development of the household and employment data. It should be noted the TAZ's boundaries were not altered for future year socio-economic data.

2.2 HOUSEHOLD DATA

Forecast data prepared by the WisDOA was used for the preliminary 2030 forecast for Manitowoc, Kewaunee, Door and Calumet Counties. Initially, household growth was allocated each TAZ based upon the WisDOA's forecasted 30-year growth rate (2000-2030). The DOA created forecasts for households by municipality; therefore, each TAZ was assigned the growth rate from the municipality primarily contained within it. Appendix D includes an example of the DOA forecast data that was used.

For Sheboygan County, the project team used data from the Sheboygan County travel demand model. The model already included 2035 household data, the same year required for the Northeast Travel Demand Model.

As noted in Section 1.0, the project team held meetings with local officials from each county and the incorporated communities of 1,000 and larger to discuss the future year forecasts. In addition, the project team used comprehensive plans prepared by the communities to help determine where future development was likely to occur. With these two sources, anticipated household growth was allocated to each TAZ for 2030. In some instances, local officials were able to identify where areas were built-out and there was no land available for growth. Local officials were also able to identify the locations where growth would

likely occur based upon factors such as utility extensions, environmental constraints, transportation facilities, and community desires.

In discussions with Bay-Lake Regional Planning Commission (BLRPC) staff and local officials from Door County, it was agreed to use the forecasts prepared by the BLRPC for the Door County Comprehensive plan, as these forecasts appeared to be more in-line with the actual growth occurring in the County.

The 2030 forecasts for Manitowoc, Kewaunee, Door and Calumet Counties were then extended to 2035 using WisDOA historical growth rates (Appendix D). Household control totals were developed for each county using the WisDOA estimates for the 2005 and WisDOA growth rates for the 2035 (Table 2.1). The historical growth rate was applied to account for growth between 2030 and 2035, with adjustments made based upon local official input. After the 2035 data was developed, a forecast household data set was developed for 2020 by interpolating the mid-point between 2005 and 2035.

2.3 EMPLOYMENT DATA

The primary source for employment data for Door, Kewaunee, Calumet and Manitowoc Counties was the Wisconsin Multi-Modal Statewide Travel Demand Model (2005). This model provided retail, service and manufacturing employment forecast data for 2030. This data was allocated to the corresponding TAZ's in the Lakeshore model, supplemented by the use of aerial imagery and local planning documents. The project team used 2035 forecast employment data from the Sheboygan County travel demand model for Sheboygan County.

As with the household data, study team members obtained information from local officials from the counties and the incorporated communities of 1,000 and larger. The local officials reviewed the 2030 forecasts and identified locations where employment was likely to grow, based upon many of the same factors that were used to locate and anticipate new household growth. They were also able to provide information about employment trends occurring in their communities that would affect future year forecasts. For Door, Kewaunee, Calumet and Manitowoc Counties, the adjusted 2030 employment forecasts provided a base from which projections were prepared for 2035, using growth trends identified between 2005 and 2030. Employment control totals were developed for each county using the Wisconsin Multi-Modal Statewide Travel Demand Model estimates for the 2005 and 2035 (Table 2.2). After the 2035 data was developed, a forecast data set was developed for 2020 by interpolating the mid-point between 2005 and 2035.

Table 2.1 – Summary of County Household Control Totals

County	Households – 2005		Households – 2035	
	Actual	Control	Actual	Control
Calumet[1]	3,861	3,863	4,641	4,497
Door	12,411	12,898	17,257	16,929
Kewaunee	8,092	8,060	10,545	10,683
Manitowoc	33,827	34,000	41,661	40,308
Sheboygan	43,846	45,440	58,508	56,840

Table 2.2 – Summary of County Employment Control Totals

County	Employees - 2005		Employees - 2035	
	Actual	Control	Actual	Control
Calumet[1]	4,654	5,574	6,257	7,529
Door	13,332	13,592	16,735	16,815
Kewaunee	7,369	8,038	9,683	10,561
Manitowoc	35,158	39,021	44,314	45,522
Sheboygan	59,303	59,551	84,964	84,613

[1] Calumet County's control totals only represent the area that was included in this study, which covers the County's rural eastern periphery.

SECTION 3.0 – Sheboygan County Data Collection and Review

3.1 DATA DEVELOPMENT

For Sheboygan County, the project team used data from the Sheboygan County Travel Demand Model that was the basis for the Sheboygan Area Transportation Plan (SATP), prepared by BLRPC. The SATP was prepared for all of Sheboygan County, using data from the 2000 Census Transportation Planning Package, WisDOA, the Wisconsin Department of Workforce Development, and local knowledge of development plans and trends. The SATP projected the 2000 base year data to 2035, the same year needed for the Northeast Travel Demand Model. The project team later projected the year 2000 household estimates to 2005 for the new base year, considering information provided by local officials regarding growth that occurred between 2000 and 2005.

3.2 COMMUNITY COMMENTS AND DATA ADJUSTMENTS[1]

It was determined that few adjustments were needed for Sheboygan County due to the extensive effort made for development of the Sheboygan County travel model. After meetings and phone interviews with Bay-Lake staff and Sheboygan area officials, adjustments were made on a case-by-case basis for the Sheboygan MPO region (Table 3.1).

Preservation of agriculture is the focus in the western side of the County. There are some development pressures along WIS 57 and I-43. In the northwest side of the County, growth is constrained by the Sheboygan Marsh and the Sheboygan County Memorial Airport.

Some small adjustments were made in the Town of Wilson to show growth areas consistent with the town's comprehensive plan. Some adjustments were suggested by the Town of Sheboygan Falls, the Town of Mosel, and the Town of Lima.

Minor adjustments were made in the Villages of Cedar Grove and Oostburg. Random Lake expects a continuation of current moderate growth trends.

[1] The following is taken largely from the notes taken during local officials meetings by project team members.

In Plymouth, several locations were identified where new housing units were added since 2000, and locations on the periphery of town where business expansions occurred. The review identified additional TAZs where future growth is planned, and the 2035 projections were believed to be too low. Industrial growth is being focused on the south side of town, while office and other business types are being planned along the WIS 23 and WIS 57 corridors on the northeast side. Residential growth is planned for the west side of town. Redevelopment and densification is occurring in several areas. There is agreement between WisDOT and the City that existing intersections with WIS 23 will be closed at an unspecified date in the future.

Appendices A and B provide the original and adjusted data for both 2005 and 2035. Refer to Figures C.1-4 in the Appendix for a visual representation of employment and household changes by TAZ for the years 2005-2035 for both Sheboygan County and the City of Sheboygan. Table 3.2 provides a summary of the forecast adjustments made to Sheboygan County's socio-economic data.

Table 3.1 – Summary of Local Contacts in Sheboygan County

Date of Meeting	Community	Name and Position
October 7, 2008	Bay-Lake Regional Planning Commission	Mark Walter, Director Jeff Agee-Aguayo Brandon Robinson Ker Vang
December 11, 2008 & follow-up phone calls	Sheboygan Metropolitan Planning Organization (MPO) Members	Jeff Agee-Aguayo, Mark Walter (Bay-Lake Regional Planning Commission) Wayne Warnecke, (Town of Mosel); Steven Bauer (Town of Sheboygan Falls);Jack Bunge, Jim Schuette (Village of Howards Grove); Roger G. Miller, Marge Pearce (Town of Wilson); Allen Price (Town of Lima); Mary Ebeling (Sheboygan County Planning and Resources Dept.); Michael Mersberger, Joel Tauschek ,Ken Sonntag (City of Sheboygan Falls); Bruce Neerhof (Village of Kohler); Steve Sokolowski (Sheboygan Dept. of City Development); Bill Blashka (Town of Sheboygan);
December 11, 2008	Elkhart Lake Cedar Grove Oostburg	Peter Menne,Village President Karen Otte, Clerk Jack Hoffmann, Village President
December 11, 2008	Plymouth	Bill Immich, Public Works Dept.
January 9, 2009	Random Lake	Judi Schluechtermann, Clerk Daniel Klotz, Director of Public Works

Table 3.2 – Summary of Data Adjustments for Sheboygan County

Item	*Future Year (Initial 2035 – Revised 2035)*	*Change*
Households	58,961 – 58,508	- 453
Employees	84,613 – 84,964	+ 351

SECTION 4.0 – Manitowoc County Data Collection and Review

4.1 DATA DEVELOPMENT

4.1.1 BASE YEAR – 2005

Household data was developed using 2000 census data and brought up to 2005 as a result of discussions with local officials and the application of growth rates based upon past trends. Employment data from the Wisconsin Multi-Modal Statewide Travel Demand Model was used for the 2000 estimates and adjusted based upon discussions with local officials. Appendix A shows the original 2000 data for households and employment, as well as the adjusted 2005 data.

4.1.2 FUTURE YEARS – 2020/2035

The future year forecast for households was based on the WisDOA forecast for 2030. Employment data from the Statewide Model was used for the initial 2030 forecast. Appendix B shows the initial household and employment data for 2030. The 2030 socio-economic data was adjusted based upon local input, and growth rates for the 2000 – 2030 period were applied to bring the data to 2035 levels. Estimates for 2020 (not shown in Appendix B) were developed by interpolating the midpoint between 2005 and 2035.

4.2 COMMUNITY COMMENTS AND DATA ADJUSTMENTS[1]

BLRPC is working with Manitowoc County and its municipalities to develop comprehensive plans for the purpose of guiding and coordinating future development. This multi-jurisdictional planning process, which began in August 2007, is a bottom-up approach with each of the participating communities developing its own detailed plan for adoption. These adopted local plans will then be incorporated into the County framework plan. The multi-jurisdictional planning process will be completed in December of 2009 with the adoption of the Manitowoc County comprehensive plan. Eleven towns are participating in the comprehensive planning process along with several of the smaller incorporated areas. Two towns have comprehensive plans that have been recently completed by BLRPC.

[1] The following is taken largely from the notes taken during local officials meetings by project team members.

According to BLRPC staff, the County is agricultural in character outside of the incorporated areas, and unincorporated towns wish to remain rural. Manitowoc and Two Rivers serve as employment centers for the County. In general, development is expected to occur along the I-43 corridor, along Lake Michigan and on the fringes of incorporated areas.

Below are brief summaries of the information obtained from meetings held with local officials from the larger incorporated communities (Table 4.1). Appendices A and B include some notes by TAZ about the data adjustments that were made to develop the base year data and the future year forecasts.

4.2.1 CITY OF MANITOWOC

The City of Manitowoc completed a comprehensive plan in 1999. The City lost many manufacturing jobs with the closure of Mirro Aluminum in 2003. The plant was re-opened with new owners and now produces specialty aluminum products, but has substantially fewer employees. In January 2009, the City annexed Silver Lake College, and will be providing water and sewer services. Some renovation and expansion of college facilities is underway.

The City is experiencing modest population growth, and has approved multiple subdivisions located on the fringes of the City. The assumption was made that most of the growth in households will occur in these areas. Jobs are slowly being added to the west side industrial park and development in general is pushing toward I-43.

4.2.2 CITY OF TWO RIVERS

The City of Two Rivers is participating in the comprehensive planning effort being led by the BLRPC. Two Rivers has lost both jobs and population in recent years. The Woodland Drive Industrial Park has approximately 200 acres available for new industries. A new high school was built adjacent to WIS 42 in 2002, and the former high school site is being redeveloped for residential uses. In general, new residential growth is locating along riverfront areas. The City has hopes for the redevelopment of a large abandoned mill site in downtown Two Rivers, likely for mixed uses.

4.2.3 VILLAGE OF REEDSVILLE

The City is participating in the comprehensive planning effort being led by the BLRPC. Reedsville is expecting little to no growth in the future. Reedsville has no industrial base and acts as a bedroom community to Manitowoc. Very little has changed from 2000 or is likely to change into the future, with the exception of possible new housing on the south/southwest side of town. The local representative believes that unless staff or funding is injected into Reedsville, development or initiatives to attract growth will be limited.

4.2.4 VILLAGE OF MISHICOT

Mishicot is expecting little to no growth in the future. Mishicot has a single industry (Fox Hills Golf Resort). The resort has a positive impact on the City, but this is a seasonal effect. Growth will be dependent upon local landowners and Mishicot's ability to keep shoppers in the community. With retail and employment options in Manitowoc only 10 minutes away, Mishicot officials realize the competition the village faces with other retail options nearby.

4.2.5 VILLAGE OF CLEVELAND

The Bay-Lake Regional Planning Commission completed a comprehensive plan for Cleveland in 2007. According to Cleveland officials, they expect a continuation of current moderate growth trends. An average of two to three new homes are being built each year. The utilities from the village do not cross I-43, and the village does not anticipate annexation of the lands on the west side of I-43. Highway commercial development is expected on the east side of I-43, and limited residential is planned for this area. The lakefront area is essentially built out at this point. Lakeshore Technical College, located adjacent to I-43, is growing but is not expected to become significantly larger.

Appendix C provides a visual representation of employment and household changes by TAZ for the years 2005-2035 for Manitowoc County, the City of Manitowoc and the City of Two Rivers. Table 4.2 provides a summary of the forecast adjustments made to Manitowoc County's socio-economic data.

Table 4.1 – Summary of Local Contacts in Manitowoc County

Date of Meeting	Community	Name and Position
October 7, 2008	Bay-Lake Regional Planning Commission	Mark Walter, Director Jeff Agee-Aguayo Brandon Robinson Ker Vang
December 22, 2008	Manitowoc County	Pete Tarnowski, County Zoning Administrator
December 22, 2008	Two Rivers	Dan Pawlitzke, Economic Development Marty Marchek, Planner Greg Buckley, City Manager
December 30, 2008	Reedsville	Carrie McGolderick, Reedsville Association for Growth and Development
December 30, 2008	Mishicot	Jim Bydalek, Village Clerk
January 9, 2009	Cleveland	Cindy Huhn, Village President

Table 4.2 – Summary of Data Adjustments for Manitowoc County

Item	Future Year (Initial 2030 – Revised 2035)	Change
Households	41,284 – 41,661	+ 377
Employees	44,113 – 44,314	+ 201

SECTION 5.0 – Door County Data Collection and Review

5.1 DATA DEVELOPMENT

5.1.1 BASE YEAR – 2005

Household data was developed using 2000 census data and brought up to 2005 as a result of discussions with local officials and the application of growth rates based upon past trends. Employment data from the Wisconsin Multi-Modal Statewide Travel Demand model was used for the 2000 estimates and adjusted to 2005 based upon discussions with local officials. Appendix A shows the original 2000 data for households and employment, as well as the adjusted 2005 data.

5.1.2 FUTURE YEARS – 2020/2035

Future household projections prepared by the WisDOA for Door County appeared to be low according to local officials; thus, projections prepared by BLRPC were used. Employment data from the Statewide Model was used for the initial 2030 forecast. Appendix B shows the initial household and employment data for 2030. The 2030 TAZ data was adjusted based upon local input, and growth rates for the 2000 – 2030 period were applied to bring the data to 2035 levels. Estimates for 2020 (not shown in Appendix B) were developed by interpolating the midpoint between 2005 and 2035.

5.2 COMMUNITY COMMENTS AND DATA ADJUSTMENTS[1]

BLRPC is working with Door County to prepare a comprehensive plan. Several of the unincorporated communities have plans that were completed in recent years, while the City of Sturgeon Bay is in the process of developing a new comprehensive plan. Refer to Table 5.1 for a list of officials that were contacted and interviewed while collecting and reviewing data for Door County.

Door County has a high seasonal population, which is not reflected in typical population and household estimates. This seasonal population supports seasonal jobs, which are also not reflected in employment figures.

In general, development is occurring in Door County in or near incorporated areas, and along the shoreline. Door County has several unincorporated

[1] The following is taken largely from the notes taken during local officials meetings by project team members.

communities that have the character of villages, while much of the inner part of the County remains rural.

The recent completion of the four-lane expansion of WIS 57 between Green Bay and Sturgeon Bay may have the effect of bringing more residences to Sturgeon Bay and southern Door County for people who commute to Green Bay. This would result in more traffic on the highway.

There is no sewer or water service available in southern Door County. This limits the density and type of development that will occur. There has been an increase in retirees building homes in northern Door County. It is not yet known if this trend will continue, or slow down as the baby boom generation ages and these seniors can no longer live independently. Group facilities are developing in Door County for seniors who cannot live alone. These facilities would not appear as households but they would appear as employment sites.

Higher gas prices appear to have had either a neutral or positive effect on the County as a tourist destination, because more people are drawn to Door County for vacations instead of travelling domestically or internationally. Since 2007, there have been some increased marketing efforts to draw tourists and this has begun to have an effect. This could result in more traffic than what would otherwise be anticipated.

There will likely be some expansion of sewer and water service from the City of Sturgeon Bay along County C. Most non-residential development is likely to occur along WIS 57 and CTH C, and in the industrial park area on the south side of Sturgeon Bay.

City of Sturgeon Bay and Door County Economic Development Corporation officials reviewed the data for the Sturgeon Bay area and made numerous suggestions for changes based upon their knowledge of recent changes and the City's plans for the future. They noted that many existing neighborhoods are built-out and growth is not likely to occur there.

Refer to Appendix C for a visual representation of employment and household changes by TAZ for the years 2005-2035 for Door County. Table 5.2 provides a summary of the forecast adjustments made to Door County's socio-economic data.

Table 5.1 – Summary of Local Contacts in Door County

Date of Meeting	Community	Name and Position
October 7, 2008	Bay-Lake Regional Planning Commission	Mark Walter, Director Jeff Agee-Aguayo Brandon Robinson Ker Vang
November 18, 2008	Door County	Mariah Goode, County Planning Director
	Village of Sister Bay	Bob Kufrin, Village Administrator
	Door County Economic Development Corp.	William Chaudoir, Director
	City of Sturgeon Bay	Martin Olejniczak, City Planner Ben Meyer, Sturgeon Bay Common Council

Table 5.2 – Summary of Data Adjustments for Door County

Item	Future Year (Initial 2030 - revised for 2035)	Change
Households	18,551 - 17, 257	-1,294
Employees	16,180 – 16,735	+ 555

SECTION 6.0 – Kewaunee County Data Collection and Review

6.1 DATA DEVELOPMENT

6.1.1 BASE YEAR – 2005

Household data was developed using 2000 census data and brought up to 2005 as a result of discussions with local officials and the application of growth rates based upon past trends. Employment data from the Wisconsin Multi-Modal Statewide Travel Demand Model was used for the 2000 estimates and adjusted for 2005 based upon discussions with local officials. Appendix A shows the original 2000 data for households and employment, as well as the adjusted 2005 data.

6.1.2 FUTURE YEARS - 2020/2035

The future year forecast for households was based on the WisDOA forecast for 2030. Employment data from the Statewide Model was used for the initial 2030 forecast. Appendix B shows the initial household and employment data for 2030. The 2030 TAZ data was adjusted based upon local input, and growth rates for the 2000 – 2030 period were applied to bring the data to 2035 levels. Estimates for 2020 (not shown in Appendix B) were developed by interpolating the midpoint between 2005 and 2035.

6.2 COMMUNITY COMMENTS AND DATA ADJUSTMENTS[1]

Information obtained from the BLRPC, local plans and interviews with local officials was used to adjust the forecast data for households and employment levels in some of the TAZs (Table 6.1). Following is a brief description of the information obtained from these sources.

Growth is expected to concentrate on the edges of the incorporated communities and along the Lake Michigan shoreline in the Town of Pierce, and the Green Bay shoreline in the Town of Red River, where the unincorporated community of Dyckesville is located. The Red River/Dyckesville area may be affected by the construction of a bypass around Dyckesville and the four-lane expansion of WIS 57, which may make the community more attractive for year-round residences. No adjustments were made for these potential effects.

[1] The following is taken largely from the notes taken during local officials meetings by project team members.

The Green Bay Metropolitan Sewerage District serves the Red River/Dykesville area. The Kewaunee County Comprehensive Plan prepared by the BLRPC shows future housing growth locating near the incorporated areas and in Dyckesville, and industry locating on the fringes of Algoma, Kewaunee and Luxemburg. Outside of the incorporated areas and the Bayshore and Lakeshore areas, growth is expected to be modest.

Below are brief summaries of the information obtained from meetings held with local officials from the larger incorporated communities. Appendices A and B include some notes by TAZ about the data adjustments that were made to develop the base year data and the future year forecasts.

6.2.1 CITY OF ALGOMA

The BLRPC staff noted that the City of Algoma has bolstered its Main Street program and is tapping into the tourist trade. There is concern about the effect that the expansion of WIS 57 in Door County could have in diverting travelers away from WIS 42 through Algoma.

The largest employer in Algoma is Wisconsin Label Corporation. Some small adjustments were made to households to reflect that some areas are built up, and new growth is likely to occur at the fringes of the community. Changes were made to reflect the loss of jobs related to the closing of Olsonite Corporation in the base year.

6.2.2 CITY OF KEWAUNEE

The BLRPC completed the City's most recent comprehensive plan in 2007. BLRPC staff noted that Kewaunee is interested in having light industrial uses on the west side of town but currently does not have sites available. Most commercial development is occurring adjacent to WIS 42 and WIS 29, and the comprehensive plan calls of a continuation of that trend into the future. The comprehensive plan also calls for additional residential growth on the north side of town adjacent to the lakeshore as well as infill near the school campus area.

The 2000 year data was revised to reflect 2005, the new base year. TAZ boundaries were revised to include Pamida, a discount store located along WIS 42 on the north side of town. Employment declined in one area of the City due to the closure of Kewaunee Machine in 2002. The City intends to employ infill development throughout the City. There will be multi-family housing units to the north, but much of the housing will be on the southwest side of town near the school.

6.2.3 VILLAGE OF LUXEMBURG

BLRPC completed the village's most recent comprehensive plan in 2007. BLRPC staff noted that Luxemburg experienced quite a bit of residential growth in the 1990s. This has dropped somewhat in more recent years. Most industrial and commercial development is occurring adjacent to WIS 54. The village receives sewer services from the Green Bay Metropolitan Sewerage District. Growth is expected to occur on the fringes of the village in the years ahead, particularly on the east side.

Refer to Appendix C for a visual representation of employment and household changes by TAZ for the years 2005-2035 for both Kewaunee County. Table 6.2 provides a summary of the forecast adjustments made to Kewaunee County's socio-economic data.

Table 6.1 – Summary of Local Contacts in Kewaunee County

Date of Meeting	Community	Name and Position
October 7, 2008	Bay-Lake Regional Planning Commission	Mark Walter, Director Jeff Agee-Aguayo Brandon Robinson Ker Vang
December 17, 2008	Kewaunee County	Chuck Wagner, County Board of Supervisors Ed Dorner, County Administrator Brandon Robinson, BLRPC Ed Selner, County Zoning Administrator
December 17, 2008	Luxemburg	Jeff Orr,Village Engineer
December 23, 2008	Kewaunee	Brian Kranz, City Administrator Chuck Balleine, Public Works Director
December 23, 2008	Algoma	Tom Romdenne, City Administrator

Table 6.2 – Summary of Data Adjustments for Kewaunee County

Item	Future Year (Initial for 2030 – Revised for 2035)	Change
Households	10,202 – 10,545	+ 343
Employees	10,302 – 9,683	- 919

SECTION 7.0 – Calumet County Data Collection and Review

7.1 DATA DEVELOPMENT

7.1.1 BASE YEAR – 2005

Household data was developed using 2000 census data and brought up to 2005 as a result of discussions with local officials and the application of growth rates based upon past trends. Employment data from the Wisconsin Multi-Modal Statewide Travel Demand Model was used for the 2000 estimates and adjusted based upon discussions with local officials. Appendix A shows the original 2000 data for households and employment, as well as the adjusted 2005 data.

7.1.2 FUTURE YEARS - 2020/2035

The future year forecast for households was based on the WisDOA forecast for 2030. Employment data from the Statewide Model was used for the initial 2030 forecast. Appendix B shows the initial household and employment data for 2030. The 2030 TAZ data was adjusted based upon local input, and growth rates for the 2000 – 2030 period were applied to bring the data to 2035 levels. Estimates for 2020 (not shown in Appendix B) were developed by interpolating the midpoint between 2005 and 2035.

7.2 COMMUNITY COMMENTS AND DATA ADJUSTMENTS[1]

The model includes a portion of the eastern half of Calumet County. In May 2007, Calumet County adopted its Year 2025 Smart Growth Plan. County staff did not feel many data adjustments were needed in the rural areas. Overall, they saw the rural areas remaining rural and growth occurring at the edges of incorporated communities.

Below are brief summaries of the information obtained from meetings held with local officials from the larger incorporated communities in the model area, Kiel and New Holstein. Table 7.1 presents summary information about these meetings.

[1] The following is taken largely from the notes taken during local officials meetings by project team members.

7.2.1 CITY OF KIEL

Between 2000 and 2005, the City of Kiel experienced a boom in housing when a large number of low-cost lots came on the market. The 2005 base data was adjusted to reflect this increase in households. Household growth in some locations was reduced from the original 2030 estimates based upon local input that these areas were already built out. In general, future household growth is expected in the fringe areas of the community. Growth was projected for the 2035 scenario but at a slower pace, as the boom in the first half of this decade may have been an anomaly. Adjustments were also made in employment data, both up and down, based upon local knowledge.

7.2.2 CITY OF NEW HOLSTEIN

New Holstein suffered a loss of over 2,000 jobs over a period of several years with the downsizing and eventual closure of Tecumseh Motors, which occurred in 2007. County and City officials/staff believe that the City will increasingly take on the character of a bedroom community. For this reason, growth in employment was scaled back somewhat from the initial estimates. Many residential areas are believed to be built out and no new homes are forecasted in these areas. Modest growth is forecasted on the eastern fringes of the City.

Refer to Appendix C for a visual representation of employment and household changes by TAZ for the years 2005-2035 for both Calumet County. Table 7.2 provides a summary of the forecast adjustments made to Calumet County's socio-economic data.

Table 7.1 – Summary of Local Contacts in Calumet County

Date of Meeting	Community	Name and Position
December 17, 2008	Calumet County	Dena Mleziva, Planning Kelly Hoxtell, Economic Dev.
December 17, 2008	Kiel	Dennis Dedering, Administrator
December 17, 2008	New Holstein	Michael Stutz, Clerk/Treasurer

Table 7.2 – Summary of Data Adjustments for Calumet County

Item	Future Year (Initial 2030 – Revised for 2035)	Change
Households	4,497 – 4,641	+ 144
Employees	7,529 – 6,257	- 1,272

SECTION 8.0 – Traffic Count Data Collection

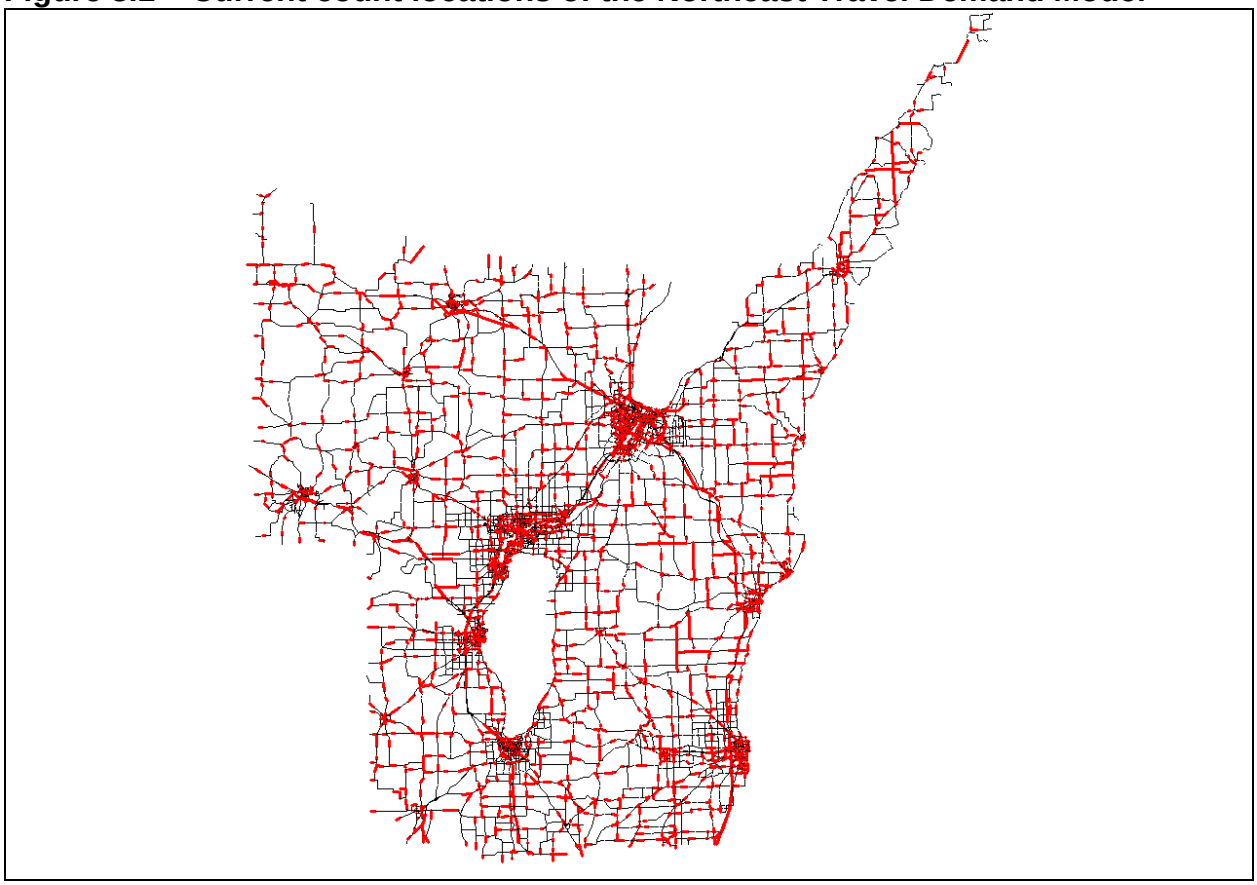
This section summarizes the methodology and results of traffic volume counts conducted by SRF Consulting Group, Inc. (SRF) for the Wisconsin Department of Transportation (WisDOT) Northeast Regional Travel Demand Model. These counts were integral to the calibration and validation of the model as they bridged gaps where counts were missing, updated old or questionable counts, provided vehicle classification data, and improved count information at the model's external stations.

8.1 BACKGROUND

Count data is a vital part of creating a functional and accurate travel demand model. The Northeast Regional Model currently had 4,374 count locations coded into its highway network. With such an extensive coverage of counts, the count data collection focused on targeting locations that may not have been accurately represented by previous collection efforts or may be too outdated to include in the model. Figure 8.1 indicates current count locations for each link of the entire Northeast Regional Model.

SRF, in conjunction with JT Engineering, Inc. collected additional traffic counts in areas where new data could increase the accuracy and performance of the model. Typically, these traffic counts were performed in locations that could potentially experience high traffic volumes, were affected by construction during the previous WisDOT coverage count cycle or are new roadway alignments since the last WisDOT count cycle.

Figure 8.1 – Current count locations of the Northeast Travel Demand Model



8.2 METHODOLOGY OF DETERMINING COUNT SITE LOCATIONS

With most internal segments of the model adequately covered by WisDOT coverage counts and the Fox Valley portion of the model, the priority of new vehicle data needs shifted to the model's external stations. Count data at external stations had been previously estimated using data from the Wisconsin Statewide Multimodal Travel Demand Model. This data set was updated with actual vehicular data counts in order to increase the model's accuracy at these locations and as a result the counts were not factored.

The Northeast Regional Model has 64 external stations, which are defined as locations at the periphery of the study area that carry traffic in and out of the study area. Determining the appropriate number of vehicles entering and exiting the model's study area is a crucial step in the validation of the model. With 64 external stations included in the model, a priority matrix was devised to determine external count locations that might improve the model's performance with new traffic count data. Since many of the external count locations are

located within rural areas, only external stations that experienced daily traffic volumes greater than 5,000 vehicles per day (vpd) were considered. The second criteria established was the determination of the significance of the route, which involved reviewing the functional classification and if the station was along a designated truck route. These conditions were established so that new counts would be collected at sites that significantly aided model development.

Upon determining the external stations that would be considered for additional traffic data collection, the focus for new counts shifted to acquiring counts at locations forecasted by WisDOT's TAFIS (Traffic Analysis Forecasting Information System) to have had recent significant increases in traffic volumes. Lastly, roadways that were recently constructed or reconfigured were considered for additional count data collection.

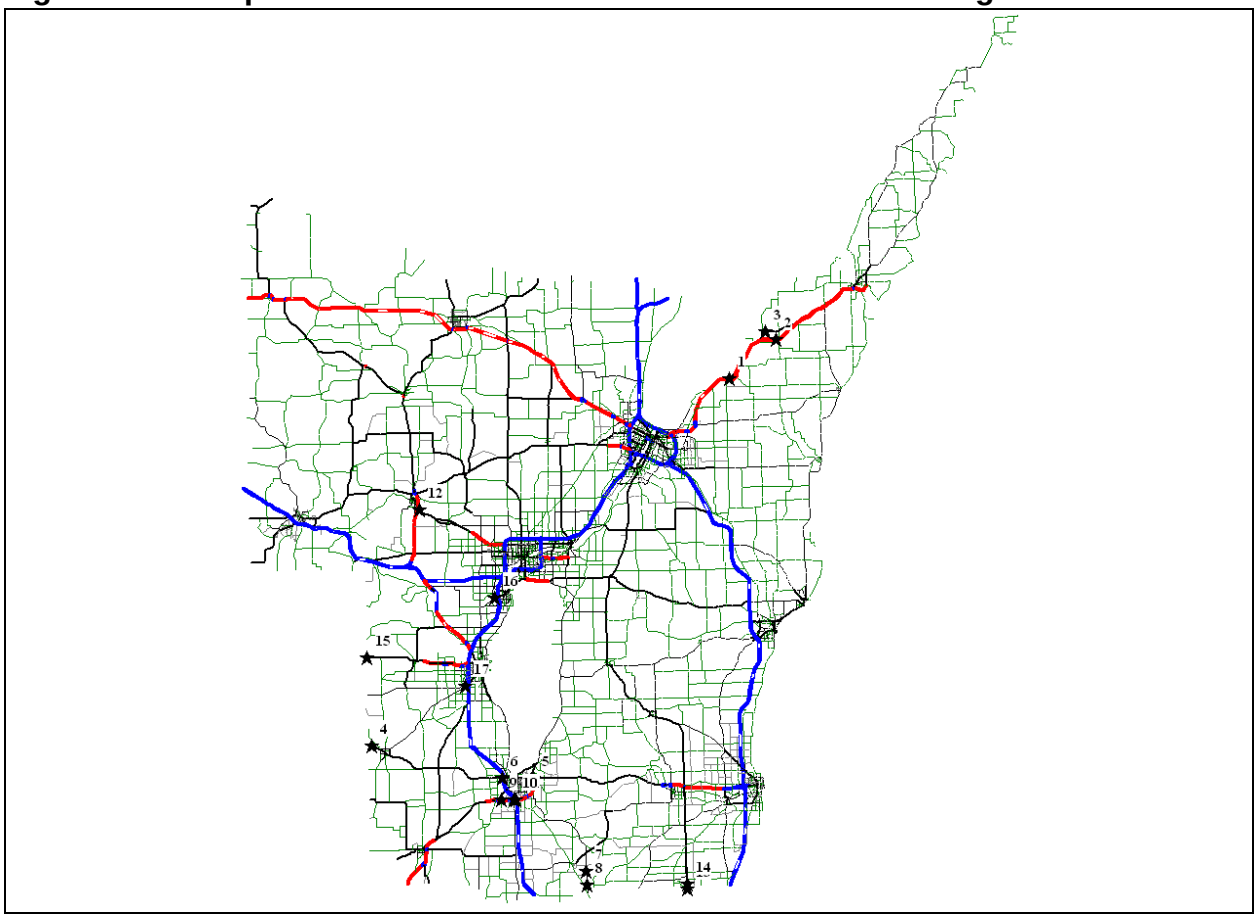
The priority matrix methodology and analysis resulted in a total of seventeen sites as potential count locations. Table 8.1 indicates the locations and count magnitude of the sites, while Figure 8.2 provides a spatial representation of the potential count locations with the Northeast Regional Model's functionally-classified roadway network. Sites 4, 7, 13 and 15 are external stations, while the remaining count sites are located within the Northeast Regional Model.

Table 8.1 – Potential Count Locations of the Northeast Travel Demand Model

Site Number	Facility	Location	County	AADT	
				5,000 - 10,000	> 10,000
1	County P	West of WIS 57	Door	X	
2	WIS 57	West of County C	Door		X
3	County DK	West of Pit Rd	Door	X	
4	WIS 23	East of County PP	Fond du Lac		X
5	WIS 23	East of US 151	Fond du Lac		X
6	WIS 23	West of County VVV	Fond du Lac		X
7	US 45	South of County Y	Fond du Lac	X	
8	US 45	South of Sandy Rd	Fond du Lac	X	
9	US 151	East of County D	Fond du Lac		X
10	US 151	East of Hickory Rd	Fond du Lac		X
11	US 151	East of WIS 175	Fond du Lac		X
12	WIS 15	East of US 45	Outagamie		X
13	WIS 57	South of County K	Ozaukee	X	
14	WIS 57	South of Orth Dr	Sheboygan	X	
15	WIS 21	East of County X	Waushara	X	
16	County JJ	West of Tullar Rd	Winnebago	X	
17	WIS 44	West of Washburn Ave	Winnebago		X

Count sites 1-3 and 9-11 were identified as an "emerging" or "near emerging" roadways due to recent construction or expansion at or near the location. These emerging roadways likely experience a significant fluctuation in traffic volume that may differ from counts observed in the Northeast Regional Model's base year model (Year 2005). These locations also could experience a significant difference in traffic volumes shortly after the model's base year due to a new facility or an expansion of an existing facility, warranting collection of traffic count data to analyze future year traffic forecasts.

Figure 8.2 – Proposed & Potential Count Locations of the NE Regional Model



8.3 RESULTS

Traffic data for the seventeen sites was collected between July 13 and August 21, 2009. Counts were typically taken from Monday afternoon to Friday morning and resulted in 48-hour or 72-hour count data for analysis. Traffic data collection at external location sites consisted of both vehicle count data (e.g., volume, directionality, and time-of-day) and vehicle classification data.

After the count collection was completed, count data was compiled for analysis. Daily counts were classified into 15-minute or one-hour time periods, depending on the location. The minimum, maximum and average 24-hour counts were summarized to determine a raw, daily count total. The raw count data was then compared against WisDOT's count information, where available, to determine if the data was within a reasonable tolerance for consistency. The results of this analysis can be seen in Table 8.2.

Table 8.2 – Traffic Supplemental Data Collection Results

Site #	Location	County	Observed Daily Counts			WisDOT ADT	Comments
			Min	*Max*	*Ave*		
1	County P west of WIS 57	Door	2,241	2,640	2,449	---	No WisDOT count info available
2	WIS 57 west of County C	Door	10,005	12,971	11,001	---	No WisDOT count info available
3	County DK west of Pit Rd	Door	708	787	761	---	No WisDOT count info available
4	WIS 23 east of County PP	Fond du Lac	3,859	4,404	3,999	11,000	Count Error
5	WIS 23 east of US 151	Fond du Lac	15,036	15,920	15,551	12,500	OK
6	WIS 23 west of County VVV	Fond du Lac	14,952	16,219	15,410	16,100	OK
7	US 45 south of County Y	Fond du Lac	2,357	3,455	2,928	2,400	OK
8	US 45 south of Sandy Rd	Fond du Lac	3,441	3,906	3,721	3,600	OK
9	US 151 east of County D	Fond du Lac	8,031	8,840	8,381	---	No WisDOT count info available
10	US 151 east of Hickory Rd	Fond du Lac	9,447	10,546	10,050	---	No WisDOT count info available
11	US 151 east of WIS 175	Fond du Lac	12,152	12,770	12,605	---	No WisDOT count info available
12	WIS 15 east of US 45	Outagamie	9,831	10,078	9,927	9,900	OK
13	WIS 57 south of County K	Ozaukee	10,927	11,795	11,419	8,500	OK, but counts are high
14	WIS 57 south of Orth Dr	Sheboygan	10,440	11,190	10,893	8,600	OK, but counts are high
15	WIS 21 east of County X	Waushara	5,789	7,320	6,477	6,200	OK
16	County JJ west of Tullar Rd	Winnebago	9,572	9,884	9,795	8,000	OK
17	WIS 44 west of Washburn Ave	Winnebago	4,167	4,354	4,246	14,200	Count Error

Note: The new count data was raw in nature, without adjustment due to seasonal and axle factors.

The results of this comparative analysis indicated that many sites fell within a reasonable limit of variation and were included for analysis in the model. Exceptions to this finding were sites 4 and 17, which show a significant variation between data sets. Count technicians indicated that these two sites required several equipment installations due to equipment failure (snapped road tubes) while counts were being conducted. Due to the discrepancies at sites 4 and 17, the observed counts were not included in the model. Counts at sites 1-3 and 9-11 were compared with an understanding that the volumes would not match, because they were identified as an emerging facility or a location affected by an emerging facility; counts taken at these sites were used for analysis and comparison of trends for future-year forecasts. The average observed daily counts from all of the other count sites were included in the model.

The Northeast Regional Model uses counts and count years that are coded into the highway network to validate the base year model assignments and aid in the creation of forecast estimates. Inputting future count data will allow for recent data to be incorporated into model's forecast estimates. New count data may help improve forecasts, but will not be representative of the model's base year socio-economic conditions against which the model was calibrated.

SECTION 9.0 – Daily Base Model Estimation and Validation

9.1 OVERVIEW

This section summarizes the expansion, calibration and validation of the base year of the Northeast Wisconsin Regional Travel Demand Model. The starting point of this effort was the Fox Valley Model. Major steps included:

1. Expanding the model network and zone system to include the Lakeshore area;
2. Updating the model inputs, Cube Voyager scripts and the model catalog to reflect the full region;
3. Recalibrating and validating the model for the full region.

While these updates were being performed, a number of improvements were made to the model.

9.1.1 MODEL EXPANSION

An overview of the development of the roadway network and traffic analysis zone (TAZ) structure is discussed. This overview provides details on expanding the network (Section 9.2 - Network Development) and zones (Section 9.3 – TAZ Development) in the Fox Valley Model to include the Lakeshore study area.

9.1.2 OPERATIONALIZING THE NORTHEAST REGIONAL MODEL

Following the development of the full network and zone system, the model input files and scripts were modified to operationalize the model for the full region (Section 9.4 – Operationalizing the Northeast Regional Model**)**. The model platform is Cube Voyageur.

9.1.3 MODEL IMPROVEMENTS AND CALIBRATION/VALIDATION

The fully operational model was calibrated for the region. The calibration effort involved adjusting various coefficients and parameters to ensure good performance of the model. During this process, a number of improvements were made to the model, including a redefinition of the model area classification boundaries and the inclusion of Long-Distance Trips. This chapter documents

the model improvements and calibration/validation in the following sub-sections:

- Trip Generation (Section 9.5): redefinition of rural and urban/suburban boundaries, plus estimation of new trip generation rates;
- Long-Distance Trip Purpose (Section 9.6): introduction of long-distance trips;
- External Trip Configuration (Section 9.7): modification of the external zones and adjustments to the external trip tables;
- Trip Distribution (Section 9.8): modification of gravity script and calibration of trip length parameters;
- Mode Split (Section 9.9): no changes were made;
- Auto Occupancy Rates (Section 9.10): rates were reassessed using NHTS data;
- Trip Assignment Parameters (Section 9.11): assignment parameters; and
- Validation (Section 9.12): tables with statistics that document the performance of the model.

9.2 NETWORK DEVELOPMENT

The roadway network of the Lakeshore Region was developed as part of the expansion of the existing Northeast Regional Model and was created with input from WisDOT, East Central Regional Planning Commission (RPC) and Bay-Lake RPC. Network expansion was completed following much of the same methodology that was used in previous modeling efforts. The network attributes were carried over from the Fox Valley model for consistency and to minimize the need to modify the model's scripts. Expansion of the model included adding the eastern periphery of Calumet County and all of Door, Kewaunee, Manitowoc and Sheboygan Counties to the new roadway network.

Using the existing Sheboygan County Travel Demand Model's roadway network as a starting point, the Lakeshore Region's network was expanded using WisDOT's Wisconsin Information System for Local Roads (WISLR) dataset. This GIS-based dataset was used for the roadways in Calumet, Door, Kewaunee, and Manitowoc Counties. The WISLR dataset was converted directly into the roadway network for the expansion area and its comprehensive set of attributes was used to populate the NE Regional Model's network attribute fields (Figure 9.1). While most of the attributes were directly converted for use the Northeast Regional Model, the functional classification scheme used by WISLR differs significantly from the scheme used in

Northeast Regional Model. To maintain consistency with the existing model, the model's roadway network and WisDOT's (FHWA-approved) functional classification maps for the expansion area counties were cross-referenced to ensure the proper identification of roadways.

All roadways functionally classified higher than local by WisDOT's functional classification scheme were included in the roadway network. Urban and rural local roads were added as needed by recommendation of WisDOT, East Central RPC, Bay-Lake RPC and other local officials contacted during the development of the socio-economic data. Throughout the development of the roadway network, the attributes carried on from WISLR were checked for accuracy and consistency. Upon completion of the Lakeshore Region's roadway network, it was appended to the Fox Valley network to complete the new model's study area (Figure 9.2). A complete list of network attributes is located in Appendix E.

Figure 9.1 – Lakeshore Region Roadway Network

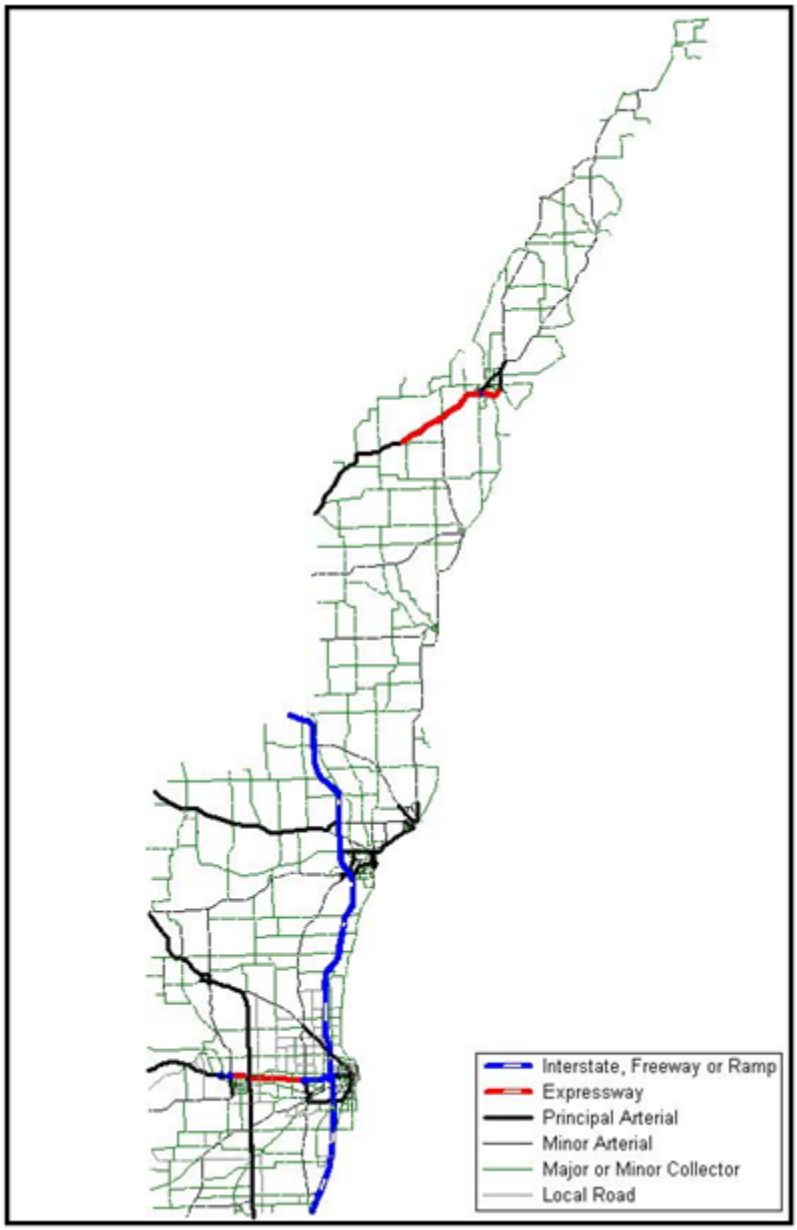
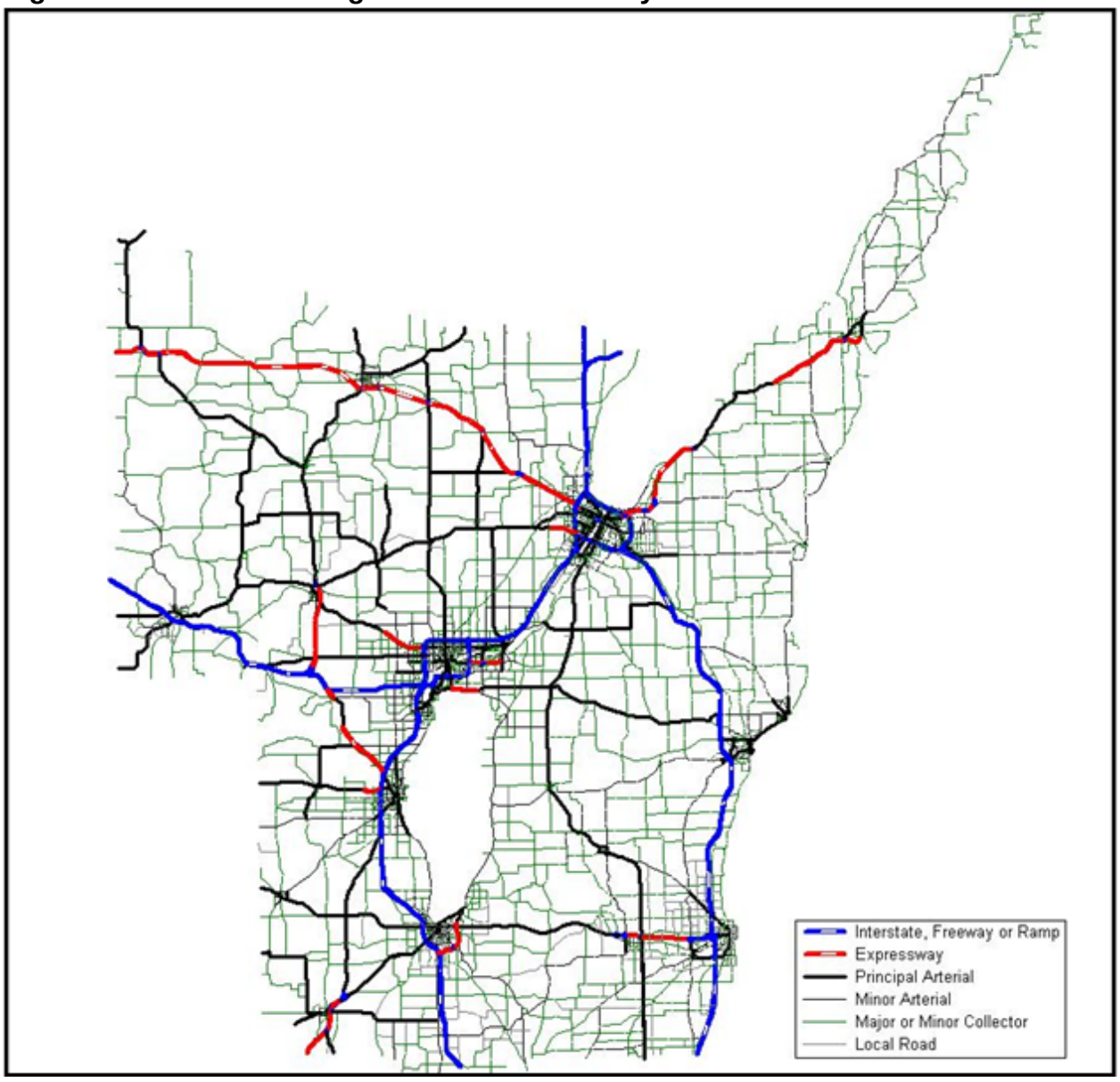


Figure 9.2 – Northeast Regional Model Roadway Network



9.3 TAZ DEVELOPMENT

Transportation analysis zones (TAZs) are aggregated geographic entities that are created to summarize homogenous land uses by socio-economic characteristics in order to produce trip origins and destinations. Due to the rural nature of the Lakeshore Region, no prior TAZs existed for Door, Kewaunee and Manitowoc Counties from previously developed models. The delineation of new TAZs was important in the development of the model, and as such, the

review and feedback from WisDOT and the local RPC's played a crucial role in the development of the zonal structure.

Using the existing Sheboygan County TAZ structure as a starting point, the Lakeshore Region TAZs were expanded to include the eastern periphery of Calumet County, as well as Door, Kewaunee and Manitowoc Counties. The new TAZs were developed based upon the combination of a number of factors, including the US Census Bureau's statistical subdivisions (e.g., tracts, blocks, and block groups), functionally classified roadways, environmental features, land use maps and the Wisconsin Statewide Multi-Modal Travel Demand Model's TAZ structure. Throughout the development of the zonal structure the block groups were used as the primary delineators of the TAZs, while many of the other factors were cross-referenced to determine the exact zonal boundaries. Upon completion of the initial Lakeshore Region TAZ structure, the zonal structure was sent to WisDOT, East Central RPC and Bay-Lake RPC for review and comment (Figure 9.3).

The TAZ numbering on the Fox Valley side of the model was updated. In the Fox Valley numbering scheme, TAZ numbers within one county did not necessarily form a continuous range. This numbering was updated so that the range of TAZ numbers within each county is a continuous set of numbers (Table 9.1). At the end of each block of zone numbers by county, several zone numbers are unused to accommodate potential future zones in the model.

Figure 9.3 – Northeast Regional Model TAZ Structure

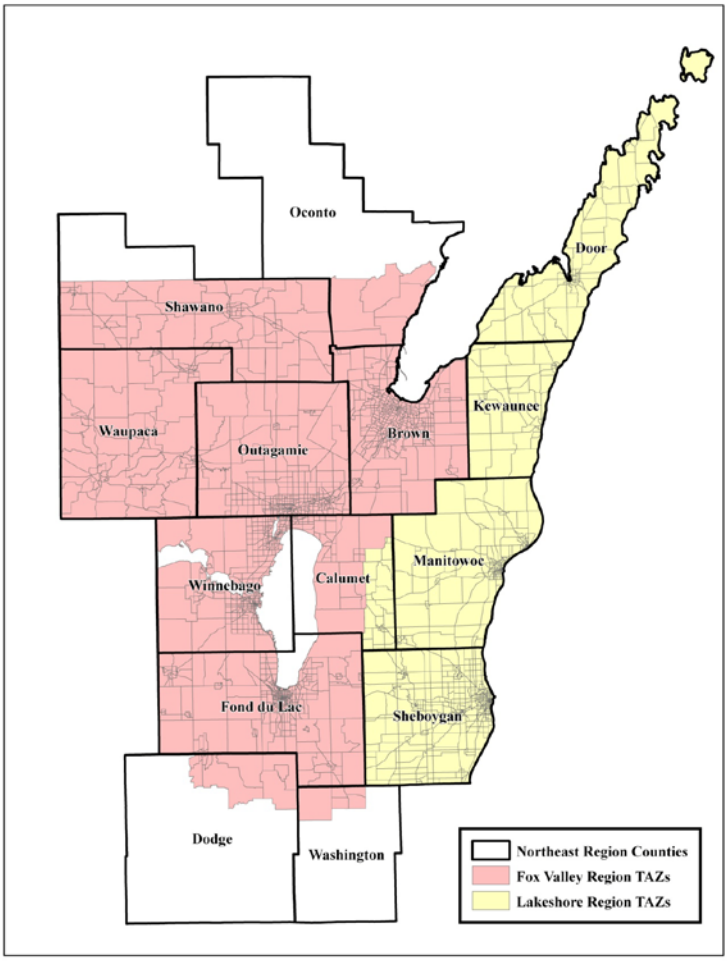


Table 9.1 – Northeast Regional Model TAZ Numbering System

County	Northeast Regional Model Zone Range	Previous Northeast Model Zone Range
Shawano	1-96	1363-1389 1830-1890
Waupaca	126-234	1420-1432 1891-1997
Outagamie	241-565	1000-1330
Winnebago	586-932	1450-1821
Fond du Lac	951-1360	500-918
Sheboygan	1381-1850	1-469
Calumet	1881-1968	400-453
Manitowoc	1976-2207	N/A
Brown	2226-2578	1-399
Kewaunee	2596-2648	N/A
Door	2656-2742	N/A
Oconto	2756-2761	950-955
Dodge	2762-2773	475-486
Washington	2774-2776	1400-1404

9.4 OPERATIONALIZING THE NORTHEAST REGIONAL MODEL

After expanding the network and socio-economic data that are input to the model, the model code was updated to incorporate the expanded Lakeshore Region study area. With this process, the model became operational for the full region. This effort involved:

- Updating the code to accommodate the new zone system;
- Updating the Fox Valley input files using the new zone system;
- Removing elements of the Fox Valley input files that were no longer necessary, such as the external trips on the eastern border of the Fox Valley model;
- Running the model and removing any bugs that are related to the changes; and
- Examining the model results for reasonableness.

9.5 TRIP GENERATION

A number of improvements were made to the trip generation procedures in the Northeast Regional Model. These improvements include:

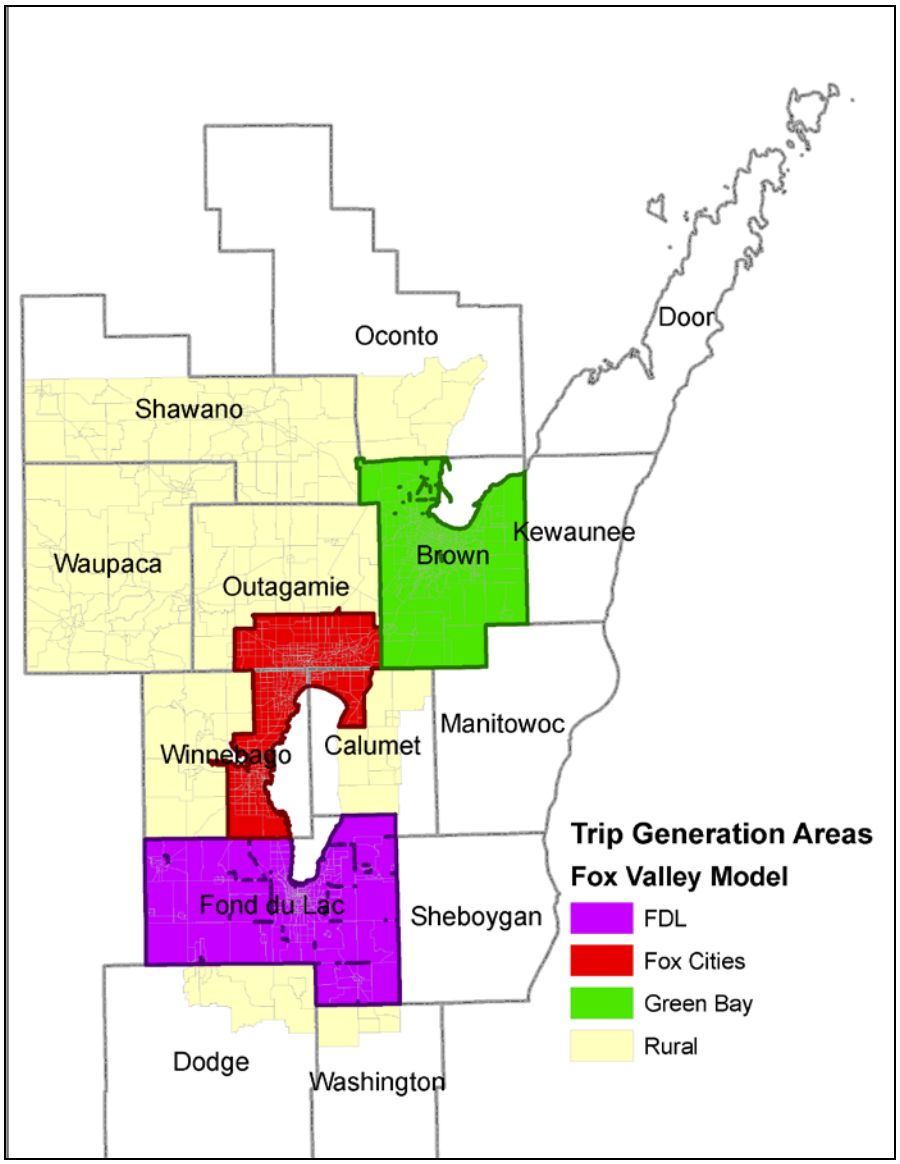
- Redefining the existing Green Bay (GB), Fox Cities (FOX), and FDL (Fond du Lac) area type definitions for improved distinction between rural and urban/suburban land use, and estimating new rates for these areas;
- Estimating new trip generation rates for the urban/suburban areas of Sheboygan and Manitowoc; and
- Removing the trip production inflation factors which artificially inflated the trips by between 10 and 40 percent.

9.5.1 New Areas

The model framework is structured to accommodate four individual geographic areas (Figure 9.4). The four areas are in the Fox Valley model are: Appleton/Oshkosh (Fox), Fond du Lac (FDL[1]), Green Bay (GB), and Rural (Other).

[1] Although the Fox and FDL zones belong to different areas, these zones all have the same trip generation rates. This is due to sample size restrictions in the NHTS dataset that was used to estimate the trip generation rates.

Figure 9.4 – Area Boundaries in the Fox Valley Model

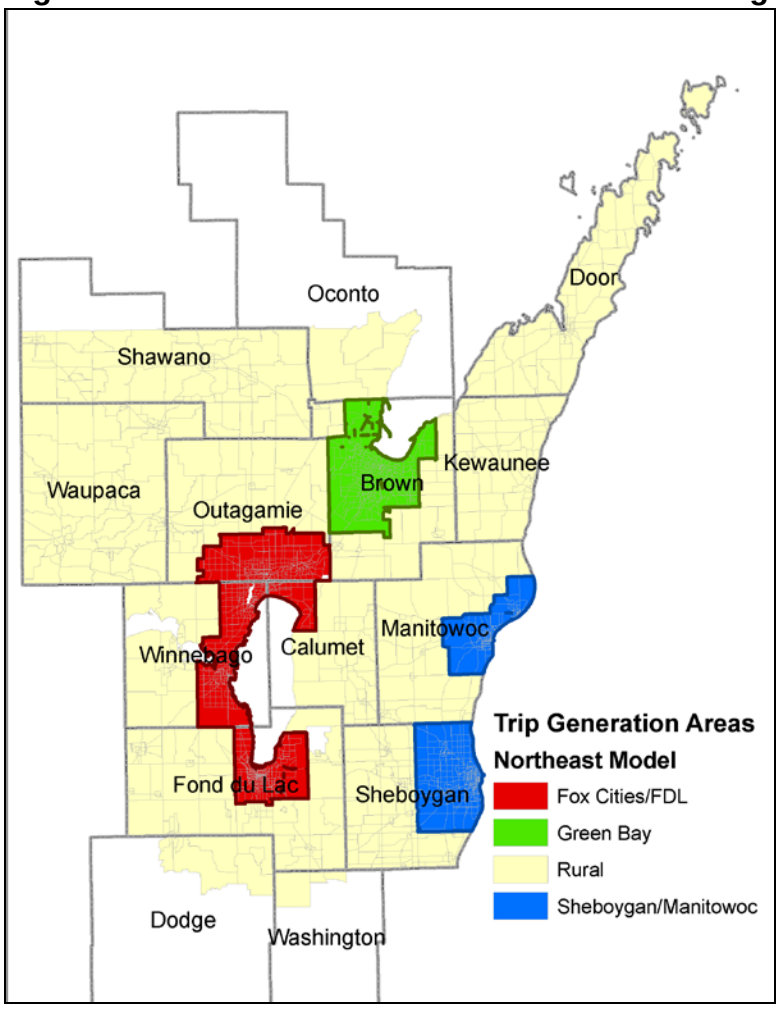


The Fox Valley Model's urban area zones were generated using zones from the MPO models. The Brown County and Fond du Lac MPO study areas contained urban, suburban and rural land uses, while the Fox Cities MPO study areas contained mostly urban and suburban zones. The MPO model boundaries for these four areas were preserved within the Fox Valley Model. In addition to the GB, FDL and Fox Cities areas, a fourth area type ("Other") was created to represent rural zones. As a result, urban and suburban zones in the Fox Valley Model were not distinguished from rural zones in a consistent manner.

The four areas in the model were redefined for the Northeast Regional Model as follows:

- The existing area boundaries were revised to better delineate urban/suburban and rural areas;
- Zones from the Fox and FDL regions were combined into one geographic area (FOX/FDL). While this change allows a new area to be included, it has no material impact on the results for the Fox and FDL areas because these two regions had been defined as different areas but were assigned the same trip generation rates in the Fox Valley model. For example, zones in the Fox and FDL areas used the same rates in the Fox Valley model and they continue to use the same rates in the new model;
- A new area was defined (SHEB). This area is comprised of the urban/suburban zones in Sheboygan and Manitowoc (Figure 9.5).

Figure 9.5 – Area Boundaries in the Northeast Regional Model



9.5.2 NEW TRIP GENERATION RATES

New trip generation rates were estimated for each area using the National Household Travel Survey (NHTS) Add-On sample data from 2001. Table 9.2 shows a total of 17,610 Wisconsin households are included in the full survey, and nearly 6,000 of these households are from the Northeast Regional Model study area.

Table 9.2 – Number of Households in NHTS Sample by Area

Model Area	Number of Households in NHTS Sample
GREEN BAY (GB)	1,557
FOX/FDL	1,979
SHEB (Includes Sheboygan and Manitowoc urban/suburban areas)	1,045
OTHER	1,414
ENTIRE NORTHEAST REGION	**5,995**
ENTIRE STATE (WI)	**17,610**

The trip generation rates were estimated using NHTS survey data for the Northeast Regional Model households. In some instances, there was not enough data to estimate rates for each trip production cross-classification category. When this occurred, the trip rates were smoothed by either aggregating data from different categories or using rates that were estimated using data from a larger area such as the entire state.

The new trip generation rates are presented in Table 9.3 through Table 9.12. These tables show the updated production and attraction rates for Home Based Work, Home Based Shop, Home Based School, Home Based Other and Non-Home Based trips. The rates for truck special generator trips are not displayed here because they were not modified from the rates in the Fox Valley Model, documentation of these rates can be found in the Fox Valley Model report.

Trip attraction models relate the trip-ends attracted by a TAZ to the type and intensity of employment in that zone. Trip attraction models are linear regression models that quantify the relationship between different types of employment and the attractiveness of a TAZ for the corresponding trip purposes. The trip attraction models developed for Wisconsin's MPO's were estimated utilizing the urban area portion of the 2001 National Household Transportation Survey add-on sample in conjunction with US Census data. During model development, consideration of the most appropriate trip attraction variables focused on answering questions as, are the attraction models statistically valid? Which is the best performing attraction model? Are the

base-year variable data available? Can the MPOs provide forecasts for the variables used in the model equations?

For the Wisconsin's metropolitan travel demand attraction models, the following variables were tested in various combinations for each trip purpose:

- Households
- Total Employment
- Retail Employment
- Service Employment
- Educational Employment (School Enrollment to be used)
- Manufacturing Employment

For HBW attractions, total employment was chosen as the attraction variable. Total employment was not only a logical variable for HBW attractions, but it was also the most statistically significant variable. Shopping trips by definition are trips that are attracted to places where retail goods are purchased. Retail employment was the logical demographic used for HBshop trip attractions. The HB-Other trip purpose attraction model uses the number of households, the total retail employment and the total service employment to predict the number of attractions. The HB-School trip purpose attraction model uses the number of households and total school enrollment to predict the number of attractions. The Non Home-Based trip purpose attraction model uses the number of households, the total retail employment and the total service employment to predict the number of attractions.

Table 9.3 – Home Based Work Trip Production Rates (NE Regional Model)

Model Area	Number of Workers in Household											
	0			1			2			3+		
	Number of Vehicles in Household											
	0	1	2+	0	1	2+	0	1	2+	0	1	2+
GB	0.03	0.03	0.03	0.92	1.12	1.48	1.85	2.39	2.81	3.22	3.91	4.77
FOX/FDL	0.02	0.02	0.02	0.88	1.12	1.45	1.85	2.39	2.81	3.22	3.91	4.77
SHEB	0.05	0.05	0.05	0.72	1.08	1.79	1.85	2.39	2.81	3.22	3.91	4.77
OTHER	0.17	0.17	0.17	0.92	1.12	1.48	2.13	2.23	2.75	2.56	3.64	4.69

Household automobile availability is used as one of the independent variables in the cross classification trip production matrices. In the HBW case, the other variable is the number workers in the household. Automobile ownership is considered a good surrogate for another indicator of trip making, household income. Because income is more difficult to measure, update, and project as a

model prediction variable, automobiles have been included which account for household trip making predictability nearly as well. While a single person household can only make work trips using one vehicle (even if two or more are available) statistics show that that household makes more work trips per day, and that there is indeed a positive correlation between multiple vehicle ownership and work trip making. As a function of income, higher daily work trip making rates for single worker households having multiple vehicles (i.e., higher income) would be logical.

Table 9.4 – Home Based Shop Trip Production Rates (NE Regional Model)

Model Area	Number of Persons in Household											
	1			2			3			4+		
	Number of Vehicles in Household											
	0	1	2+	0	1	2+	0	1	2+	0	1	2+
GB	0.39	0.60	0.62	1.25	1.25	1.58	2.02	2.02	2.13	1.91	1.91	2.65
FOX/FDL	0.28	0.61	0.64	1.27	1.38	1.73	1.93	1.93	1.93	1.20	2.24	2.48
SHEB	0.39	0.60	0.62	1.27	1.38	1.73	1.88	1.88	2.31	2.94	2.94	2.94
OTHER	0.57	0.75	0.75	1.38	1.44	1.60	1.59	1.59	1.59	1.79	1.79	1.79

Table 9.5 – Home Based School Trip Production Rates (NE Regional Model)

Model Area	Number of Persons in Household											
	1			2			3			4+		
	Number of Vehicles in Household											
	0	1	2+	0	1	2+	0	1	2+	0	1	2+
GB	0.00	0.00	0.00	0.11	0.11	0.11	0.91	0.91	0.91	2.39	2.39	2.39
FOX/FDL	0.00	0.00	0.00	0.05	0.05	0.05	0.53	0.53	0.53	2.59	2.59	2.59
SHEB	0.00	0.00	0.00	0.05	0.05	0.05	1.65	1.65	1.65	2.86	2.86	2.86
OTHER	0.00	0.00	0.00	0.09	0.09	0.09	0.96	0.96	0.96	3.01	3.01	3.01

Table 9.6 – Home Based Other Trip Production Rates (NE Regional Model)

Model Area	Number of Persons in Household											
	1			2			3			4+		
	Number of Vehicles in Household											
	0	1	2+	0	1	2+	0	1	2+	0	1	2+
GB	0.53	0.98	1.18	2.43	2.43	2.62	4.65	4.65	4.65	3.38	5.65	6.57
FOX/FDL	0.59	0.97	1.27	2.79	2.79	2.79	4.81	4.81	4.81	3.38	5.65	6.57
SHEB	0.60	1.07	1.38	3.83	3.83	3.83	5.41	5.41	5.98	3.38	5.65	6.57
OTHER	0.91	0.91	0.91	2.20	2.20	2.20	4.51	4.51	4.51	4.36	4.36	6.02

Table 9.7 – Non-Home Based Trip Production Rates (NE Regional Model)

Model Area	Number of Persons in Household											
	1			2			3			4+		
	Number of Vehicles in Household											
	0	1	2+	0	1	2+	0	1	2+	0	1	2+
GB	0.33	1.28	1.42	3.40	3.40	4.00	4.40	4.40	5.00	5.90	5.90	6.50
FOX/FDL	0.55	1.21	1.95	2.38	2.38	3.25	4.74	4.74	4.74	5.67	5.67	5.67
SHEB	0.63	1.49	1.49	2.22	2.22	3.36	4.39	4.39	4.66	4.94	4.94	4.94
OTHER	0.14	0.84	0.84	1.46	1.46	1.53	2.13	2.82	2.82	3.86	4.11	4.11

Table 9.8 – Home Based Work Trip Attraction Rates (NE Regional Model)

Model Area	Total Employment
GREEN BAY	1.79
FOX/FDL	1.50
SHEB	1.94
OTHER	1.64

Table 9.9 – Home Based Shop Trip Attraction Rates (NE Regional Model)

Model Area	Retail Employment
GREEN BAY	9.05
FOX/FDL	9.71
SHEB	13.55
OTHER	10.29

Table 9.10 – Home Based School Trip Attraction Rates (NE Regional Model)

Model Area	School Enrollment
GREEN BAY	1.48
FOX/FDL	0.71
SHEB	1.90
OTHER	1.95

Table 9.11 – Home Based Other Trip Attraction Rates (NE Regional Model)

Model Area	Households	Retail Employment	Service Employment
GREEN BAY	2.26	1.91	2.75
FOX/FDL	2.17	3.79	0.82
SHEB	2.17	3.79	0.82
OTHER	2.26	3.75	0.75

Table 9.12 – Non-Home Based Trip Attraction Rates (NE Regional Model)

Model Area	Households	Retail Employment	Service Employment
GREEN BAY	1.09	11.15	1.46
FOX/FDL	2.06	5.74	0.90
SHEB	1.37	8.22	1.62
OTHER	1.37	8.22	1.62

9.5.3 REMOVAL OF TRIP FACTORS

In the Fox Valley model, trips were being arbitrarily factored upwards by between 1.1 and 1.4 to increase the number of trips being modeled. There is no theoretical basis for the usage of these factors. Therefore, the factors were removed from the Northeast Regional Model.

9.6 LONG-DISTANCE TRIP PURPOSE

Long-distance trips are an important component of travel for Northeast Wisconsin residents. According to the NHTS 2001 dataset and the Wisconsin Statewide Model, these trips account for about two percent of trips made, but 12 percent of vehicle-miles traveled (VMT) in the state of Wisconsin. Because the other modeled trips were derived directly from the NHTS data, Long-Distance Trips must be included as well in order to fully represent the universe of trips that were recorded in the NHTS. Not including the long distance trips would remove approximately 12 percent of the Northeast Regional Model VMT.

The Long-Distance Trips were introduced into the model using the following procedure. First, Long-Distance Trips for the Northeast Regional Model area were extracted from the Wisconsin Statewide Model using a subarea extraction process. This process produced a trip table with Long-Distance Trips that originate in, are destined to, or travel through the Northeast Wisconsin model area. The zone system for this trip table is a subset of the Statewide Model zone system, which uses zones that are much larger than the Northeast Regional Model zones. The second step of the process involved disaggregating the trip data from the Statewide zones to the Northeast Regional Model zones. A new procedure was introduced into the model stream to perform the disaggregation. The new procedure disaggregates the trips using socio-economic information for each Northeast Regional Model zone, allowing the Northeast Regional Model to be responsive to land use changes that may occur in future years.

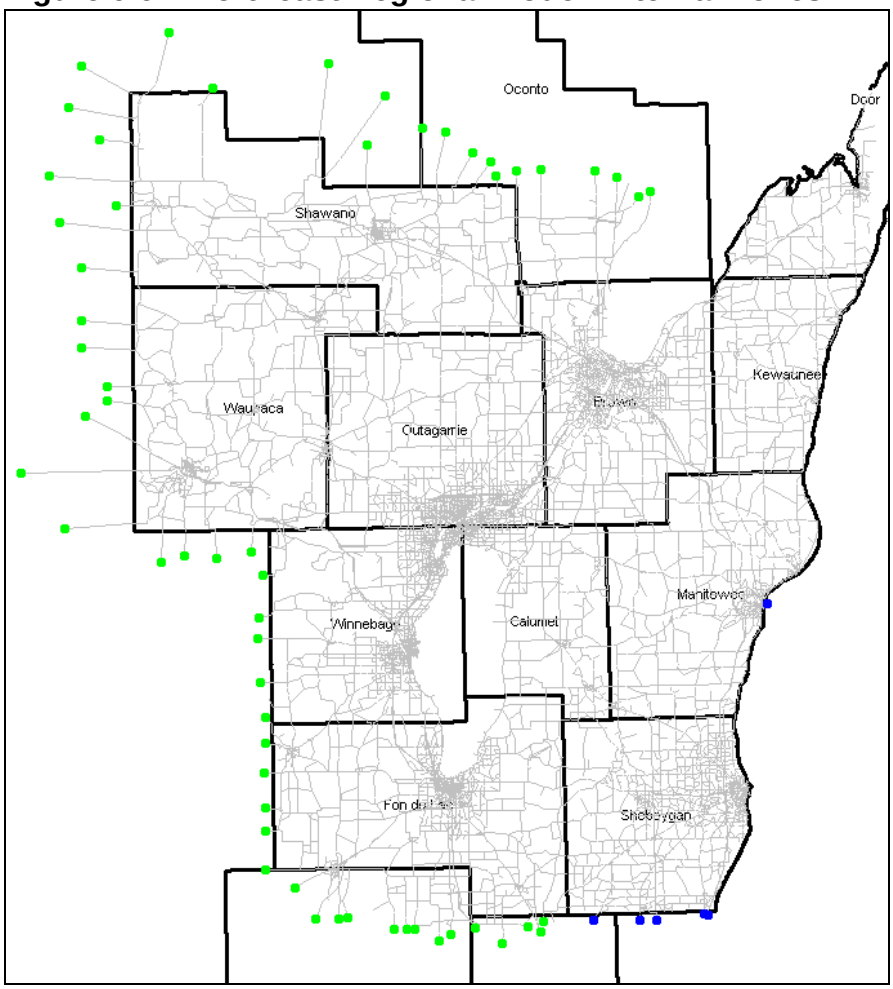
9.7 EXTERNAL TRIP CONFIGURATION

9.7.1 EXTERNAL ZONES IN THE NORTHEAST REGIONAL MODEL

The external trip tables were modified to account for the new geographic area and the introduction of Long-Distance Trips. External zones on the former eastern side of the Fox Valley Model were removed and new external zones were added on the southern border of Sheboygan County and at the SS Badger Ferry station in Manitowoc, resulting in a total of 64 external zones. The through trip table and the external-internal productions and attractions were updated in accordance with these changes.

Figure 9.6 shows the locations of the external zones in the Northeast Regional Model.

Figure 9.6 – Northeast Regional Model External Zones



9.7.2 FERRY TRIPS

The number of trips that are associated with the SS Badger Ferry station in Manitowoc was developed based on an interview with the City of Manitowoc and information from the ferry website[2]. According to these sources, the ferry makes 490 trips a year and has a capacity of 180 cars. It operates from May through October. To determine the average number of daily trips, a 75 percent occupancy rate was assumed for 5 months (about 135 days) of operation. Based upon 490 rounds trips per year multiplied by the capacity of 180 cars per trip, with a 75% occupancy rate, the average number of vehicles would be about 500 a day during the operational period. Using the same methodology as the previous calculation, but factoring in the non-operational period and using the entire calendar year (January 1 - December 31), the average number of vehicles per day would be approximately 175.

9.7.3 NHB TRIP TARGETS IN EXTERNAL-INTERNAL TRIP TABLE

In the Fox Valley model, a portion of the NHB external-internal trips were being "lost" during model processing. As a result, the model was not meeting target volumes at the external zones. This disparity was found to be due to the balancing procedure in which NHB trips are balanced to attractions. The NHB external-internal trips were originally divided into productions and attractions using a 70/30 percent split respectively. Using this ratio caused about 40 percent of NHB trips to be removed during the balancing procedure. By adjusting the NHB trip productions and attractions in the external-internal trip table (to a 50/50 split), the issue is resolved and the external volumes now match the target volumes.

9.7.4 2020 AND 2035 FORECAST VOLUMES

The 2035 forecast volumes for the 64 external zones in the Northeast Regional Model were developed by WisDOT and the consultant team. The forecast volumes were developed as follows:

- The Northeast Regional Model uses the same forecasts that were used in the Fox Valley model where available (58 the externals are in this category);
- For the remaining externals, three forecast volumes were compared (Table 9.13). These volumes are based on:
  - The Wisconsin Statewide model
  - TAFIS
  - A default annual growth rate of 1.5 percent

[2] http://www.ssbadger.com/, accessed in August 2009.

– Count data obtained for study (Section 8.3)

- Future year external station forecasts were agreed upon by WisDOT and MPO staff (Table 9.13)

Table 9.13 – Proposed Future Year Traffic Volumes

			Statewide Forecast (Option 1)		TAFIS Forecast (Option 2)		1.5% Annual Growth (Option 3)	
NE Model Zone	Road Name	AADT	2020	2035	2020	2035	2020	2035
2859	WIS 144	3,100	3,465	3,872	3,970	4,590	3,876	4,846
2860	County I	700	806	928			875	1,094
2861	WIS 57	8,800	10,965	11,236	11,470	13,480	13,377	16,725
2862	WIS 32	2,400	2,763	3,181			3,001	3,751
2863	I-43	26,400	29,027	31,915	31,620	35,220	33,006	41,265
2864	Ferry*	175	189	204			219	274

* The Statewide ferry zone growth uses an average rate based on collector roads from the statewide model

The final 2035 forecast volumes are shown in Table 9.14 alongside the 2005 base year volumes. The 2020 external forecast volumes were derived using an interpolation between the 2005 and 2035 volumes.

Table 9.14 – Final Future Year Traffic Volumes

Zone Number		Link Description			Volumes	
NE Model	FV model	Road Name	Linkclass	County	Base Year AADT	2035 Target Volume
2801	2086	County S	23	Oconto	780	1,070
2802	2085	US 41	2	Oconto	10,300	16,062
2803	2084	County J	24	Oconto	560	787
2804	2083	US 141	2	Oconto	13,600	21,200
2805	2082	County C	23	Oconto	960	1,539
2806	2081	WIS 32	22	Oconto	3,000	4,436
2807	2106	County BB	23	Oconto	400	721
2808	2133	WIS 22	21	Oconto	3,200	4,170
2809	2132	County V	24	Oconto	320	500
2810	2131	County R	23	Oconto	3,000	3,900
2811	2130	Menominee Line Road	24	Oconto	450	752
2812	2129	WIS 47	21	Shawano	6,200	9,570
2813	2128	County VV	23	Shawano	580	900
2814	2127	County G	23	Shawano	620	971
2815	2126	County Z	23	Shawano	750	975
2816	2125	US 45	21	Shawano	6,200	8,660
2817	2124	WIS 52	21	Shawano	1,800	2,930
2818	2123	County Z	23	Shawano	1,000	1,300

(Table 9.14 Continued)

2819	2122	County N	23	Shawano	1,300	2,021
2820	2121	County OO	24	Shawano	360	576
2821	2120	County 29	23	Shawano	10,990	16,530
2822	2119	WIS 153	23	Shawano	780	1,100
2823	2118	County PP	23	Shawano	120	190
2824	2117	WIS 49	22	Waupaca	1,500	1,950
2825	2116	County Z	24	Waupaca	320	500
2826	2115	WIS 161	23	Waupaca	1,300	1,860
2827	2114	County B	23	Waupaca	710	1,110
2828	2113	US 10	2	Waupaca	11,900	16,700
2829	2112	WIS 54	21	Waupaca	3,300	4,300
2830	2111	WIS 22	21	Waupaca	3,650	4,750
2831	2110	County K	24	Waupaca	840	1,174
2832	2109	County E	23	Waupaca	1,000	1,300
2833	2108	County A	24	Waupaca	400	618
2834	2066	WIS 49	24	Waupaca	2,570	3,880
2835	2063	County H	24	Winnebago	1,000	1,450
2836	2062	County D	23	Winnebago	1,100	1,600
2837	2061	WIS 21	21	Winnebago	6,200	8,500
2838	2057	WIS 91	22	Winnebago	4,820	7,240
2839	2104	County FF	23	Fond du Lac	1,200	1,618
2840	2056	WIS 23	21	Fond du Lac	11,000	15,110
2841	2055	County KK	23	Fond du Lac	2,600	3,400
2842	2053	WIS 44	21	Fond du Lac	1,800	2,350
2843	2052	County AS	24	Fond du Lac	210	322
2844	2049	County AW	23	Fond du Lac	2,500	3,475
2845	2048	WIS 68	21	Dodge	2,700	3,750
2846	2046	US 151	4	Dodge	14,900	22,700
2847	2045	County I	24	Dodge	225	325
2848	2044	WIS 26	21	Dodge	3,000	4,685
2849	2042	County Z	24	Dodge	980	1,550
2850	2041	County Y	22	Dodge	1,600	2,566
2851	2039	County V	23	Dodge	1,700	2,401
2852	2038	County AY	24	Dodge	860	1,344
2853	2037	WIS 175	22	Dodge	4,690	6,520
2854	2103	US 41	2	Washington	28,200	41,550
2855	2036	County W	24	Washington	780	1,090
2856	2102	WIS 28	24	Washington	2,400	3,540
2857	2101	US 45	22	Washington	7,100	10,830
2858	2035	County G	23	Fond du Lac	2,100	2,910
2859		WIS 144	22	Sheboygan	3,100	4,600
2860		County I	23	Sheboygan	700	1,100
2861		WIS 57	21	Sheboygan	8,800	13,500
2862		WIS 32	23	Sheboygan	2,400	3,800
2863		I-43	1	Sheboygan	26,400	35,200
2864		Ferry	24	Manitowoc	175	270

9.8 TRIP DISTRIBUTION

Two improvements were made to the trip distribution procedures. The model script was updated to produce a faster model run time. In addition, the coefficients in the impedance factor were adjusted for an improved fit with the observed trip length data.

9.8.1 GRAVITY MODEL CODING

In the Fox Valley model, trip productions and attractions were distributed using a singly constrained gravity model, then "fratared" to preserve zonal trip attractions. However, this process was coded using multiple matrix manipulation steps and FRATAR step, which added to processing time. Replacing the Fox Valley Model's trip distribution script with the GRAVITY statement in Cube, produces similar distribution results, but is 5% faster than the original script and is doubly constrained. A singly constrained model distributes trips from a production TAZ that are set equal to the number of productions estimated within trip generation for that TAZ, but does not control for the number of trips distributed to attraction TAZs. Conversely, a doubly constrained model attempts to match both trip productions and trip attractions to the trip generation results by TAZ by making adjustments to both the production and attraction totals.

9.8.2 TRIP LENGTHS

The modeled trip lengths were modified to improve the fit with trip lengths from the observed NHTS trip data. Trip length is measured in minutes and miles. Ideally, the observed and modeled trip lengths should match in terms of both average trip length and the distribution of trip lengths.

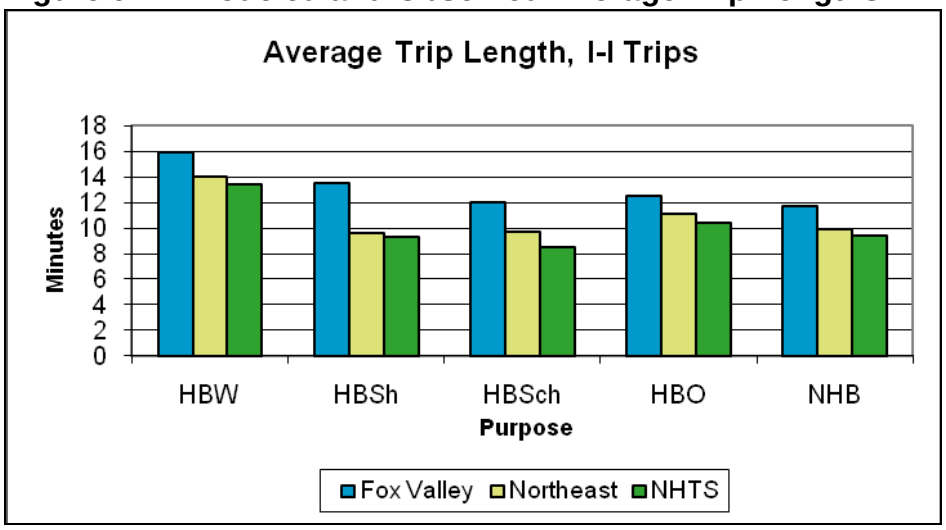
The trip distribution procedure relies on an impedance factor to help quantify the perceived impedance for each trip purpose. These factors are calculated during the model process and are a function of time and distance coefficients. The coefficients for these variables were adjusted during model validation with the goal of maximizing the fit between the modeled and observed values for average trip length and distribution of trip lengths (as measured by the Coincidence Ratios). See Table 9.15 for a list of the adjusted coefficients.

Figure 9.7 and Table 9.16 show the average trip lengths by purpose for the Fox Valley model, the Northeast Regional Model, and the NHTS data. The NHTS data represent the target values. These data show that the trip lengths in the Northeast Regional Model were improved for a better comparison with the observed NHTS data.

Table 9.15 –Trip Length Coefficients by Purpose

	HBW		HBShop		HBSchl		HBOther		NHB	
	Time	Dist	Time	Dist	Time	Dist	Time	Dist	Time	Dist
FV Model	0.14	1.10	0.21	0.35	0.21	0.35	0.21	0.35	0.215	0.35
NE Model	0.18	1.00	0.35	0.40	0.40	0.45	0.21	0.35	0.21	0.35
	SG_Coll		SG_CAS		SG_AIR		SG_MALL			
	Time	Dist	Time	Dist	Time	Dist	Time	Dist		
FV Model	0.14	1.10	0.14	1.10	0.14	1.10	0.14	1.10		
NE Model	0.14	1.10	0.14	1.10	0.14	1.10	0.14	1.10		

Figure 9.7 – Modeled and Observed Average Trip Lengths



Sources: Fox Valley Model, Northeast Regional Model, NHTS 2001 Add-On Sample

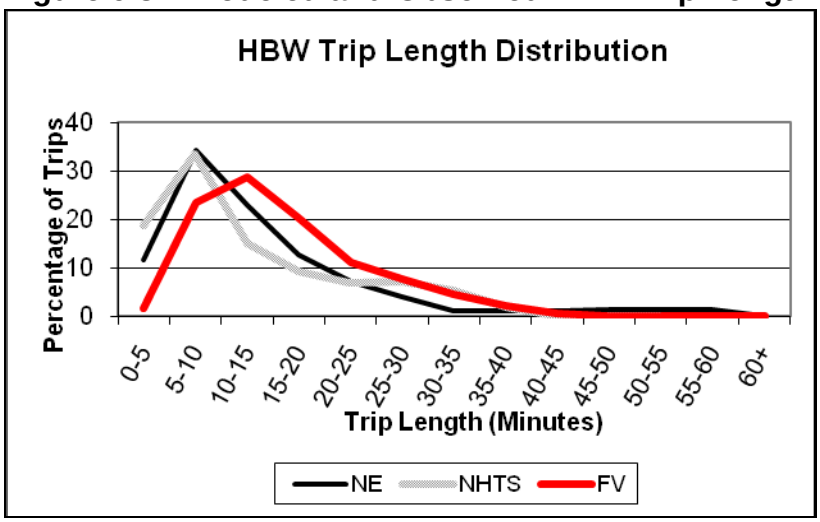
Table 9.16 – Average Trip Length by Purpose

Trip Purpose	Fox Valley	Northeast	NHTS	% Diff (FV)	%Diff (NE)
HBW	16.0	14.0	13.4	19%	5%
HBSh	13.5	9.6	9.3	45%	3%
HBSch	12.0	9.7	8.5	42%	14%
HBO	12.5	11.1	10.4	21%	7%
NHB	11.7	9.9	9.4	25%	6%

Sources: Fox Valley Model, Northeast Regional Model, NHTS 2001 Add-On Sample

The distribution of trip lengths was also examined as part of model validation. For example, the trip length distribution of HBW trips is shown in Figure 9.8. The objective is to maximize the area under each curve that is shared by the two curves, which represent observed and modeled trip length distributions. As this figure suggests, the Northeast Regional Model has improved the fit between the modeled and observed values.

Figure 9.8 – Modeled and Observed HBW Trip Length Distributions



The Coincidence Ratio, which represents the shared area under the modeled and observed curves, was calculated for each purpose using the modeled and observed (NHTS) values, with a higher coincidence indicating a better fit. Table 9.17 shows the Coincidence Ratios are improved in the Northeast Regional Model.

Table 9.17 – Coincidence Ratio of Trip Length Distributions by Purpose

Trip Purpose	Fox Valley	Northeast
HBW	54%	73%
HBSh	52%	69%
HBSch	52%	74%
HBO	52%	68%
NHB	51%	70%

9.8.3 K-FACTORS

The K-factors which were utilized in the Fox Valley model were removed and new ones were introduced to better represent flows between different regions in the geographically larger Northeast Regional Model. Modeled travel patterns may deviate from observed patterns because of factors not explained in the model, typically political boundaries, river crossings or other perceived boundaries. To account for this K-factors are applied. K-factors are systematic adjustments applied to account for trip distribution inconsistencies in the travel demand model.

9.9 MODE SPLIT

The Northeast Regional Model uses the same transit network and mode split procedures as the Fox Valley model. The transit share in the new model is similar in magnitude to the original transit share. See the Fox Valley Model documentation and reference manual for more information.

9.10 AUTO OCCUPANCY RATES

The Northeast Regional Model uses a revised set of auto occupancy rates. The Fox Valley model used different occupancy rates for each MPO area. Using statistical tests, it was found that the data do not support using different rates for each area, although they do support different rates by purpose. Therefore, a new set of auto occupancy rates was developed using observed auto occupancies by purpose (Table 9.18).

Table 9.18 – Auto Occupancy Rates by Purpose

Purpose	Auto Occupancy
Home Based Work	1.07
Home Based Shop	1.58
Home Based School	1.36
Home Based Other	1.97
Non-Home Based	1.74
College	1.13
Casino	1.82
Airport	2.55
Mall	1.81

9.11 TRIP ASSIGNMENT PARAMETERS

During model validation, the parameters that govern assignment were modified to improve the model fit. These parameters include:

- Speeds by area type and linkclass (functional classification)
- Volume delay curve parameters
- User speed “overrides”

9.12 MODEL VALIDATION

Model calibration is the process of adjusting various components of the model to improve the fit between modeled and observed values for validation. Trip assignment fit is measured primarily by comparison of observed Average Daily Traffic (ADT) with the model assignment results. The direct calculation of error (ADT-Model Volume) and Root Mean Square Error (RMSE) were tracked throughout the model expansion and validation process.

Figure 9.9 shows the Modeled volumes compared to the observed ADT in the Northeast Regional Model starting with the Fox Valley model (-4.1%) and ending with the final validated Northeast Regional Model. The figure shows the individual impact of each major model improvement progressively on total model fit. The major improvements/changes were:

- Expand model coverage to include Lakeshore region;
- Remove trip production factors;
- Introduce Long-Distance Trips;
- Expand 2000 Fox Valley household to 2005 totals;
- Reduce average trip lengths to better match observed data; and
- Model validation adjustments.

The figure demonstrates that expanding the Fox Valley model to include the Lakeshore area and removing the trip production factors both had a negative impact on model fit. When Long-Distance Trips were introduced and households were adjusted to match 2005 data, model fit improved. The next improvement, which involved reducing trip lengths for a better match with NTHS data, reduced model fit. The final set of improvements, which involved adjusting various parameters such as speeds and k-factors, improved the net model fit to about -3.64% (See Table 9.19).

Figure 9.9 – Modeled vs. Observed ADT

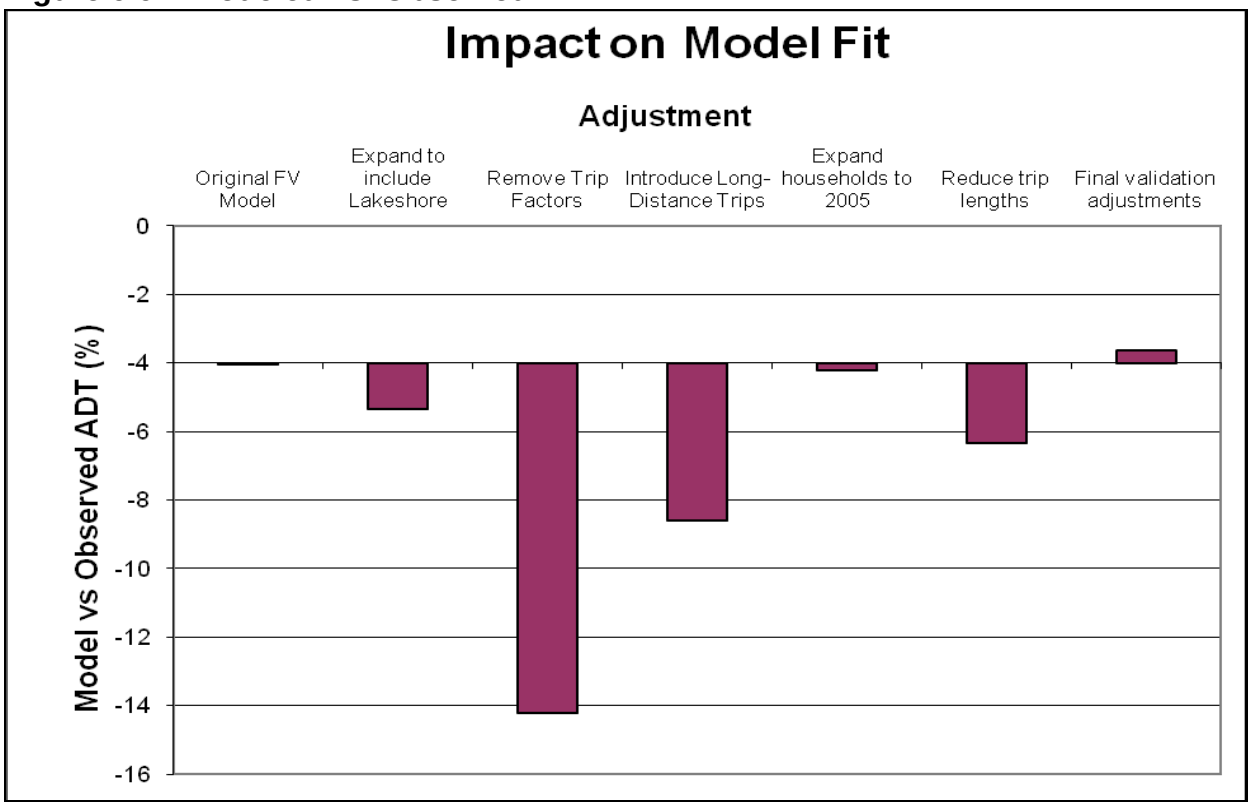


Table 9.19 shows modeled vs. observed ADT by linkclass in the Northeast Regional Model. The model performs very well on major roadways such as interstates, freeways, expressways, and arterials. The fit is lower for urban and rural local roads, but these are not regionally significant roads and represent about 100 of the nearly 9,000 count links.

Table 9.19 – Modeled vs. Observed ADT by Functional Class

FUNCTIONAL CLASS	LINKS	MODEL ADT	COUNT ADT	MODEL / COUNT (%)	ACCEPTABLE %	
INTERSTATE	46	595,311	573,200	3.86	+-	7
FREEWAYS	171	3,401,318	3,431,710	-0.89	+-	7
RAMPS	355	1,398,323	1,517,440	-7.85	N.A.	
EXPRESSWAYS	162	1,221,174	1,215,370	0.48	+-	10
URBAN PRIN. ARTS	1,127	7,073,948	7,533,276	-6.1	+-	10
URBAN MINOR ARTS	1,820	6,365,398	6,304,690	0.96	+-	15
URB COLLCTRS	1,528	1,810,977	2,225,185	-18.61	+-	25
URB MNR COLLCTRS	-	-	-	-100	+-	25
URBAN LOCALS	73	25,413	75,265	-66.24	N.A.	
RURAL PRIN ARTS	530	1,548,480	1,605,633	-3.56	+-	7
RURAL MINOR ARTS	532	1,183,038	1,093,258	8.21	+-	10

(Table 9.19 Continued)

RUR MJR COLLCTRS	1,397	1,093,470	1,157,122	-5.5	+-	15
RUR MNR COLLCTRS	992	477,786	445,458	7.26	+-	25
RURAL LOCALS	28	5,626	11,984	-53.05	+-	25
RURAL OTHERS	-	-	-	-100	N.A.	
ALL CLASSES	8,761	26,200,264	27,189,591	-3.64	N.A.	

The modeled RMSE is shown in Table 9.20 and Table 9.21. As Table 9.20 shows, when all count data are included in the tabulation, the modeled RMSE is slightly above the percentage range that is considered acceptable. Most of the high RMSE values are attributable to links that have counts in the 0-5,000 range. The model contains over 7,000 links with counts in this low volume range. Links in this range are generally not significant at the regional level. Therefore, it is helpful to also examine the RMSE that results when links with low volume counts are removed from the tabulation. As Table 9.21 indicates, when the low volume count links are removed from the tabulation, the RMSE improves substantially and the model meets the acceptable all thresholds.

Table 9.20 – Root Mean Squared Error, All Count Data

ADT RANGE	LINKS	MODEL RMSE %	ACCEPTABLE %
0 - 5,000	7,116	55.59	45-55
5,001 - 10,000	1,255	28.07	35-45
10,001 - 20,000	312	17.76	27-35
20,001 - 30,000	42	11.48	24-27
30,001 - 100,000	38	11.34	24-27
0 - 100,000	8,763	40.27	32-39

Table 9.21 – Root Mean Squared Error, Low-Volume Counts Omitted

Links with Count>5,000 vehicles			
ADT RANGE	**LINKS**	**MODEL RMSE %**	**ACCEPTABLE %**
N/A	-	0	45-55
5,001 - 10,000	1,255	28.07	35-45
10,001 - 20,000	312	17.76	27-35
20,001 - 30,000	42	11.48	24-27
30,001 - 100,000	38	11.34	24-27
5,001 - 100,000	1,647	23.03	32-39
Links with Count>1,000 vehicles			
ADT RANGE	**LINKS**	**MODEL RMSE %**	**ACCEPTABLE %**
1,001-5,000	4,168	45.93	45-55
5,001 - 10,000	1,255	28.07	35-45
10,001 - 20,000	312	17.76	27-35
20,001 - 30,000	42	11.48	24-27
30,001 - 100,000	38	11.34	24-27
1,001 - 100,000	5,815	33.85	32-39
Links with Count>500 vehicles			
ADT RANGE	**LINKS**	**MODEL RMSE %**	**ACCEPTABLE %**
501-5,000	5,628	50.45	45-55
5,001 - 10,000	1,255	28.07	35-45
10,001 - 20,000	312	17.76	27-35
20,001 - 30,000	42	11.48	24-27
30,001 - 100,000	38	11.34	24-27
501 - 100,000	7,275	37.01	32-39

SECTION 10.0 – Lakeshore Region Peak Hour Model

This section summarizes the methodology and results of the Lakeshore Region peak hour model. The Lakeshore Region includes the same time of day (TOD) splits as the previously completed Fox Valley Model. A review and verification of the peak hour model's volumes for key highway facilities within the Lakeshore Region is provided to confirm the reasonableness of the model's traffic assignments.

10.1 PEAK HOUR FACTORS

During the development of the Lakeshore Region component of the Northeast Regional Model, the time of day factors were carried over from the Fox Valley Model. TOD periods were broken into four time intervals that reflected data collected by the National Household Transportation Survey (NHTS). The TOD periods were delineated as follows:

- AM period is from 6:00 a.m. to 9:00 a.m.,
- Mid-Day (MD) period is from 9:00 a.m. to 3:00 p.m.,
- PM period is from 3:00 p.m. to 6:00 p.m. and
- Night-Time (NT) period is from 6:00 p.m. to 6:00 a.m.

TOD factors were broken down by trip purpose for both automobiles and trucks for the four TOD periods to represent a percentage of the total daily trips.

The peak hour factors for the automobile trips were broken down by the five traditional trip purposes (Home-Based Work, Home-Based Shop, Home-Based School, Home-Based Other, Non Home-Based) and the College, Casino, Airport and Mall special generators (Table 10.1). Truck peak hour factors were only broken out by truck type for each of the TOD periods (Table 10.2). These TOD factors were applied to the daily trip tables to determine the trip tables for each TOD period.

Table 10.1 – Time of Day Automobile Factors

Trip Purpose	AM	MD	PM	NT
Home-Based Work (HBW)	33.4%	18.3%	26.9%	21.4%
Home-Based Shop (HBSHOP)	9.2%	47.6%	26.5%	16.7%
Home-Based School (HBSCHL)	43.0%	21.8%	24.2%	11.0%
Home-Based Other (HBO)	15.8%	28.9%	25.1%	30.2%
Non Home-Based (NHB)	11.3%	49.5%	24.5%	14.7%
College	13.3%	31.4%	25.1%	30.2%
Casino	13.3%	31.4%	25.1%	30.2%
Airport	20.0%	40.0%	20.0%	20.0%
Mall	6.7%	50.1%	26.5%	16.7%

Table 10.2 – Time of Day Truck Factors

Truck Type	AM	MD	PM	NT	Total
Single Unit	20.0%	35.7%	25.5%	18.8%	100.0%
Combination	12.3%	22.0%	15.7%	50.0%	100.0%

10.2 PEAK HOUR ASSIGNMENTS

In determining if the Northeast Regional Model's peak hour assignments were reasonable, two tests of reasonableness were conducted for key facilities across the Lakeshore Region. The first test reviewed the percentage of volume per period along 14 key facilities, while the second test reviewed the directionality proportions at 12 different automatic traffic recorder (ATR) sites. Each test selected sites from each of the five counties within the Lakeshore Region and compared modeled traffic volumes against WisDOT's observed traffic data. WisDOT provided count data in 48-hour, 72-hour or week-long format for each site, allowing for averages to be calculated for each TOD period. These analyses tested the reasonableness of the peak hour model assignments, but validation targets were not as stringent as the targets set forth for the daily model.

Testing the reasonableness of the volumes for each TOD period was conducted by aggregating WisDOT's daily count data into the AM, MD, PM and NT periods for each site. After counts were aggregated to each TOD period, the averages were calculated and compared against the daily volume to determine the percentage for each period. Upon calculating the average count for each TOD period per site, the WisDOT count volumes were compared against modeled volumes for the four periods (Table 10.3).

The TOD volume analysis yielded results that confirmed that the model is generally assigning the appropriate amounts of volume per TOD period throughout the Lakeshore Region. Although all of these sites represent key facilities, much of the Lakeshore Region is highly rural in nature and most roadways have lower roadway volumes. Some of the variation of the volume

differences for each period may be explained by slight volume differences on lower volume facilities resulting in larger percent differences.

Table 10.3 – Lakeshore Region Key Facilities TOD % Comparison

Roadway	ID	Location	County	Type	AM	MD	PM	NT
WIS 32/57	080110	S of Tecumseh	Calumet	Modeled	20%	33%	24%	23%
				Measured	16%	39%	22%	23%
WIS 57	150102	W of Stone Rd	Door	Modeled	19%	25%	33%	23%
				Measured	18%	41%	24%	17%
WIS 42	150278	S of County J	Door	Modeled	20%	33%	25%	22%
				Measured	16%	37%	25%	22%
WIS 54	310102	E of County A	Kewaunee	Modeled	20%	32%	25%	23%
				Measured	21%	34%	25%	21%
WIS 29	310104	E of County V (South)	Kewaunee	Modeled	19%	33%	25%	23%
				Measured	20%	34%	24%	22%
I-43	360002	S of WIS 96	Manitowoc	Modeled	20%	31%	24%	25%
				Measured	16%	40%	20%	24%
US 10	360438	W of County W	Manitowoc	Modeled	21%	32%	25%	22%
				Measured	19%	37%	23%	21%
US 151	360109	E of WIS 67	Manitowoc	Modeled	24%	27%	25%	23%
				Measured	20%	39%	23%	19%
WIS 42	360838	S of US 151	Manitowoc	Modeled	20%	31%	26%	22%
				Measured	19%	34%	25%	23%
I-43	590103	N of WIS 32	Sheboygan	Modeled	19%	34%	25%	23%
				Measured	17%	35%	20%	27%
WIS 23	590118	W of County U	Sheboygan	Modeled	19%	33%	24%	24%
				Measured	19%	36%	22%	23%
WIS 32	590112	E of County M	Sheboygan	Modeled	23%	28%	25%	24%
				Measured	21%	31%	24%	25%
WIS 42	591251	W of I-43	Sheboygan	Modeled	21%	32%	25%	22%
				Measured	15%	37%	24%	24%
WIS 57	590337	N of County K	Sheboygan	Modeled	18%	34%	26%	22%
				Measured	18%	33%	22%	27%

Data provided by WisDOT from twelve ATR stations throughout the Lakeshore Region was used to further test the reasonableness of the TOD assignments. The ATR sites provided locations where data was collected in a format that allowed for counts to be aggregated hourly and directionally. After counts were aggregated to each TOD period by direction, directional splits were calculated to be compared against the model's TOD directional splits (Table 10.4).

By highlighting key facilities in the region, this peak hour analysis used key commuting corridors to determine if the model was accurately representing traffic movements in the delineated time periods. While this analysis tested the

reasonableness of the peak hour movements, the validation was not as stringent as parameters for the daily model due to the methods in which the peak hour model was developed.

The TOD directional analysis yielded results that confirm the model is generally replicating the appropriate traffic patterns per TOD period throughout the Lakeshore Region. Directional assignments for each site were well within reason and followed the general patterns throughout the day, within an acceptable range of variation. The WIS 42 site in Sheboygan County is an example of how a facility had strong directionality in both the AM and PM periods, and the model was able to replicate the same general pattern for each of the periods. Variation was to be expected at each site, but the model's assignments held up well against WisDOT's ATR data throughout the Lakeshore Region.

Table 10.4 – Lakeshore Region ATR Station TOD Directional Splits

Roadway	ID	Location	County	Type	TOD + Dir.	AM	MD	PM	NT
WIS 32/57	086107	N of County E	Calumet	Modeled	NB	54%	52%	48%	48%
				Measured		49%	50%	50%	50%
WIS 57	156109	E of WIS 42	Door	Modeled	NB	53%	48%	45%	49%
				Measured		63%	44%	38%	58%
WIS 57	310001	N of County A	Kewaunee	Modeled	NB	33%	46%	56%	53%
				Measured		43%	44%	53%	65%
WIS 54	316110	E of County D	Kewaunee	Modeled	EB	52%	48%	47%	50%
				Measured		54%	49%	44%	60%
I-43	360001	N of County C	Manitowoc	Modeled	NB	58%	51%	46%	51%
				Measured		45%	49%	54%	52%
I-43	360002	S of WIS 96	Manitowoc	Modeled	NB	49%	52%	53%	46%
				Measured		52%	54%	53%	56%
US 10	360661	E of County P Branch	Manitowoc	Modeled	EB	76%	50%	34%	48%
				Measured		62%	51%	42%	42%
US 151	366111	E of County S	Manitowoc	Modeled	EB	78%	50%	31%	48%
				Measured		65%	50%	39%	48%
WIS 42	366120	S of County VV	Manitowoc	Modeled	NB	30%	51%	63%	51%
				Measured		45%	46%	51%	58%
WIS 57	590001	N of County J	Sheboygan	Modeled	NB	40%	50%	56%	49%
				Measured		34%	50%	61%	47%
WIS 42	590161	SE of County JJ	Sheboygan	Modeled	NB	35%	52%	61%	51%
				Measured		29%	51%	64%	50%
WIS 23	590608	E of WIS 32	Sheboygan	Modeled	EB	69%	50%	40%	51%
				Measured		60%	44%	37%	48%

SECTION 11.0 – Future Year Existing Plus Committed Network Analysis

This section summarizes the development of the Wisconsin Department of Transportation (WisDOT) Northeast (NE) Regional Travel Demand Model future year, existing plus committed (E+C) network and the results of these future year forecasts. Model parameters that were reviewed using the future year models include the following: select link, operational deficiency, and peak hour assignment. A list of committed transportation projects and a narrative of the impacts observed from the future year runs was also performed.

11.1 NETWORK DEVELOPMENT

The NE Regional Travel Demand Model's future year network was developed in conjunction with WisDOT, East Central Wisconsin Regional Planning Commission (RPC) and BLRPC to determine appropriate roadway modifications needed for inclusion in the Year 2020 and 2035 networks. Projects with funding commitments that either expand roadway capacity (e.g. add lanes) or create a new roadway were considered for inclusion in the future year, E+C network. Planned projects are included in the model but have a separate component that allows for inclusion of planned projects based upon the compilation of a planned projects spreadsheet with specific project ID's. Committed and planned projects that were included in the future year, E+C network are illustrated in Figure 11.1, while Tables 11.1 and 11.2 describe the committed and planned projects included in the E+C network.

Figure 11.1 – Northeast Regional Model Committed Projects

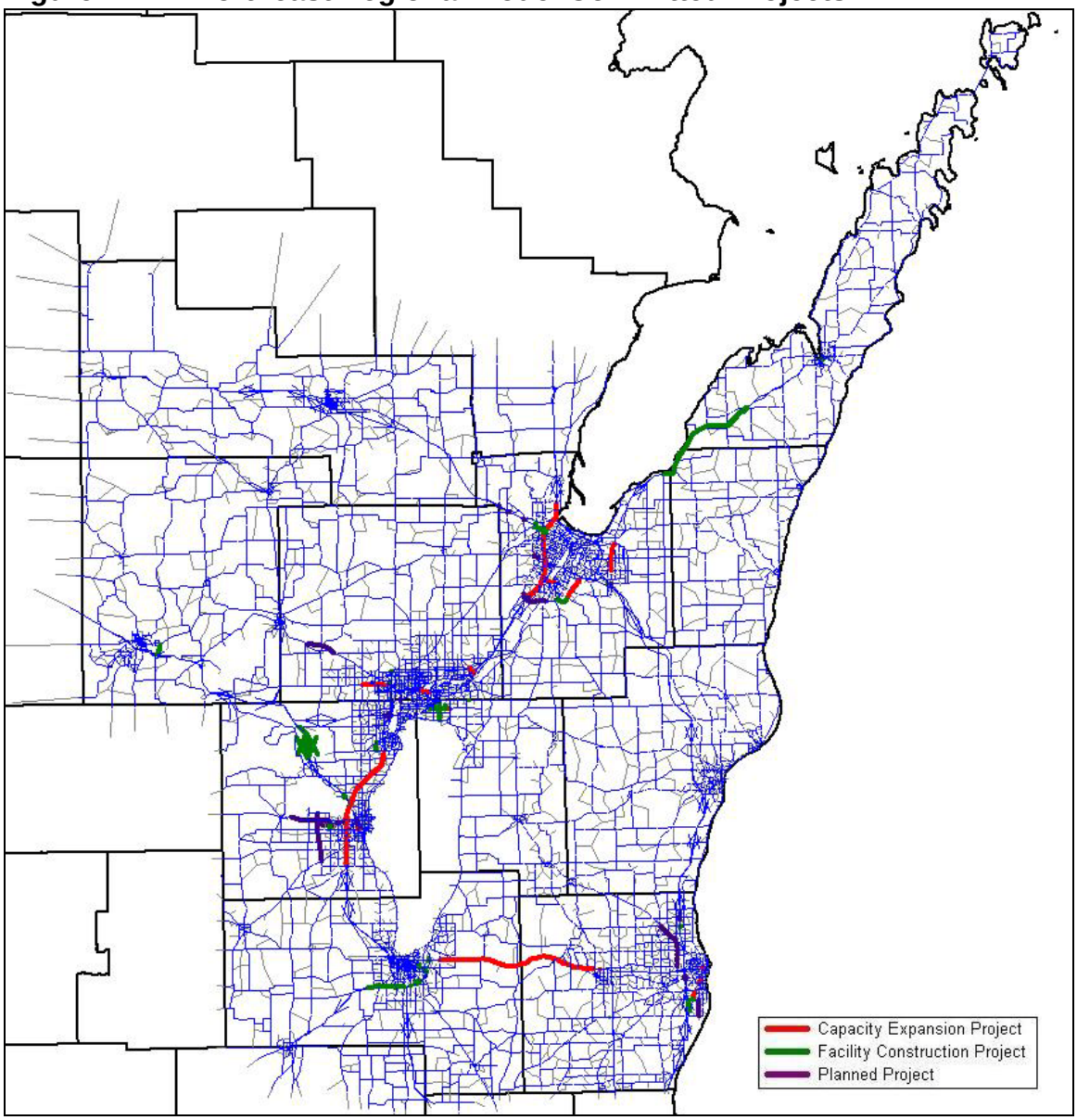


Table 11.1 – Northeast Region E+C Network Committed Projects List

County	Facility	Location	Type
Brown	WIS 29	County J - Duck Creek	Add 2 Lanes Making a 4 Lane Facility
Brown	WIS 29	US 41	Create System Interchange
Brown	Frontage Rd	County J - Packerland Dr	Create New 2 Lane Facility
Brown	County J	WIS 29	Create Overpass
Brown	Packerland Dr	WIS 29	Create Overpass
Brown	US 41	Orange Lane - County F	Add 2 Lanes Making a 6 Lane Facility
Brown	US 41	County F - Velp Ave	Add 2 Lanes Making a 8 Lane Facility and 2 Aux. Lanes
Brown	US 41	Velp Ave - I-43	Add 2 Lanes Making a 6 Lane Facility
Brown	US 41	I-43 - County M	Add 2 Lanes Making a 6 Lane Facility and 2 Aux. Lanes
Brown	Main Ave	6th St - 3rd St	Add 1 Lane Making 2 a Lane Facility
Brown	Main Ave	3rd St - George St	Add 2 Lanes Making a 4 Lane Facility
Brown	Rockland Rd	County PP - County GV	Create New 2 Lane Facility
Brown	County GV	County X - Van Rd	Add 2 Lanes Making a 4 Lane Facility
Brown	Huron Rd	Humboldt Rd - WIS 29	Add 2 Lanes Making a 4 Lane Facility
Brown	US 141	I-43 - Main St	Add 2 Lanes Making a 4 Lane Facility
Calumet	Eisenhower Rd	US 10 - Plank Rd	New 2 Lane Facility
Calumet	Midway Rd	Plank Rd - County N	New 4 Lane Facility
Door	Oregon St	Maple St - 1st Ave	New 2 Lane Bridge
Door	WIS 57	County DK - County H	New 4 Lane Facility
Fond du Lac	WIS 23	County UU - County G	Add 2 Lanes Making a 4 Lane Facility
Fond du Lac	US 151	Townline Rd - WIS 175	New 4 Lane Facility
Fond du Lac	Martin Rd	US 151	New Overpass
Fond du Lac	County V	US 151	New Interchange, Overpass, Roundabout and Frontage Rd
Fond du Lac	County K	WIS 23	New Interchange and Overpass
Fond du Lac	County T	US 151	New Overpass
Fond du Lac	Rienzi Rd	US 151	New Overpass
Fond du Lac	Main St	US 151	New Interchange
Fond du Lac	Hickory Rd	US 151	New Interchange
Fond du Lac	Military Rd	US 151	New Interchange
Fond du Lac	Mari Earl Ln	County T - Division St	New 2 Lane Facility
Outagamie	College Ave	Alton Ct - Walter Avenue	Add 2 Lanes Making a 4 Lane Facility
Outagamie	Delanglade St	Lawe Street - US 41	Add 2 Lanes Making a 4 Lane Facility
Outagamie	WIS 96	WIS 76 - Casaloma Drive	Add 2 Lanes Making a 4 Lane Facility
Outagamie	Trasino Way	Federated Dr - Westfield Dr	New 2 Lane Facility
Outagamie	Westfield Dr	Westfield Dr - Parkway Blvd	New 2 Lane Facility
Sheboygan	WIS 23	County S - WIS 67	Add 2 Lanes Making a 4 Lane Facility
Sheboygan	Michigan St	14th Street - 8th Street	Remove 2 Lanes Making a 2 Lane Facility
Sheboygan	County OK	WIS 28 - County EE	Add 2 Lanes Making a 4 Lane Facility, w/ center turn lane
Sheboygan	County OK	County EE	New Roundabout Intersection
Sheboygan	S. Taylor Dr	County EE - County OK	New 4 Lane Facility
Sheboygan	Rowe Rd	I-43	New Half Interchange - Only Access To/From South
Waupaca	County A	Apple Tree Lane - WIS 54	New 4 Lane Facility
Winnebago	US 41	WIS 21 - US 45	Add 2 Lanes Making a 6 Lane Facility
Winnebago	US 41	US 45 - Breezewood Lane	Add 2 Lanes Making a 6 Lane Facility
Winnebago	US 41	WIS 26 - WIS 21	Add 2 Lanes Making a 6 Lane Facility
Winnebago	US 45	County G - County II	Add 2 Lanes Making a 4 Lane Facility
Winnebago	US 441	Racine St. Interchange	Add Westbound Aux. Lane before WB On Ramp
Winnebago	US 45	County T Interchange	New Interchange
Winnebago	Snell Rd	US 41	New Overpass
Winnebago	Pendelton Rd	County JJ - Breezewood	New 2 Lane Facility

(Table 11.1 Continued)

Winnebago	Washburn	Westowne Ave - Washburn	New 2 Lane Facility
Winnebago	Wisconsin St	Witzel Ave - Warren Rd	Add 2 Lanes Making a 4 Lane Facility

Table 11.2 – Northeast Region E+C Network Planned Projects List

County	Facility	Location	Type
Brown	WIS 29	Marley St	New Interchange
Brown	WIS 29	Hillcrest Dr	New Interchange
Brown	County U	WIS 29	New Overpass
Brown	WIS 172	County EB	New Interchange
Brown	Babcock Rd	WIS 172	New Overpass
Brown	Cottage Rd	WIS 29 - Wall St	New 2 Lane Facility
Brown	Southbridge Rd	US 41	New 2 Lane Facility and Interchange
Brown	Rockland Rd	Fox River	New 4 Lane Bridge
Outagamie	WIS 15	County JJ - County T	New 4 Lane Bypass
Outagamie	US 10	US 41	New Ramps at Interchange
Outagamie	County A	Prospect Ave	New 2 Lane Facility
Outagamie	County A	Fox River	New 2 Lane Bridge
Sheboygan	County FF	I-43	New Interchange
Sheboygan	Lower Falls Rd	I-43	New Interchange
Sheboygan	WIS 42	County Y - County A	Add 2 Lanes Making a 4 Lane Facility
Sheboygan	S 18th St	County EE - County V	New 2 Lane Facility
Sheboygan	County Y	County O - WIS 42	Add 2 Lanes Making a 4 Lane Facility
Winnebago	WIS 21	Leonard Pt Rd - Omro	Expressway Conversion
Winnebago	New Rural Hwy	WIS 21 - WIS 44	New 2 Lane Facility
Winnebago	WIS 21	New Rural Hwy	New Interchange
Winnebago	WIS 21	Oakwood Rd	New Interchange
Winnebago	Taft Ave	US 41 - WIS 21	New 2 Lane Facility and Overpass
Winnebago	Frontage Rd	US 41 - WIS 21	New 2 Lane Facility
Winnebago	WIS 21	US 41	New Ramps at Interchange
Winnebago	Pearl Ave	Congress Ave - Wisconsin St	Two new 2 Lane One-Way Streets

11.2 OPERATIONAL DEFICIENCIES

An analysis of the Year 2020 and 2035 operational deficiencies was performed in conjunction with the development of the E+C network for these respective horizon years. This analysis compared future year forecasts against sufficiency thresholds for each functionally-classified roadway. Sufficiency thresholds were established by WisDOT's *Corridors 2020 Plan* to create parameters that classifies the traffic operations of a particular roadway. Every roadway was classified using the Corridors 2020 classification system based upon functionality and its urban or rural location to determine sufficiency thresholds (Table 11.3). These operational classifications were used to calculate the

following deficiency rankings: Sufficient, Approaching Sufficient, Approaching Deficient, Deficient and Severely Deficient.

Table 11.3 – NE Regional Model Corridors 2020 Classification System

Sub-System	Urban Classification (Pop. >50,000)	Rural Classification (Pop. <50,000)
Backbone Routes	Backbone	
Connector Routes	U_C2020	R_C2020
Other Principal Arterials	U_OPA	R_OPA
Minor Arterials	U_MA	R_MA
Collectors and Other Local Roads	U_OTHER	R_OTHER

The deficiency analysis was carried out using WisDOT's primary and secondary methods of analysis, as detailed in WisDOT's *Facilities Development Manual* (FDM Chap. 13, Sec. 5, Sub. 3). This primary deficiency analysis assigned an operational assessment to roadways based upon the roadways' significance within the regional transportation system using volume to capacity ratios and Corridors 2020 LOS congestion thresholds. The primary deficiency analysis uses estimated forecasts, operationally-based capacities and a dynamic deficiency threshold based upon Corridors 2020 classifications and should be used instead of the secondary analysis where available.

The primary analysis involved comparing estimated traffic forecasts to roadway capacities for functionally-classified roadways. This comparison resulted in the generation of roadway level of service (LOS) thresholds, which was measured against the roadway's pre-defined Corridors 2020 LOS congestion threshold. LOS capacity to congestion ratios were developed to categorize the primary operational deficiencies using the Corridors 2020 classifications.

In locations where estimated traffic forecasts were not available, the secondary analysis was also conducted to expand coverage where the primary analysis was not available. This analysis involved calculating deficiencies by comparing raw model volumes to the model's functionally-based, link roadway capacities. Similar to the primary analysis, the congestion thresholds for the secondary analysis were compared against the pre-defined Corridors 2020 LOS thresholds to determine a deficiency status.

Figures 11.2 through 11.4 illustrate the operational deficiencies for the primary and secondary analyses, showing operational deficiencies of roadways under the E+C network scenario for Year 2005 and the horizon years 2020 and 2035.

Figure 11.2 – NE Region 2005 Primary and Secondary Operational Deficiencies

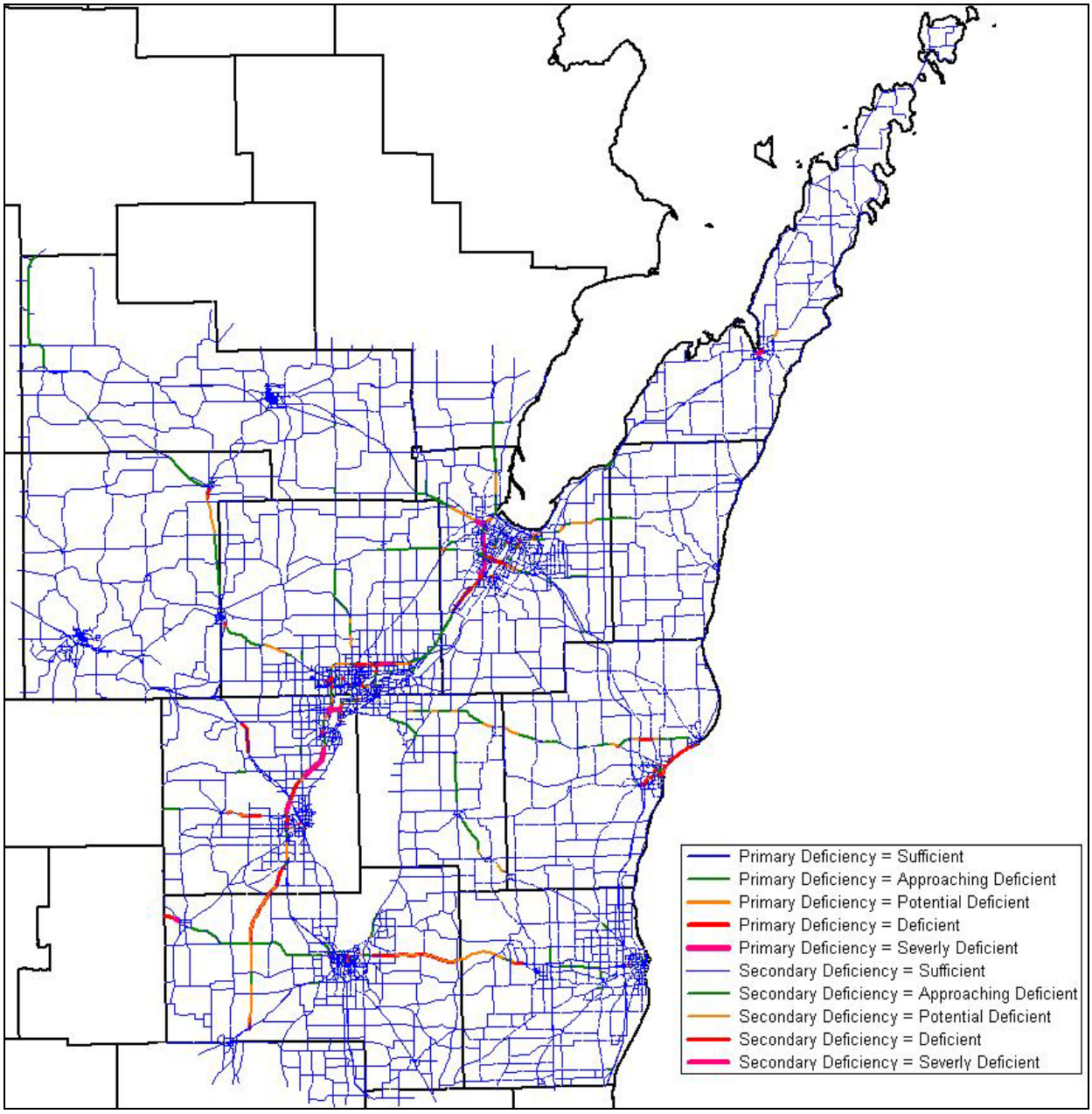


Figure 11.3 – NE Region 2020 Primary and Secondary Operational Deficiencies

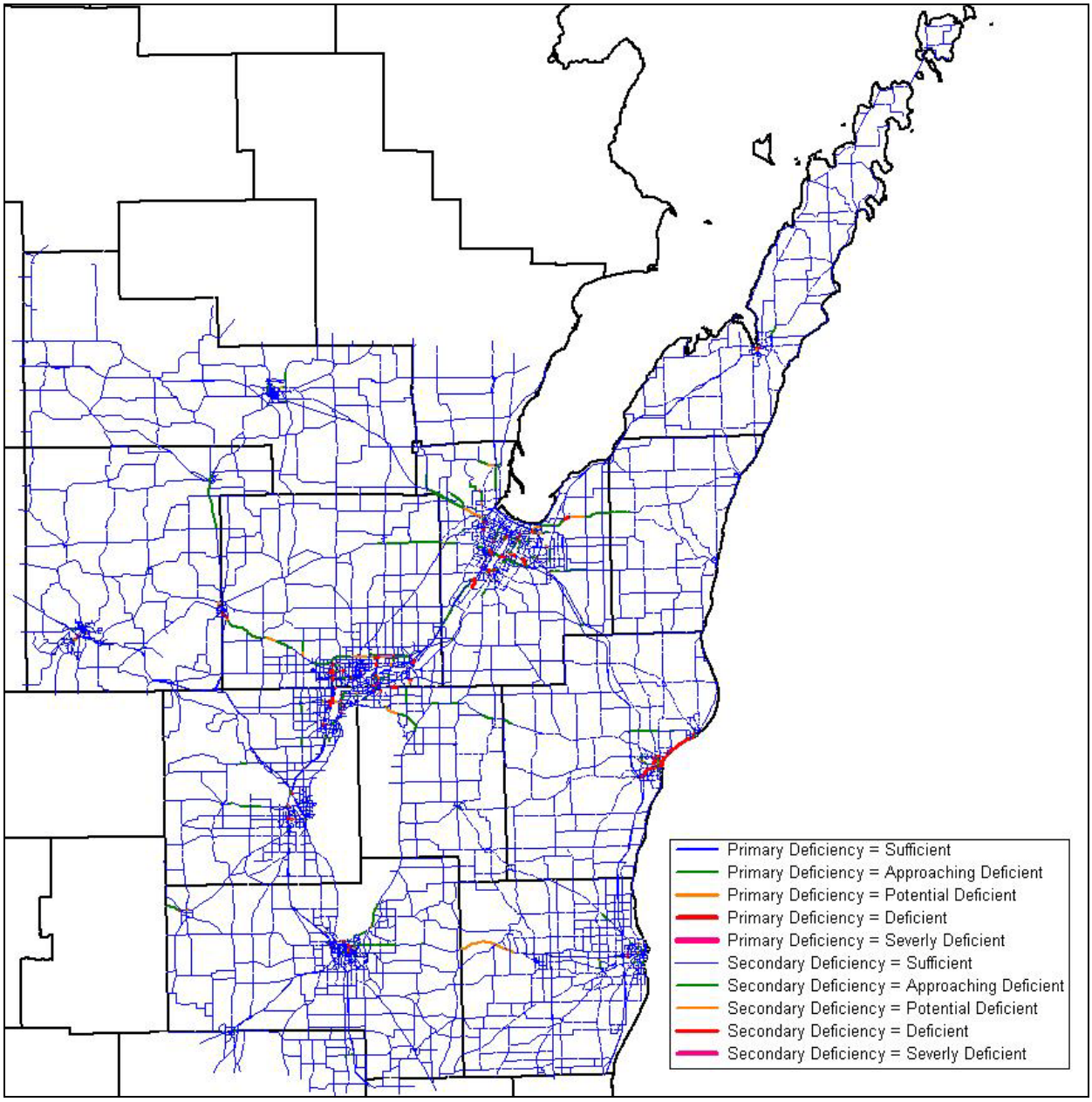


Figure 11.4 – NE Region 2035 Primary and Secondary Operational Deficiencies

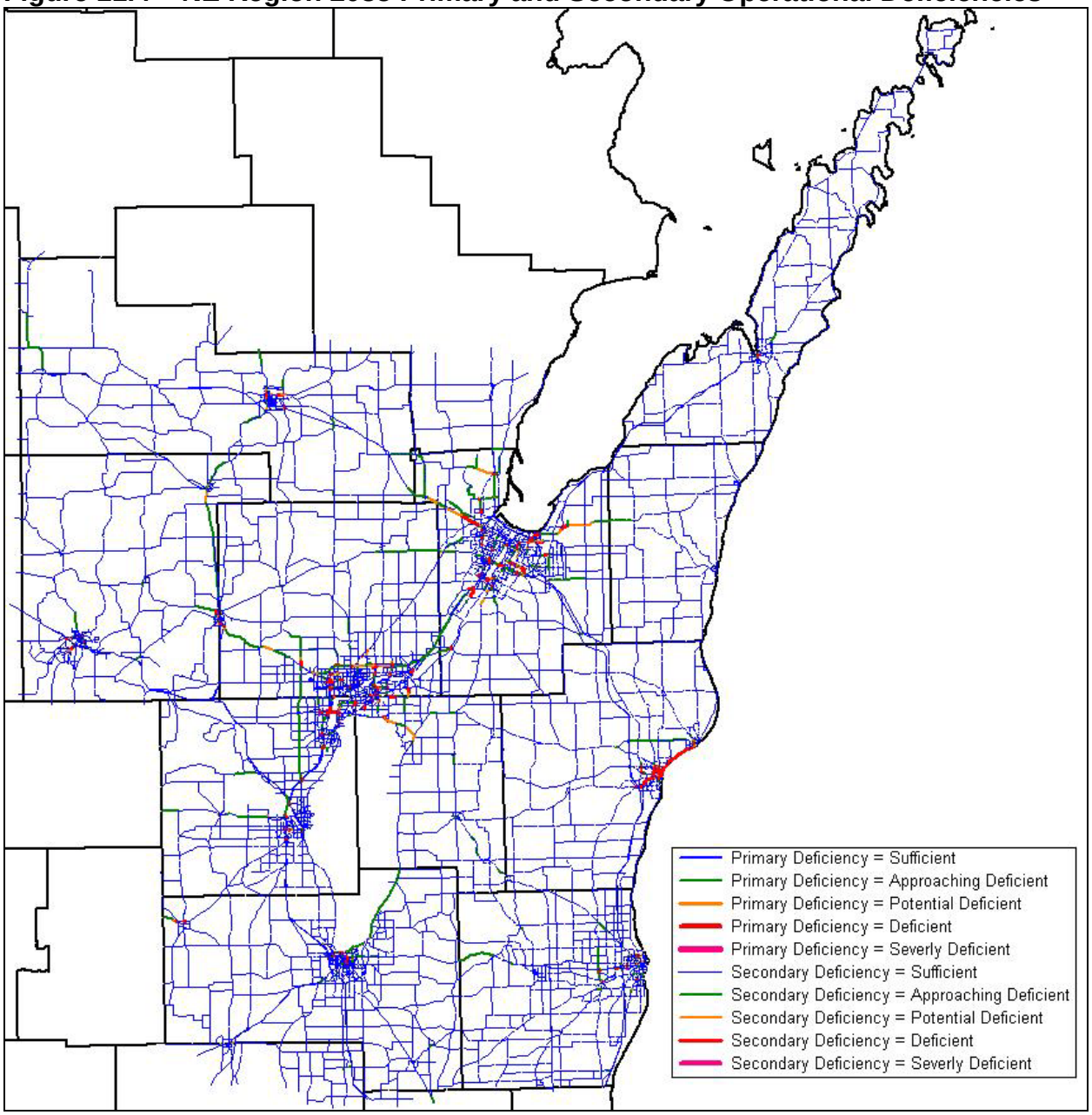


Figure 11.2 indicates that there may be potentially deficient, deficient or severely deficient sections of roadway along the US 41, WIS 23, and WIS 26 corridors. These conditions are ameliorated in the future years due to roadway expansions or the construction of new facilities (Figures 11.3 and 11.4). US 41 and WIS 23's performances are shown to be improving in future year forecasts, which is primarily due to committed projects that will expand capacity along those corridors (Table 11.1). Despite no committed or planned projects along

WIS 26, the roadway improves its performance in future year deficiency analysis. Instead of a potential deficient of deficient classification, the roadway is now sufficient for the portion of the corridor in the NE Regional Model. This improvement along WIS 26 is a function of the operational and capacity improvements to US 151 between the Cities of Waupun and Fond du Lac. The WIS 42 corridor connecting the Cities of Manitowoc and Two Rivers also appears to be operationally deficient across all time horizons.

11.3 SELECT LINK ANALYSIS

In order to validate the NE Regional Model's future-year forecasts, a review of several model parameters and their application was performed. This analysis was performed by conducting seventeen select link analyses within the future year E+C network (Table 11.4). A select link analysis highlights an individual section of a roadway and details all of the trip origins and destinations associated with the users of that section of roadway. This analysis provides an intuitive method to analyze traffic movements on key roadways and may pinpoint errors or deficiencies in a roadway network.

Locations for the select link analyses were selected through consultation with WisDOT, East Central RPC and Bay-Lake RPC. The sites chosen for this analysis were selected from the entire study area, which allowed for a review of a wide variety of regional traffic movements.

Table 11.4 – Northeast Regional Model Select Link Analysis Locations

County	Facility	Location	A-Node	B-Node
Brown	US 41 NB	S of Shawano Ave	56311	60083
Brown	WIS 172 - WB Off	US 41	55849	55855
Calumet	US 10	E of WIS 55	78103	78134
Dodge	US 151	W of WIS 49	101385	101414
Door	WIS 57 - NB Off Ramp	Green Bay Rd	179284	208846
Fond du Lac	US 41 - SB Off Ramp	US 23	98685	98983
Fond du Lac	US 151 - WB On Ramp	Military Rd	91353	95344
Kewaunee	WIS 29	E of County V	160825	160826
Manitowoc	I-43 - SB Off Ramp	US 151	209412	157947
Outagamie	US 41 - NB Off Ramp	WIS 15	70781	70558
Outagamie	WIS 441 - WB On Ramp	College Ave	74131	74714
Shawano	WIS 29 - WB Off Ramp	WIS 22	108753	108650
Sheboygan	I-43 - NB On Ramp	WIS 23	115722	116231
Waupaca	US 10 - WB Off Ramp	Fulton St	106690	106668
Winnebago	US 41 - SB Off Ramp	WIS 441	78054	87390
Winnebago	US 41 - SB On Ramp	US 45	82899	82975
Winnebago	WIS 26	N of US 151	101591	101599

Trip distribution patterns were evaluated for each site based upon TOD periods and total daily volume. These locations included roadways that were functionally-classified as arterials or greater, which allowed for analysis of regional trip patterns. Sites with greater regional influence, such as US 41 in Brown County, verified the trip lengths and interaction of traffic between urban centers.

To review the functionality of newly created, long-distance roadways, WIS 57 in Door County was selected for analysis. This analysis highlighted the interaction between Sturgeon Bay (and Northern Door County) and the Green Bay urban area. In addition, this analysis was able to identify regional, long-range trips that utilize this particular corridor. The results of these analyses, combined with all of the other individual select link analyses, verified the reasonability of the future year forecasts.

The select link analyses are detailed in Appendix F.

SECTION 12.0 – Lakeshore Air Quality Analysis

As part of the expansion of the Wisconsin Department of Transportation (WisDOT) Northeast Regional Travel Demand Model (model), an air quality conformity analysis was performed to determine counties that did not conform to minimum air quality standards. CUBE TP+ scripts were developed and integrated with the model to generate data required for the following non-conforming counties: Door, Kewaunee, Manitowoc and Sheboygan. Vehicle miles of travel (VMT) and vehicle hours of travel (VHT) were classified by congested speed and facility type for the aforementioned counties in a format consistent with the outputs of the existing Sheboygan County Travel Demand Model. Outputs were generated for modeled years 2020 and 2035. Results were then interpolated for the non-modeled years of 2012 and 2030. For each of the four analysis horizons, results were summarized by location for the entire region and each of the non-conforming counties.

Air quality statistics were generated during two phases of the model. The "full model run" phase generates statistics for the selected future scenario only, which produces results for Year 2020 or 2035 but not for the 2005 scenario or for 2012 and 2030. During the "combiner model run", statistics were generated for all air quality analysis years. This process involves running the base, 2020 and 2035 models first to produce the required loaded network inputs for the combiner model run air quality scripts.

As a quality check for the model, the newly created air quality statistics for Sheboygan County were compared with statistics derived from the existing Sheboygan County Model. Due to variations in model assumptions and parameters, some deviation of the results was reasonable to assume for this check as long as it can be explained and is consistent across all forecast horizons. Table 12.1 provides a brief summary of this model comparison for Year 2035.

Table 12.1 – Air Quality Statistical Comparison, Year 2035

	NE Regional Model			Sheboygan County Model			Percent Difference		
	VMT	VHT	Ave. Speed	VMT	VHT	Ave. Speed	VMT	VHT	Ave. Speed
Autos	3,308,681	74,514	44	3,637,911	92,089	40	-9%	-19%	12%
Trucks	440,069	8,394	52	454,916	11,006	41	-3%	-24%	27%
Total	3,748,749	82,908	45	4,092,826	103,095	40	-8%	-20%	14%

The Northeast Regional and Sheboygan County models produce reasonably consistent VMT, VHT and average speed results. The 8% lower total VMT in the Northeast Regional Model is primarily due to the Sheboygan County model forecasting high traffic volumes along I-43. Table 12.2 summarizes a comparison of Year 2005 and 2035 daily traffic volumes at the northern external location of I-43.

Table 12.2 – North I-43 Sheboygan County External Location

	2008 AADT	2005 Daily Model Volume		2035 Daily Model Volume	
		Sheboygan	NE Regional	Sheboygan	NE Regional
N I-43 Sheboygan External location	21,600	23,100	20,500	43,400	34,900

Table 12.2 indicates that the Sheboygan County Model forecasts approximately 8,500 more vehicles at this location than the Northeast Regional Model, resulting in higher volumes along the I-43 corridor. External model links generally have a higher degree of uncertainty than internal links since they are fixed inputs to the model. The Sheboygan County Model relies on fixed volume assumptions at the I-43 northern external location and is not sensitive to travel patterns in neighboring counties. Since the Northeast Regional Model includes the counties of Manitowoc, Calumet and Fond du Lac, it can better account for the effects of travel pattern changes in neighboring counties and does not rely on fixed external volumes at these locations. This deviation likely accounts for the disparity in VMT and also contributes to the difference in VHT from Table 12.1.

In addition to VMT, average speed also deviated between the Sheboygan County model and Northeast Regional Model by approximately five miles per hour. This deviation is due to changes in each model's speed assumptions. The modeled free-flow speed on IH 43 in the Northeast Regional Model was inputted 75 MPH while the Sheboygan County Model inputted I-43 at 58 MPH. The speed table for the original Sheboygan County Model was artificially low

to accommodate WisDNR's limited amount of air quality emission factors. This resulted in the speed lookups for the existing Northeast Regional Model and Sheboygan County Model being different. To maintain consistency in the expanded Northeast Regional Model, the lookups and assumptions of the existing Northeast Regional Model were carried through to the expanded portion of the model, which includes Sheboygan County. This results in a higher average congested speed and a reduced VMT in the Northeast Regional model.

Deviations in model assumptions directly relate to the changes in air quality statistics. Overall, the deviation in VMT, VHT and average speed are modest and are reasonable, given the changes in assumptions between the two models.

SECTION 13.0 – Door County Count Adjustments

This section summarizes the methodology and results of Door County traffic count adjustments conducted for the Northeast Regional Model. These count adjustments were integral to the calibration and validation of the model, as they were needed to account for seasonal populations that have a distinct effect on the average daily traffic (ADT).

13.1 BACKGROUND

The current socio-economic data that has been used in the modeling of Door County has been based on permanent (e.g., "year-long") residents and permanent employees. As such, this data had not accounted for seasonal variations. Because of this, the Door County socio-economic data that was previously being used in the model was close to its annual low point, or minimum value. During the model validation process, it was realized that the socio-economic data was in direct correlation with the under-assignment of trips throughout the County. This resulted in non-seasonal, socio-economic data being compared with the average annual daily traffic (AADT) data that included a seasonal component. Based upon this condition, it was determined that Door County count data should reflect the actual socio-economic conditions to better represent an "average" travel day for the existing socio-economic data.

It was originally intended that the socio-economic data be manually adjusted to reflect the spring or fall conditions to better represent an average travel day of the year. After further review of "Estimating the Seasonal Population of Door County"[1] the methodology used to estimate the seasonal population was not deemed accurate enough to re-calculate the non-seasonal population of the County. Other reasons for deciding to adjust the count data were: the inability to accurately quantify an ever-changing seasonal population, complications arising from future household data adjustments (e.g., Census 2010) and consistency of socio-economic data throughout the model. For these reasons and the input received from WisDOT forecasting staff, it was determined that the socio-economic data would not be factored, rather automatic traffic recorder (ATR) stations would be used to seasonally factor counts at Door County's ATR stations to match the socio-economic data in the model.

[1] Lamb, Greg. Door County University Extension (1999).

13.2 METHODOLOGY

WisDOT supplied the continuous count data for each of the six ATR stations in Door County, which is illustrated in Figure 13.1. Daily count data for sites 15-0408, 15-0417, 15-0431 and 15-0458 was provided for the 2008 count year and included approximately 330 observations for each site. Sites 15-6106, 15-6109 and 15-6184 were provided for the 2009 count year and had daily count data for approximately 110 observations for each site.

The AADT of each ATR site was calculated by averaging all of daily counts collected for the given year. Each month's ADT was then calculated for comparison with the AADT to determine the seasonal factor. A seasonal factor was created for each month per ATR site in the same manner that is generated by WisDOT. This results in a ratio between the AADT and the monthly ADT (e.g., AADT/ADT). The seasonal factor will determine which month represented the lowest volume month of the year and determine the degree of seasonality experienced at each site.

Figure 13.1 – Door County ATR Site Locations

13.3 RESULTS

The results of the ATR station analysis can be seen in Table 13.1. From this analysis, sites located within the City of Sturgeon Bay have a very small variation over the course of the year. The consistency of traffic volumes on the local city streets can be explained by the permanent year-round population base that resides in Sturgeon Bay. The analysis also indicates that ATR sites located on highway facilities in rural areas were subject to seasonal variation, a component of their function to carry regional traffic, which can be subject to a greater amount of seasonality. The sites with the two largest seasonal factors

were located the furthest north, an area of the County known for large summer populations and a limited number of permanent residents.

Table 13.1 – Door County ATR Analysis

ATR Site	*Location*	*ATR Station Data*			*Previous Count*
		AADT	*January*	*Seasonal Factor*	
150408	Egg Harbor Rd – W of Peterson Rd	9,040	7,734	1.17	9,700
150417	Michigan St. Bridge – Sturgeon Bay	14,287	12,440	1.15	15,100
150431*	Michigan St. – W of 14th Ave	5,337	4,711	1.13	5,300
150458	Green Bay Rd – W of Lansing	7,041	6,114	1.15	7,300
150470	WIS 42/57 Bridge – Sturgeon Bay	12,806	8,898	1.44	12,500
156106	WIS 42 – S of COUNTY T	4,808	1,865	2.58	4,900
156109	WIS 57 – W of COUNTY PD	10,771	7,514	1.43	13,400
156184	WIS 57 – S of COUNTY E	2,688	1,405	1.91	2,500

* Site 150431 used December data.

The January ADT volumes were inserted into the model to complete the validation efforts within the County. This time of year was chosen because it most closely represents the socio-economic data, having least amount seasonal influence. While all traffic counts within the County experience a degree of seasonality, only the ATR sites were adjusted to represent January traffic counts. Table 13.1 highlights the varying seasonality that rural highways experience. Table 13.1 also indicates an additional level of variation between the northern and southern parts of the County that would warrant different adjustment factors.

After reviewing the count data and other potential model adjustments during model validation, it was decided that the seasonality of the socio-economic data and would be addressed by adjusting the count data. The decision to adjust the count data was preferred due to the inability to accurately quantify Door County's ever-changing seasonal population, complications that may arise from future socio-economic data adjustments (e.g., Census 2010) and potential inconsistencies of the socio-economic data throughout the model. The seasonal adjustments to the ATR sites resulted in traffic volumes that more accurately represented the socio-economic data on four key urban and four key rural roadways.

SECTION 14.0 – Model Refinement and Validation

14.1 SOCIO-ECONOMIC DATA UPDATES

A comprehensive quality check was jointly completed by WisDOT and SRF Consulting Group at the completion of the model development process. This check started with a review of the model's socio-economic data inputs. The socio-economic data review was performed to verify the accuracy of the model's trip generation input data. The review of the socio-economic data focused on updating and verifying the households, employment, K-12 school enrollment, college enrollment, mall employment, casino attendance and airport boardings.

14.1.1 SOCIO-ECONOMIC REVIEW

The Northeast Regional Model socio-economic data review began by analyzing the inputs by TAZ and county to verify their accuracy. This review included all of the socio-economic variables, but had a primary emphasis on the household and employment variables.

The review started with the portions of the model that were developed as an expansion to the original MPO models, as well as peripheral TAZ's adjacent to previous external stations. Upon reviewing the expanded and rural peripheral areas of the model, additional attention was placed on reviewing the data for villages and cities in the western portion of the modeled area.

US Census (2000) household data was obtained at the block level data and attached to the Census' topologically integrated geographically encoding and referencing database (TIGER) files. Aggregated employment estimates were obtained from the US Census (2007), the Wisconsin Department of Workforce Development (DWD), InfoUSA (2010) and local economic development agencies. After obtaining all of the datasets, the data was joined to GIS maps to perform spatial analyses at the desired local and regional levels.

A summary of the socio-economic updates is provided in Appendix G: Socio-economic Data Updates.

14.1.2 HOUSEHOLD CONTROL TOTALS

In an effort to maintain consistency throughout the model, household data was reviewed at the county level. This review checked that household totals were in-line with the estimates produced by the WisDOA. See Table 14.1 for the

county household totals and WisDOA control totals for the model's three forecast years (2005, 2020 and 2035).

During the review of the household socio-economic data at the county level, counties in the western portion of the model were found to have household totals significantly lower than 2005 WisDOA estimates. The counties in the western portion of the model were developed prior to the Lakeshore model expansion and needed adjustment to correspond with WisDOA's 2005 estimates. Future year household totals were reviewed by WisDOT and MPO staff and were determined to be reasonable.

Countywide adjustments were derived by applying TAZ-level household growth trends to the county's control totals. The control totals were the WisDOA 2005 estimates. New household data was computed by distributing household growth among zones based upon the household growth rates of each individual zone. For example, if a zone had 2% of the county's household growth from 2000-2020, the zone received 2% of the household growth to reach the county's WisDOA 2005 estimate. This procedure eliminated additional households from being distributed to zones that were built-out and directed additional households to areas that were anticipated to have growth.

In areas with incomplete county TAZ coverage, the county control total method was not utilized. For these areas, TAZ's were aggregated and compared WisDOA estimates at the city, village or township level.

Table 14.1 – County HH Totals and WisDOA Estimates and Projections

County	*2005*	*2020*	*2035*	*County*	*2005*	*2020*	*2035*
Brown	94,265	114,523	127,385	Outagamie	65,848	80,232	90,599
(DOA est.)	*94,461*	*115,183*	*127,791*	*(DOA est.)*	*65,416*	*80,206*	*90,715*
Calumet	17,963	22,954	27,162	Shawano	14,259	16,191	18,470
(DOA est.)	*16,608*	*21,816*	*25,710*	*(DOA est.)*	*14,174*	*16,193*	*18,461*
Dodge	4,427	4,960	5,621	Sheboygan	43,846	51,337	58,890
(DOA est.)	*5,317*	*6,042*	*6,486*	*(DOA est.)*	*45,440*	*51,241*	*55,210*
Door	12,411	14,858	17,257	Washington	704	866	1,040
(DOA est.)	*12,898*	*15,495*	*16,251*	*(DOA est.)*	*666*	*866*	*998*
Fond du Lac	39,588	42,991	47,914	Waupaca	20,524	23,402	24,539
(DOA est.)	*38,960*	*44,692*	*47,779*	*(DOA est.)*	*20,952*	*23,917*	*25,075*
Kewaunee	8,092	9,320	10,545	Winnebago	64,510	74,674	81,917
(DOA est.)	*8,060*	*9,403*	*10,294*	*(DOA est.)*	*64,596*	*74,968*	*81,891*
Manitowoc	33,827	37,765	41,665	Totals	423,852	499,844	560,735
(DOA est.)	*34,000*	*37,546*	*39,373*	*(DOA est.)*	*426,249*	*504,229*	*554,072*
Oconto	3,588	5,771	7,731				
(DOA est.)	*4,701*	*6,661*	*8,038*				

Source: *Wisconsin Department of Administration, 2009.*

14.1.3 EMPLOYMENT DATA REVIEW

Employment data was also reviewed for reasonableness. Census data, InfoUSA reports, DWD estimates, economic development plans, chamber of commerce reports and aerial imagery were used to review employment data throughout the Northeast Regional Model area.

Employment reviews were made on an as-needed basis throughout the validation process. The employment reviews tended to be more concentrated around sub-areas that were being analyzed for the Special Generator Analysis (Section 14.2) and Major Corridor Performance Improvement (Section 14.4) tasks. The locations of major employers, malls, airports, casinos and retail centers were verified as an initial check. A focused analysis of site-specific employment estimates was undertaken when aerial imagery appeared to contradict the socio-economic database estimates.

A summary of the socio-economic employment updates is provided in Appendix G: Socio-economic Data Updates.

14.1.4 SCHOOL, COLLEGE AND AIRPORT DATA REVIEW

As a final check of the socio-economic database, the K-12 school enrollment, college enrollment and airport boardings were reviewed. The K-12 school enrollment data review revealed inconsistencies in the location and enrollment estimates for a number of counties in the western portion Northeast Regional Model area. To improve consistency throughout the model, it was determined that the K-12 school enrollment data would be updated for the following counties: Brown, Calumet, Dodge, Fond du Lac, Outagamie, Shawano, Waupaca and Winnebago. K-12 school enrollment data for public and private schools was obtained from the Wisconsin Department of Public Instruction (WisDPI, September 2005). Updated school enrollment data was allocated to respective TAZ's on a county-by-county basis.

College enrollment estimates were verified using each college's on-line statistics. Airport passenger boardings were verified using the Federal Aviation Administration's (FAA) Air Carrier Activity Information System (ACAIS) dataset. The review of the college enrollment and airport passenger boardings confirmed the accuracy of the data and no adjustments were needed.

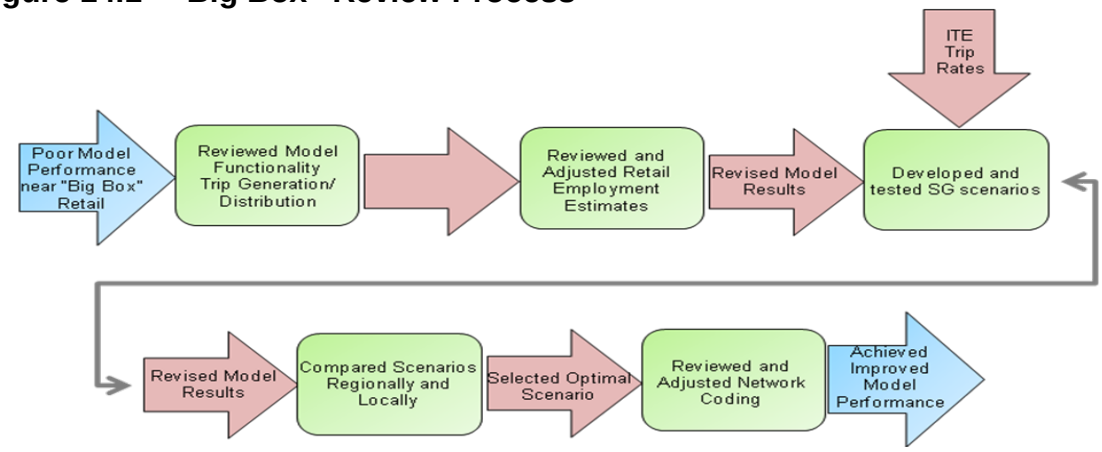
14.2 SPECIAL GENERATOR ANALYSIS

A review of major retail centers within the model's study area was performed to identify under-performing areas. The Northeast Regional Model's socio-economic data, as well as non-NE Region Cube TP+ models were reviewed to determine if there were consistent discrepancies with all major retail centers. Additional research was conducted to determine the potential of a new trip purpose and ways to mitigate trip generation issues dealing with high-density retail centers.

14.2.1 METHODOLOGY

The Northeast Regional Model as of June 2010 performed poorly near major ("Big Box") retail store locations. In order to improve the performance of the model a review of the "Big Box" retail centers was performed. The process depicted in Figure 14.1 summarizes the steps used at "Big Box" locations to improve model performance.

Figure 14.1 - "Big Box" Review Process



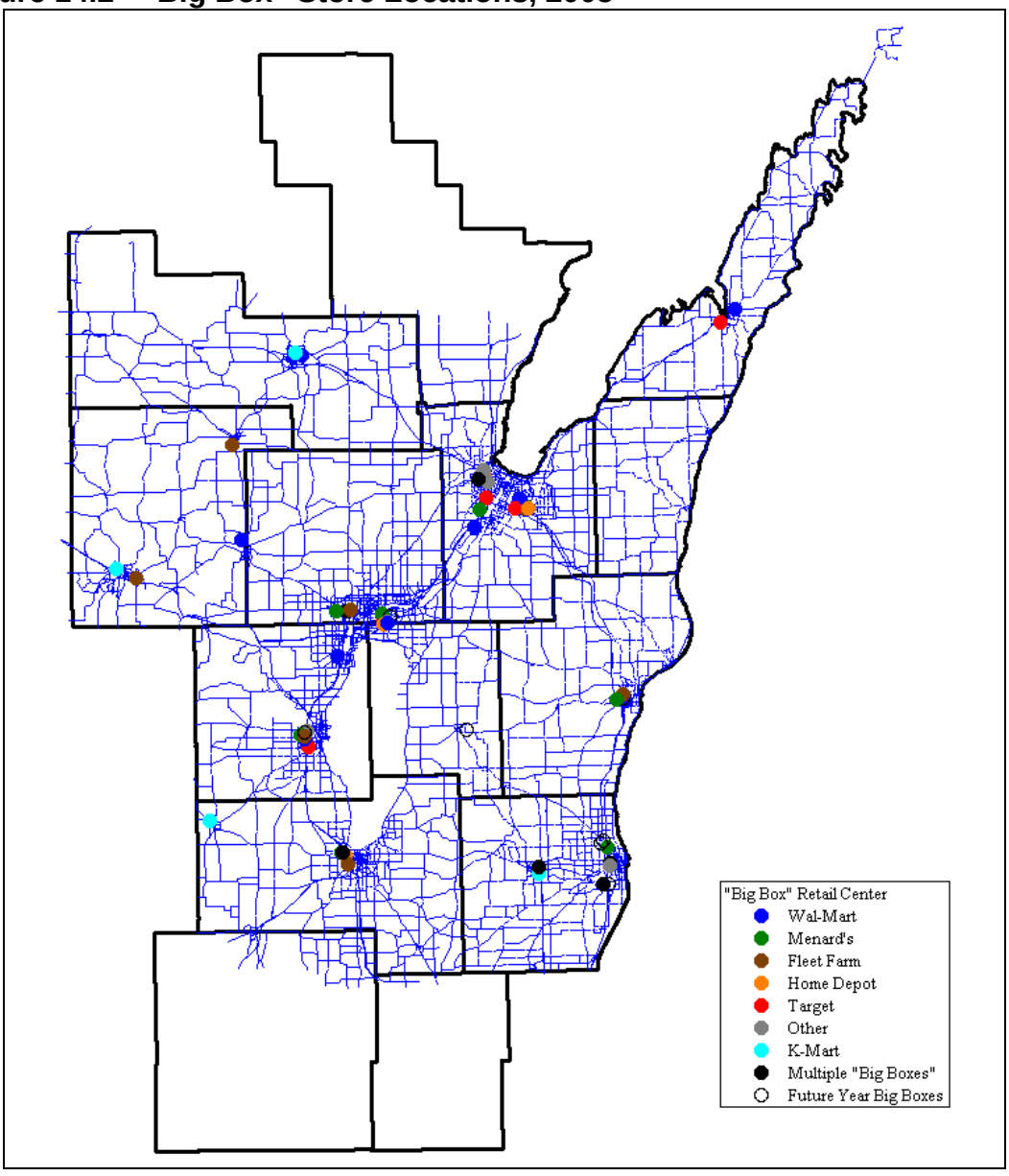
First, the model functionality for trip generation and trip distribution was reviewed. The trip generation rates used for home-based shopping trips were consistent with estimated trip rates provided in NCHRP 365[10]. Trip distribution was also reviewed for all purposes. Trip length frequency distribution curves were found to be reasonable compared to other travel demand models.

Next, all "Big Box" retail stores in the region were identified. See Figure 14.2 for depiction of these locations. For the purpose of this analysis, "Big Box" was defined as any large retail superstore that attracts more trips per employee than an average retail store. Generally this included stores such as Wal-Mart, Sam's Club, Target, Fleet Farm, Home Depot and Menards. Depending on the

[10] *National Cooperative Highway Research Program Report 365: Travel Estimation Techniques for Urban Planning (1998).*

location, other stores were also identified as “Big Box” if they functioned as such in respect to their location. Careful consideration was given to include any store in operation during 2005 in the base scenario, while any store that was documented to have opened or closed after this time was accounted for in the future scenarios.

Figure 14.2 - “Big Box” Store Locations, 2005



A review of the retail employment estimate was then conducted for all TAZs with “Big Box” stores. A factor of 1.7 Employees per thousand square feet (KSF) was assumed for all locations. This factor was estimated based on imputed data from ITE Trip Generation and other sources. A comparison

between the revised employment estimates and the InfoUSA employment data that was provided by WisDOT was conducted to determine the reasonableness of applying the KSF factor. A summary table of this comparison is provided in Table 14.2. It was determined by WisDOT and MPO staff that the 1.7 employees per KSF assumption was a reasonable approximation based upon the InfoUSA sample size provided for this analysis. This employment assumption should be used throughout the model for any additional or future special generator analyses in order to maintain consistency. The employment assumptions for "Big Box" TAZs are provided in Table 14.3.

Table 14.2 - "Big Box" Retail Special Generator Employment Assumptions

		Factor (Employees per KSF)
Walmart	InfoUSA	1.8
	Modeled	**1.7**
Fleet Farm	InfoUSA	1.6
	Modeled	**1.7**
Sam's Club	InfoUSA	1.5
	Modeled	**1.7**
Home Depot	InfoUSA	1.4
	Modeled	**1.7**
Target	InfoUSA	1.3
	Modeled	**1.7**
Menards	InfoUSA	1.1
	Modeled	**1.7**

KSF = 1,000 ft^2

Table 14.3 - "Big Box" Retail Special Generator Assumptions

	2005					*2005-2010 Growth*		
Zone	*Previous Retail*	*Adjusted Retail*	*Big Box Employees*	*SG P&A*	*Store*	*Big Box Employees*	*SG P&A*	*Store*
16	300	407	339	4,400	Wal-Mart			
18	120	326	156	2,000	K-Mart			
142	220	181	150	1,900	K-Mart			
147	120	56	56	700	Fleet Farm			
150	157	134	91	1,200	Wal-Mart			
213	5	127	59	800	Fleet Farm			
276	83	252	128	2,800	Sam’s Club			
277	2,000	1,200	629	8,100	Home Depot / Woodman’s / Burlington Northern			
278	297	146	146	1,900	Fleet Farm			
357	363	259	220	2,800	Target			
358	347	316	282	3,700	Menards			
370						393	5,100	Lowe's
371	155	245	146	1,900	Kohl’s			
437	1,256	1,256	279	3,600	Wal-Mart			
450	15	299	299	3,900	Menards			
668	135	192	192	2,500	Sears			
703	331	481	192	2,500	Target			
725	100	417	366	4,700	Wal-Mart			
731	115	458	302	3,900	Menards			
732	164	338	220	2,800	Fleet Farm			
733						265	3,400	Lowe's
888	118	512	512	6,600	Wal-Mart			
953	41	260	156	2,000	K-Mart			
1056	474	474	170	2,200	Home Depot	-170	-2,200	Home Depot Closed
1066	91	289	260	3,400	Fleet Farm			
1205	497	350	265	3,400	Menards			
1206	185	649	564	7,300	Target / Wal-Mart			
1404	405	336	156	2,000	K-Mart			
1524	265	331	229	3,000	Wal-Mart	-229	-3,000	Wal-Mart moved
1526	375	553	553	7,200	Kohl’s / Sears			
1527	195	170	156	2,000	Shopko			
1560	30	189	189	2,400	Menards	-189	-2,400	Menards moved to 1727
1584						357	4,600	Wal-Mart
1655	65	507	507	6,600	Wal-Mart / Fleet Farm			
1727						353	4,600	Menards
1738	15	604	412	5,300	Target / Home Depot			
1739						348	4,500	Wal-Mart
1890	9	199	199	2,600	Home Depot	94	1,200	Best Buy/Office Max
1918	528	528	357	4,600	Wal-Mart			
1956						285	3,700	Wal-Mart
2032	423	380	344	4,500	Wal-Mart			
2034						302	3,900	Lowe's
2038	117	281	281	3,600	Fleet Farm			
2161	123	284	284	3,700	Menards			
2259	115	256	256	3,300	Fleet Farm			
2260	260	422	262	3,400	Menards			
2264	340	238	194	2,500	Wal-Mart			
2327	200	381	281	3,600	Fleet Farm			
2328	550	660	208	2,700	Home Depot			
2334	210	548	174	2,300	Sears			
2345	145	340	238	3,100	Target			
2348	6	330	213	2,800	Target			
2369	130	241	201	2,600	Home Depot			
2397	935	1,100	650	8,400	Wal-Mart / Sam’s Club			
2419	385	119	119	1,500	Menards			
2421	210	476	357	4,600	Wal-Mart			
2669	98	229	121	1,600	Wal-Mart			
2688	73	209	189	2,400	Target			
2371	-	490	343	4,400	Woodman’s			

14.2.2 ANALYSIS

Once "Big Box" employment estimates were reviewed and adjusted, the revised model output vehicle trips were compared with ITE trip generation rates for Free-Standing Discount and Home Improvement Superstores. As suspected, vehicle trips to and from "Big Box" stores were being underestimated. The underestimation of trips was likely the result of the model's inability to capture all of the non-home base trips, which are most often represented as trips between shopping destinations. Employment estimates alone were unable to account for the magnitude of activity at each retail center, which necessitated analyzing the impact of adding a "Big Box" special generator. Scenarios that were tested included various incremental increases to the "Big Box" production and attractions. They were developed to incrementally increase the model vehicle trips toward an ITE vehicle trip estimate. The following five scenarios were established for further analysis.

1. Base - No Retail Employment Adjustment / No Special Generator
2. Retail - Retail Employment Adjustment / No Special Generator
3. SG1 - Retail Employment Adjustment / 1 Increment of Special Generator Productions and Attractions
4. SG2- Retail Employment Adjustment / 2 Increments of Special Generator Productions and Attractions
5. SG3- Retail Employment Adjustment / 3 Increments of Special Generator Productions and Attractions

These Scenarios were compared at a regional and local level to determine which scenario provided optimal model performance. The regional comparison involved a quantitative comparison regional root mean square error (RMSE) between scenarios. The results are summarized in Table 14.4.

Table 14.4 - Regional Statistical Comparison

	Base	*Retail*	*SG1*	*SG2*	*SG3*
Regional RMSE	35.32	35.26	35.28	35.24	35.29
Ranking	5	2	3	1	4

Regionally, the change in RMSE between scenarios was low. This was expected due to the small magnitude of the change on a regional basis. The ranking above shows scenario SG2 as slightly better than the other scenarios in the comparison.

Next, the scenarios were compared at a site level to focus the review on areas with the greatest expected change. This comparison was done at both a qualitative and quantitative level. The qualitative review involved a site review of each "Big Box" location for each of the five scenarios. A one through five ranking was given to each of the scenarios to denote which scenarios validated

best. A value of one, colored light blue, denotes the best validation of the alternatives, while a value of five, colored dark blue, denotes the worst validation (Table 14.5). This data is summarized in Table 14.6.

Table 14.5 - Site Qualitative Comparison

Zone	*Base*	*Retail*	*SG1*	*SG2*	*SG3*
16					
18					
142					
150					
213					
357					
371					
668					
703					
725					
731					
732					
888					
953					
1205					
1206					
1404					
1524					
1526					
1527					
1560					
1561					
1655					
1738					
1890					
1918					
2032					
2034					
2161					
2259					
2260					
2334					
2369					
2397					
2421					
2669					
2688					

Table 14.6 - Site Qualitative Comparison Summary

	Base	*Retail*	*SG1*	*SG2*	*SG3*
Total	165	113	91	85	99
Weighted Total*		36	30	28	29
Final Ranking	5	4	3	1	2

** Weighted by magnitude of vehicle trips per zone*

The "Total" row in the table above is a sum total of the individual site rankings from Table 14.5. This clearly shows that applying the retail adjustment is an improvement over the base scenario. Additionally, applying a "Big Box" special generator has a positive impact on model validation. Another comparative measure was added to further compare the scenarios. Row two in the table above includes a weighted ranking by the magnitude of vehicle trips per zone. The weighted total accounts for the increased importance of zones with higher travel activity. This performance metric indicates that there is little difference between the special generator scenarios; however, SG2 provides slightly better results than SG1 and SG3 under all measures of comparison. As a result, SG2 was selected as the preferred alternative and applied to the Northeast Regional Model.

The updated special generator file includes a fixed number of additional productions and attractions per "Big Box" retail employee. All future model applications should maintain consistency with this special generator process in order to properly account for future "Big Box" retail locations. The following formulas were applied to all existing and future "Big Box" special generators:

$$\text{Home Based Shop Attractions} = 50\% \times 13 \times \textit{Big Box Employees}$$

$$\text{Non Home Based Productions} = 25\% \times 13 \times \textit{Big Box Employees}$$

$$\text{Non Home Based Attractions} = 25\% \times 13 \times \textit{Big Box Employees}$$

The current model includes all "Big Box" development or store closings that occurred between 2005 and 2010. No attempt was made to predict future locations of "Big Box" stores.

The special generator input files are located within the model directory at the following location:

…\NE_Model_v14\Base\inputs\year XX\SG_XX.dbf
Where: XX = 2005, 2020, 2035

14.2.3 REVIEW

Once the preferred special generator assumptions were implemented, a review was completed to analyze their effectiveness. All count locations within a half mile radius of a "Big Box" retail TAZ were aggregated and summarized. Table 14.7 provides an overview of the impact of adding the special generators to the model.

Table 14.7 - Special Generator Quantitative Review

	Total Zonal Vehicle Trips	*Total Count*	*Total Model Volume*	*Total Percent Difference*	*RMSE*
No Special Generator	420,000	4,220,000	3,920,000	-7.2%	21.3%
With Special Generator	490,000	4,220,000	4,040,000	-4.3%	20.8%
Percent Change	16%	n/a	3%	40%	2.4%

The preferred "Big Box" retail special generator scenario increased the total zonal vehicle trips by 16% for the zones with "Big Box" retail stores. A percent difference was calculated between the total count and total model volume, which revealed a 40% reduction in the difference by adding the special generator file. Additionally, the RMSE was reduced by 2.4%. This improvement is significant in light of the modest increase in vehicle trips at the "Big Box" zones.

14.3 NETWORK DEVELOPMENT AND VALIDATION

The Northeast Regional Model's input network was reviewed to verify the accuracy of the model's link attributes. Model validation efforts were focused on under-performing areas of the model, the Green Bay MPO area and key corridors that were identified for a higher level of validation.

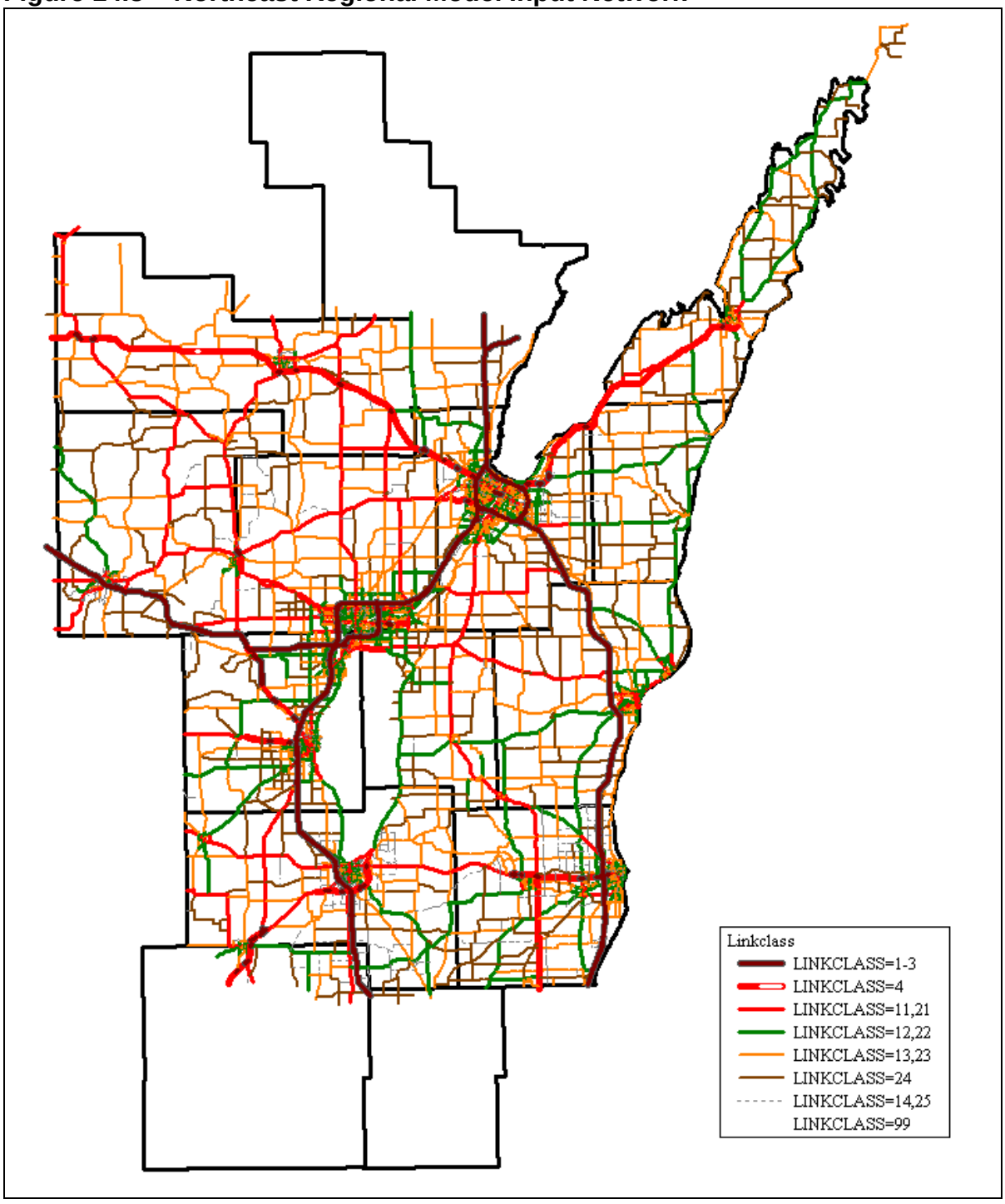
14.3.1 NETWORK DEVELOPMENT

The Northeast Regional Model's link attributes were analyzed at a local and county level in attempt to verify the accuracy of the model's input network. This review focused on verifying the "linkclass", "area type", "userspeed", "lanes", "count", "count year" and "committed projects" network attributes. The linkclass of the roadways was verified using the available WisDOT-approved functional classification maps (2003) for rural, urban, and urbanized areas. See Figure 14.3 for an overview of the functional classification for the model's input network. Area types were verified using aerial imagery and roadway lanes were verified using WisDOT's WISLR GIS shapefile. In addition to reviewing the network attributes, centroid connections were reviewed for possible alterations to improve validation on a site-by-site basis.

Throughout the review of the link attributes, counts and count years were constantly checked to verify the accuracy and consistency of counts throughout the model. Counts were adjusted if newer/better counts were available that more closely reflected the base year (2005). The removal of counts only occurred when duplicate or inaccurate counts were included in the network. If rural areas of the model contained high levels of count detail and large TAZ's, some counts on local roads were removed simply due to the limitations of the regional model. Count adjustments were applied consistently throughout the model and were always accompanied with an update to the count year attribute to more accurately reflect the process of developing future year traffic forecasts.

A summary of the network updates is provided in Appendix H: Network Updates.

Figure 14.3 – Northeast Regional Model Input Network



14.3.2 MODEL VALIDATION

Final model validation efforts were focused primarily on under-performing areas of the model and on the greater Green Bay area. For these updates, the link attributes coincided with much of the previous validation work. The validation process focused on improving specific base year traffic assignments to more closely match the traffic counts in the model.

As previously noted, improvements to the base year traffic assignments were achieved through a variety of methods, including: verifying the socio-economic data, verifying the link attributes, adjusting the centroid connections and reviewing the count data. Socio-economic and network data updates to the model were documented for each successive milestone to trace the improvement of the model and can be viewed in Appendices G and H.

County and MPO boundaries were delineated in the input network to track the validation of specific model sub-areas. Table 14.8 highlights the validation improvements model-wide and for the Brown County sub-area from the beginning to the end of the project. After completing the validation efforts, additional regional screenlines were added to the model and an analysis was conducted to verify the accuracy of major regional travel patterns (Table 14.9). The new model screenlines were identified in conjunction with WisDOT staff to evaluate key regional routes (Figure 14.4)

For a complete overview of the validation statistics and improvements throughout the validation process, please refer to Appendix I: Validation Statistics.

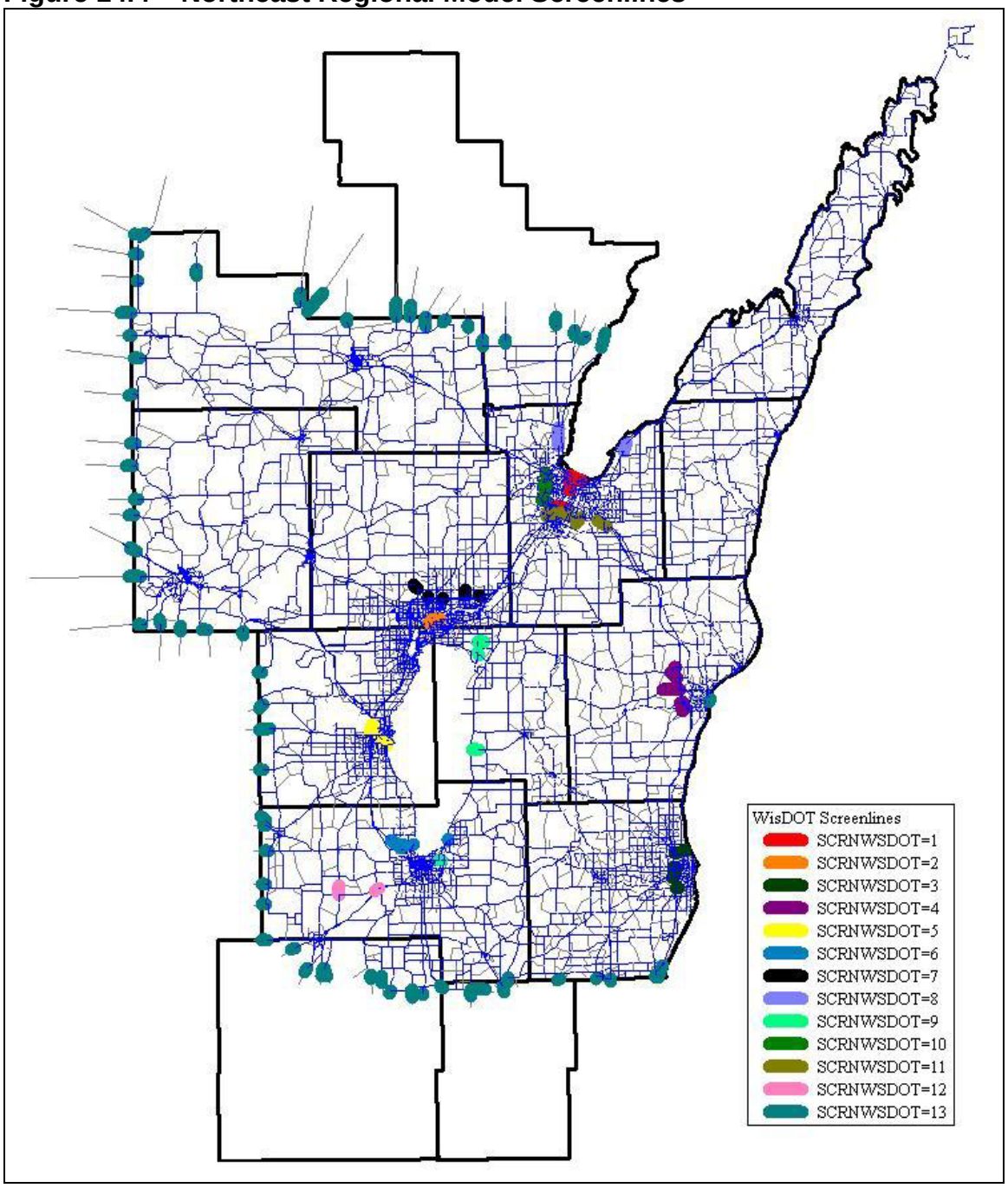
Table 14.8 – Northeast Regional Model Summary Validation Statistics

	Acceptable Ranges	Total - Original		Total - Final		Brown Co - Original		Brown Co - Final	
ADT Total 0 - 100,000		-3.99		-3.43		-6.23		-4.78	
GEH > 10 =	0.40	0.62		0.56		0.67		0.61	
GEH > 20 =	0.30	0.34		0.28		0.40		0.34	
GEH > 30 =	0.15	0.17		0.13		0.21		0.19	
GEH > 40 =	0.05	0.07		0.05		0.12		0.09	
R-SQUARED =	> 0.88	0.91		0.93		0.90		0.93	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	4,755	77.02	4,543	66.89	483	84.05	496	68.65
2,001 - 5,000	45-55	2,329	39.11	2,275	34.40	383	41.46	386	38.73
5,001 - 10,000	35-45	1,245	27.85	1,225	23.33	321	30.14	331	24.81
10,001 - 20,000	27-35	322	16.88	310	14.21	121	19.54	113	15.55
20,001 - 30,000	24-27	39	11.34	45	9.17	25	14.18	17	7.43
30,001 - 100,000	24-27	40	11.96	35	7.76	11	13.23	11	11.97
0 - 100,000	32-39	8,730	39.92	8,427	33.52	1,344	34.61	1,354	29.38
Key Updates				• Verified base-year household totals • Updated special generators • Updated employment totals • Verified link attributes • Updated count data				• Verified base-year household totals • Updated special generators • Updated employment totals • Verified link attributes • Updated count data	

Table 14.9 – Northeast Regional Model Screenline Validation Statistics

Screenline	*Count*	*Volume*	*% Diff*	*Location*	*Sites*
1	204,300	214,508	5.0%	Green Bay Bridges	6
2	66,200	72,380	9.3%	Fox Cities Bridges	4
3	79,650	80,272	0.8%	Sheboygan	6
4	22,960	24,968	8.7%	Manitowoc	6
5	123,200	117,143	-4.9%	Oshkosh Bridges	4
6	54,590	57,572	5.5%	Fond du Lac	4
7	51,800	51,350	-0.9%	Northern Appleton	5
8	49,200	50,412	2.5%	Northern Green Bay	2
9	32,500	33,382	2.7%	Eastern Lake Winnebago	4
10	116,500	111,011	-4.7%	Western Green Bay	5
11	153,090	156,966	2.5%	Southern Green Bay	8
12	17,400	17,506	0.6%	WIS 26 and USH 151	2
13	240,440	239,096	-0.6%	External Stations	64
Total	1,211,830	1,226,566	1.2%		

Figure 14.4 – Northeast Regional Model Screenlines



14.4 MAJOR CORRIDOR PERFORMANCE IMPROVEMENT

Validation efforts for the major corridors within the Northeast Regional Model focused on under-performing areas of the model that were identified by WisDot and MPO staff which required a higher level of validation. Higher validation targets were identified by WisDOT which exceeded the targets achieved in previous modeling efforts.

14.4.1 SUB-AREA VALIDATION

For the first step in improving model validation for sub-areas of the model, the model's county and MPO regions were delineated for validation summary reports (Figure 14.5). The subdivision of the model for the summary reports allowed for more focused analysis on specific sub-areas of the model. For a summary of all of the validation summary reports generated by county throughout the validation process, refer to Appendix I: Validation Statistics.

All areas of the model received some level of attention, but a greater amount of time was spent on base year validation for areas of the model that were not within a previously existing MPO model. Significant sub-area performance improvements were achieved for the following counties: Brown, Door, Kewaunee, Manitowoc and Sheboygan (Figure 14.6). Major corridor performance improvement coincided with much of the work performed for the special generator analysis, socio-economic updates, network development and model validation.

Figure 14.5 – Northeast Regional Model County and MPO Regions

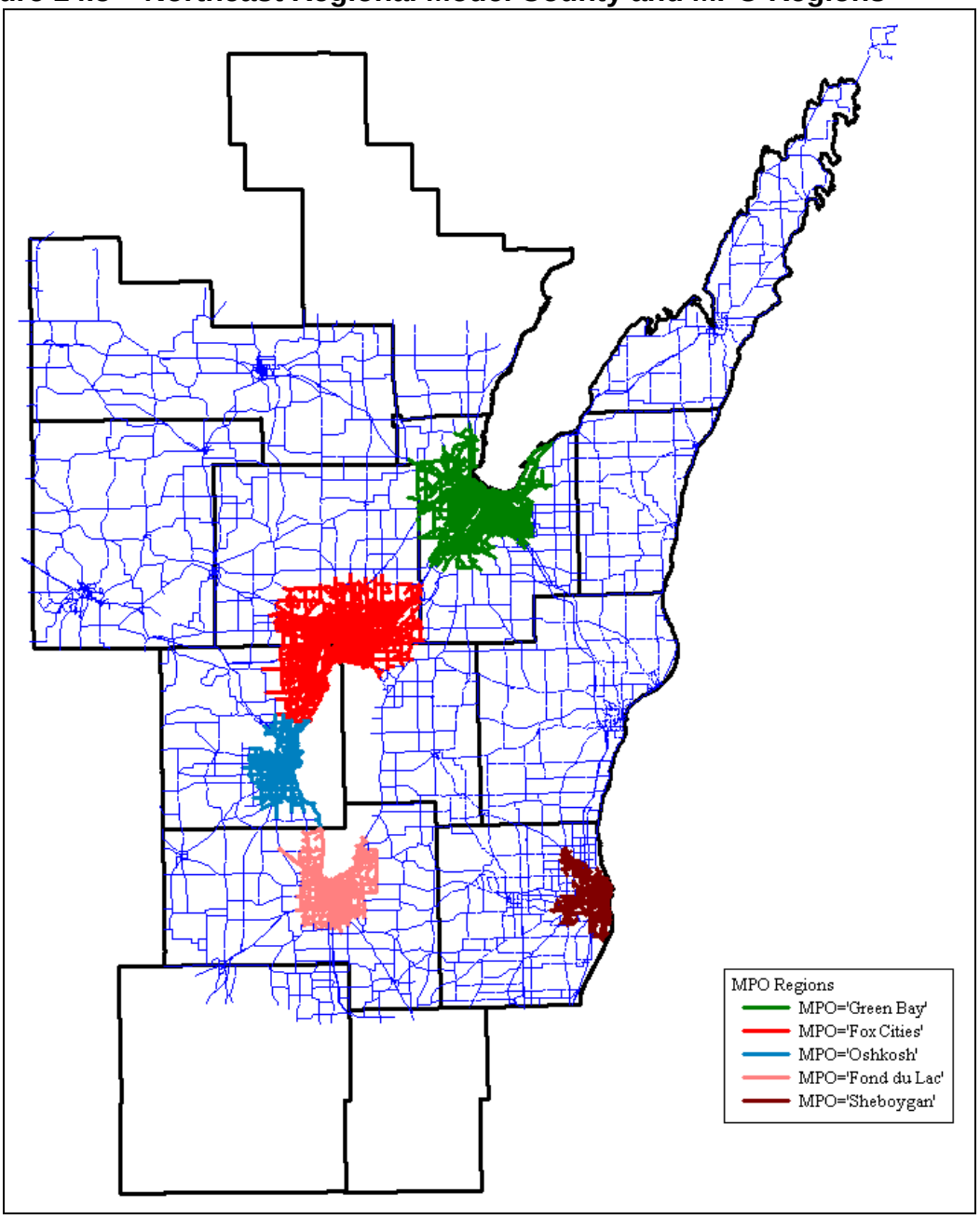
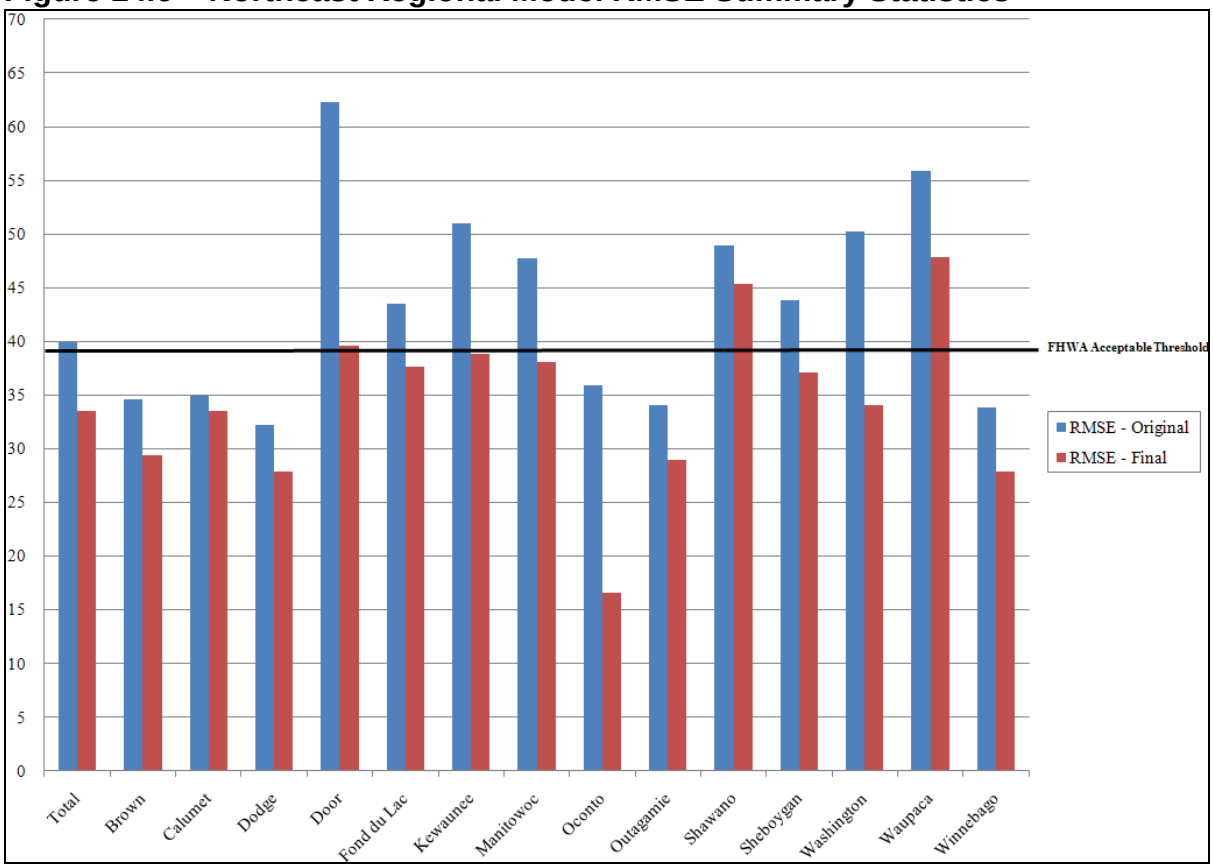


Figure 14.6 – Northeast Regional Model RMSE Summary Statistics



14.4.2 FUTURE YEAR FORECASTS

Similar to the analysis of the corridors, the future year forecasts were reviewed for areas of the model that were not within a previously existing MPO model. In addition to the review of those areas of the model, links having negative or no traffic growth were reviewed.

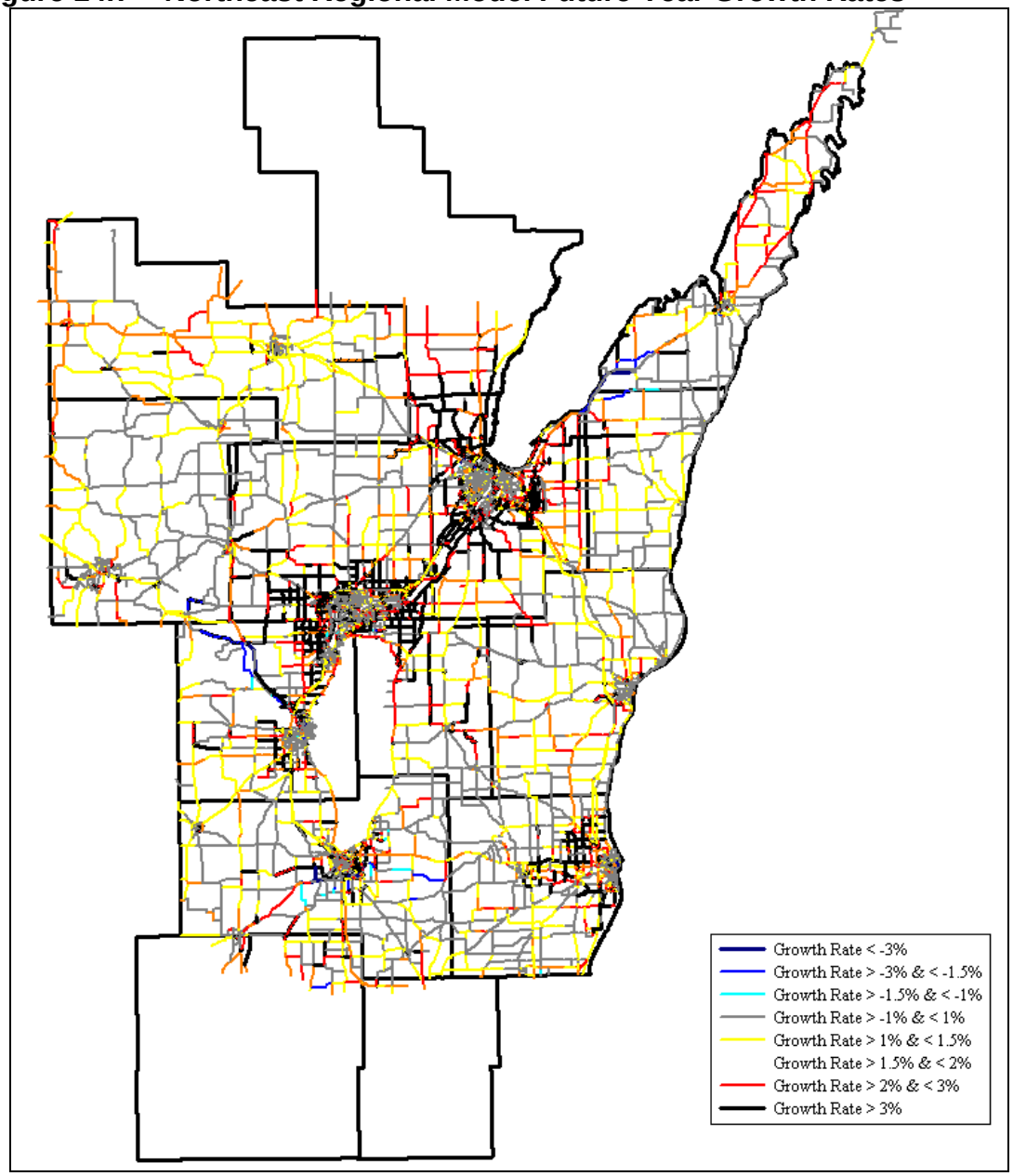
The first step in analyzing the traffic growth trends was to review the socio-economic data on a local and regional level. Household estimates for 2020 and 2035 were verified on county-by-county basis throughout the model, using the WisDOA projections as the control totals (Table 14.1). Upon verifying the forecasted county household totals, household growth patterns were reviewed on a local scale using GIS shapefiles and Cube-based node/point charts.

GIS shapefiles were used to emphasize areas of large growth, using magnitude or density to normalize the data. The shapefiles highlighted areas that growth appeared unlikely and areas where more growth was expected. Magnitude and density growth analyses enabled the re-distribution of household growth on a local level. Node/point charts were utilized within the Cube software to display the trips generated on a TAZ level for the base and future year traffic forecasts.

Using a combination of the node/point charts and links colored by growth rates, inconsistencies in the socio-economic data were identified. A summary of the socio-economic updates is provided in Appendix G: Socio-economic Updates.

After completing the future year socio-economic data review, the future models were run using the new growth assumptions (Figure 14.7). The growth rates were reviewed for reasonability and in certain instances, WisDOT's TAFIS database was also utilized to verify growth rates along a corridor.

Figure 14.7 – Northeast Regional Model Future Year Growth Rates



14.5 SUMMARY

After a thorough review, analysis and update of the Northeast Regional Model's input data, there was a significant improvement in the model's performance as indicated by industry-accepted validation measures (Table 14.8). The improved validation met or exceeded the WisDOT and FHWA thresholds model-wide and for nearly every sub-area (Figure 14.6). To track the progress of the validation over the course of the project, statistical reports were generated at each milestone to track ongoing improvement for the entire model as well as individual counties (Appendix J: Validation Statistics).

Improvements to the model's sub-areas, corridors and major retail centers coincided with all of the updates to the socio-economic data, input network and special generators. Updates to those model parameters were incrementally applied to systematically improve the validation of the model at the local and regional levels. Local improvements consisted of adjustments to the socio-economic data and centroid connectors on a TAZ level, while regional improvements were typically linked to the update of county-wide control totals and the adjustment to the special generator inputs.

Upon refining the model to improve the base year validation, the future year forecasts were reviewed to mitigate illogical low or negative traffic growth rates along corridors. A majority of the updates to the model involved resolving incorrect future household or employment data. In some circumstances, adding new or expanded facilities that were previously unaccounted for led to shifts in traffic patterns that resolved low or negative traffic growth rates along regional travel corridors.

END OF DOCUMENT

APPENDIX A – 2005 Socio-economic Data Development and Review

Table A.1 - 2005 Socio-Economic Data Development and Review

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1381	Sheboygan	295	198	295	No change	0	198	No change	0
1382	Sheboygan	390	152	440	New Residential, Post-2000 Lots (50HH)	50	152	No change	0
1383	Sheboygan	275	290	275	No change	0	290	No change	0
1384	Sheboygan	4	15	4	No change	0	15	No change	0
1385	Sheboygan	10	40	10	No change	0	40	No change	0
1386	Sheboygan	4	18	4	No change	0	18	No change	0
1387	Sheboygan	45	144	45	No change	0	144	No change	0
1388	Sheboygan	25	183	25	No change	0	183	No change	0
1389	Sheboygan	70	180	70	No change	0	180	No change	0
1390	Sheboygan	105	104	105	No change	0	104	No change	0
1391	Sheboygan	135	114	135	No change	0	114	No change	0
1392	Sheboygan	145	14	145	No change	0	14	No change	0
1393	Sheboygan	390	140	390	No change	0	140	No change	0
1394	Sheboygan	0	458	0	No change	0	458	No change	0
1395	Sheboygan	65	0	65	No change	0	0	No change	0
1396	Sheboygan	535	180	535	No change	0	180	No change	0
1397	Sheboygan	275	128	275	No change	0	128	No change	0
1398	Sheboygan	485	173	485	No change	0	173	No change	0
1399	Sheboygan	340	643	340	No change	0	643	No change	0
1400	Sheboygan	360	573	360	No change	0	573	No change	0
1401	Sheboygan	30	24	30	No change	0	24	No change	0
1402	Sheboygan	60	24	60	No change	0	24	No change	0
1403	Sheboygan	55	284	55	No change	0	284	No change	0
1404	Sheboygan	180	658	180	No change	0	658	No change	0
1405	Sheboygan	15	64	15	No change	0	64	No change	0
1406	Sheboygan	50	73	50	No change	0	73	No change	0
1407	Sheboygan	200	248	200	No change	0	248	No change	0
1408	Sheboygan	25	131	25	No change	0	131	No change	0
1409	Sheboygan	25	120	25	No change	0	120	No change	0
1410	Sheboygan	30	10	30	No change	0	10	No change	0
1411	Sheboygan	0	4	0	No change	0	4	No change	0
1412	Sheboygan	0	202	0	No change	0	202	No change	0
1413	Sheboygan	35	733	35	No change	0	733	No change	0
1414	Sheboygan	15	555	15	No change	0	555	No change	0
1415	Sheboygan	40	33	40	No change	0	33	No change	0
1416	Sheboygan	0	74	0	No change	0	74	No change	0
1417	Sheboygan	30	74	30	No change	0	74	No change	0
1418	Sheboygan	0	104	0	No change	0	104	No change	0
1419	Sheboygan	360	130	360	No change	0	130	No change	0
1420	Sheboygan	10	439	90	New Condo Development	80	439	No change	0
1421	Sheboygan	70	517	70	No change	0	517	No change	0
1422	Sheboygan	0	513	0	No change	0	513	No change	0
1423	Sheboygan	280	594	280	No change	0	594	No change	0
1425	Sheboygan	30	62	51	New Condo Development	21	62	No change	0
1426	Sheboygan	405	204	405	No change	0	204	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1427	Sheboygan	250	63	250	No change	0	63	No change	0
1428	Sheboygan	175	48	175	No change	0	48	No change	0
1429	Sheboygan	300	144	300	No change	0	144	No change	0
1430	Sheboygan	305	168	305	No change	0	168	No change	0
1431	Sheboygan	160	728	160	No change	0	728	No change	0
1432	Sheboygan	190	30	190	No change	0	30	No change	0
1433	Sheboygan	300	60	300	No change	0	60	No change	0
1434	Sheboygan	650	62	650	No change	0	62	No change	0
1435	Sheboygan	320	108	320	No change	0	108	No change	0
1436	Sheboygan	125	199	125	No change	0	199	No change	0
1437	Sheboygan	215	75	215	No change	0	75	No change	0
1438	Sheboygan	110	83	110	No change	0	83	No change	0
1439	Sheboygan	195	108	195	No change	0	108	No change	0
1440	Sheboygan	0	19	0	No change	0	19	No change	0
1441	Sheboygan	30	14	30	No change	0	14	No change	0
1442	Sheboygan	30	299	30	No change	0	299	No change	0
1443	Sheboygan	190	87	190	No change	0	87	No change	0
1444	Sheboygan	15	43	15	No change	0	43	No change	0
1445	Sheboygan	0	240	0	No change	0	240	No change	0
1446	Sheboygan	70	68	70	No change	0	68	No change	0
1447	Sheboygan	0	424	0	No change	0	424	No change	0
1448	Sheboygan	175	263	175	No change	0	263	No change	0
1449	Sheboygan	110	65	110	No change	0	65	No change	0
1450	Sheboygan	310	54	310	No change	0	54	No change	0
1451	Sheboygan	0	84	0	No change	0	84	No change	0
1452	Sheboygan	25	8	25	No change	0	8	No change	0
1453	Sheboygan	130	10	130	No change	0	10	No change	0
1454	Sheboygan	20	819	20	No change	0	839	New Restaurant	20
1455	Sheboygan	90	164	90	No change	0	164	No change	0
1456	Sheboygan	105	132	105	No change	0	132	No change	0
1457	Sheboygan	95	29	95	No change	0	29	No change	0
1458	Sheboygan	190	69	190	No change	0	69	No change	0
1459	Sheboygan	180	65	180	No change	0	65	No change	0
1460	Sheboygan	195	30	195	No change	0	30	No change	0
1461	Sheboygan	155	15	155	No change	0	15	No change	0
1462	Sheboygan	170	4	170	No change	0	4	No change	0
1463	Sheboygan	285	44	285	No change	0	44	No change	0
1464	Sheboygan	370	144	370	No change	0	144	No change	0
1465	Sheboygan	25	0	25	No change	0	0	No change	0
1466	Sheboygan	15	330	15	No change	0	330	No change	0
1467	Sheboygan	305	123	305	No change	0	123	No change	0
1468	Sheboygan	300	74	300	No change	0	74	No change	0
1469	Sheboygan	370	50	370	No change	0	50	No change	0
1470	Sheboygan	140	229	140	No change	0	229	No change	0
1471	Sheboygan	80	186	80	No change	0	186	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1472	Sheboygan	75	0	75	No change	0	0	No change	0
1473	Sheboygan	100	234	100	No change	0	234	No change	0
1474	Sheboygan	170	84	170	No change	0	84	No change	0
1475	Sheboygan	0	463	0	No change	0	463	No change	0
1476	Sheboygan	0	4	0	No change	0	4	No change	0
1477	Sheboygan	75	0	75	No change	0	0	No change	0
1478	Sheboygan	145	4	145	No change	0	4	No change	0
1479	Sheboygan	20	235	20	No change	0	235	No change	0
1480	Sheboygan	310	19	310	No change	0	19	No change	0
1481	Sheboygan	485	73	485	No change	0	73	No change	0
1482	Sheboygan	145	38	145	No change	0	38	No change	0
1483	Sheboygan	115	10	115	No change	0	10	No change	0
1484	Sheboygan	680	115	680	No change	0	115	No change	0
1485	Sheboygan	50	0	50	No change	0	0	No change	0
1486	Sheboygan	100	19	100	No change	0	19	No change	0
1487	Sheboygan	75	124	75	No change	0	124	No change	0
1488	Sheboygan	300	34	300	No change	0	34	No change	0
1489	Sheboygan	285	22	285	No change	0	22	No change	0
1490	Sheboygan	75	10	75	No change	0	10	No change	0
1491	Sheboygan	130	20	130	No change	0	20	No change	0
1492	Sheboygan	160	65	160	No change	0	65	No change	0
1493	Sheboygan	0	258	0	No change	0	258	No change	0
1494	Sheboygan	315	197	315	No change	0	197	No change	0
1495	Sheboygan	0	2159	0	No change	0	2159	No change	0
1496	Sheboygan	10	475	10	No change	0	475	No change	0
1497	Sheboygan	0	130	0	No change	0	130	No change	0
1498	Sheboygan	190	19	190	No change	0	19	No change	0
1499	Sheboygan	40	95	40	No change	0	95	No change	0
1500	Sheboygan	0	390	0	No change	0	390	No change	0
1501	Sheboygan	0	193	0	No change	0	193	No change	0
1502	Sheboygan	15	69	15	No change	0	69	No change	0
1503	Sheboygan	115	20	115	No change	0	20	No change	0
1504	Sheboygan	220	145	220	No change	0	145	No change	0
1505	Sheboygan	310	63	310	No change	0	63	No change	0
1506	Sheboygan	65	0	65	No change	0	0	No change	0
1507	Sheboygan	65	105	65	No change	0	105	No change	0
1508	Sheboygan	190	68	190	No change	0	68	No change	0
1509	Sheboygan	190	419	190	No change	0	419	No change	0
1510	Sheboygan	270	45	270	No change	0	45	No change	0
1511	Sheboygan	45	4	45	No change	0	4	No change	0
1512	Sheboygan	225	98	225	No change	0	98	No change	0
1513	Sheboygan	75	33	75	No change	0	33	No change	0
1514	Sheboygan	30	90	30	No change	0	90	No change	0
1515	Sheboygan	180	344	180	No change	0	344	No change	0
1516	Sheboygan	40	93	40	No change	0	93	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1517	Sheboygan	150	4	150	No change	0	4	No change	0
1518	Sheboygan	250	12	250	No change	0	12	No change	0
1519	Sheboygan	4	4	4	No change	0	4	No change	0
1520	Sheboygan	15	189	15	No change	0	189	No change	0
1521	Sheboygan	0	10	0	No change	0	10	No change	0
1522	Sheboygan	4	76	4	No change	0	76	No change	0
1523	Sheboygan	15	98	15	No change	0	98	No change	0
1524	Sheboygan	0	329	0	No change	0	329	No change	0
1525	Sheboygan	10	317	10	No change	0	317	No change	0
1526	Sheboygan	0	461	0	No change	0	461	No change	0
1527	Sheboygan	0	377	0	No change	0	377	No change	0
1528	Sheboygan	130	84	130	No change	0	84	No change	0
1529	Sheboygan	310	98	310	No change	0	98	No change	0
1530	Sheboygan	205	343	205	No change	0	343	No change	0
1531	Sheboygan	125	93	125	No change	0	93	No change	0
1532	Sheboygan	140	59	140	No change	0	59	No change	0
1533	Sheboygan	210	89	210	No change	0	89	No change	0
1534	Sheboygan	190	24	190	No change	0	24	No change	0
1535	Sheboygan	50	790	50	No change	0	790	No change	0
1536	Sheboygan	0	800	0	No change	0	800	No change	0
1537	Sheboygan	115	45	115	No change	0	45	No change	0
1538	Sheboygan	130	0	130	No change	0	0	No change	0
1539	Sheboygan	180	78	180	No change	0	78	No change	0
1540	Sheboygan	10	60	10	No change	0	60	No change	0
1541	Sheboygan	230	0	230	No change	0	0	No change	0
1542	Sheboygan	180	20	180	No change	0	20	No change	0
1543	Sheboygan	180	4	180	No change	0	4	No change	0
1544	Sheboygan	130	358	130	No change	0	358	No change	0
1545	Sheboygan	65	318	65	No change	0	318	No change	0
1546	Sheboygan	15	499	15	No change	0	499	No change	0
1547	Sheboygan	0	4	7	Correction	7	0	Correction	4
1548	Sheboygan	125	10	125	No change	0	10	No change	0
1549	Sheboygan	100	10	100	No change	0	10	No change	0
1550	Sheboygan	250	24	250	No change	0	24	No change	0
1551	Sheboygan	250	14	250	No change	0	14	No change	0
1552	Sheboygan	95	0	95	No change	0	0	No change	0
1553	Sheboygan	315	277	315	No change	0	277	No change	0
1554	Sheboygan	15	352	15	No change	0	352	No change	0
1555	Sheboygan	55	179	55	No change	0	179	No change	0
1556	Sheboygan	55	14	55	No change	0	14	No change	0
1557	Sheboygan	10	10	10	No change	0	10	No change	0
1558	Sheboygan	0	0	0	No change	0	0	No change	0
1559	Sheboygan	65	24	65	No change	0	24	No change	0
1560	Sheboygan	45	239	45	No change	0	239	No change	0
1561	Sheboygan	4	159	4	No change	0	159	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1562	Sheboygan	175	74	175	No change	0	74	No change	0
1563	Sheboygan	10	92	10	No change	0	92	No change	0
1564	Sheboygan	30	230	30	No change	0	230	No change	0
1565	Sheboygan	180	49	180	No change	0	49	No change	0
1566	Sheboygan	150	40	150	No change	0	40	No change	0
1567	Sheboygan	70	0	70	No change	0	0	No change	0
1568	Sheboygan	145	290	145	No change	0	290	No change	0
1569	Sheboygan	60	94	60	No change	0	94	No change	0
1570	Sheboygan	10	919	10	No change	0	919	No change	0
1571	Sheboygan	120	130	120	No change	0	130	No change	0
1572	Sheboygan	50	127	50	No change	0	127	No change	0
1573	Sheboygan	275	54	275	No change	0	54	No change	0
1574	Sheboygan	0	603	0	No change	0	603	No change	0
1575	Sheboygan	280	14	280	No change	0	14	No change	0
1576	Sheboygan	330	110	330	No change	0	110	No change	0
1577	Sheboygan	205	0	205	No change	0	0	No change	0
1578	Sheboygan	110	15	110	No change	0	15	No change	0
1579	Sheboygan	220	29	220	No change	0	29	No change	0
1580	Sheboygan	95	10	95	No change	0	10	No change	0
1581	Sheboygan	35	0	35	No change	0	0	No change	0
1582	Sheboygan	90	0	90	No change	0	0	No change	0
1583	Sheboygan	115	14	115	No change	0	14	No change	0
1584	Sheboygan	145	130	145	No change	0	130	No change	0
1585	Sheboygan	295	30	295	No change	0	30	No change	0
1586	Sheboygan	95	10	95	No change	0	10	No change	0
1587	Sheboygan	80	83	80	No change	0	83	No change	0
1588	Sheboygan	45	14	45	No change	0	14	No change	0
1589	Sheboygan	190	69	190	No change	0	69	No change	0
1590	Sheboygan	0	0	0	No change	0	4	No change	4
1591	Sheboygan	10	33	10	No change	0	33	No change	0
1592	Sheboygan	0	0	0	No change	0	5	No change	5
1593	Sheboygan	10	8	10	No change	0	8	No change	0
1594	Sheboygan	135	117	135	No change	0	117	No change	0
1595	Sheboygan	50	23	50	No change	0	23	No change	0
1596	Sheboygan	85	31	85	No change	0	31	No change	0
1597	Sheboygan	420	191	420	No change	0	191	No change	0
1598	Sheboygan	70	121	70	No change	0	121	No change	0
1599	Sheboygan	15	44	15	No change	0	44	No change	0
1600	Sheboygan	65	43	65	No change	0	43	No change	0
1601	Sheboygan	70	204	70	No change	0	204	No change	0
1602	Sheboygan	85	58	85	No change	0	58	No change	0
1603	Sheboygan	0	6338	0	No change	0	6338	No change	0
1604	Sheboygan	105	569	105	No change	0	569	No change	0
1605	Sheboygan	10	0	10	No change	0	0	No change	0
1606	Sheboygan	85	552	85	No change	0	552	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1607	Sheboygan	105	0	105	No change	0	0	No change	0
1608	Sheboygan	215	79	215	No change	0	79	No change	0
1609	Sheboygan	165	32	165	No change	0	32	No change	0
1610	Sheboygan	100	70	100	No change	0	70	No change	0
1611	Sheboygan	60	0	60	No change	0	0	No change	0
1612	Sheboygan	65	454	65	No change	0	454	No change	0
1613	Sheboygan	140	987	140	No change	0	987	No change	0
1614	Sheboygan	395	262	395	No change	0	262	No change	0
1615	Sheboygan	185	52	185	No change	0	52	No change	0
1616	Sheboygan	40	18	40	No change	0	18	No change	0
1617	Sheboygan	20	65	20	No change	0	65	No change	0
1618	Sheboygan	115	84	115	No change	0	84	No change	0
1619	Sheboygan	75	28	75	No change	0	28	No change	0
1620	Sheboygan	35	0	35	No change	0	0	No change	0
1621	Sheboygan	250	259	250	No change	0	259	No change	0
1622	Sheboygan	335	430	335	No change	0	430	No change	0
1623	Sheboygan	45	0	45	No change	0	0	No change	0
1624	Sheboygan	40	2162	40	No change	0	2162	No change	0
1625	Sheboygan	80	18	80	No change	0	18	No change	0
1626	Sheboygan	445	85	445	No change	0	85	No change	0
1627	Sheboygan	20	0	20	No change	0	0	No change	0
1628	Sheboygan	10	325	10	No change	0	325	No change	0
1629	Sheboygan	100	151	100	No change	0	151	No change	0
1630	Sheboygan	45	52	45	No change	0	52	No change	0
1631	Sheboygan	90	38	90	No change	0	38	No change	0
1632	Sheboygan	30	18	30	No change	0	18	No change	0
1633	Sheboygan	30	68	30	No change	0	68	No change	0
1634	Sheboygan	340	46	340	No change	0	46	No change	0
1635	Sheboygan	115	77	115	No change	0	77	No change	0
1636	Sheboygan	75	214	75	No change	0	214	No change	0
1637	Sheboygan	45	38	23	No change	-22	88	No change	50
1638	Sheboygan	140	101	140	No change	0	101	No change	0
1639	Sheboygan	60	188	60	No change	0	188	No change	0
1640	Sheboygan	85	24	85	No change	0	24	No change	0
1641	Sheboygan	90	53	90	No change	0	53	No change	0
1642	Sheboygan	75	92	75	No change	0	92	No change	0
1643	Sheboygan	0	0	0	No change	0	0	No change	0
1644	Sheboygan	115	24	115	No change	0	24	No change	0
1645	Sheboygan	50	8	50	No change	0	8	No change	0
1646	Sheboygan	10	0	10	No change	0	0	No change	0
1647	Sheboygan	15	0	15	No change	0	0	No change	0
1648	Sheboygan	180	16	180	No change	0	16	No change	0
1649	Sheboygan	140	866	140	No change	0	866	No change	0
1650	Sheboygan	110	130	110	No change	0	130	No change	0
1651	Sheboygan	45	145	45	No change	0	145	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1652	Sheboygan	185	36	185	No change	0	36	No change	0
1653	Sheboygan	0	0	0	No change	0	0	No change	0
1654	Sheboygan	105	458	105	No change	0	458	No change	0
1655	Sheboygan	15	139	15	No change	0	139	No change	0
1656	Sheboygan	15	16	15	No change	0	16	No change	0
1657	Sheboygan	10	0	10	No change	0	0	No change	0
1658	Sheboygan	15	34	15	No change	0	34	No change	0
1659	Sheboygan	10	0	10	No change	0	0	No change	0
1660	Sheboygan	40	12	40	No change	0	12	No change	0
1661	Sheboygan	45	0	45	No change	0	0	No change	0
1662	Sheboygan	10	10	10	No change	0	10	No change	0
1663	Sheboygan	20	0	20	No change	0	0	No change	0
1664	Sheboygan	25	4	25	No change	0	4	No change	0
1665	Sheboygan	10	134	10	No change	0	134	No change	0
1666	Sheboygan	45	4	45	No change	0	4	No change	0
1667	Sheboygan	4	0	4	No change	0	0	No change	0
1668	Sheboygan	125	8	125	No change	0	8	No change	0
1669	Sheboygan	15	8	15	No change	0	8	No change	0
1670	Sheboygan	15	10	15	No change	0	10	No change	0
1671	Sheboygan	4	25	4	No change	0	25	No change	0
1672	Sheboygan	4	54	4	No change	0	54	No change	0
1673	Sheboygan	10	0	10	No change	0	0	No change	0
1674	Sheboygan	25	19	25	No change	0	19	No change	0
1675	Sheboygan	4	4	4	No change	0	4	No change	0
1676	Sheboygan	10	4	10	No change	0	4	No change	0
1677	Sheboygan	70	4	70	No change	0	4	No change	0
1678	Sheboygan	15	33	15	No change	0	33	No change	0
1679	Sheboygan	10	0	10	No change	0	0	No change	0
1680	Sheboygan	0	20	0	No change	0	20	No change	0
1681	Sheboygan	30	8	30	No change	0	8	No change	0
1682	Sheboygan	65	12	65	No change	0	12	No change	0
1683	Sheboygan	40	381	40	No change	0	381	No change	0
1684	Sheboygan	15	8	15	No change	0	8	No change	0
1685	Sheboygan	10	19	10	No change	0	19	No change	0
1686	Sheboygan	15	4	15	No change	0	4	No change	0
1687	Sheboygan	15	19	15	No change	0	19	No change	0
1688	Sheboygan	30	0	30	No change	0	0	No change	0
1689	Sheboygan	110	24	110	No change	0	24	No change	0
1690	Sheboygan	15	10	15	No change	0	24	Town of Mosel revision	14
1691	Sheboygan	25	29	25	No change	0	29	No change	0
1692	Sheboygan	65	4	65	No change	0	4	No change	0
1693	Sheboygan	4	0	4	No change	0	0	No change	0
1694	Sheboygan	4	0	4	No change	0	0	No change	0
1695	Sheboygan	4	4	4	No change	0	4	No change	0
1696	Sheboygan	20	19	20	No change	0	19	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1697	Sheboygan	20	24	20	No change	0	24	No change	0
1698	Sheboygan	15	0	15	No change	0	0	No change	0
1699	Sheboygan	25	10	25	No change	0	10	No change	0
1700	Sheboygan	4	4	4	No change	0	4	No change	0
1701	Sheboygan	30	20	30	No change	0	20	No change	0
1702	Sheboygan	155	449	155	No change	0	449	No change	0
1703	Sheboygan	70	28	70	No change	0	28	No change	0
1704	Sheboygan	4	0	4	No change	0	0	No change	0
1705	Sheboygan	70	22	70	No change	0	22	No change	0
1706	Sheboygan	85	46	85	No change	0	46	No change	0
1707	Sheboygan	0	8	0	No change	0	8	No change	0
1708	Sheboygan	35	8	35	No change	0	8	No change	0
1709	Sheboygan	30	23	30	No change	0	23	No change	0
1710	Sheboygan	15	0	15	No change	0	2	Mosel Edit	2
1711	Sheboygan	25	4	25	No change	0	4	No change	0
1712	Sheboygan	20	74	20	No change	0	4	Town of Mosel revision	-70
1713	Sheboygan	4	0	4	No change	0	0	No change	0
1714	Sheboygan	15	8	15	No change	0	8	No change	0
1715	Sheboygan	15	23	15	No change	0	40	Mosel Edit	17
1716	Sheboygan	10	0	10	No change	0	0	No change	0
1717	Sheboygan	4	18	4	No change	0	18	No change	0
1718	Sheboygan	10	0	10	No change	0	0	No change	0
1719	Sheboygan	4	0	4	No change	0	0	No change	0
1720	Sheboygan	4	0	4	No change	0	0	No change	0
1721	Sheboygan	4	0	4	No change	0	0	No change	0
1722	Sheboygan	10	20	10	No change	0	0	Town of Mosel revision	-20
1723	Sheboygan	25	0	25	No change	0	0	No change	0
1724	Sheboygan	10	4	10	No change	0	4	No change	0
1725	Sheboygan	90	20	90	No change	0	30	Mosel Edit	10
1726	Sheboygan	25	42	25	No change	0	34	Town of Mosel revision	-8
1727	Sheboygan	55	88	55	No change	0	88	No change	0
1728	Sheboygan	10	344	10	No change	0	344	No change	0
1729	Sheboygan	130	170	130	No change	0	170	No change	0
1730	Sheboygan	10	50	10	No change	0	15	Town of Mosel revision	-35
1731	Sheboygan	15	61	15	No change	0	800	Town of Mosel revision	739
1732	Sheboygan	10	0	10	No change	0	0	No change	0
1733	Sheboygan	35	688	35	No change	0	4	Town of Mosel revision	-684
1734	Sheboygan	10	15	10	No change	0	15	No change	0
1735	Sheboygan	120	18	120	No change	0	18	No change	0
1736	Sheboygan	0	0	0	No change	0	0	No change	0
1737	Sheboygan	10	109	10	No change	0	109	No change	0
1738	Sheboygan	50	37	50	No change	0	37	No change	0
1739	Sheboygan	0	130	0	No change	0	130	No change	0
1740	Sheboygan	240	542	240	No change	0	542	No change	0
1741	Sheboygan	0	100	0	No change	0	100	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1742	Sheboygan	0	239	0	No change	0	239	No change	0
1743	Sheboygan	0	28	0	No change	0	28	No change	0
1744	Sheboygan	4	85	4	No change	0	85	No change	0
1745	Sheboygan	35	8	35	No change	0	8	No change	0
1746	Sheboygan	15	4	15	No change	0	4	No change	0
1747	Sheboygan	85	54	85	No change	0	54	No change	0
1748	Sheboygan	4	0	4	No change	0	0	No change	0
1749	Sheboygan	4	0	4	No change	0	0	No change	0
1750	Sheboygan	15	189	15	No change	0	189	No change	0
1751	Sheboygan	0	0	0	No change	0	0	No change	0
1752	Sheboygan	20	34	20	No change	0	34	No change	0
1753	Sheboygan	4	0	4	No change	0	0	No change	0
1754	Sheboygan	75	4	75	No change	0	54	New Golf Course	50
1755	Sheboygan	30	4	30	No change	0	4	No change	0
1756	Sheboygan	0	0	0	No change	0	0	No change	0
1757	Sheboygan	25	4	25	No change	0	4	No change	0
1758	Sheboygan	70	8	70	No change	0	8	No change	0
1759	Sheboygan	85	115	85	No change	0	115	No change	0
1760	Sheboygan	125	28	125	No change	0	28	No change	0
1761	Sheboygan	65	62	65	No change	0	20	Revision from Towns of Lima/Wilson	-42
1762	Sheboygan	15	0	15	No change	0	0	No change	0
1763	Sheboygan	215	27	215	No change	0	27	No change	0
1764	Sheboygan	50	8	50	No change	0	8	No change	0
1765	Sheboygan	20	8	20	No change	0	8	No change	0
1766	Sheboygan	35	14	35	No change	0	14	No change	0
1767	Sheboygan	60	232	60	No change	0	82	Schneider Cheese Reduction	-150
1768	Sheboygan	260	166	260	No change	0	55	Revision from Towns of Lima/Wilson	-111
1769	Sheboygan	95	8	95	No change	0	8	No change	0
1770	Sheboygan	25	10	25	No change	0	10	No change	0
1771	Sheboygan	4	4	4	No change	0	4	No change	0
1772	Sheboygan	10	4	10	No change	0	4	No change	0
1773	Sheboygan	10	18	10	No change	0	18	No change	0
1774	Sheboygan	50	8	50	No change	0	8	No change	0
1775	Sheboygan	100	23	100	No change	0	23	No change	0
1776	Sheboygan	30	70	30	No change	0	70	No change	0
1777	Sheboygan	35	16	35	No change	0	16	No change	0
1778	Sheboygan	15	0	15	No change	0	0	No change	0
1779	Sheboygan	45	233	45	No change	0	233	No change	0
1780	Sheboygan	20	28	20	No change	0	28	No change	0
1781	Sheboygan	50	42	50	No change	0	42	No change	0
1782	Sheboygan	85	32	85	No change	0	32	No change	0
1783	Sheboygan	20	54	20	No change	0	54	No change	0
1784	Sheboygan	225	78	225	No change	0	78	No change	0
1785	Sheboygan	190	115	190	No change	0	115	No change	0
1786	Sheboygan	30	4	30	No change	0	4	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1787	Sheboygan	155	35	155	No change	0	35	No change	0
1788	Sheboygan	155	369	155	No change	0	369	No change	0
1789	Sheboygan	4	0	4	No change	0	0	No change	0
1790	Sheboygan	4	15	4	No change	0	15	No change	0
1791	Sheboygan	105	41	105	No change	0	41	No change	0
1792	Sheboygan	60	19	60	No change	0	19	No change	0
1793	Sheboygan	20	4	20	No change	0	4	No change	0
1794	Sheboygan	60	23	60	No change	0	23	No change	0
1795	Sheboygan	45	8	45	No change	0	8	No change	0
1796	Sheboygan	55	20	55	No change	0	20	No change	0
1797	Sheboygan	75	28	75	No change	0	28	No change	0
1798	Sheboygan	55	4	55	No change	0	4	No change	0
1799	Sheboygan	15	0	15	No change	0	0	No change	0
1800	Sheboygan	170	66	170	No change	0	66	No change	0
1801	Sheboygan	4	4	4	No change	0	4	No change	0
1802	Sheboygan	55	12	55	No change	0	12	No change	0
1803	Sheboygan	45	43	45	No change	0	43	No change	0
1804	Sheboygan	35	12	35	No change	0	12	No change	0
1805	Sheboygan	160	16	160	No change	0	16	No change	0
1806	Sheboygan	10	0	10	No change	0	0	No change	0
1807	Sheboygan	4	0	4	No change	0	0	No change	0
1808	Sheboygan	20	8	20	No change	0	8	No change	0
1809	Sheboygan	40	12	40	No change	0	12	No change	0
1810	Sheboygan	160	80	160	No change	0	80	No change	0
1811	Sheboygan	90	52	90	No change	0	52	No change	0
1812	Sheboygan	75	8	75	No change	0	8	No change	0
1813	Sheboygan	55	22	55	No change	0	22	No change	0
1814	Sheboygan	10	0	10	No change	0	0	No change	0
1815	Sheboygan	20	12	20	No change	0	12	No change	0
1816	Sheboygan	15	4	15	No change	0	4	No change	0
1817	Sheboygan	75	20	75	No change	0	20	No change	0
1818	Sheboygan	45	43	45	No change	0	43	No change	0
1819	Sheboygan	30	48	30	No change	0	48	No change	0
1820	Sheboygan	75	123	75	No change	0	75	Employment over-estimated	-48
1821	Sheboygan	225	212	225	No change	0	212	No change	0
1822	Sheboygan	400	818	436	New Subdivision (~36HH)	36	866	Employment under-estimated	48
1823	Sheboygan	15	85	15	No change	0	30	Transient Employee HQ	-55
1824	Sheboygan	20	29	20	No change	0	29	No change	0
1825	Sheboygan	30	4	30	No change	0	4	No change	0
1826	Sheboygan	55	8	55	No change	0	8	No change	0
1827	Sheboygan	110	45	110	No change	0	45	No change	0
1828	Sheboygan	205	140	205	No change	0	140	No change	0
1829	Sheboygan	20	12	20	No change	0	12	No change	0
1830	Sheboygan	55	4	55	No change	0	4	No change	0
1831	Sheboygan	4	8	4	No change	0	8	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1832	Sheboygan	15	0	15	No change	0	0	No change	0
1833	Sheboygan	45	50	45	No change	0	50	No change	0
1834	Sheboygan	35	8	35	No change	0	8	No change	0
1835	Sheboygan	210	46	210	No change	0	46	No change	0
1836	Sheboygan	25	8	25	No change	0	8	No change	0
1837	Sheboygan	20	63	20	No change	0	63	No change	0
1838	Sheboygan	20	4	20	No change	0	4	No change	0
1839	Sheboygan	20	0	20	No change	0	0	No change	0
1840	Sheboygan	65	12	65	No change	0	12	No change	0
1841	Sheboygan	50	36	50	No change	0	36	No change	0
1842	Sheboygan	400	161	440	New Residential, Post-2000 Lots (30-50H	40	181	New Retirement Home	20
1843	Sheboygan	4	0	4	No change	0	0	No change	0
1844	Sheboygan	15	14	15	No change	0	14	No change	0
1845	Sheboygan	80	191	80	No change	0	191	No change	0
1846	Sheboygan	4	0	4	No change	0	0	No change	0
1847	Sheboygan	95	95	95	No change	0	95	No change	0
1848	Sheboygan	125	137	125	No change	0	137	No change	0
1849	Sheboygan	180	261	180	No change	0	261	No change	0
1850	Sheboygan	250	54	250	No change	0	54	No change	0
1902	Calumet	390	360	390	From Daar Report	0	360	From Daar Report	0
1903	Calumet	536	538	536	From Daar Report	0	538	From Daar Report	0
1904	Calumet	33	14	303	TAZ border adjustment	2	139	Applied 5 year growth rate	125
1905	Calumet	117	92	117	No change	0	92	No change	0
1906	Calumet	106	206	106	No change	0	206	No change	0
1907	Calumet	75	68	75	No change	0	643	Re-shaped TAZ	575
1908	Calumet	170	216	170	No change	0	216	No change	0
1909	Calumet	303	380	303	No change	0	380	No change	0
1910	Calumet	116	0	116	No change	0	0	No change	0
1911	Calumet	222	0	222	No change	0	0	No change	0
1912	Calumet	143	514	164	New Subdivision (~20HH) & Extend TA	21	536	Under-estimated	22
1913	Calumet	24	94	25	Applied 5 year growth rate	1	116	Under-estimated	22
1914	Calumet	32	43	33	Applied 5 year growth rate	1	45	Applied 5 year growth rate	2
1915	Calumet	100	14	85	Res growth over-estimated	-15	14	No change	0
1950	Calumet	35	64	37	Applied 5 year growth rate	2	74	Applied 5 year growth rate	10
1951	Calumet	42	35	45	Applied 5 year growth rate	3	41	Applied 5 year growth rate	6
1952	Calumet	105	89	112	Applied 5 year growth rate	7	103	Applied 5 year growth rate	14
1953	Calumet	100	84	106	Applied 5 year growth rate	6	97	Applied 5 year growth rate	13
1954	Calumet	45	10	45	No change	0	11	Applied 5 year growth rate	1
1955	Calumet	39	9	39	No change	0	9	No change	0
1956	Calumet	48	13	48	No change	0	14	Super Wal-Mart and Ind. Park	1
1957	Calumet	90	90	90	No change	0	21	Re-adjusted boundary	-69
1958	Calumet	21	10	21	No change	0	10	No change	0
1959	Calumet	90	39	94	Applied 5 year growth rate	4	41	Applied 5 year growth rate	2
1960	Calumet	93	78	97	Applied 5 year growth rate	4	82	Applied 5 year growth rate	4
1961	Calumet	53	227	53	No change	0	227	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
1962	Calumet	37	10	39	Applied 5 year growth rate	2	11	Applied 5 year growth rate	1
1963	Calumet	90	144	94	Applied 5 year growth rate	4	100	Over-estimated	-44
1964	Calumet	60	51	63	Applied 5 year growth rate	3	54	Applied 5 year growth rate	3
1965	Calumet	10	323	10	No change	0	323	No change	0
1966	Calumet	45	45	45	No change	0	45	OK	0
1967	Calumet	107	45	112	Applied 5 year growth rate	5	47	Applied 5 year growth rate	2
1968	Calumet	64	56	66	Applied 5 year growth rate	3	59	New Plant/Co-Op (St Anna)	3
1976	Manitowoc	44	21	44	No change	0	21	No change	0
1977	Manitowoc	4	24	4	No change	0	24	No change	0
1978	Manitowoc	1	18	1	No change	0	18	No change	0
1979	Manitowoc	3	13	3	No change	0	13	No change	0
1980	Manitowoc	0	24	0	No change	0	24	No change	0
1981	Manitowoc	52	14	52	No change	0	14	No change	0
1982	Manitowoc	1	13	1	No change	0	13	No change	0
1983	Manitowoc	4	21	4	No change	0	21	No change	0
1984	Manitowoc	0	15	0	No change	0	15	No change	0
1985	Manitowoc	0	11	0	No change	0	11	No change	0
1986	Manitowoc	3	26	3	No change	0	26	No change	0
1987	Manitowoc	9	15	9	No change	0	15	No change	0
1988	Manitowoc	7	27	7	No change	0	27	No change	0
1989	Manitowoc	2	426	2	No change	0	426	No change	0
1990	Manitowoc	0	90	0	No change	0	90	No change	0
1991	Manitowoc	1	22	1	No change	0	22	No change	0
1992	Manitowoc	1	53	1	No change	0	53	No change	0
1993	Manitowoc	4	24	4	No change	0	24	No change	0
1994	Manitowoc	2	32	2	No change	0	32	No change	0
1995	Manitowoc	17	86	17	No change	0	86	No change	0
1996	Manitowoc	12	44	12	No change	0	44	No change	0
1997	Manitowoc	0	107	0	No change	0	107	No change	0
1998	Manitowoc	76	73	76	No change	0	150	Employment increase	77
1999	Manitowoc	58	220	58	No change	0	220	No change	0
2000	Manitowoc	102	8	102	No change	0	8	No change	0
2001	Manitowoc	16	73	16	No change	0	73	No change	0
2002	Manitowoc	2	110	2	No change	0	350	Employment increase	240
2003	Manitowoc	0	57	0	No change	0	57	No change	0
2004	Manitowoc	169	48	169	No change	0	48	No change	0
2005	Manitowoc	310	67	310	No change	0	67	No change	0
2006	Manitowoc	158	18	158	No change	0	18	No change	0
2007	Manitowoc	0	56	0	No change	0	56	No change	0
2008	Manitowoc	1	98	1	No change	0	98	No change	0
2009	Manitowoc	33	85	33	No change	0	85	No change	0
2010	Manitowoc	21	31	21	No change	0	31	No change	0
2011	Manitowoc	33	91	33	No change	0	91	No change	0
2012	Manitowoc	93	44	93	No change	0	44	No change	0
2013	Manitowoc	246	32	246	No change	0	32	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2014	Manitowoc	170	116	170	No change	0	116	No change	0
2015	Manitowoc	428	17	428	No change	0	17	No change	0
2016	Manitowoc	296	8	296	No change	0	8	No change	0
2017	Manitowoc	206	0	206	No change	0	0	No change	0
2018	Manitowoc	242	158	242	No change	0	158	No change	0
2019	Manitowoc	293	640	293	No change	0	150	Decline in employment	-490
2020	Manitowoc	438	271	438	No change	0	271	No change	0
2021	Manitowoc	209	6	209	No change	0	6	No change	0
2022	Manitowoc	235	182	235	No change	0	182	No change	0
2023	Manitowoc	44	39	55	New hh added	11	39	No change	0
2024	Manitowoc	310	53	310	No change	0	53	No change	0
2025	Manitowoc	128	307	138	Applied 5 year growth rate	10	425	Employment increase	118
2026	Manitowoc	162	586	162	No change	0	586	No change	0
2027	Manitowoc	133	85	133	No change	0	85	No change	0
2028	Manitowoc	315	223	315	No change	0	223	No change	0
2029	Manitowoc	21	541	21	No change	0	541	No change	0
2030	Manitowoc	0	561	0	No change	0	561	No change	0
2031	Manitowoc	304	77	304	No change	0	77	No change	0
2032	Manitowoc	163	519	163	No change	0	542	Employment increase	23
2033	Manitowoc	101	233	101	No change	0	233	No change	0
2034	Manitowoc	248	1884	248	No change	0	1959	Employment increase	75
2035	Manitowoc	79	140	98	New hh added	19	140	No change	0
2036	Manitowoc	175	42	175	No change	0	42	No change	0
2037	Manitowoc	53	0	53	No change	0	0	No change	0
2038	Manitowoc	534	175	534	No change	0	175	No change	0
2039	Manitowoc	16	453	16	No change	0	453	No change	0
2040	Manitowoc	334	96	334	No change	0	96	No change	0
2041	Manitowoc	118	153	118	No change	0	153	No change	0
2042	Manitowoc	12	17	12	No change	0	17	No change	0
2043	Manitowoc	0	44	0	No change	0	44	No change	0
2044	Manitowoc	0	52	0	No change	0	52	No change	0
2045	Manitowoc	115	36	115	No change	0	36	No change	0
2046	Manitowoc	105	85	105	No change	0	85	No change	0
2047	Manitowoc	209	14	209	No change	0	14	No change	0
2048	Manitowoc	101	114	101	No change	0	114	No change	0
2049	Manitowoc	147	109	147	No change	0	350	Employment increase	241
2050	Manitowoc	143	1199	143	No change	0	850	Decline in employment	-349
2051	Manitowoc	173	1412	173	No change	0	1200	Decline in employment	-212
2052	Manitowoc	187	210	187	No change	0	150	Decline in employment	-60
2053	Manitowoc	90	278	90	No change	0	400	Decline in employment	122
2054	Manitowoc	43	25	43	No change	0	43	Employment increase	18
2055	Manitowoc	179	8	179	No change	0	8	Applied 5 year growth rate	0
2056	Manitowoc	85	54	85	No change	0	54	No change	0
2057	Manitowoc	318	0	324	6 new hh added	6	0	No change	0
2058	Manitowoc	116	30	116	No change	0	30	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2059	Manitowoc	329	14	329	No change	0	14	No change	0
2060	Manitowoc	129	0	129	No change	0	0	No change	0
2061	Manitowoc	70	5	70	No change	0	5	No change	0
2062	Manitowoc	92	0	92	No change	0	0	No change	0
2063	Manitowoc	192	7	192	No change	0	7	No change	0
2064	Manitowoc	72	40	72	No change	0	40	No change	0
2065	Manitowoc	150	0	150	No change	0	0	No change	0
2066	Manitowoc	85	0	85	No change	0	0	No change	0
2067	Manitowoc	187	0	187	No change	0	0	No change	0
2068	Manitowoc	58	1961	58	No change	0	1961	No change	0
2069	Manitowoc	83	112	83	No change	0	70	Decline in employment	-42
2070	Manitowoc	120	16	120	No change	0	16	No change	0
2071	Manitowoc	149	58	149	No change	0	58	No change	0
2072	Manitowoc	177	113	177	No change	0	113	No change	0
2073	Manitowoc	139	65	139	No change	0	65	No change	0
2074	Manitowoc	318	3	318	No change	0	3	No change	0
2075	Manitowoc	284	35	289	5 new hh	5	35	No change	0
2076	Manitowoc	339	124	339	No change	0	124	No change	0
2077	Manitowoc	141	238	141	No change	0	238	No change	0
2078	Manitowoc	321	220	321	No change	0	150	Decline in employment	-70
2079	Manitowoc	31	82	31	No change	0	82	No change	0
2080	Manitowoc	40	216	40	No change	0	216	No change	0
2081	Manitowoc	148	32	148	No change	0	32	No change	0
2082	Manitowoc	0	42	0	No change	0	42	No change	0
2083	Manitowoc	455	107	525	New hh added	70	107	No change	0
2084	Manitowoc	400	34	400	No change	0	34	No change	0
2085	Manitowoc	94	61	94	No change	0	61	No change	0
2086	Manitowoc	235	707	235	No change	0	707	No change	0
2087	Manitowoc	330	584	330	No change	0	50	Loss of Fisher Hamilton	-534
2088	Manitowoc	206	49	208	Applied 5 year growth rate	2	51	Applied 5 year growth rate	2
2089	Manitowoc	46	305	46	No change	0	305	No change	0
2090	Manitowoc	28	160	28	No change	0	165	Applied 5 year growth rate	5
2091	Manitowoc	21	126	21	No change	0	130	Applied 5 year growth rate	4
2092	Manitowoc	190	12	191	Applied 5 year growth rate	1	12	No change	0
2093	Manitowoc	72	61	72	No change	0	61	No change	0
2094	Manitowoc	238	161	238	No change	0	161	No change	0
2095	Manitowoc	31	53	31	No change	0	40	Decline in employment	-13
2096	Manitowoc	9	52	9	No change	0	52	No change	0
2097	Manitowoc	16	30	16	No change	0	30	No change	0
2098	Manitowoc	7	75	7	No change	0	75	No change	0
2099	Manitowoc	4	63	4	No change	0	63	No change	0
2100	Manitowoc	110	22	110	No change	0	22	No change	0
2101	Manitowoc	50	69	50	No change	0	69	No change	0
2102	Manitowoc	45	185	77	New hh added	32	185	No change	0
2103	Manitowoc	71	941	71	No change	0	750	Decline in employment	-191

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2104	Manitowoc	384	208	384	No change	0	208	No change	0
2105	Manitowoc	270	37	270	No change	0	80	Employment increase	43
2106	Manitowoc	86	9	86	No change	0	9	No change	0
2107	Manitowoc	259	45	259	No change	0	25	Decline in employment	-20
2108	Manitowoc	383	15	383	No change	0	15	No change	0
2109	Manitowoc	370	79	370	No change	0	79	No change	0
2110	Manitowoc	353	38	353	No change	0	38	No change	0
2111	Manitowoc	206	13	206	No change	0	13	No change	0
2112	Manitowoc	185	74	185	No change	0	74	No change	0
2113	Manitowoc	21	24	21	No change	0	25	Applied 5 year growth rate	1
2114	Manitowoc	380	29	380	No change	0	29	No change	0
2115	Manitowoc	145	125	145	No change	0	125	No change	0
2116	Manitowoc	245	122	245	No change	0	122	No change	0
2117	Manitowoc	71	23	71	No change	0	5	Decline in employment	-18
2118	Manitowoc	211	486	211	No change	0	486	No change	0
2119	Manitowoc	183	0	172	Over-estimation	-11	0	No change	0
2120	Manitowoc	118	78	118	No change	0	174	Employment increase	96
2121	Manitowoc	127	120	111	Decline in hh	-16	5	Decline in employment	-115
2122	Manitowoc	302	97	240	Decline in hh	-62	97	No change	0
2123	Manitowoc	451	210	416	Over-estimation	-35	183	Decline in employment	-27
2124	Manitowoc	247	422	187	Decline in hh	-60	417	Decline in employment	-5
2125	Manitowoc	41	15	44	Applied 5 year growth rate	3	15	No change	0
2126	Manitowoc	30	426	10	Over-estimation	-20	414	Decline in employment	-12
2127	Manitowoc	141	74	141	No change	0	150	Under-estimation	76
2128	Manitowoc	101	187	101	No change	0	177	Decline in employment	-10
2129	Manitowoc	115	172	115	No change	0	172	Targeted Employment Growth Area	0
2130	Manitowoc	445	33	451	Applied 5 year growth rate	6	34	Applied 5 year growth rate	1
2131	Manitowoc	232	286	241	Applied 5 year growth rate	9	298	Applied 5 year growth rate	12
2132	Manitowoc	129	44	134	Applied 5 year growth rate	5	46	Applied 5 year growth rate	2
2133	Manitowoc	158	65	166	Applied 5 year growth rate	8	66	Applied 5 year growth rate	1
2134	Manitowoc	167	82	176	Applied 5 year growth rate	9	84	Applied 5 year growth rate	2
2135	Manitowoc	215	45	224	Applied 5 year growth rate	9	25	Decline in employment	-20
2136	Manitowoc	53	91	55	Two new hh added	2	95	Applied 5 year growth rate	4
2137	Manitowoc	83	124	89	Applied 5 year growth rate	6	204	Employment increase	80
2138	Manitowoc	35	100	35	No change	0	27	Mis-Allocation of Golf Resort Jobs	-73
2139	Manitowoc	15	29	15	No change	0	18	Decline in employment	-11
2140	Manitowoc	110	170	110	No change	0	82	Decline in employment	-88
2141	Manitowoc	102	221	102	No change	0	271	Under-estimation (Schools)	50
2142	Manitowoc	373	167	399	Applied 5 year growth rate	26	175	Applied 5 year growth rate	8
2143	Manitowoc	113	935	117	Applied 5 year growth rate	4	961	Applied 5 year growth rate	26
2144	Manitowoc	122	21	130	Applied 5 year growth rate	8	21	No change	0
2145	Manitowoc	39	9	39	No change	0	9	No change	0
2146	Manitowoc	149	17	149	No change	0	17	No change	0
2147	Manitowoc	253	30	253	No change	0	30	No change	0
2148	Manitowoc	10	176	10	No change	0	176	No change	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2149	Manitowoc	149	33	160	Applied 5 year growth rate	11	33	No change	0
2150	Manitowoc	155	17	165	10 new hh added	10	17	No change	0
2151	Manitowoc	137	215	145	Applied 5 year growth rate	8	215	No change	0
2152	Manitowoc	5	1704	5	No change	0	25	Mirro Closing	-1679
2153	Manitowoc	217	96	228	Applied 5 year growth rate	11	97	Applied 5 year growth rate	1
2154	Manitowoc	278	155	292	Applied 5 year growth rate	14	158	Applied 5 year growth rate	3
2155	Manitowoc	93	547	145	Additional new development	52	607	Employment increase	60
2156	Manitowoc	270	445	281	11 new hh added	11	300	Decline in employment	-145
2157	Manitowoc	269	216	391	New hh added	122	216	No change	0
2158	Manitowoc	48	146	48	No change	0	146	No change	0
2159	Manitowoc	38	18	38	No change	0	18	No change	0
2160	Manitowoc	301	100	328	new hh added	27	100	No change	0
2161	Manitowoc	2	264	2	No change	0	264	No change	0
2162	Manitowoc	57	783	57	No change	0	783	No change	0
2163	Manitowoc	256	184	256	No change	0	184	No change	0
2164	Manitowoc	228	328	282	New hh added	54	328	No change	0
2165	Manitowoc	4	128	4	No change	0	385	Employment increase	257
2166	Manitowoc	12	113	12	No change	0	113	No change	0
2167	Manitowoc	12	100	12	No change	0	100	No change	0
2168	Manitowoc	0	638	0	No change	0	745	Employment increase	107
2169	Manitowoc	178	193	178	No change	0	193	No change	0
2170	Manitowoc	148	67	148	No change	0	67	No change	0
2171	Manitowoc	321	150	321	No change	0	150	No change	0
2172	Manitowoc	150	34	161	Applied 5 year growth rate	11	36	Applied 5 year growth rate	2
2173	Manitowoc	98	53	105	Applied 5 year growth rate	7	55	Applied 5 year growth rate	2
2174	Manitowoc	344	198	362	Applied 5 year growth rate	18	203	Applied 5 year growth rate	5
2175	Manitowoc	586	306	599	Applied 5 year growth rate	13	316	Applied 5 year growth rate	10
2176	Manitowoc	334	189	339	Applied 5 year growth rate	5	197	Applied 5 year growth rate	8
2177	Manitowoc	370	417	370	No change	0	417	No change	0
2178	Manitowoc	279	123	295	Applied 5 year growth rate	16	128	Applied 5 year growth rate	5
2179	Manitowoc	48	28	51	Applied 5 year growth rate	3	29	Applied 5 year growth rate	1
2180	Manitowoc	165	37	177	Applied 5 year growth rate	12	39	Applied 5 year growth rate	2
2181	Manitowoc	156	42	167	Applied 5 year growth rate	11	44	Applied 5 year growth rate	2
2182	Manitowoc	49	8	53	Applied 5 year growth rate	4	8	No change	0
2183	Manitowoc	312	256	343	Applied 5 year growth rate	31	265	Applied 5 year growth rate	9
2184	Manitowoc	48	251	53	Applied 5 year growth rate	5	260	Applied 5 year growth rate	9
2185	Manitowoc	86	36	94	Applied 5 year growth rate	8	37	Applied 5 year growth rate	1
2186	Manitowoc	123	85	135	Applied 5 year growth rate	12	88	Applied 5 year growth rate	3
2187	Manitowoc	27	109	30	Applied 5 year growth rate	3	114	Applied 5 year growth rate	5
2188	Manitowoc	144	119	158	Applied 5 year growth rate	14	123	Applied 5 year growth rate	4
2189	Manitowoc	39	23	41	Applied 5 year growth rate	2	24	Applied 5 year growth rate	1
2190	Manitowoc	78	88	83	Applied 5 year growth rate	5	91	Applied 5 year growth rate	3
2191	Manitowoc	81	52	86	Applied 5 year growth rate	5	53	Applied 5 year growth rate	1
2192	Manitowoc	48	48	51	Applied 5 year growth rate	3	49	Applied 5 year growth rate	1
2193	Manitowoc	111	50	118	Applied 5 year growth rate	7	51	Applied 5 year growth rate	1

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2194	Manitowoc	75	154	80	Applied 5 year growth rate	5	158	Applied 5 year growth rate	4
2195	Manitowoc	334	83	357	Applied 5 year growth rate	23	84	OK - Apply 5yr GR	1
2196	Manitowoc	84	34	90	Applied 5 year growth rate	6	34	No change	0
2197	Manitowoc	188	41	201	Applied 5 year growth rate	13	41	No change	0
2198	Manitowoc	172	62	175	Applied 5 year growth rate	3	106	Decline in employment	44
2199	Manitowoc	87	69	89	Applied 5 year growth rate	2	25	Decline in employment	-44
2200	Manitowoc	375	255	412	Applied 5 year growth rate	37	269	Applied 5 year growth rate	14
2201	Manitowoc	228	219	242	Applied 5 year growth rate	14	227	Applied 5 year growth rate	8
2202	Manitowoc	166	223	171	Applied 5 year growth rate	5	230	Applied 5 year growth rate	7
2203	Manitowoc	274	609	280	Building Permits	6	460	Decline in employment	-149
2204	Manitowoc	86	31	91	Applied 5 year growth rate	5	33	Applied 5 year growth rate	2
2205	Manitowoc	55	34	58	Applied 5 year growth rate	3	36	Applied 5 year growth rate	2
2206	Manitowoc	153	62	159	New building Permits	6	62	No change	0
2207	Manitowoc	203	53	203	No change	0	53	No change	0
2596	Kewaunee	376	400	376	No change	0	550	Under-estimation (Schools)	150
2597	Kewaunee	330	522	330	No change	0	447	Over-estimation	-75
2598	Kewaunee	372	53	372	No change	0	53	No change	0
2599	Kewaunee	40	497	40	No change	0	150	Olsonite closed	-347
2600	Kewaunee	0	595	0	No change	0	520	Over-estimation	-75
2601	Kewaunee	323	187	323	No change	0	187	No change	0
2602	Kewaunee	148	23	148	No change	0	23	No change	0
2603	Kewaunee	120	19	124	Applied 5 year growth rate	4	21	Applied 5 year growth rate	2
2604	Kewaunee	48	7	50	Applied 5 year growth rate	2	8	Applied 5 year growth rate	1
2605	Kewaunee	90	64	90	No change	0	64	No change	0
2606	Kewaunee	186	61	197	Applied 5 year growth rate	11	63	Applied 5 year growth rate	2
2607	Kewaunee	55	49	58	Applied 5 year growth rate	3	52	Applied 5 year growth rate	3
2608	Kewaunee	132	50	137	Applied 5 year growth rate	5	53	Applied 5 year growth rate	3
2609	Kewaunee	124	44	129	Applied 5 year growth rate	5	47	Applied 5 year growth rate	3
2610	Kewaunee	158	71	174	5yr GR - Increased GR by .9%	16	76	Applied 5 year growth rate	5
2611	Kewaunee	96	74	106	5yr GR - Increased GR by .9%	10	79	Applied 5 year growth rate	5
2612	Kewaunee	97	65	107	5yr GR - Increased GR by .9%	10	70	Applied 5 year growth rate	5
2613	Kewaunee	157	122	173	5yr GR - Increased GR by .9%	16	132	Applied 5 year growth rate	10
2614	Kewaunee	107	87	118	5yr GR - Increased GR by .9%	11	94	Applied 5 year growth rate	7
2615	Kewaunee	135	196	150	Applied 5 year growth rate	15	207	Applied 5 year growth rate	11
2616	Kewaunee	43	50	48	Applied 5 year growth rate	5	53	Applied 5 year growth rate	3
2617	Kewaunee	82	75	91	5yr GR	9	79	Applied 5 year growth rate	4
2618	Kewaunee	103	74	110	Applied 5 year growth rate	7	78	Applied 5 year growth rate	4
2619	Kewaunee	64	33	68	Applied 5 year growth rate	4	35	Applied 5 year growth rate	2
2620	Kewaunee	82	51	88	Applied 5 year growth rate	6	54	Applied 5 year growth rate	3
2621	Kewaunee	175	54	187	Applied 5 year growth rate	12	57	Applied 5 year growth rate	3
2622	Kewaunee	110	79	122	Applied 5 year growth rate	12	83	Applied 5 year growth rate	4
2623	Kewaunee	79	103	88	Applied 5 year growth rate	9	215	Under-estimation	112
2624	Kewaunee	211	125	234	Applied 5 year growth rate	23	88	Over-estimation	-37
2625	Kewaunee	378	343	419	Applied 5 year growth rate	41	268	Over-estimation	-75
2626	Kewaunee	91	77	101	Applied 5 year growth rate	10	81	Applied 5 year growth rate	4

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2627	Kewaunee	214	83	223	Applied 5 year growth rate	9	83	Applied 5 year growth rate	0
2628	Kewaunee	211	150	220	Applied 5 year growth rate	9	156	Applied 5 year growth rate	6
2629	Kewaunee	131	88	136	Applied 5 year growth rate	5	89	Applied 5 year growth rate	1
2630	Kewaunee	156	118	165	Applied 5 year growth rate	9	121	Applied 5 year growth rate	3
2631	Kewaunee	207	99	216	Applied 5 year growth rate	9	102	Applied 5 year growth rate	3
2632	Kewaunee	195	121	206	Applied 5 year growth rate	11	125	Applied 5 year growth rate	4
2633	Kewaunee	210	480	217	Applied 5 year growth rate	7	503	Applied 5 year growth rate	23
2634	Kewaunee	48	25	50	Applied 5 year growth rate	2	26	Applied 5 year growth rate	1
2635	Kewaunee	27	17	28	Applied 5 year growth rate	1	18	Applied 5 year growth rate	1
2636	Kewaunee	99	28	103	Applied 5 year growth rate	4	29	Applied 5 year growth rate	1
2637	Kewaunee	31	67	32	Applied 5 year growth rate	1	70	Applied 5 year growth rate	3
2638	Kewaunee	140	55	146	Applied 5 year growth rate	6	57	Applied 5 year growth rate	2
2639	Kewaunee	88	61	94	Applied 5 year growth rate	6	64	Applied 5 year growth rate	3
2640	Kewaunee	122	58	130	Applied 5 year growth rate	8	61	Applied 5 year growth rate	3
2641	Kewaunee	31	8	33	Applied 5 year growth rate	2	8	Applied 5 year growth rate	0
2642	Kewaunee	49	92	52	Applied 5 year growth rate	3	42	Extended TAZ to capture Pamida	-50
2643	Kewaunee	6	19	17	New duplexes	11	12	Over-estimation	-7
2644	Kewaunee	3	542	75	New Apartments	72	592	Extended TAZ to capture Pamida	50
2645	Kewaunee	262	566	262	No change	0	516	Kewaunee Machine closed 2002	-50
2646	Kewaunee	202	77	250	New apartments	48	77	No change	0
2647	Kewaunee	398	531	398	No change	0	427	Kewaunee Machine Closed 2002	-104
2648	Kewaunee	281	146	281	No change	0	204	Under-estimation (Schools/Gov)	58
2656	Door	22	183	22	No change	0	183	Revision from City of Sturgeon Bay	0
2657	Door	12	606	12	No change	0	500	Revision from City of Sturgeon Bay	-106
2658	Door	28	267	28	No change	0	400	Revision from City of Sturgeon Bay	133
2659	Door	19	296	19	No change	0	200	Revision from City of Sturgeon Bay	-96
2660	Door	87	349	87	No change	0	349	Revision from City of Sturgeon Bay	0
2661	Door	162	0	162	No change	0	0	Revision from City of Sturgeon Bay	0
2662	Door	135	11	135	No change	0	20	Revision from City of Sturgeon Bay	9
2663	Door	209	82	209	No change	0	82	Revision from City of Sturgeon Bay	0
2664	Door	15	1245	15	No change	0	900	Revision from City of Sturgeon Bay	-345
2665	Door	192	0	192	No change	0	0	Revision from City of Sturgeon Bay	0
2666	Door	280	183	280	No change	0	183	Revision from City of Sturgeon Bay	0
2667	Door	302	174	302	No change	0	225	Revision from City of Sturgeon Bay	51
2668	Door	93	584	93	No change	0	300	Revision from City of Sturgeon Bay	-284
2669	Door	16	323	16	No change	0	323	Revision from City of Sturgeon Bay	0
2670	Door	15	130	15	No change	0	160	Revision from City of Sturgeon Bay	30
2671	Door	45	11	45	No change	0	50	Revision from City of Sturgeon Bay	39
2672	Door	69	91	69	No change	0	91	Revision from City of Sturgeon Bay	0
2673	Door	411	87	411	No change	0	87	Revision from City of Sturgeon Bay	0
2674	Door	287	143	287	No change	0	275	Revision from City of Sturgeon Bay	132
2675	Door	70	364	70	No change	0	550	Revision from City of Sturgeon Bay	186
2676	Door	185	10	185	No change	0	10	Revision from City of Sturgeon Bay	0
2677	Door	51	17	51	No change	0	40	Revision from City of Sturgeon Bay	23
2678	Door	79	0	79	Revision from City of Sturgeon Bay	0	0	Revision from City of Sturgeon Bay	0

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2679	Door	76	6	76	No change	0	25	Revision from City of Sturgeon Bay	19
2680	Door	0	289	0	No change	0	150	Revision from City of Sturgeon Bay	-139
2681	Door	100	98	100	No change	0	98	Revision from City of Sturgeon Bay	0
2682	Door	169	2	169	No change	0	20	Revision from City of Sturgeon Bay	18
2683	Door	145	103	145	No change	0	75	Revision from City of Sturgeon Bay	-28
2684	Door	181	49	181	No change	0	75	Revision from City of Sturgeon Bay	26
2685	Door	109	175	109	No change	0	150	Revision from City of Sturgeon Bay	-25
2686	Door	0	178	0	No chcnge	0	200	Revision from City of Sturgeon Bay	22
2687	Door	101	172	101	No change	0	150	Revision from City of Sturgeon Bay	-22
2688	Door	7	181	7	Revision from City of Sturgeon Bay	0	210	Revision from City of Sturgeon Bay	29
2689	Door	129	226	129	Revision from City of Sturgeon Bay	0	423	Revision from City of Sturgeon Bay	197
2690	Door	1	554	1	No change	0	989	Revision from City of Sturgeon Bay	435
2691	Door	92	116	175	Revision from City of Sturgeon Bay	83	75	Revision from City of Sturgeon Bay	-41
2692	Door	109	36	120	Revision from City of Sturgeon Bay	11	60	Revision from City of Sturgeon Bay	24
2693	Door	90	39	90	Revision from City of Sturgeon Bay	0	39	Revision from City of Sturgeon Bay	0
2694	Door	192	44	192	No change	0	10	Revision from City of Sturgeon Bay	-34
2695	Door	61	187	64	Applied BLRPC growth rate	3	50	Revision from City of Sturgeon Bay	-137
2696	Door	184	234	184	Revision from City of Sturgeon Bay	0	234	Revision from City of Sturgeon Bay	0
2697	Door	126	22	132	Applied BLRPC growth rate	6	23	Applied 5 yr growth rate	1
2698	Door	162	114	167	Applied BLRPC growth rate	5	114	Applied 5 yr growth rate	0
2699	Door	200	42	209	Applied BLRPC growth rate	9	43	Applied 5 yr growth rate	1
2700	Door	117	80	118	Applied BLRPC growth rate	1	83	Applied 5 yr growth rate	3
2701	Door	71	38	74	Applied BLRPC growth rate	3	39	Applied 5 yr growth rate	1
2702	Door	75	21	78	Applied BLRPC growth rate	3	22	Applied 5 yr growth rate	1
2703	Door	99	46	102	Applied BLRPC growth rate	3	48	Applied 5 yr growth rate	2
2704	Door	172	300	177	Applied BLRPC growth rate	5	315	Applied 5 yr growth rate	15
2705	Door	209	115	226	Applied BLRPC growth rate	17	122	Applied 5 yr growth rate	7
2706	Door	221	60	239	Applied BLRPC growth rate	18	64	Applied 5 yr growth rate	4
2707	Door	62	21	66	Applied BLRPC growth rate	4	23	Applied 5 yr growth rate	2
2708	Door	129	107	138	Applied BLRPC growth rate	9	113	Applied 5 yr growth rate	6
2709	Door	121	29	129	Applied BLRPC growth rate	8	31	Applied 5 yr growth rate	2
2710	Door	236	81	252	Applied BLRPC growth rate	16	87	Applied 5 yr growth rate	6
2711	Door	339	52	351	Applied BLRPC growth rate	12	55	Applied 5 yr growth rate	3
2712	Door	115	63	119	Applied BLRPC growth rate	4	66	Applied 5 yr growth rate	3
2713	Door	269	127	269	Revision from City of Sturgeon Bay	0	75	Revision from City of Sturgeon Bay	-52
2714	Door	131	139	131	No change	0	75	Revision from City of Sturgeon Bay	-64
2715	Door	125	48	125	Revision from City of Sturgeon Bay	0	48	Revision from City of Sturgeon Bay	0
2716	Door	74	64	78	Applied BLRPC growth rate	4	65	Applied 5 yr growth rate	1
2717	Door	265	91	279	Applied BLRPC growth rate	14	96	Applied 5 yr growth rate	5
2718	Door	224	104	236	Applied BLRPC growth rate	12	109	Applied 5 yr growth rate	5
2719	Door	307	93	337	Applied BLRPC growth rate	30	98	Applied 5 yr growth rate	5
2720	Door	77	54	84	Applied BLRPC growth rate	7	56	Applied 5 yr growth rate	2
2721	Door	237	133	249	Applied BLRPC growth rate	12	137	Applied 5 yr growth rate	4
2722	Door	94	40	99	Applied BLRPC growth rate	5	41	Applied 5 yr growth rate	1
2723	Door	79	85	87	Applied BLRPC growth rate	8	89	Applied 5 yr growth rate	4

NE TAZ	County	Households 2000	Employment 2000	Households 2005	Comment on Changes to Households	Total HH Change	Employment 2005	Comment on Changes to Employment	Total Employment Change
2724	Door	116	146	127	Applied BLRPC growth rate	11	153	Applied 5 yr growth rate	7
2725	Door	128	261	140	Applied BLRPC growth rate	12	273	Applied 5 yr growth rate	12
2726	Door	85	47	93	Applied BLRPC growth rate	8	49	Applied 5 yr growth rate	2
2727	Door	68	24	74	Applied BLRPC growth rate	6	24	Applied 5 yr growth rate	0
2728	Door	162	64	177	Applied BLRPC growth rate	15	65	Applied 5 yr growth rate	1
2729	Door	119	53	130	Applied BLRPC growth rate	11	54	Applied 5 yr growth rate	1
2730	Door	354	502	385	Applied BLRPC growth rate	31	524	Applied 5 yr growth rate	22
2731	Door	315	307	343	Applied BLRPC growth rate	28	324	Applied 5 yr growth rate	17
2732	Door	14	91	15	Applied BLRPC growth rate	1	96	Applied 5 yr growth rate	5
2733	Door	58	130	62	Applied BLRPC growth rate	4	136	Applied 5 yr growth rate	6
2734	Door	41	68	44	Applied BLRPC growth rate	3	72	Applied 5 yr growth rate	4
2735	Door	138	325	154	Applied BLRPC growth rate	16	339	Applied 5 yr growth rate	14
2736	Door	226	261	252	Applied BLRPC growth rate	26	272	Applied 5 yr growth rate	11
2737	Door	234	122	261	Applied BLRPC growth rate	27	127	Applied 5 yr growth rate	5
2738	Door	202	136	225	Applied BLRPC growth rate	23	142	Applied 5 yr growth rate	6
2739	Door	108	113	120	Applied BLRPC growth rate	12	118	Applied 5 yr growth rate	5
2740	Door	14	85	16	Applied BLRPC growth rate	2	89	Applied 5 yr growth rate	4
2741	Door	280	128	312	Applied BLRPC growth rate	32	133	Applied 5 yr growth rate	5
2742	Door	293	241	303	Applied BLRPC growth rate	10	244	Applied 5 yr growth rate	3

APPENDIX B – 2035 Socio-economic Data Development and Review

Table B.1 - 2035 Socio-Economic Data Development and Review

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1381	Sheboygan	375	304	340	Modest Res Potential - Condos	-35	304	No change	0
1382	Sheboygan	783	245	490	Limited res growth expected	-293	245	No change	0
1383	Sheboygan	660	448	350	Limited res growth expected	-310	448	No change	0
1384	Sheboygan	10	15	10	No change	0	15	No change	0
1385	Sheboygan	15	40	10	Less res growth	-5	40	No change	0
1386	Sheboygan	20	18	5	Less HH Growth	-15	18	No change	0
1387	Sheboygan	55	144	47	Less HH Growth	-8	144	No change	0
1388	Sheboygan	30	183	30	No change	0	183	No change	0
1389	Sheboygan	65	181	65	No change	0	181	No change	0
1390	Sheboygan	90	105	90	No change	0	105	No change	0
1391	Sheboygan	155	117	137	Less HH Growth	-18	117	No change	0
1392	Sheboygan	150	14	150	No change	0	14	No change	0
1393	Sheboygan	528	402	528	No change	0	237	Emp over-estimated	-165
1394	Sheboygan	0	616	0	No change	0	616	No change	0
1395	Sheboygan	140	0	153	Increased HH growth	13	0	No change	0
1396	Sheboygan	610	221	610	No change	0	221	No change	0
1397	Sheboygan	355	396	281	Limited room for growth	-74	152	Limited room for growth	-244
1398	Sheboygan	625	454	625	No change	0	454	OK	0
1399	Sheboygan	385	698	385	No change	0	448	Hospital relocation	-250
1400	Sheboygan	420	630	387	Area built-out	-33	600	Area built-out	-30
1401	Sheboygan	110	61	110	No change	0	24	Employment over-estimated	-37
1402	Sheboygan	72	283	120	Increased HH Growth	48	64	Res growth area	-219
1403	Sheboygan	60	288	135	Increased HH Growth	75	324	High school growth	36
1404	Sheboygan	249	986	374	Increased HH Growth	125	986	No change	0
1405	Sheboygan	15	64	15	No change	0	64	No change	0
1406	Sheboygan	55	73	55	No change	0	73	No change	0
1407	Sheboygan	205	248	205	No change	0	248	No change	0
1408	Sheboygan	30	131	30	No change	0	131	No change	0
1409	Sheboygan	25	124	25	No change	0	124	No change	0
1410	Sheboygan	35	10	35	No change	0	10	No change	0
1411	Sheboygan	0	4	0	No change	0	4	No change	0
1412	Sheboygan	0	202	0	No change	0	202	No change	0
1413	Sheboygan	35	765	35	No change	0	765	No change	0
1414	Sheboygan	10	555	10	No change	0	555	No change	0
1415	Sheboygan	40	33	40	No change	0	33	No change	0
1416	Sheboygan	0	74	0	No change	0	74	No change	0
1417	Sheboygan	45	81	45	No change	0	81	No change	0
1418	Sheboygan	0	104	0	No change	0	104	No change	0
1419	Sheboygan	370	130	370	No change	0	130	No change	0
1420	Sheboygan	15	439	95	New condo development	80	439	No change	0
1421	Sheboygan	85	586	85	No change	0	586	No change	0
1422	Sheboygan	0	585	0	No change	0	585	No change	0
1423	Sheboygan	325	594	325	No change	0	594	No change	0
1425	Sheboygan	25	129	93	New condo development	68	129	No change	0
1426	Sheboygan	380	204	380	No change	0	204	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1427	Sheboygan	292	110	292	No change	0	110	No change	0
1428	Sheboygan	190	81	190	No change	0	81	No change	0
1429	Sheboygan	310	145	310	No change	0	145	No change	0
1430	Sheboygan	355	186	355	No change	0	186	No change	0
1431	Sheboygan	160	728	160	No change	0	728	No change	0
1432	Sheboygan	215	30	215	No change	0	30	No change	0
1433	Sheboygan	365	60	365	No change	0	60	No change	0
1434	Sheboygan	645	62	645	No change	0	62	No change	0
1435	Sheboygan	345	111	345	No change	0	111	No change	0
1436	Sheboygan	155	200	155	No change	0	200	No change	0
1437	Sheboygan	210	75	210	No change	0	75	No change	0
1438	Sheboygan	145	83	145	No change	0	83	No change	0
1439	Sheboygan	230	109	230	No change	0	109	No change	0
1440	Sheboygan	0	22	0	No change	0	22	No change	0
1441	Sheboygan	35	23	35	No change	0	23	No change	0
1442	Sheboygan	30	299	30	No change	0	299	No change	0
1443	Sheboygan	220	104	220	No change	0	104	No change	0
1444	Sheboygan	26	56	26	No change	0	56	No change	0
1445	Sheboygan	0	241	0	No change	0	241	No change	0
1446	Sheboygan	75	90	75	No change	0	90	No change	0
1447	Sheboygan	128	645	128	No change	0	645	No change	0
1448	Sheboygan	214	277	274	Anticipated condo development	60	277	No change	0
1449	Sheboygan	130	109	130	No change	0	109	No change	0
1450	Sheboygan	345	108	345	No change	0	108	No change	0
1451	Sheboygan	0	144	0	No change	0	144	No change	0
1452	Sheboygan	34	8	34	No change	0	8	No change	0
1453	Sheboygan	135	10	135	No change	0	10	No change	0
1454	Sheboygan	35	898	35	No change	0	918	New restaurant	20
1455	Sheboygan	110	171	110	No change	0	171	No change	0
1456	Sheboygan	130	138	130	No change	0	138	No change	0
1457	Sheboygan	95	43	95	No change	0	43	No change	0
1458	Sheboygan	195	69	195	No change	0	69	No change	0
1459	Sheboygan	180	65	180	No change	0	65	No change	0
1460	Sheboygan	195	30	195	No change	0	30	No change	0
1461	Sheboygan	160	15	160	No change	0	15	No change	0
1462	Sheboygan	210	7	210	No change	0	7	No change	0
1463	Sheboygan	310	44	310	No change	0	44	No change	0
1464	Sheboygan	385	161	385	No change	0	161	No change	0
1465	Sheboygan	25	0	25	No change	0	0	No change	0
1466	Sheboygan	20	330	20	No change	0	330	No change	0
1467	Sheboygan	290	123	290	No change	0	123	No change	0
1468	Sheboygan	290	78	290	No change	0	78	No change	0
1469	Sheboygan	395	50	395	No change	0	50	No change	0
1470	Sheboygan	145	298	145	No change	0	298	No change	0
1471	Sheboygan	80	276	80	No change	0	276	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1472	Sheboygan	70	0	70	No change	0	0	No change	0
1473	Sheboygan	95	234	95	No change	0	234	No change	0
1474	Sheboygan	170	92	170	No change	0	92	No change	0
1475	Sheboygan	0	483	0	No change	0	483	No change	0
1476	Sheboygan	0	4	0	No change	0	4	No change	0
1477	Sheboygan	75	0	75	No change	0	0	No change	0
1478	Sheboygan	140	4	140	No change	0	4	No change	0
1479	Sheboygan	20	351	20	No change	0	351	No change	0
1480	Sheboygan	385	119	385	No change	0	119	No change	0
1481	Sheboygan	503	93	503	No change	0	93	No change	0
1482	Sheboygan	195	65	195	No change	0	65	No change	0
1483	Sheboygan	175	27	175	No change	0	27	No change	0
1484	Sheboygan	935	537	935	No change	0	537	No change	0
1485	Sheboygan	60	30	60	No change	0	30	No change	0
1486	Sheboygan	330	332	330	No change	0	332	No change	0
1487	Sheboygan	106	158	106	No change	0	158	No change	0
1488	Sheboygan	340	57	340	No change	0	57	No change	0
1489	Sheboygan	375	35	375	No change	0	35	No change	0
1490	Sheboygan	75	17	75	No change	0	17	No change	0
1491	Sheboygan	390	53	390	No change	0	53	No change	0
1492	Sheboygan	400	112	400	No change	0	112	No change	0
1493	Sheboygan	0	359	0	No change	0	359	No change	0
1494	Sheboygan	695	542	695	No change	0	542	No change	0
1495	Sheboygan	0	2727	0	No change	0	2727	No change	0
1496	Sheboygan	4	935	4	No change	0	935	No change	0
1497	Sheboygan	0	223	0	No change	0	223	No change	0
1498	Sheboygan	260	36	260	No change	0	36	No change	0
1499	Sheboygan	90	21	90	No change	0	21	No change	0
1500	Sheboygan	0	481	0	No change	0	481	No change	0
1501	Sheboygan	0	193	0	No change	0	193	No change	0
1502	Sheboygan	20	219	20	No change	0	219	No change	0
1503	Sheboygan	115	43	115	No change	0	43	No change	0
1504	Sheboygan	215	147	215	No change	0	147	No change	0
1505	Sheboygan	315	70	315	No change	0	70	No change	0
1506	Sheboygan	60	0	60	No change	0	0	No change	0
1507	Sheboygan	60	212	60	No change	0	212	No change	0
1508	Sheboygan	195	70	195	No change	0	70	No change	0
1509	Sheboygan	175	420	175	No change	0	420	No change	0
1510	Sheboygan	255	78	255	No change	0	78	No change	0
1511	Sheboygan	50	21	50	No change	0	21	No change	0
1512	Sheboygan	213	111	213	No change	0	111	No change	0
1513	Sheboygan	115	64	115	No change	0	64	No change	0
1514	Sheboygan	25	197	25	No change	0	197	No change	0
1515	Sheboygan	200	402	200	No change	0	402	No change	0
1516	Sheboygan	45	114	45	No change	0	114	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1517	Sheboygan	145	4	145	No change	0	4	No change	0
1518	Sheboygan	280	22	280	No change	0	22	No change	0
1519	Sheboygan	4	4	4	No change	0	4	No change	0
1520	Sheboygan	10	273	10	No change	0	273	No change	0
1521	Sheboygan	0	17	0	No change	0	17	No change	0
1522	Sheboygan	14	101	14	No change	0	101	No change	0
1523	Sheboygan	70	155	70	No change	0	155	No change	0
1524	Sheboygan	0	463	0	No change	0	463	No change	0
1525	Sheboygan	10	517	10	No change	0	517	No change	0
1526	Sheboygan	0	526	0	No change	0	526	No change	0
1527	Sheboygan	0	967	0	No change	0	967	No change	0
1528	Sheboygan	140	144	140	No change	0	144	No change	0
1529	Sheboygan	320	108	320	No change	0	108	No change	0
1530	Sheboygan	220	358	220	No change	0	358	No change	0
1531	Sheboygan	140	93	140	No change	0	93	No change	0
1532	Sheboygan	160	69	160	No change	0	69	No change	0
1533	Sheboygan	250	90	250	No change	0	90	No change	0
1534	Sheboygan	195	37	195	No change	0	37	No change	0
1535	Sheboygan	60	1088	60	No change	0	1088	No change	0
1536	Sheboygan	0	840	0	No change	0	840	No change	0
1537	Sheboygan	124	48	124	No change	0	48	No change	0
1538	Sheboygan	130	0	130	No change	0	0	No change	0
1539	Sheboygan	195	99	195	No change	0	99	No change	0
1540	Sheboygan	10	77	10	No change	0	77	No change	0
1541	Sheboygan	232	0	232	No change	0	0	No change	0
1542	Sheboygan	175	20	175	No change	0	20	No change	0
1543	Sheboygan	180	4	180	No change	0	4	No change	0
1544	Sheboygan	135	464	135	No change	0	464	No change	0
1545	Sheboygan	75	536	75	No change	0	536	No change	0
1546	Sheboygan	20	499	20	No change	0	499	No change	0
1547	Sheboygan	0	7	37	Mixed-use development	37	45	Mixed-use development	38
1548	Sheboygan	130	17	130	No change	0	17	No change	0
1549	Sheboygan	90	27	90	No change	0	27	No change	0
1550	Sheboygan	235	41	235	No change	0	41	No change	0
1551	Sheboygan	236	14	236	No change	0	14	No change	0
1552	Sheboygan	106	0	106	No change	0	0	No change	0
1553	Sheboygan	333	344	333	No change	0	344	No change	0
1554	Sheboygan	15	454	15	No change	0	454	No change	0
1555	Sheboygan	50	259	50	No change	0	259	No change	0
1556	Sheboygan	85	24	85	No change	0	24	No change	0
1557	Sheboygan	387	10	387	No change	0	10	No change	0
1558	Sheboygan	0	0	0	No change	0	0	No change	0
1559	Sheboygan	70	24	70	No change	0	24	No change	0
1560	Sheboygan	60	588	60	No change	0	588	No change	0
1561	Sheboygan	10	159	10	No change	0	159	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1562	Sheboygan	205	84	205	No change	0	84	No change	0
1563	Sheboygan	10	93	10	No change	0	93	No change	0
1564	Sheboygan	25	309	25	No change	0	309	No change	0
1565	Sheboygan	210	101	210	No change	0	101	No change	0
1566	Sheboygan	180	50	180	No change	0	50	No change	0
1567	Sheboygan	65	0	65	No change	0	0	No change	0
1568	Sheboygan	150	291	150	No change	0	291	No change	0
1569	Sheboygan	65	94	65	No change	0	94	No change	0
1570	Sheboygan	10	1018	10	No change	0	1018	No change	0
1571	Sheboygan	125	203	125	No change	0	203	No change	0
1572	Sheboygan	75	185	75	No change	0	185	No change	0
1573	Sheboygan	350	92	350	No change	0	92	No change	0
1574	Sheboygan	0	832	0	No change	0	832	No change	0
1575	Sheboygan	270	31	270	No change	0	31	No change	0
1576	Sheboygan	315	143	315	No change	0	143	No change	0
1577	Sheboygan	195	0	195	No change	0	0	No change	0
1578	Sheboygan	130	25	130	No change	0	25	No change	0
1579	Sheboygan	249	129	249	No change	0	129	No change	0
1580	Sheboygan	105	10	105	No change	0	10	No change	0
1581	Sheboygan	35	33	35	No change	0	33	No change	0
1582	Sheboygan	305	167	305	No change	0	167	No change	0
1583	Sheboygan	235	31	235	No change	0	31	No change	0
1584	Sheboygan	175	584	175	No change	0	584	No change	0
1585	Sheboygan	290	63	290	No change	0	63	No change	0
1586	Sheboygan	165	10	165	No change	0	10	No change	0
1587	Sheboygan	100	204	100	No change	0	204	No change	0
1588	Sheboygan	75	181	75	No change	0	181	No change	0
1589	Sheboygan	290	119	290	No change	0	119	No change	0
1590	Sheboygan	0	0	0	No change	0	4	Town of Mosel revision	4
1591	Sheboygan	115	134	115	No change	0	60	Town of Mosel revision	-74
1592	Sheboygan	0	0	10	Town of Model revision	10	5	Town of Mosel revision	5
1593	Sheboygan	85	75	85	No change	0	75	No change	0
1594	Sheboygan	180	281	180	No change	0	281	No change	0
1595	Sheboygan	125	56	125	No change	0	56	No change	0
1596	Sheboygan	190	64	190	No change	0	64	No change	0
1597	Sheboygan	625	464	625	No change	0	464	No change	0
1598	Sheboygan	70	122	70	No change	0	122	No change	0
1599	Sheboygan	10	44	10	No change	0	44	No change	0
1600	Sheboygan	85	94	85	No change	0	94	No change	0
1601	Sheboygan	95	346	95	No change	0	346	No change	0
1602	Sheboygan	140	112	140	No change	0	112	No change	0
1603	Sheboygan	0	8081	0	No change	0	8081	No change	0
1604	Sheboygan	190	816	190	No change	0	816	No change	0
1605	Sheboygan	15	10	15	No change	0	10	No change	0
1606	Sheboygan	90	553	90	No change	0	553	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1607	Sheboygan	110	0	110	No change	0	0	No change	0
1608	Sheboygan	210	129	210	No change	0	129	No change	0
1609	Sheboygan	190	44	190	No change	0	44	No change	0
1610	Sheboygan	100	88	100	No change	0	88	No change	0
1611	Sheboygan	55	0	55	No change	0	0	No change	0
1612	Sheboygan	65	506	65	No change	0	506	No change	0
1613	Sheboygan	210	1196	210	No change	0	1196	No change	0
1614	Sheboygan	480	852	480	No change	0	852	No change	0
1615	Sheboygan	185	85	185	No change	0	85	No change	0
1616	Sheboygan	45	19	45	No change	0	19	No change	0
1617	Sheboygan	20	65	20	No change	0	65	No change	0
1618	Sheboygan	120	84	120	No change	0	84	No change	0
1619	Sheboygan	85	42	85	No change	0	42	No change	0
1620	Sheboygan	50	0	50	No change	0	0	No change	0
1621	Sheboygan	285	426	285	No change	0	426	No change	0
1622	Sheboygan	351	441	351	No change	0	441	No change	0
1623	Sheboygan	46	33	46	No change	0	33	No change	0
1624	Sheboygan	50	2261	50	No change	0	2261	No change	0
1625	Sheboygan	85	18	85	No change	0	18	No change	0
1626	Sheboygan	515	418	515	No change	0	418	No change	0
1627	Sheboygan	70	0	70	No change	0	0	No change	0
1628	Sheboygan	15	396	15	No change	0	396	No change	0
1629	Sheboygan	122	190	122	No change	0	190	No change	0
1630	Sheboygan	50	63	50	No change	0	63	No change	0
1631	Sheboygan	85	51	85	No change	0	51	No change	0
1632	Sheboygan	35	22	35	No change	0	22	No change	0
1633	Sheboygan	35	88	35	No change	0	88	No change	0
1634	Sheboygan	345	62	345	No change	0	62	No change	0
1635	Sheboygan	155	124	135	Res growth over-estimated	-20	124	No change	0
1636	Sheboygan	85	343	85	No change	0	343	No change	0
1637	Sheboygan	55	57	40	Res growth over-estimated	-15	105	Potential industrial park growth	48
1638	Sheboygan	335	152	275	Res growth over-estimated	-60	152	No change	0
1639	Sheboygan	75	297	75	No change	0	240	Employment overestimated	-57
1640	Sheboygan	160	35	160	No change	0	35	No change	0
1641	Sheboygan	210	72	210	No change	0	72	No change	0
1642	Sheboygan	158	124	158	No change	0	124	No change	0
1643	Sheboygan	0	0	0	No change	0	0	No change	0
1644	Sheboygan	115	39	115	No change	0	39	No change	0
1645	Sheboygan	50	11	50	No change	0	11	No change	0
1646	Sheboygan	10	0	10	No change	0	0	No change	0
1647	Sheboygan	10	0	10	No change	0	0	No change	0
1648	Sheboygan	238	25	238	No change	0	25	No change	0
1649	Sheboygan	203	1078	203	No change	0	1078	No change	0
1650	Sheboygan	163	201	163	No change	0	201	No change	0
1651	Sheboygan	60	250	60	No change	0	250	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1652	Sheboygan	229	48	229	No change	0	48	No change	0
1653	Sheboygan	0	0	0	No change	0	0	No change	0
1654	Sheboygan	150	830	150	No change	0	567	Limited room for growth	-263
1655	Sheboygan	45	226	15	Res growth over-estimated	-30	591	Hospital relocation/emp growth area	365
1656	Sheboygan	265	26	115	No change	-150	425	Industrial emp expected	399
1657	Sheboygan	10	0	183	Increased HH growth	173	0	No change	0
1658	Sheboygan	20	56	20	No change	0	56	No change	0
1659	Sheboygan	15	0	15	No change	0	0	No change	0
1660	Sheboygan	40	12	40	No change	0	12	No change	0
1661	Sheboygan	150	17	150	No change	0	17	No change	0
1662	Sheboygan	10	17	10	No change	0	17	No change	0
1663	Sheboygan	105	17	105	No change	0	17	No change	0
1664	Sheboygan	773	283	773	No change	0	283	No change	0
1665	Sheboygan	132	385	132	No change	0	385	No change	0
1666	Sheboygan	145	4	145	No change	0	4	No change	0
1667	Sheboygan	110	0	110	No change	0	0	No change	0
1668	Sheboygan	320	8	320	No change	0	8	No change	0
1669	Sheboygan	75	26	75	No change	0	26	No change	0
1670	Sheboygan	50	28	50	No change	0	28	No change	0
1671	Sheboygan	104	72	104	No change	0	72	No change	0
1672	Sheboygan	15	54	15	No change	0	1550	Morgan Aircraft expansion	1496
1673	Sheboygan	10	0	10	No change	0	0	No change	0
1674	Sheboygan	25	32	25	No change	0	32	No change	0
1675	Sheboygan	4	4	4	No change	0	4	No change	0
1676	Sheboygan	15	4	15	No change	0	4	No change	0
1677	Sheboygan	70	7	70	No change	0	7	No change	0
1678	Sheboygan	15	39	15	No change	0	39	No change	0
1679	Sheboygan	60	0	60	No change	0	0	No change	0
1680	Sheboygan	0	22	0	No change	0	22	No change	0
1681	Sheboygan	30	11	30	No change	0	11	No change	0
1682	Sheboygan	65	15	65	No change	0	15	No change	0
1683	Sheboygan	35	456	35	No change	0	456	No change	0
1684	Sheboygan	10	8	10	No change	0	8	No change	0
1685	Sheboygan	10	24	10	No change	0	24	No change	0
1686	Sheboygan	15	4	15	No change	0	4	No change	0
1687	Sheboygan	120	21	120	No change	0	21	No change	0
1688	Sheboygan	145	0	145	No change	0	0	No change	0
1689	Sheboygan	210	25	210	No change	0	25	No change	0
1690	Sheboygan	115	111	115	No change	0	40	Town of Mosel revision	-71
1691	Sheboygan	120	33	120	No change	0	33	No change	0
1692	Sheboygan	160	4	160	No change	0	4	No change	0
1693	Sheboygan	10	0	10	No change	0	0	No change	0
1694	Sheboygan	40	0	40	No change	0	0	No change	0
1695	Sheboygan	4	4	4	No change	0	4	No change	0
1696	Sheboygan	20	32	20	No change	0	32	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1697	Sheboygan	110	37	110	No change	0	37	No change	0
1698	Sheboygan	15	0	15	No change	0	0	No change	0
1699	Sheboygan	30	11	30	No change	0	11	No change	0
1700	Sheboygan	104	4	104	No change	0	4	No change	0
1701	Sheboygan	35	22	35	No change	0	22	No change	0
1702	Sheboygan	140	734	140	No change	0	734	No change	0
1703	Sheboygan	65	31	65	No change	0	31	No change	0
1704	Sheboygan	4	16	4	No change	0	16	No change	0
1705	Sheboygan	75	39	75	No change	0	39	No change	0
1706	Sheboygan	90	56	90	No change	0	56	No change	0
1707	Sheboygan	50	9	50	No change	0	9	No change	0
1708	Sheboygan	35	11	35	No change	0	11	No change	0
1709	Sheboygan	25	32	25	No change	0	32	No change	0
1710	Sheboygan	20	0	20	No change	0	2	No change	2
1711	Sheboygan	25	4	40	Mosel Edit	15	4	No change	0
1712	Sheboygan	15	102	23	No change	8	4	Town of Mosel revision	-98
1713	Sheboygan	4	0	7	No change	3	0	No change	0
1714	Sheboygan	15	11	40	Condo Potential near golf course	25	40	Town of Model revision	29
1715	Sheboygan	15	23	15	No change	0	50	Town of Model revision	27
1716	Sheboygan	10	0	10	No change	0	0	No change	0
1717	Sheboygan	10	18	10	No change	0	18	No change	0
1718	Sheboygan	10	0	10	No change	0	0	No change	0
1719	Sheboygan	4	0	4	No change	0	0	No change	0
1720	Sheboygan	4	0	7	No change	3	0	No change	0
1721	Sheboygan	4	0	6	No change	2	0	No change	0
1722	Sheboygan	10	22	10	No change	0	0	Town of Mosel revision	-22
1723	Sheboygan	110	67	110	No change	0	67	No change	0
1724	Sheboygan	10	4	30	Mosel Edit	20	4	No change	0
1725	Sheboygan	90	20	90	No change	0	20	No change	0
1726	Sheboygan	25	46	25	No change	0	40	Town of Mosel revision	-6
1727	Sheboygan	50	599	50	No change	0	599	No change	0
1728	Sheboygan	10	594	10	No change	0	594	No change	0
1729	Sheboygan	600	377	600	No change	0	377	No change	0
1730	Sheboygan	10	83	10	No change	0	15	Town of Mosel revision	-68
1731	Sheboygan	120	97	120	No change	0	900	Town of Mosel revision	803
1732	Sheboygan	15	0	15	No change	0	0	No change	0
1733	Sheboygan	125	828	125	No change	0	6	Town of Mosel revision	-822
1734	Sheboygan	20	48	20	No change	0	48	No change	0
1735	Sheboygan	275	35	275	No change	0	35	No change	0
1736	Sheboygan	0	67	0	No change	0	67	No change	0
1737	Sheboygan	10	192	10	No change	0	192	No change	0
1738	Sheboygan	155	149	155	No change	0	40	No emp growth expected, ag area	-109
1739	Sheboygan	0	740	0	No change	0	740	No change	0
1740	Sheboygan	305	1579	305	No change	0	1579	No change	0
1741	Sheboygan	0	100	0	No change	0	100	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1742	Sheboygan	0	469	0	No change	0	469	No change	0
1743	Sheboygan	30	228	30	No change	0	228	No change	0
1744	Sheboygan	4	128	4	No change	0	128	No change	0
1745	Sheboygan	330	48	330	No change	0	48	No change	0
1746	Sheboygan	124	37	124	No change	0	37	No change	0
1747	Sheboygan	135	328	135	No change	0	328	No change	0
1748	Sheboygan	4	33	4	No change	0	33	No change	0
1749	Sheboygan	4	0	4	No change	0	200	Industrial Emp Expected	200
1750	Sheboygan	15	255	15	No change	0	255	No change	0
1751	Sheboygan	0	0	0	No change	0	0	No change	0
1752	Sheboygan	20	43	20	No change	0	43	No change	0
1753	Sheboygan	24	17	24	No change	0	17	No change	0
1754	Sheboygan	276	38	276	No change	0	84	New golf course	46
1755	Sheboygan	130	37	130	No change	0	37	No change	0
1756	Sheboygan	0	0	0	No change	0	0	No change	0
1757	Sheboygan	25	4	25	No change	0	4	No change	0
1758	Sheboygan	70	8	70	No change	0	8	No change	0
1759	Sheboygan	75	386	105	Most Immediate HH (Oostburg)	30	386	No change	0
1760	Sheboygan	120	37	120	No change	0	37	No change	0
1761	Sheboygan	60	102	75	Lima/Wilson Edits	15	20	Lima/Wilson Edits	-82
1762	Sheboygan	15	0	20	Lima/Wilson revisions	5	0	No change	0
1763	Sheboygan	525	36	525	No change	0	36	No change	0
1764	Sheboygan	50	8	50	No change	0	18	Lima/Wilson revisions	10
1765	Sheboygan	20	8	20	No change	0	8	No change	0
1766	Sheboygan	40	18	40	No change	0	18	No change	0
1767	Sheboygan	60	356	67	Lima/Wilson Edits	7	12	Loss of Schneider Cheese	-344
1768	Sheboygan	270	223	280	New subdivision	10	40	Lima/Wilson Edits	-183
1769	Sheboygan	95	15	115	New subdivision	20	15	No change	0
1770	Sheboygan	33	11	33	No change	0	11	No change	0
1771	Sheboygan	6	7	6	No change	0	7	No change	0
1772	Sheboygan	12	7	12	No change	0	7	No change	0
1773	Sheboygan	10	29	10	No change	0	29	No change	0
1774	Sheboygan	73	10	73	No change	0	10	No change	0
1775	Sheboygan	112	40	112	No change	0	40	No change	0
1776	Sheboygan	50	113	50	No change	0	113	No change	0
1777	Sheboygan	37	20	37	No change	0	20	No change	0
1778	Sheboygan	15	0	15	No change	0	375	Industrial emp expected	375
1779	Sheboygan	295	275	194	Res growth over-estimated	-101	275	No change	0
1780	Sheboygan	420	67	420	No change	0	100	Employement under-estimated	33
1781	Sheboygan	55	63	55	No change	0	63	No change	0
1782	Sheboygan	85	46	85	No change	0	46	No change	0
1783	Sheboygan	15	90	15	No change	0	90	No change	0
1784	Sheboygan	301	105	301	No change	0	105	No change	0
1785	Sheboygan	225	151	225	No change	0	151	No change	0
1786	Sheboygan	30	4	30	No change	0	4	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1787	Sheboygan	195	52	195	No change	0	52	No change	0
1788	Sheboygan	180	613	180	No change	0	613	No change	0
1789	Sheboygan	4	0	4	No change	0	0	No change	0
1790	Sheboygan	4	17	4	No change	0	17	No change	0
1791	Sheboygan	128	62	128	No change	0	62	No change	0
1792	Sheboygan	135	24	135	No change	0	24	No change	0
1793	Sheboygan	30	7	30	No change	0	7	No change	0
1794	Sheboygan	99	29	99	No change	0	29	No change	0
1795	Sheboygan	70	11	70	No change	0	11	No change	0
1796	Sheboygan	74	29	74	No change	0	29	No change	0
1797	Sheboygan	85	34	85	No change	0	34	No change	0
1798	Sheboygan	65	4	65	No change	0	4	No change	0
1799	Sheboygan	15	0	15	No change	0	0	No change	0
1800	Sheboygan	175	103	175	No change	0	103	No change	0
1801	Sheboygan	4	5	4	No change	0	5	No change	0
1802	Sheboygan	80	23	80	No change	0	23	No change	0
1803	Sheboygan	60	56	60	No change	0	56	No change	0
1804	Sheboygan	45	18	45	No change	0	18	No change	0
1805	Sheboygan	240	26	240	No change	0	26	No change	0
1806	Sheboygan	10	0	10	No change	0	0	No change	0
1807	Sheboygan	4	0	4	No change	0	0	No change	0
1808	Sheboygan	21	10	21	No change	0	10	No change	0
1809	Sheboygan	48	18	48	No change	0	18	No change	0
1810	Sheboygan	211	124	211	No change	0	124	No change	0
1811	Sheboygan	104	71	104	No change	0	71	No change	0
1812	Sheboygan	84	11	84	No change	0	11	No change	0
1813	Sheboygan	72	30	72	No change	0	30	No change	0
1814	Sheboygan	15	0	15	No change	0	0	No change	0
1815	Sheboygan	20	15	20	No change	0	15	No change	0
1816	Sheboygan	10	4	10	No change	0	4	No change	0
1817	Sheboygan	84	29	84	No change	0	29	No change	0
1818	Sheboygan	47	65	47	No change	0	65	No change	0
1819	Sheboygan	37	54	37	No change	0	54	No change	0
1820	Sheboygan	115	164	115	No change	0	80	Growth over-estimated	-84
1821	Sheboygan	290	363	265	Growth over-estimated	-25	250	Growth over-estimated	-113
1822	Sheboygan	550	1092	550	No change	0	950	Growth over-estimated	-142
1823	Sheboygan	17	109	17	No change	0	40	Environmental constraints	-69
1824	Sheboygan	15	50	15	No change	0	50	No change	0
1825	Sheboygan	32	7	32	No change	0	7	No change	0
1826	Sheboygan	58	11	58	No change	0	11	No change	0
1827	Sheboygan	110	64	110	No change	0	64	No change	0
1828	Sheboygan	229	192	229	No change	0	192	No change	0
1829	Sheboygan	20	15	20	No change	0	15	No change	0
1830	Sheboygan	65	7	65	No change	0	7	No change	0
1831	Sheboygan	4	11	4	No change	0	11	No change	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
1832	Sheboygan	15	0	15	No change	0	0	OK	0
1833	Sheboygan	40	87	40	No change	0	87	No change	0
1834	Sheboygan	35	11	35	No change	0	11	No change	0
1835	Sheboygan	213	58	213	No change	0	58	No change	0
1836	Sheboygan	25	11	25	No change	0	11	No change	0
1837	Sheboygan	20	86	20	No change	0	86	No change	0
1838	Sheboygan	15	4	15	No change	0	4	No change	0
1839	Sheboygan	15	0	15	No change	0	0	No change	0
1840	Sheboygan	60	18	60	No change	0	18	No change	0
1841	Sheboygan	55	56	55	No change	0	56	No change	0
1842	Sheboygan	560	236	583	Res growth under-estimated	23	186	Employment over-estimated	-50
1843	Sheboygan	4	0	4	No change	0	0	No change	0
1844	Sheboygan	20	18	20	No change	0	18	No change	0
1845	Sheboygan	183	246	160	Res growth over-estimated	-23	282	Employment under-estimated	36
1846	Sheboygan	24	0	24	No change	0	0	No change	0
1847	Sheboygan	250	136	140	Res growth over-estimated	-110	150	Potential business park	14
1848	Sheboygan	150	234	125	Area is built out	-25	234	No change	0
1849	Sheboygan	183	333	205	Strong HH Potential	22	300	Growth over-estimated	-33
1850	Sheboygan	456	82	456	No change	0	82	No change	0
1902	Calumet	415	426	415	From Daar Report	0	426	From Daar Report	0
1903	Calumet	601	704	601	From Daar Report	0	704	From Daar Report	0
1904	Calumet	51	154	54	Applied 5 year growth rate	3	178	Applied 5 year growth rate	24
1905	Calumet	348	525	303	Area is built out	-45	501	Built Out	-24
1906	Calumet	164	710	184	New Subdivision (~20HH)	20	734	Under-estimated	24
1907	Calumet	255	0	222	Area is built out	-33	0	No change expected	0
1908	Calumet	28	130	24	Area is built out	-4	154	Under-estimated	24
1909	Calumet	61	313	53	Area is built out	-8	313	No change expected	0
1910	Calumet	49	14	51	Applied 5 year growth rate	2	14	Applied 5 year growth rate	0
1911	Calumet	118	198	208	Res growth area	90	150	Growth over-estimation	-48
1912	Calumet	90	90	60	Re-Adjusted Boundary	-30	21	Re-Adjusted Boundary	-69
1913	Calumet	141	61	147	Applied 5 year growth rate	6	64	Applied 5 year growth rate	3
1914	Calumet	138	18	110	Growth over-estimation	-28	18	No change expected	0
1915	Calumet	122	107	128	Applied 5 year growth rate	6	112	Applied 5 year growth rate	5
1950	Calumet	61	84	65	Applied 5 year growth rate	4	97	Applied 5 year growth rate	13
1951	Calumet	153	214	163	Applied 5 year growth rate	10	248	Applied 5 year growth rate	34
1952	Calumet	48	34	482	Applied 5 year growth rate	434	194	Applied 5 year growth rate	160
1953	Calumet	45	17	45	No change expected	0	19	Applied 5 year growth rate	2
1954	Calumet	146	200	155	Applied 5 year growth rate	9	231	Applied 5 year growth rate	31
1955	Calumet	118	51	124	Applied 5 year growth rate	6	54	Applied 5 year growth rate	3
1956	Calumet	195	298	170	Over-estimated - area is built out	-25	250	Nearly Built Out	-48
1957	Calumet	122	284	106	Area is built out	-16	284	No change expected	0
1958	Calumet	86	94	75	Area is built out	-11	478	Re-shaped TAZ	384
1959	Calumet	133	0	116	Area is built out	-17	0	No change expected	0
1960	Calumet	117	152	117	Area is built out	0	152	Built Out	0
1961	Calumet	76	76	78	Applied 5 year growth rate	2	85	New Plant/Co-Op (St Anna)	9

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1962	Calumet	59	18	62	Applied 5 year growth rate	3	18	No change expected	0
1963	Calumet	79	69	127	Res growth area	48	73	Applied 5 year growth rate	4
1964	Calumet	42	58	44	Applied 5 year growth rate	2	61	Applied 5 year growth rate	3
1965	Calumet	14	355	14	No change expected	0	355	No change expected	0
1966	Calumet	21	13	21	Applied 5 year growth rate	0	14	Applied 5 year growth rate	1
1967	Calumet	48	17	78	New Subdivision	30	243	Super Wal-Mart and Ind. Park	226
1968	Calumet	39	12	39	Applied 5 year growth rate	0	12	Applied 5 year growth rate	0
1976	Manitowoc	164	58	170	Applied 5 year growth rate	6	61	Applied 5 year growth rate	3
1977	Manitowoc	275	386	450	Long range growth area	175	386	No change expected	0
1978	Manitowoc	151	44	165	Applied 5 year growth rate	14	46	Applied 5 year growth rate	2
1979	Manitowoc	216	104	237	Applied 5 year growth rate	21	108	Applied 5 year growth rate	4
1980	Manitowoc	1	21	1	No change expected	0	35	Employmt growth area	14
1981	Manitowoc	207	55	169	Growth over-estimated	-38	80	Employmt growth area	25
1982	Manitowoc	54	24	44	Growth over-estimated	-10	40	Employmt growth area	16
1983	Manitowoc	11	17	9	Growth over-estimated	-2	35	Employmt growth area	18
1984	Manitowoc	655	200	534	Growth over-estimated	-121	200	No change expected	0
1985	Manitowoc	20	518	16	Growth over-estimated	-4	518	No change expected	0
1986	Manitowoc	304	2153	248	Growth over-estimated	-56	2290	Employmt growth area	137
1987	Manitowoc	326	271	346	Applied 5 year growth rate	20	281	Applied 5 year growth rate	10
1988	Manitowoc	47	141	52	Applied 5 year growth rate	5	147	Applied 5 year growth rate	6
1989	Manitowoc	256	16	209	Growth over-estimated	-47	16	No change expected	0
1990	Manitowoc	657	348	722	Applied 5 year growth rate	65	367	Applied 5 year growth rate	19
1991	Manitowoc	124	163	150	Growth over-estimated	-114	275	Employmt growth area	112
1992	Manitowoc	555	218	593	Applied 5 year growth rate	38	228	Applied 5 year growth rate	10
1993	Manitowoc	309	218	537	Planned neighborhood/growth area	228	218	No change expected	0
1994	Manitowoc	317	208	317	No change expected	0	208	No change expected	0
1995	Manitowoc	200	270	225	More HH Growth	25	279	Applied 5 year growth rate	9
1996	Manitowoc	219	83	180	Limited HH growth expected	-39	83	No change expected	0
1997	Manitowoc	116	60	123	Applied 5 year growth rate	7	61	Applied 5 year growth rate	1
1998	Manitowoc	213	74	224	Applied 5 year growth rate	11	76	Applied 5 year growth rate	2
1999	Manitowoc	401	18	401	No change expected	0	18	No change expected	0
2000	Manitowoc	211	557	250	County staff revision	39	557	No change expected	0
2001	Manitowoc	229	240	187	Growth over-estimated	-42	240	No change expected	0
2002	Manitowoc	410	110	334	Growth over-estimated	-76	110	No change expected	0
2003	Manitowoc	195	81	235	More HH Growth	40	275	Employmt growth area	194
2004	Manitowoc	48	186	115	Long range growth area	67	186	No change expected	0
2005	Manitowoc	200	593	200	No change expected	0	593	No change expected	0
2006	Manitowoc	97	162	98	1 additional household	1	350	Growth expected	188
2007	Manitowoc	290	71	240	Limited HH growth expected	-50	71	No change expected	0
2008	Manitowoc	253	0	253	No change expected	0	0	No change expected	0
2009	Manitowoc	56	28	59	Applied 5 year growth rate	3	29	Applied 5 year growth rate	1
2010	Manitowoc	111	105	118	Applied 5 year growth rate	7	108	Applied 5 year growth rate	3
2011	Manitowoc	623	231	419	Limited HH growth expected	-204	255	Employmt growth area	24
2012	Manitowoc	222	23	222	No change expected	0	23	No change expected	0
2013	Manitowoc	249	197	249	No change expected	0	200	Limited empl growth expected	3

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2014	Manitowoc	502	90	537	Applied 5 year growth rate	35	91	Applied 5 year growth rate	1
2015	Manitowoc	668	368	683	Growth area	15	380	Applied 5 year growth rate	12
2016	Manitowoc	513	533	415	Limited HH growth space	-98	430	Limited Emp Growth Pressure/Space	-103
2017	Manitowoc	123	43	131	Growth area	8	45	Applied 5 year growth rate	2
2018	Manitowoc	84	309	92	Applied 5 year growth rate	8	319	Applied 5 year growth rate	10
2019	Manitowoc	137	258	175	County staff revision	38	258	No change expected	0
2020	Manitowoc	346	713	346	No change expected	0	600	Limited Emp Growth Pressure/Space	-113
2021	Manitowoc	292	103	307	Applied 5 year growth rate	15	104	Applied 5 year growth rate	1
2022	Manitowoc	115	27	115	No change expected	0	27	No change expected	0
2023	Manitowoc	32	65	50	HH development potential	18	65	No change expected	0
2024	Manitowoc	148	85	272	Long-range growth area	124	85	No change expected	0
2025	Manitowoc	294	370	306	Applied 5 year growth rate	12	386	Applied 5 year growth rate	16
2026	Manitowoc	2	302	2	No change expected	0	400	Growth area	98
2027	Manitowoc	70	895	163	Planned neighborhood/growth area	93	1250	Growth area	355
2028	Manitowoc	321	192	625	Long-range growth area	304	192	No change expected	0
2029	Manitowoc	97	98	99	Applied 5 year growth rate	2	35	Growth over-estimated	-63
2030	Manitowoc	252	143	277	Applied 5 year growth rate	25	147	Applied 5 year growth rate	4
2031	Manitowoc	125	625	465	Growth area	340	775	Growth area	150
2032	Manitowoc	491	39	400	Growth over-estimated	-91	39	No change expected	0
2033	Manitowoc	48	372	60	HH development potential	12	372	No change expected	0
2034	Manitowoc	163	97	133	Growth over-estimated	-30	97	No change expected	0
2035	Manitowoc	398	35	398	No change expected	0	35	No change expected	0
2036	Manitowoc	257	149	257	No change expected	0	149	No change expected	0
2037	Manitowoc	402	254	402	No change expected	0	254	No change expected	0
2038	Manitowoc	388	96	370	Area built out	-18	96	No change expected	0
2039	Manitowoc	155	17	200	County staff revision	45	17	No change expected	0
2040	Manitowoc	525	19	428	Growth over-estimated	-97	19	No change expected	0
2041	Manitowoc	302	37	246	Growth over-estimated	-56	37	No change expected	0
2042	Manitowoc	373	88	304	Growth over-estimated	-69	88	No change expected	0
2043	Manitowoc	39	9	50	County staff revision	11	9	No change expected	0
2044	Manitowoc	199	670	162	Growth over-estimated	-37	670	No change expected	0
2045	Manitowoc	387	158	409	Applied 5 year growth rate	22	164	Applied 5 year growth rate	6
2046	Manitowoc	40	104	33	Growth over-estimated	-7	104	No change expected	0
2047	Manitowoc	124	130	101	Growth over-estimated	-23	130	No change expected	0
2048	Manitowoc	282	41	302	Applied 5 year growth rate	20	41	Applied 5 year growth rate	0
2049	Manitowoc	41	469	60	Some hh growth expected	19	565	Employmt growth area	96
2050	Manitowoc	390	3	318	Growth over-estimated	-72	3	No change expected	0
2051	Manitowoc	301	121	500	Planned neighborhood/growth area	199	121	No change expected	0
2052	Manitowoc	215	226	375	Planned neighborhood/growth area	160	226	No change expected	0
2053	Manitowoc	175	51	260	Planned neighborhood/growth area	85	51	No change expected	0
2054	Manitowoc	386	255	315	Growth over-estimated	-71	255	No change expected	0
2055	Manitowoc	110	318	140	Growth area	30	475	Growth expected	157
2056	Manitowoc	404	16	329	Growth over-estimated	-75	16	No change expected	0
2057	Manitowoc	53	29	43	Growth over-estimated	-10	29	No change expected	0
2058	Manitowoc	175	1370	143	Growth over-estimated	-32	1200	Growth over-estimated	-170

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2059	Manitowoc	380	77	310	Growth over-estimated	-70	100	Growth expected	23
2060	Manitowoc	2	126	2	No change expected	0	390	Growth expected	264
2061	Manitowoc	359	731	293	Growth over-estimated	-66	731	No change expected	0
2062	Manitowoc	537	310	438	Growth over-estimated	-99	300	Growth over-estimated	-10
2063	Manitowoc	235	859	300	County staff revision	65	859	No change expected	0
2064	Manitowoc	613	122	975	Planned neighborhood/growth area	362	122	No change expected	0
2065	Manitowoc	182	37	148	Growth over-estimated	-34	37	No change expected	0
2066	Manitowoc	173	272	245	Growth area	72	173	Growth over-estimated	-99
2067	Manitowoc	164	228	115	Nearly Built Out	-49	95	Limited emp growth space	-133
2068	Manitowoc	152	297	105	Nearly Built Out	-47	297	No change expected	0
2069	Manitowoc	392	813	280	Growth over-estimated	-112	510	Mecko - Multiple Locactions	-303
2070	Manitowoc	380	61	310	Growth over-estimated	-70	61	No change expected	0
2071	Manitowoc	183	66	149	Growth over-estimated	-34	75	Growth expected	9
2072	Manitowoc	15	129	15	No change expected	0	315	Growth expected	186
2073	Manitowoc	416	142	340	Growth over-estimated	-76	142	No change expected	0
2074	Manitowoc	390	0	324	Growth over-estimated	-66	0	No change expected	0
2075	Manitowoc	364	509	550	Long range growth area	186	425	Growth over-estimated	-84
2076	Manitowoc	74	10	80	Applied 5 year growth rate	6	11	Applied 5 year growth rate	1
2077	Manitowoc	7	1948	7	No change expected	0	600	Mirro closed	-1348
2078	Manitowoc	278	60	250	Limited hh growth expected	-248	75	Employmt growth area	15
2079	Manitowoc	464	233	487	Applied 5 year growth rate	23	239	Applied 5 year growth rate	6
2080	Manitowoc	547	316	600	Applied 5 year growth rate	53	327	Applied 5 year growth rate	11
2081	Manitowoc	250	48	268	Applied 5 year growth rate	18	50	Applied 5 year growth rate	2
2082	Manitowoc	483	42	489	Applied 5 year growth rate	6	44	Applied 5 year growth rate	2
2083	Manitowoc	26	35	21	Growth over-estimated	-5	35	No change expected	0
2084	Manitowoc	193	88	196	Applied 5 year growth rate	3	125	Dairy Farm	37
2085	Manitowoc	362	244	367	Applied 5 year growth rate	5	255	Applied 5 year growth rate	11
2086	Manitowoc	102	128	83	Growth over-estimated	-19	140	Growth expected	12
2087	Manitowoc	394	251	330	Growth over-estimated	-64	251	No change expected	0
2088	Manitowoc	26	618	21	Growth over-estimated	-5	618	No change expected	0
2089	Manitowoc	147	18	130	Growth over-estimated	-17	74	Growth expected	56
2090	Manitowoc	157	351	154	Growth over-estimated	-3	450	Growth expected	99
2091	Manitowoc	256	7	209	Growth over-estimated	-47	7	No change expected	0
2092	Manitowoc	5	146	5	No change expected	0	500	Growth expected	354
2093	Manitowoc	0	729	0	No change expected	0	729	No change expected	0
2094	Manitowoc	217	129	255	Growth over-estimated	38	129	No change expected	0
2095	Manitowoc	20	83	16	Growth over-estimated	-4	83	No change expected	0
2096	Manitowoc	125	9	102	Growth over-estimated	-23	9	No change expected	0
2097	Manitowoc	1	61	1	No change expected	0	61	No change expected	0
2098	Manitowoc	2	487	2	No change expected	0	487	No change expected	0
2099	Manitowoc	1	25	1	No change expected	0	50	Growth expected	25
2100	Manitowoc	0	103	0	No change expected	0	103	No change expected	0
2101	Manitowoc	2	37	2	No change expected	0	37	No change expected	0
2102	Manitowoc	5	27	4	Growth over-estimated	-1	35	No change expected	8
2103	Manitowoc	21	98	17	Growth over-estimated	-4	98	No change expected	0

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2104	Manitowoc	15	114	12	Growth over-estimated	-3	114	No change expected	0
2105	Manitowoc	93	83	76	Growth over-estimated	-17	83	No change expected	0
2106	Manitowoc	71	251	58	Growth over-estimated	-13	251	No change expected	0
2107	Manitowoc	142	34	116	Growth over-estimated	-26	34	No change expected	0
2108	Manitowoc	158	0	129	Growth over-estimated	-29	10	Growth expected	10
2109	Manitowoc	220	9	179	Growth over-estimated	-41	9	No change expected	0
2110	Manitowoc	194	21	158	Growth over-estimated	-36	21	No change expected	0
2111	Manitowoc	104	62	85	Growth over-estimated	-19	62	No change expected	0
2112	Manitowoc	212	1613	173	Growth over-estimated	-39	1613	No change expected	0
2113	Manitowoc	15	50	12	Growth over-estimated	-3	50	No change expected	0
2114	Manitowoc	0	122	0	No change expected	0	122	No change expected	0
2115	Manitowoc	86	6	70	Growth over-estimated	-16	6	No change expected	0
2116	Manitowoc	184	0	150	Growth over-estimated	-34	0	No change expected	0
2117	Manitowoc	71	2241	58	Growth over-estimated	-13	1961	Growth over-estimated	-280
2118	Manitowoc	113	0	92	Growth over-estimated	-21	0	No change expected	0
2119	Manitowoc	227	44	244	Applied 5 year growth rate	17	46	Applied 5 year growth rate	2
2120	Manitowoc	49	247	40	Growth over-estimated	-9	350	Employmt growth area	103
2121	Manitowoc	149	69	159	Applied 5 year growth rate	10	72	Applied 5 year growth rate	3
2122	Manitowoc	225	94	237	Applied 5 year growth rate	12	96	Applied 5 year growth rate	2
2123	Manitowoc	375	177	394	Applied 5 year growth rate	19	181	Applied 5 year growth rate	4
2124	Manitowoc	271	56	315	HH development potential	44	25	Over-estimation	-31
2125	Manitowoc	175	132	113	Limited HH Growth	-62	5	Over-estimation	-127
2126	Manitowoc	363	9	296	Growth over-estimated	-67	9	No change expected	0
2127	Manitowoc	216	16	206	Built Out	-10	16	No change expected	0
2128	Manitowoc	341	464	221	Limited HH Growth	-120	464	No change expected	0
2129	Manitowoc	297	181	242	Growth over-estimated	-55	181	No change expected	0
2130	Manitowoc	4	15	3	Growth over-estimated	-1	30	Growth expected	15
2131	Manitowoc	52	134	40	Limited HH growth space	-12	45	Mis-Allocation of Golf Resort Jobs	-89
2132	Manitowoc	5	27	4	Growth over-estimated	-1	40	Growth expected	13
2133	Manitowoc	0	50	0	No change expected	0	50	No change expected	0
2134	Manitowoc	15	19	12	Growth over-estimated	-3	19	No change expected	0
2135	Manitowoc	22	39	22	No change expected	0	27	Limited emp growth space	-12
2136	Manitowoc	0	17	0	No change expected	0	17	No change expected	0
2137	Manitowoc	0	59	0	No change expected	0	59	No change expected	0
2138	Manitowoc	1	15	1	No change expected	0	30	Growth expected	15
2139	Manitowoc	0	13	20	No growth expected	20	13	No change expected	0
2140	Manitowoc	0	27	0	No change expected	0	40	Growth expected	13
2141	Manitowoc	5	24	5	No change expected	0	75	Growth expected	51
2142	Manitowoc	67	121	70	Applied 5 year growth rate	3	127	Applied 5 year growth rate	6
2143	Manitowoc	171	74	139	Growth over-estimated	-32	74	No change expected	0
2144	Manitowoc	64	16	52	Growth over-estimated	-12	35	Growth expected	19
2145	Manitowoc	0	65	0	No change expected	0	65	No change expected	0
2146	Manitowoc	9	31	9	No change expected	0	40	Growth expected	9
2147	Manitowoc	4	30	4	No change expected	0	50	Growth expected	20
2148	Manitowoc	104	0	85	Growth over-estimated	-19	0	No change expected	0

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2149	Manitowoc	59	45	75	Growth expected	16	45	No change expected	0
2150	Manitowoc	62	15	75	Growth expected	13	15	No change expected	0
2151	Manitowoc	141	41	115	Growth over-estimated	-26	41	No change expected	0
2152	Manitowoc	209	133	170	Growth over-estimated	-39	133	No change expected	0
2153	Manitowoc	126	34	135	Applied 5 year growth rate	9	34	No change expected	0
2154	Manitowoc	152	195	141	Growth over-estimated	-11	195	No change expected	0
2155	Manitowoc	269	261	650	Planned neighborhood/growth area	381	261	No change expected	0
2156	Manitowoc	122	21	150	County staff revision	28	21	No change expected	0
2157	Manitowoc	139	1104	144	Applied 5 year growth rate	5	1135	Applied 5 year growth rate	31
2158	Manitowoc	129	97	105	Growth over-estimated	-24	97	No change expected	0
2159	Manitowoc	40	97	33	Growth over-estimated	-7	97	No change expected	0
2160	Manitowoc	229	0	187	Growth over-estimated	-42	0	No change expected	0
2161	Manitowoc	74	1149	74	No change expected	0	750	Growth over-estimated	-399
2162	Manitowoc	185	89	265	County staff revision	80	74	Limited emp growth space	-15
2163	Manitowoc	4	77	4	No change expected	0	77	No change expected	0
2164	Manitowoc	90	11	86	Built Out	-4	11	No change expected	0
2165	Manitowoc	88	46	72	Growth over-estimated	-16	46	No change expected	0
2166	Manitowoc	0	48	0	No change expected	0	48	No change expected	0
2167	Manitowoc	115	70	115	No change expected	0	70	No change expected	0
2168	Manitowoc	236	55	253	Applied 5 year growth rate	17	57	Applied 5 year growth rate	2
2169	Manitowoc	7	92	7	No change expected	0	92	No change expected	0
2170	Manitowoc	38	94	31	Growth over-estimated	-7	94	No change expected	0
2171	Manitowoc	1	112	1	No change expected	0	112	No change expected	0
2172	Manitowoc	114	50	93	Growth over-estimated	-21	50	No change expected	0
2173	Manitowoc	0	64	0	No change expected	0	64	No change expected	0
2174	Manitowoc	145	175	118	Growth over-estimated	-27	175	No change expected	0
2175	Manitowoc	180	125	147	Growth over-estimated	-33	400	Growth expected	275
2176	Manitowoc	377	40	333	Growth over-estimated	-44	40	No change expected	0
2177	Manitowoc	10	176	30	County staff revision	20	200	Emp Potential	24
2178	Manitowoc	370	46	370	No change expected	0	46	No change expected	0
2179	Manitowoc	149	33	180	County staff revision	31	33	OK - Apply 5yr GR	0
2180	Manitowoc	0	641	0	No change expected	0	641	No change expected	0
2181	Manitowoc	67	36	70	Applied 5 year growth rate	3	37	OK - Apply 5yr GR	1
2182	Manitowoc	152	153	165	HH development potential	13	153	No change expected	0
2183	Manitowoc	283	45	270	Built Out	-13	80	Under-estimation (Schools)	35
2184	Manitowoc	71	28	71	No change expected	0	9	OVer-estimation	-19
2185	Manitowoc	47	226	77	HH development potential	30	226	No change expected	0
2186	Manitowoc	22	29	22	No change expected	0	29	No change expected	0
2187	Manitowoc	17	37	16	Built Out	-1	30	Limited emp growth expected	-7
2188	Manitowoc	75	74	72	Built Out	-3	74	No change expected	0
2189	Manitowoc	9	64	29	HH development potential	20	64	No change expected	0
2190	Manitowoc	52	84	52	No change expected	0	84	No change expected	0
2191	Manitowoc	38	23	79	Growth area	41	23	No change expected	0
2192	Manitowoc	79	46	84	Applied 5 year growth rate	5	49	Applied 5 year growth rate	3
2193	Manitowoc	236	8	192	Growth over-estimated	-44	8	No change expected	0

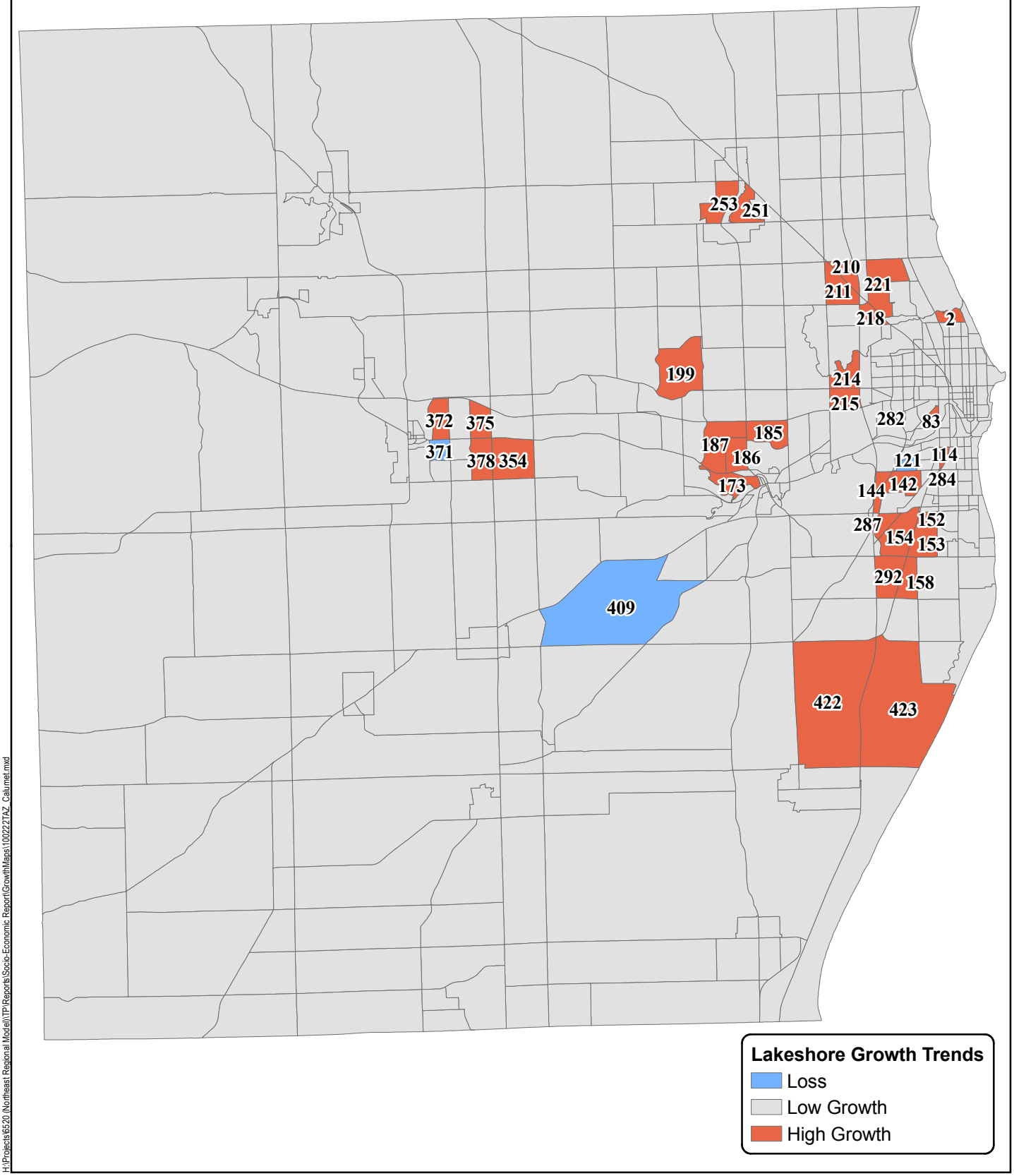
NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
2194	Manitowoc	29	195	30	Applied 5 year growth rate	1	202	Applied 5 year growth rate	7
2195	Manitowoc	348	40	294	Growth over-estimated	-54	60	Employmt growth area	20
2196	Manitowoc	163	86	124	Limited HH Growth	-39	190	Double Check	104
2197	Manitowoc	124	266	101	Growth over-estimated	-23	266	No change expected	0
2198	Manitowoc	253	0	206	Growth over-estimated	-47	0	No change expected	0
2199	Manitowoc	69	55	73	Applied 5 year growth rate	4	56	Applied 5 year growth rate	1
2200	Manitowoc	22	154	21	Built Out	-1	154	No change expected	0
2201	Manitowoc	216	60	205	Built Out	-11	49	Over-estimation	-11
2202	Manitowoc	199	15	190	Built Out	-9	10	Over-estimation	-5
2203	Manitowoc	65	0	53	Growth over-estimated	-12	0	No change expected	0
2204	Manitowoc	107	177	114	Applied 5 year growth rate	7	181	Applied 5 year growth rate	4
2205	Manitowoc	158	57	168	Applied 5 year growth rate	10	59	Applied 5 year growth rate	2
2206	Manitowoc	173	185	200	More HH Growth	27	185	No change expected	0
2207	Manitowoc	417	107	328	Limited HH Growth	-89	107	No change expected	0
2596	Kewaunee	420	517	420	No change expected	0	600	Under-estimation (Schools)	83
2597	Kewaunee	111	87	111	No change expected	0	107	Business Park & Hwy Commercial	20
2598	Kewaunee	59	11	59	No change expected	0	12	Applied 5 year growth rate	1
2599	Kewaunee	254	637	254	No change expected	0	668	Applied 5 year growth rate	31
2600	Kewaunee	216	138	216	No change expected	0	160	Kewaunee County staff revision	22
2601	Kewaunee	273	83	273	No change expected	0	115	Kewaunee County staff revision	32
2602	Kewaunee	219	107	219	Applied 5 year growth rate	0	115	Applied 5 year growth rate	8
2603	Kewaunee	156	61	156	Applied 5 year growth rate	0	65	Applied 5 year growth rate	4
2604	Kewaunee	336	784	336	No change expected	0	560	Kewaunee Machine closed 2002	-224
2605	Kewaunee	180	70	180	No change expected	0	73	Applied 5 year growth rate	3
2606	Kewaunee	128	36	128	No change expected	0	38	Applied 5 year growth rate	2
2607	Kewaunee	267	116	267	No change expected	0	120	Applied 5 year growth rate	4
2608	Kewaunee	262	75	262	No change expected	0	78	Applied 5 year growth rate	3
2609	Kewaunee	360	242	400	Infrastructure and land available	40	242	No emp growth expected	0
2610	Kewaunee	148	30	148	No change expected	0	32	Applied 5 year growth rate	2
2611	Kewaunee	132	143	133	Expansion to east expected	1	280	Under-estimation	137
2612	Kewaunee	351	174	234	Area is built out	-117	102	Over-estimation	-72
2613	Kewaunee	183	36	208	Infrastructure and land available	25	36	No emp growth expected	0
2614	Kewaunee	629	478	419	Area is built out	-210	413	Over-estimation	-65
2615	Kewaunee	137	104	137	No change expected	0	110	Applied 5 year growth rate	6
2616	Kewaunee	133	110	133	No change expected	0	118	Applied 5 year growth rate	8
2617	Kewaunee	167	95	167	No change expected	0	130	Kewaunee County staff revision	35
2618	Kewaunee	122	71	122	No change expected	0	75	Applied 5 year growth rate	4
2619	Kewaunee	40	90	40	No change expected	0	95	Applied 5 year growth rate	5
2620	Kewaunee	35	22	35	No change expected	0	23	Applied 5 year growth rate	1
2621	Kewaunee	166	70	166	No change expected	0	74	Applied 5 year growth rate	4
2622	Kewaunee	152	107	152	No change expected	0	113	Applied 5 year growth rate	6
2623	Kewaunee	62	32	62	No change expected	0	34	Applied 5 year growth rate	2
2624	Kewaunee	183	110	183	No change expected	0	116	Applied 5 year growth rate	6
2625	Kewaunee	270	149	270	No change expected	0	154	Applied 5 year growth rate	5
2626	Kewaunee	182	78	182	No change expected	0	82	Applied 5 year growth rate	4

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
2627	Kewaunee	511	735	398	Area is built out	-113	550	Kewaunee Machine closed 2002	-185
2628	Kewaunee	8	26	26	Duplex construction	0	28	Applied 5 year growth rate	2
2629	Kewaunee	0	769	0	No change expected	0	694	Over-estimation	-75
2630	Kewaunee	261	75	261	No change expected	0	79	Applied 5 year growth rate	4
2631	Kewaunee	218	193	312	Applied 5 year growth rate	94	208	Applied 5 year growth rate	15
2632	Kewaunee	259	107	360	Probable Infill Development near School	101	107	No emp growth expected	0
2633	Kewaunee	44	10	44	No change expected	0	10	No emp growth expected	0
2634	Kewaunee	131	82	131	No change expected	0	86	Applied 5 year growth rate	4
2635	Kewaunee	72	70	223	Luxemburg Probable Growth	151	74	Applied 5 year growth rate	4
2636	Kewaunee	135	103	192	Applied 5 year growth rate	57	111	Applied 5 year growth rate	8
2637	Kewaunee	269	187	269	No change expected	0	194	Applied 5 year growth rate	7
2638	Kewaunee	368	675	330	Area is built out	-38	600	Over-estimation	-75
2639	Kewaunee	225	273	418	Luxemburg probable growth area	193	288	Applied 5 year growth rate	15
2640	Kewaunee	149	138	149	No change expected	0	149	Applied 5 year growth rate	11
2641	Kewaunee	361	202	380	Probable growth here	19	300	Under-estimated	98
2642	Kewaunee	4	751	125	Probable multi-family res	121	700	Over-estimation + New Pamida	-51
2643	Kewaunee	45	643	45	No change expected	0	150	Olsonite closed	-493
2644	Kewaunee	154	102	154	No change expected	0	108	Applied 5 year growth rate	6
2645	Kewaunee	415	69	415	No change expected	0	69	No emp growth expected	0
2646	Kewaunee	69	113	69	No change expected	0	117	Applied 5 year growth rate	4
2647	Kewaunee	95	46	95	No change expected	0	48	Applied 5 year growth rate	2
2648	Kewaunee	77	69	77	No change expected	0	73	Applied 5 year growth rate	4
2656	Door	311	85	377	Applied BLRPC growth rate	66	90	Applied 5 yr growth rate	5
2657	Door	349	345	245	Applied BLRPC growth rate	-104	361	Applied 5 yr growth rate	16
2658	Door	173	191	173	Revision from City of Sturgeon Bay	0	100	Revision from City of Sturgeon Bay	-91
2659	Door	128	61	123	Applied BLRPC growth rate	-5	64	Applied 5 yr growth rate	3
2660	Door	326	125	375	Applied BLRPC growth rate	49	135	Applied 5 yr growth rate	10
2661	Door	562	334	481	Applied BLRPC growth rate	-81	349	Applied 5 yr growth rate	15
2662	Door	295	51	271	Applied BLRPC growth rate	-24	53	Applied 5 yr growth rate	2
2663	Door	373	209	373	Revision from City of Sturgeon Bay	0	275	Revision from City of Sturgeon Bay	66
2664	Door	253	0	253	Revision from City of Sturgeon Bay	0	10	Revision from City of Sturgeon Bay	10
2665	Door	114	140	244	Revision from City of Sturgeon Bay	130	120	Revision from City of Sturgeon Bay	-20
2666	Door	15	729	15	Revision from City of Sturgeon Bay	0	625	Revision from City of Sturgeon Bay	-104
2667	Door	229	45	239	Revision from City of Sturgeon Bay	10	10	Revision from City of Sturgeon Bay	-35
2668	Door	135	211	115	Revision from City of Sturgeon Bay	-20	115	Revision from City of Sturgeon Bay	-96
2669	Door	229	12	199	Revision from City of Sturgeon Bay	-30	12	Revision from City of Sturgeon Bay	0
2670	Door	125	207	125	Revision from City of Sturgeon Bay	0	207	Revision from City of Sturgeon Bay	0
2671	Door	19	1498	19	Revision from City of Sturgeon Bay	0	1000	Revision from City of Sturgeon Bay	-498
2672	Door	355	172	295	Revision from City of Sturgeon Bay	-60	300	Revision from City of Sturgeon Bay	128
2673	Door	200	0	170	Revision from City of Sturgeon Bay	-30	0	Revision from City of Sturgeon Bay	0
2674	Door	508	105	428	Revision from City of Sturgeon Bay	-80	105	Revision from City of Sturgeon Bay	0
2675	Door	751	651	562	Applied BLRPC growth rate	-189	680	Applied 5 yr growth rate	29
2676	Door	269	72	257	Applied BLRPC growth rate	-12	73	Applied 5 yr growth rate	1
2677	Door	1	667	1	Revision from City of Sturgeon Bay	0	1200	Revision from City of Sturgeon Bay	533
2678	Door	124	118	104	Revision from City of Sturgeon Bay	-20	118	Revision from City of Sturgeon Bay	0

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
2679	Door	122	45	133	Applied BLRPC growth rate	11	46	Applied 5 yr growth rate	1
2680	Door	0	348	0	Revision from City of Sturgeon Bay	0	200	Revision from City of Sturgeon Bay	-148
2681	Door	94	7	94	Revision from City of Sturgeon Bay	0	50	Revision from City of Sturgeon Bay	43
2682	Door	63	20	63	Revision from City of Sturgeon Bay	0	100	Revision from City of Sturgeon Bay	80
2683	Door	21	405	61	Revision from City of Sturgeon Bay	40	420	Revision from City of Sturgeon Bay	15
2684	Door	23	356	23	Revision from City of Sturgeon Bay	0	210	Revision from City of Sturgeon Bay	-146
2685	Door	19	156	19	Revision from City of Sturgeon Bay	0	250	Revision from City of Sturgeon Bay	94
2686	Door	35	321	35	Revision from City of Sturgeon Bay	0	415	Revision from City of Sturgeon Bay	94
2687	Door	346	220	306	Revision from City of Sturgeon Bay	-40	183	Revision from City of Sturgeon Bay	-37
2688	Door	87	92	65	Applied BLRPC growth rate	-22	97	Applied 5 yr growth rate	5
2689	Door	85	109	105	Revision from City of Sturgeon Bay	20	109	Revision from City of Sturgeon Bay	0
2690	Door	27	220	37	Revision from City of Sturgeon Bay	10	220	Revision from City of Sturgeon Bay	0
2691	Door	35	109	30	Applied BLRPC growth rate	-5	114	Applied 5 yr growth rate	5
2692	Door	343	416	294	Applied BLRPC growth rate	-49	434	Applied 5 yr growth rate	18
2693	Door	582	156	498	Applied BLRPC growth rate	-84	163	Applied 5 yr growth rate	7
2694	Door	503	174	430	Applied BLRPC growth rate	-73	182	Applied 5 yr growth rate	8
2695	Door	269	145	230	Applied BLRPC growth rate	-39	151	Applied 5 yr growth rate	6
2696	Door	316	192	222	Applied BLRPC growth rate	-94	201	Applied 5 yr growth rate	9
2697	Door	113	27	108	Applied BLRPC growth rate	-5	28	Applied 5 yr growth rate	1
2698	Door	258	99	218	Revision from City of Sturgeon Bay	-40	99	Revision from City of Sturgeon Bay	0
2699	Door	186	27	171	Applied BLRPC growth rate	-15	28	Applied 5 yr growth rate	1
2700	Door	86	32	99	Applied BLRPC growth rate	13	35	Applied 5 yr growth rate	3
2701	Door	105	46	96	Applied BLRPC growth rate	-9	48	Applied 5 yr growth rate	2
2702	Door	108	420	88	Revision from City of Sturgeon Bay	-20	375	Revision from City of Sturgeon Bay	-45
2703	Door	94	27	95	Applied BLRPC growth rate	1	29	Applied 5 yr growth rate	2
2704	Door	172	97	127	Applied BLRPC growth rate	-45	101	Applied 5 yr growth rate	4
2705	Door	223	401	214	Applied BLRPC growth rate	-9	420	Applied 5 yr growth rate	19
2706	Door	115	703	95	Revision from City of Sturgeon Bay	-20	325	Revision from City of Sturgeon Bay	-378
2707	Door	87	438	87	Revision from City of Sturgeon Bay	0	578	Revision from City of Sturgeon Bay	140
2708	Door	56	13	76	Revision from City of Sturgeon Bay	20	70	Revision from City of Sturgeon Bay	57
2709	Door	167	13	137	Revision from City of Sturgeon Bay	-30	30	Revision from City of Sturgeon Bay	17
2710	Door	179	124	149	Revision from City of Sturgeon Bay	-30	300	Revision from City of Sturgeon Bay	176
2711	Door	178	145	205	Applied BLRPC growth rate	27	153	Applied 5 yr growth rate	8
2712	Door	30	125	22	Applied BLRPC growth rate	-8	132	Applied 5 yr growth rate	7
2713	Door	837	124	587	Applied BLRPC growth rate	-250	130	Applied 5 yr growth rate	6
2714	Door	224	59	184	Revision from City of Sturgeon Bay	-40	80	Revision from City of Sturgeon Bay	21
2715	Door	0	214	0	Revision from City of Sturgeon Bay	0	214	Revision from City of Sturgeon Bay	0
2716	Door	215	111	151	Applied BLRPC growth rate	-64	116	Applied 5 yr growth rate	5
2717	Door	209	2	178	Revision from City of Sturgeon Bay	-31	20	Revision from City of Sturgeon Bay	18
2718	Door	210	67	147	Applied BLRPC growth rate	-63	69	Applied 5 yr growth rate	2
2719	Door	9	220	29	Revision from City of Sturgeon Bay	20	300	Revision from City of Sturgeon Bay	80
2720	Door	154	268	194	Revision from City of Sturgeon Bay	40	577	Revision from City of Sturgeon Bay	309
2721	Door	232	60	163	Applied BLRPC growth rate	-69	63	Applied 5 yr growth rate	3
2722	Door	113	52	123	Revision from City of Sturgeon Bay	10	52	Revision from City of Sturgeon Bay	0
2723	Door	136	46	266	Revision from City of Sturgeon Bay	130	193	Revision from City of Sturgeon Bay	147

NE TAZ	County	Households 2035	Employment 2035	Households 2035 (Adj)	Comment on Changes to Households	Total HH Change	Employment 2035 (Adj)	Comment on Changes to Employment	Total Employment Change
2724	Door	144	84	146	Applied BLRPC growth rate	2	88	Applied 5 yr growth rate	4
2725	Door	354	175	354	Revision from City of Sturgeon Bay	0	100	Revision from City of Sturgeon Bay	-75
2726	Door	88	67	98	Revision from City of Sturgeon Bay	10	67	Revision from City of Sturgeon Bay	0
2727	Door	424	69	430	Applied BLRPC growth rate	6	72	Applied 5 yr growth rate	3
2728	Door	73	191	83	Revision from City of Sturgeon Bay	10	50	Revision from City of Sturgeon Bay	-141
2729	Door	349	125	380	Applied BLRPC growth rate	31	132	Applied 5 yr growth rate	7
2730	Door	123	173	92	Applied BLRPC growth rate	-31	181	Applied 5 yr growth rate	8
2731	Door	98	0	98	Revision from City of Sturgeon Bay	0	0	Revision from City of Sturgeon Bay	0
2732	Door	294	160	357	Applied BLRPC growth rate	63	169	Applied 5 year growth rate	9
2733	Door	167	45	192	Applied BLRPC growth rate	25	48	Applied 5 year growth rate	3
2734	Door	230	289	260	Revision from City of Sturgeon Bay	30	289	Revision from City of Sturgeon Bay	0
2735	Door	149	0	159	Revision from City of Sturgeon Bay	10	60	Revision from City of Sturgeon Bay	60
2736	Door	187	116	200	Applied BLRPC growth rate	13	116	Applied 5 year growth rate	0
2737	Door	295	139	321	Applied BLRPC growth rate	26	146	Applied 5 year growth rate	7
2738	Door	306	161	336	Applied BLRPC growth rate	30	166	Applied 5 year growth rate	5
2739	Door	197	60	189	Applied BLRPC growth rate	-8	61	Applied 5 year growth rate	1
2740	Door	668	422	500	Applied BLRPC growth rate	-168	445	Applied 5 year growth rate	23
2741	Door	697	164	596	Applied BLRPC growth rate	-101	171	Applied 5 year growth rate	7
2742	Door	402	259	368	Applied BLRPC growth rate	-34	262	Applied 5 year growth rate	3

APPENDIX C –Socio-economic Data Maps



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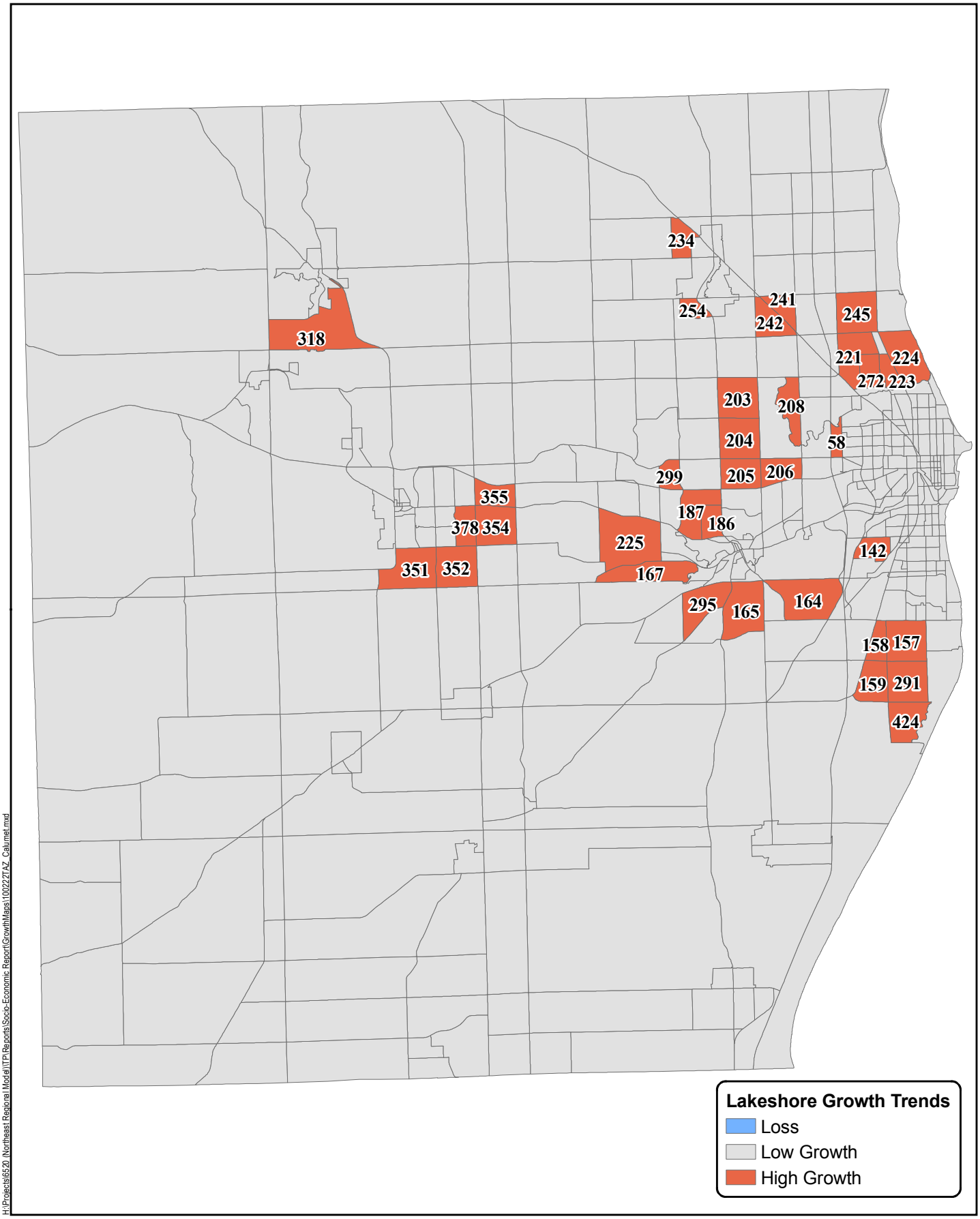
SRF Consulting Group, Inc.

Sheboygan County - Employment Change 2005-2035

Figure C.1

Northeast Travel Demand Model

Wisconsin Department of Transportation



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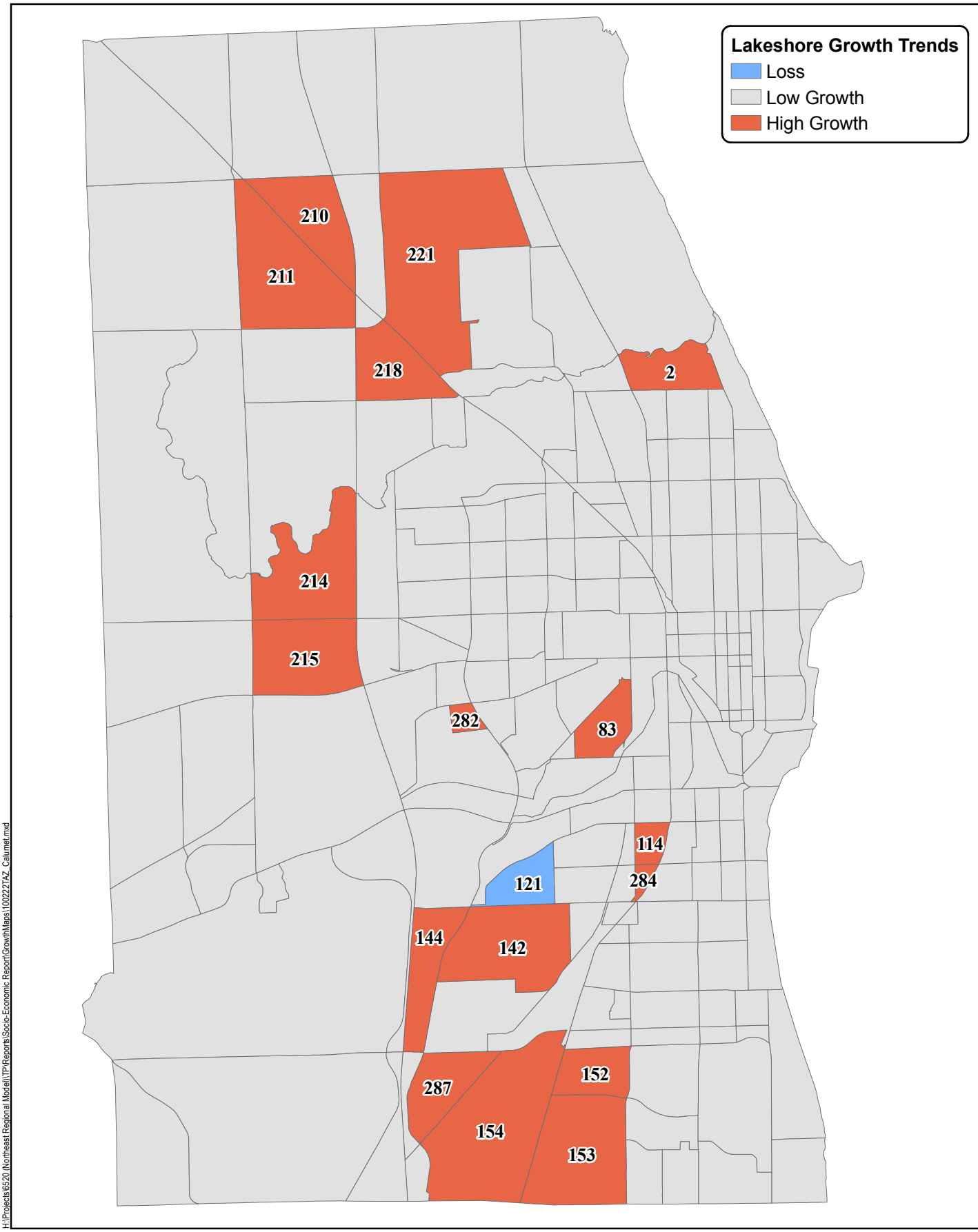
SRF Consulting Group, Inc.

Sheboygan County - Household Change 2005-2035

Figure C.2

Northeast Travel Demand Model

Wisconsin Department of Transportation



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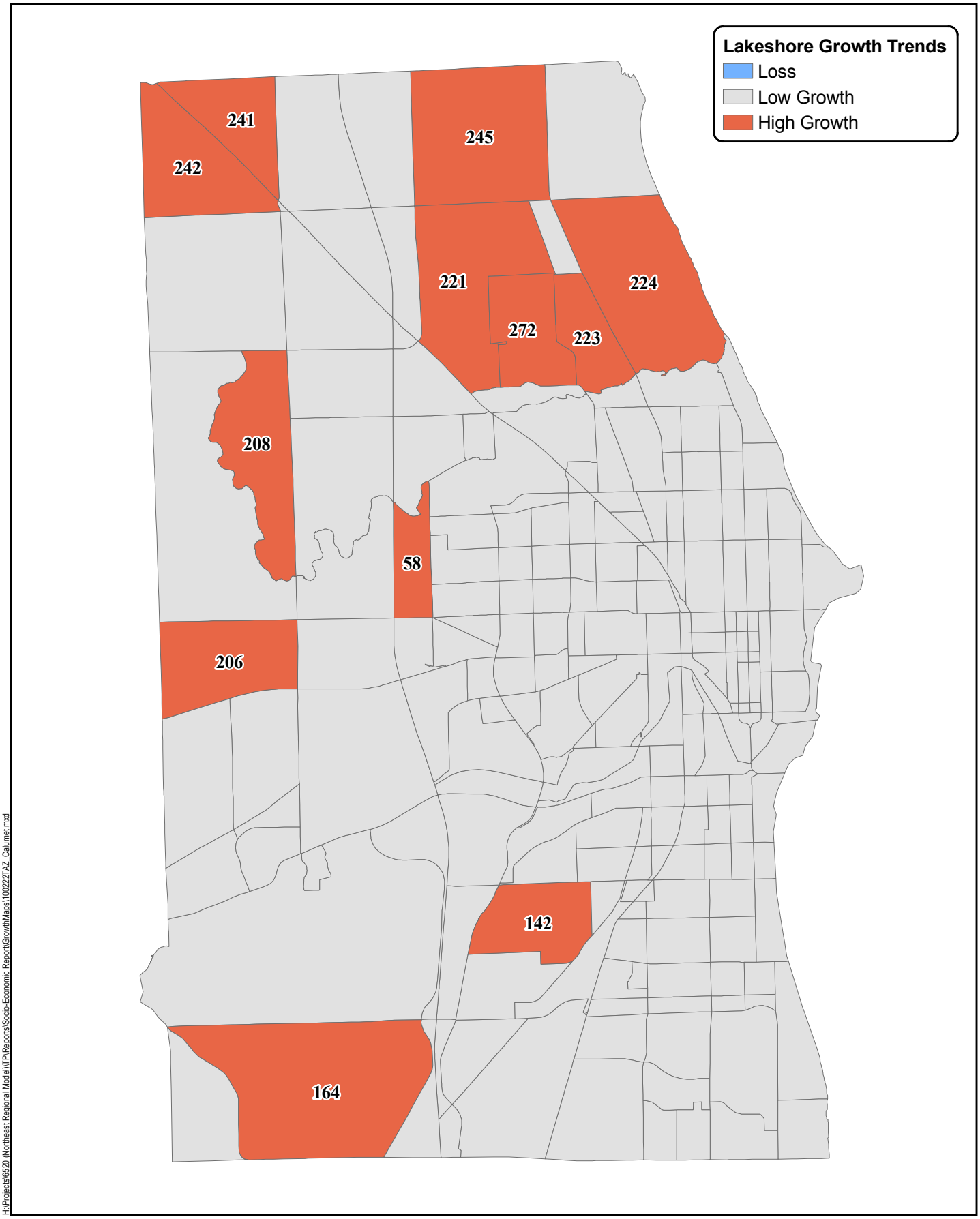
SRF Consulting Group, Inc.

City of Sheboygan - Employment Change 2005-2035

Northeast Travel Demand Model

Wisconsin Department of Transportation

Figure C.3



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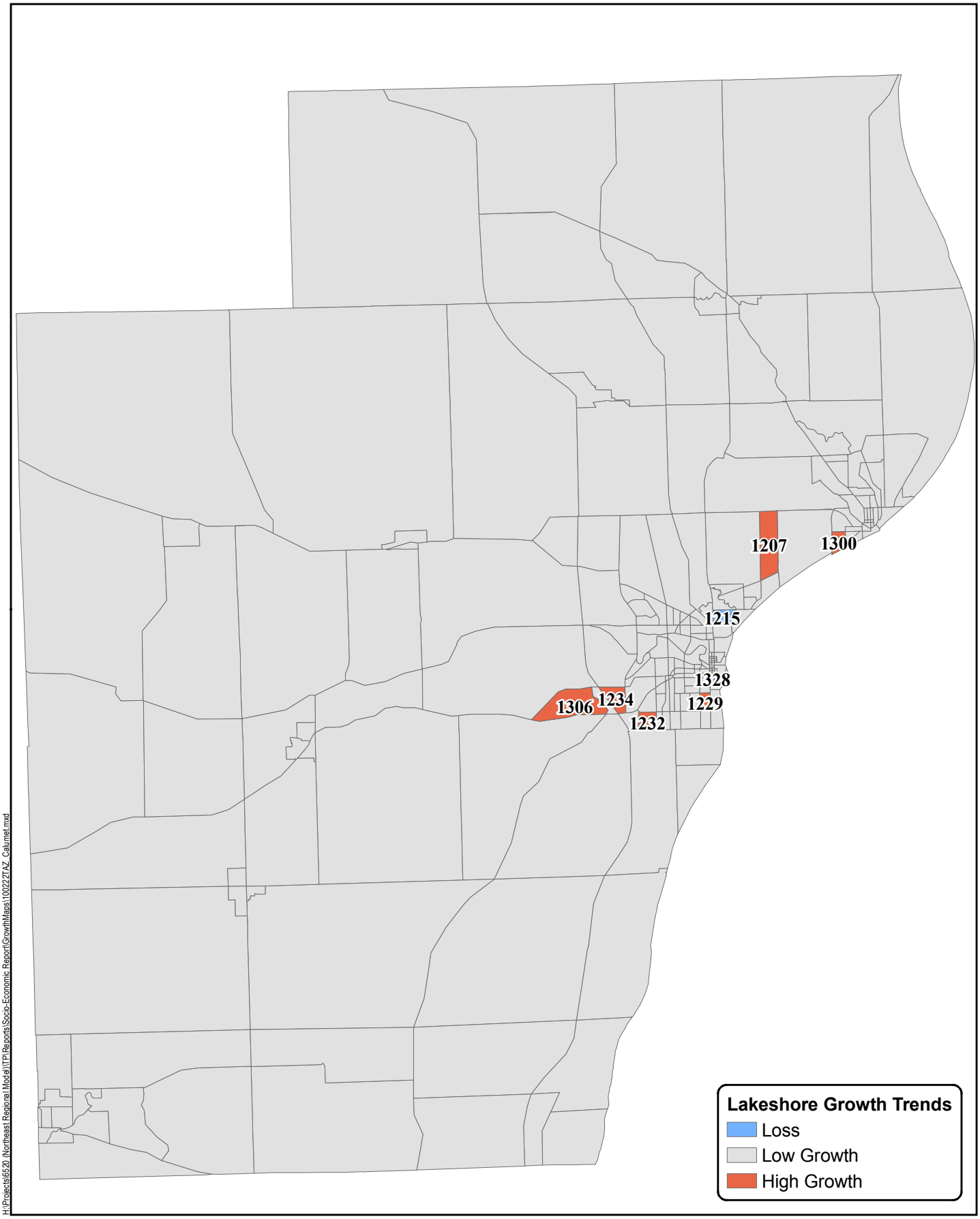
SRF Consulting Group, Inc.

City of Sheboygan - Household Change 2005-2035

Northeast Travel Demand Model

Wisconsin Department of Transportation

Figure C.4



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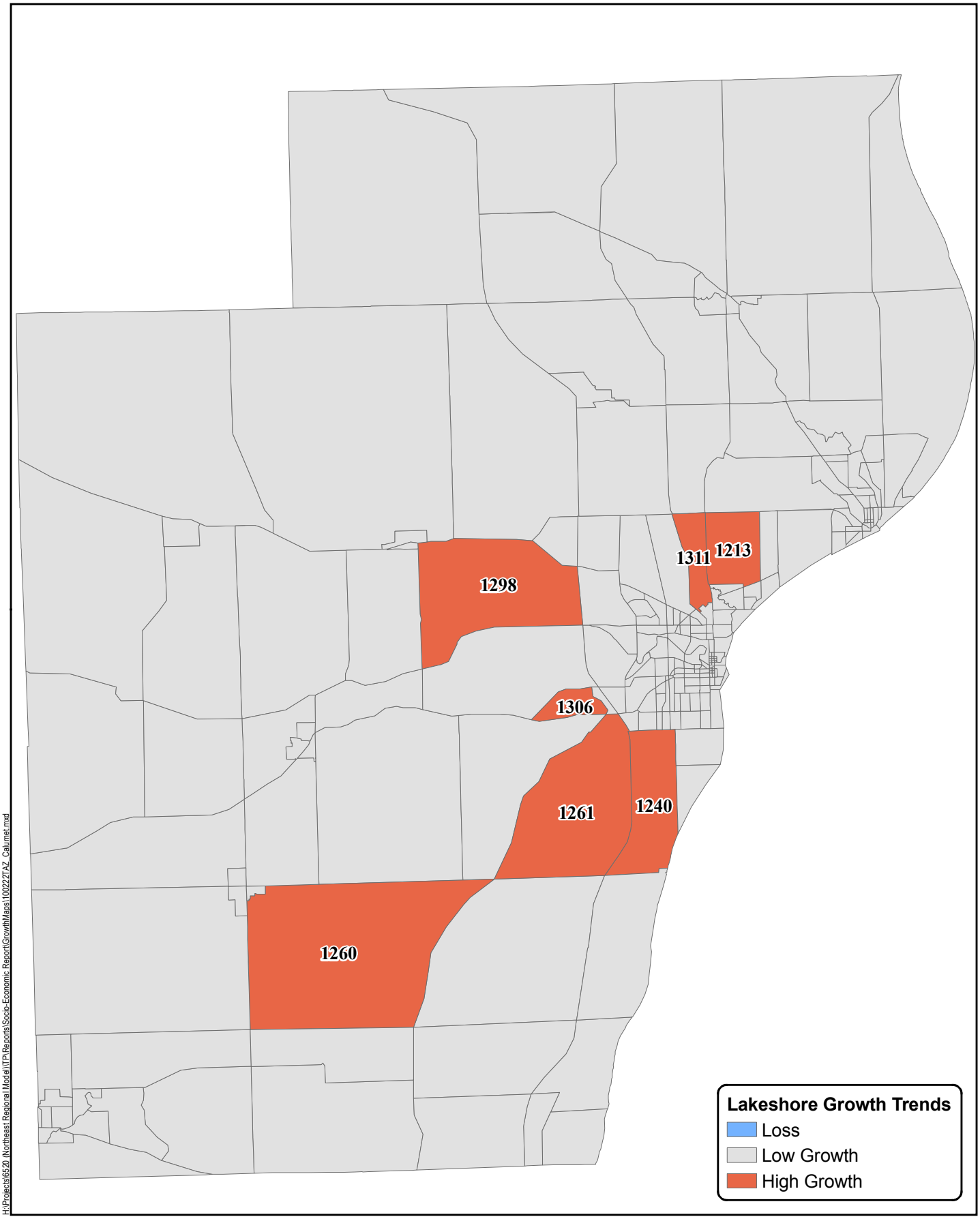
SRF Consulting Group, Inc.

Manitowoc County - Employment Change 2005-2035

Figure C.5

Northeast Travel Demand Model

Wisconsin Department of Transportation



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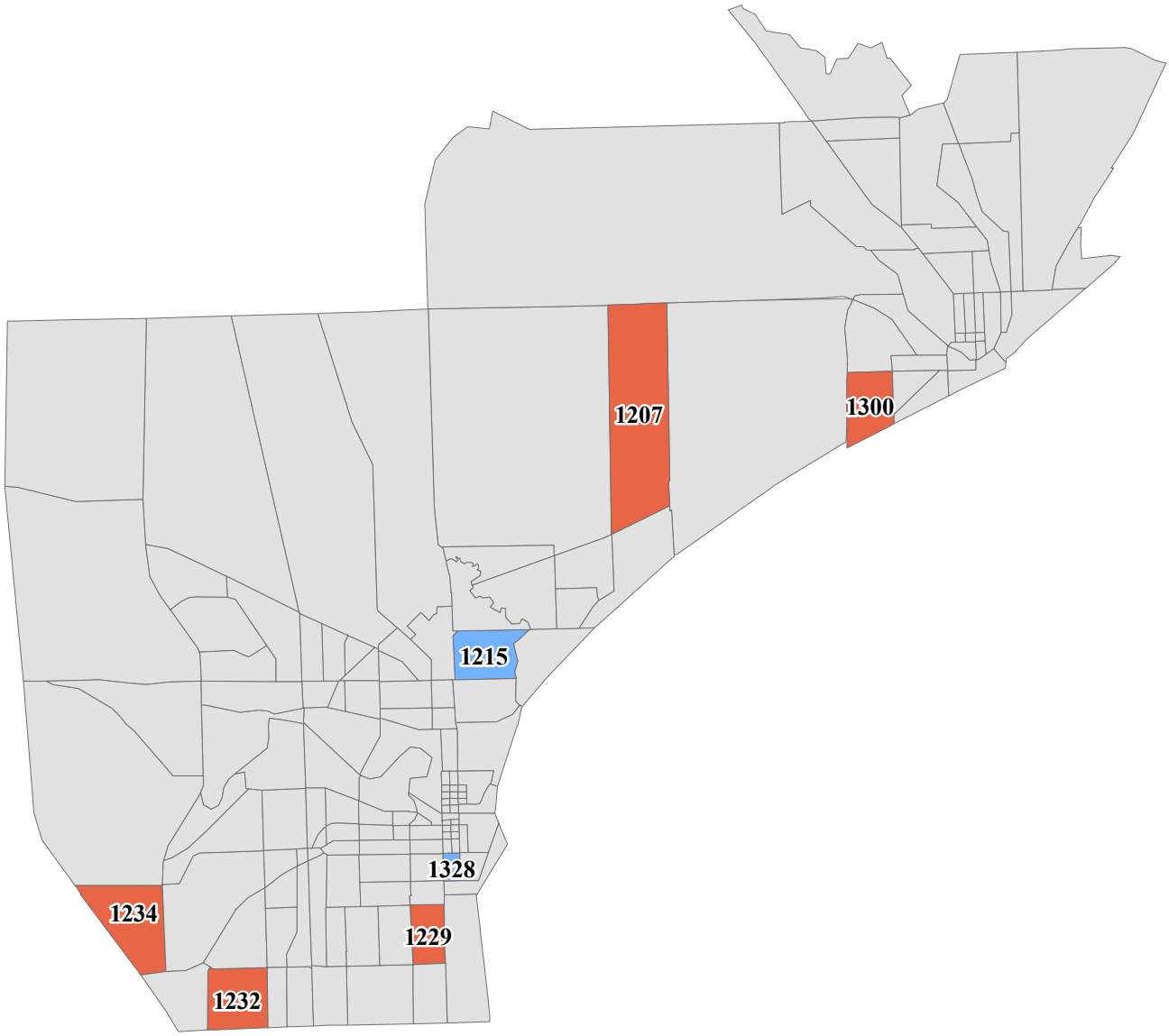
SRF Consulting Group, Inc.

Manitowoc County - Household Change 2005-2035

Figure C.6

Northeast Travel Demand Model

Wisconsin Department of Transportation



Lakeshore Growth Trends
- Loss
- Low Growth
- High Growth

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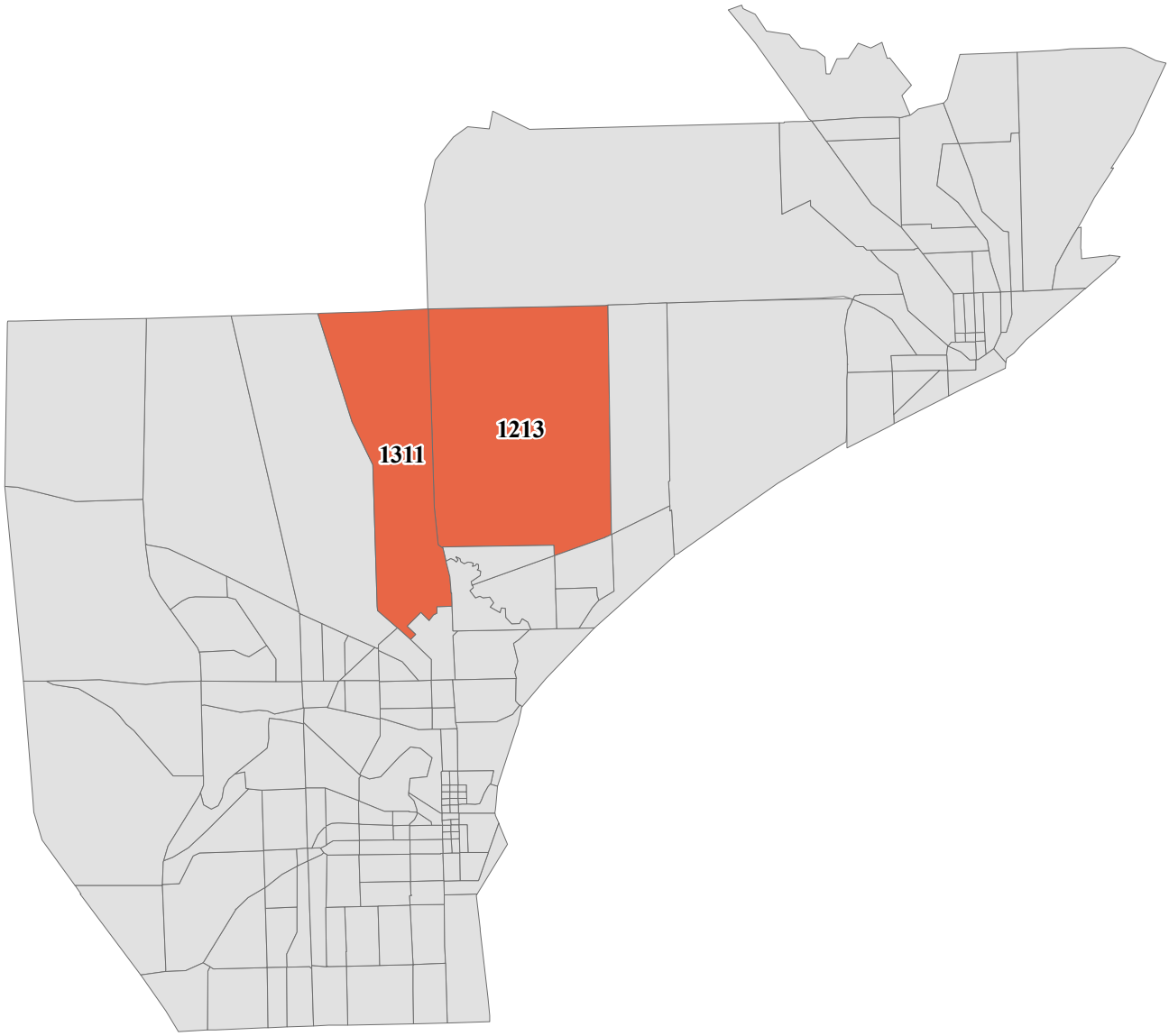
SRF Consulting Group, Inc.

Cities of Manitowoc and Two Rivers - Employment Change 2005-2035

Figure C.7

Northeast Travel Demand Model

Wisconsin Department of Transportation



Lakeshore Growth Trends
- Loss
- Low Growth
- High Growth

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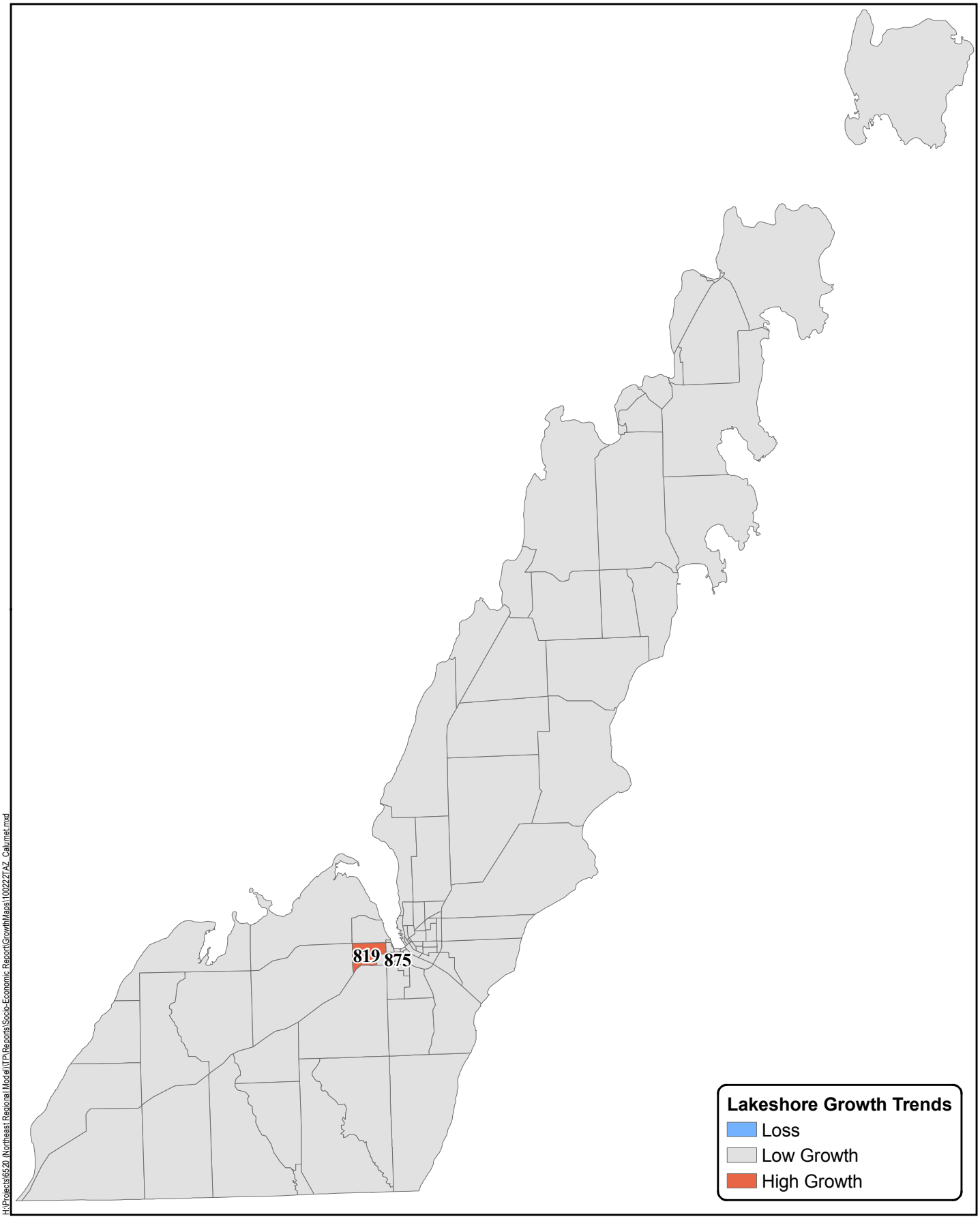
SRF Consulting Group, Inc.

Cities of Manitowoc and Two Rivers - Household Change 2005-2035

Figure C.8

Northeast Travel Demand Model

Wisconsin Department of Transportation



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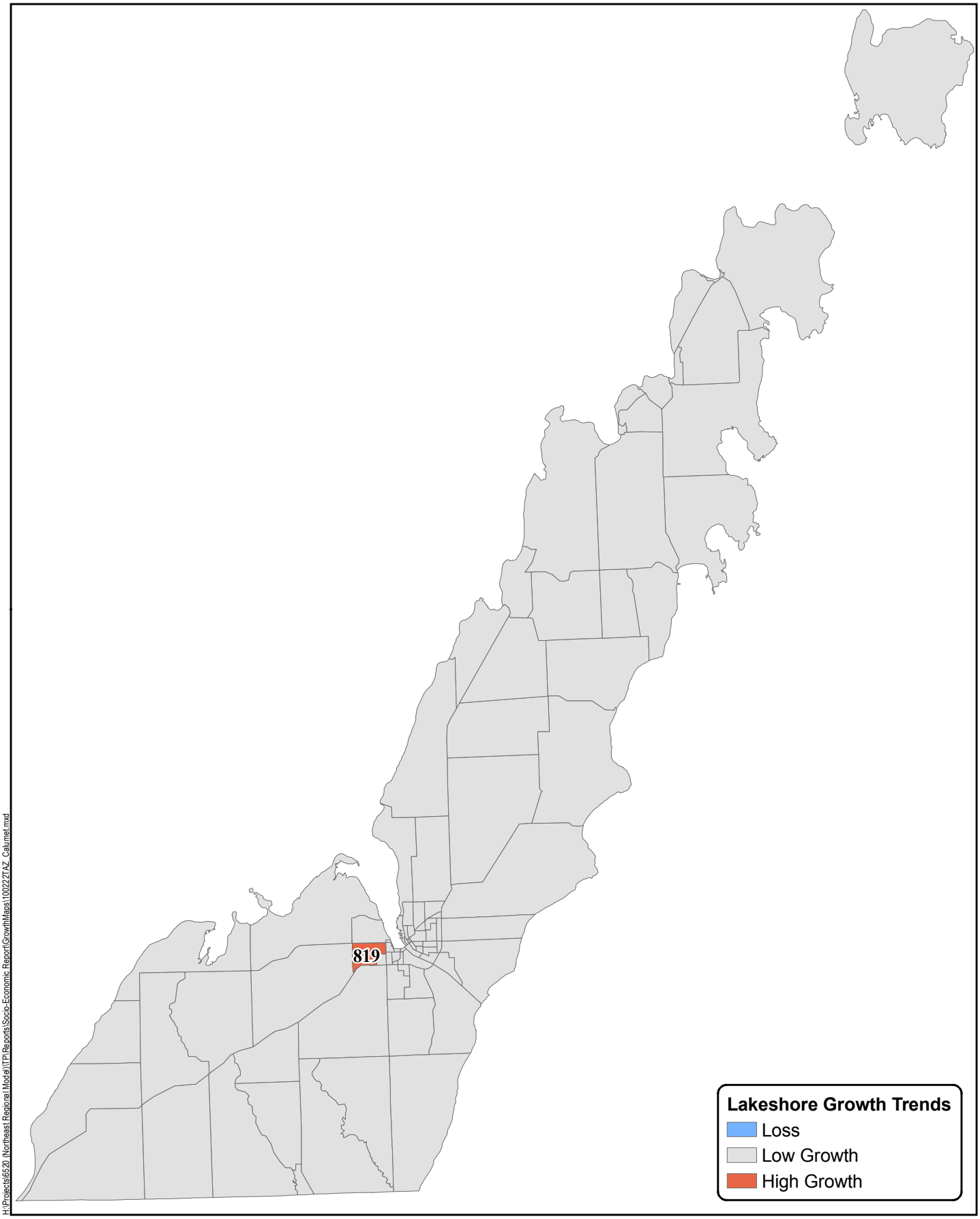
SRF Consulting Group, Inc.

Door County - Employment Change 2005-2035

Figure C.9

Northeast Travel Demand Model

Wisconsin Department of Transportation



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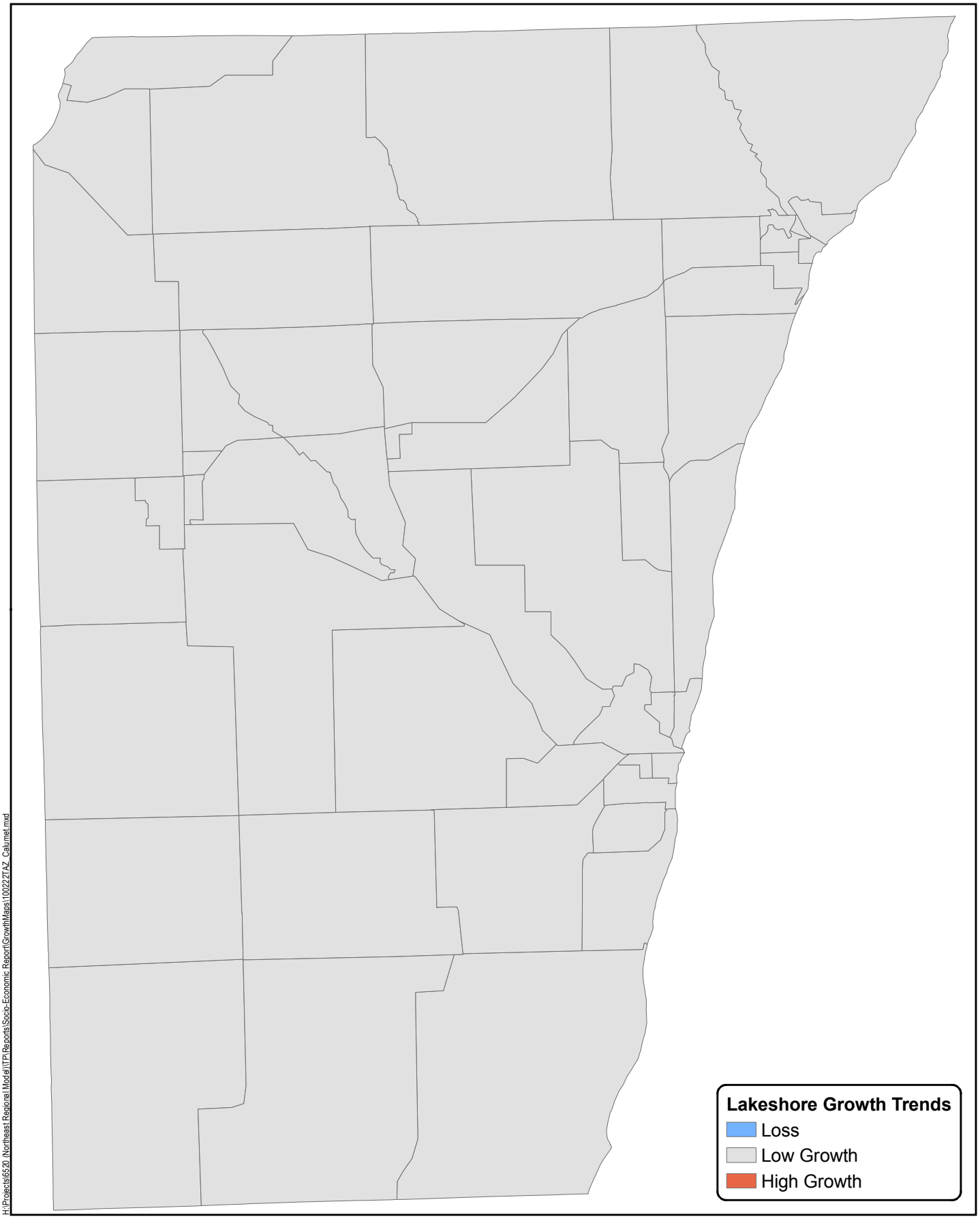
SRF Consulting Group, Inc.

Door County - Household Change 2005-2035

Figure C.10

Northeast Travel Demand Model

Wisconsin Department of Transportation



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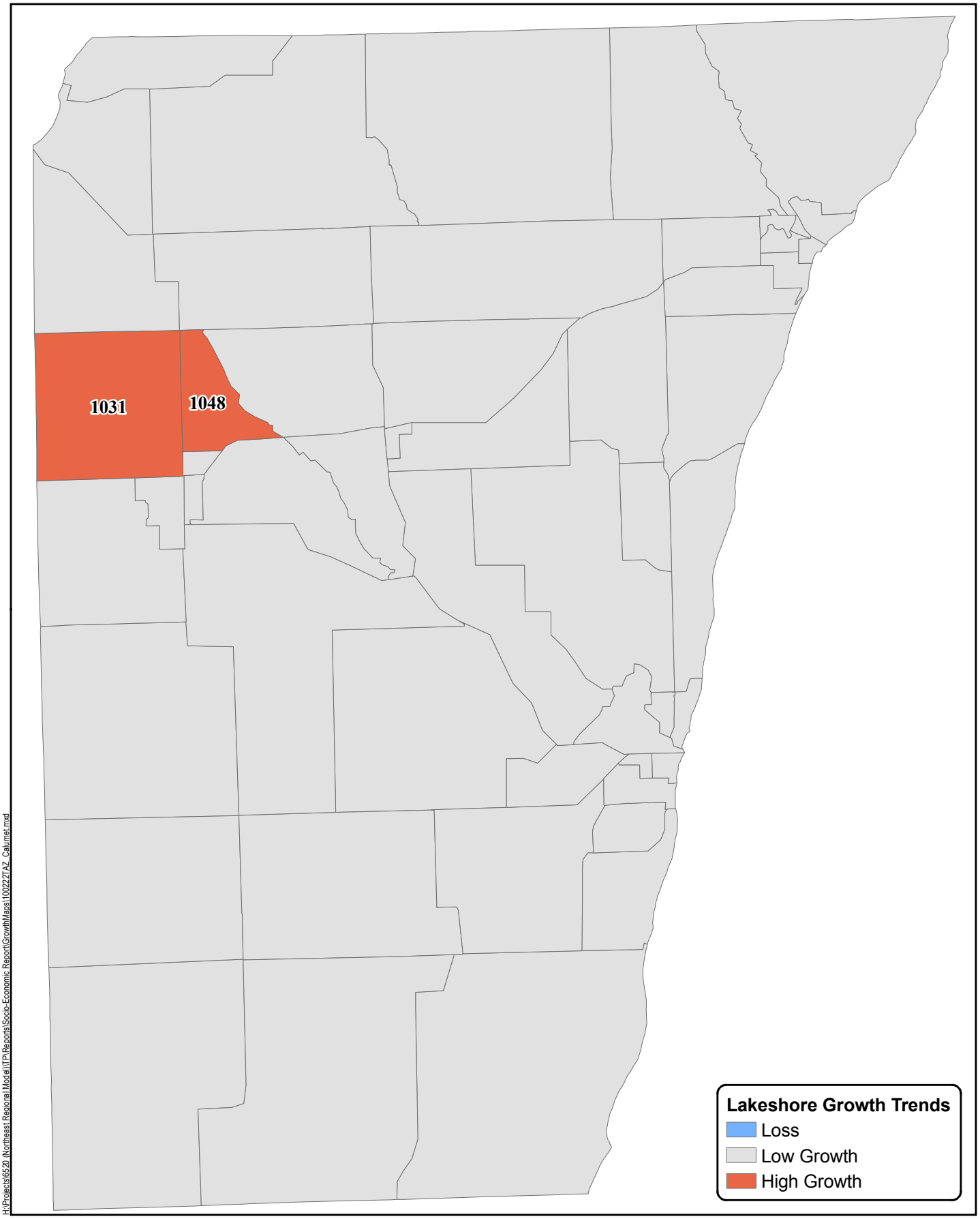
SRF Consulting Group, Inc.

Kewaunee County - Employment Change 2005-2035

Figure C.11

Northeast Travel Demand Model

Wisconsin Department of Transportation



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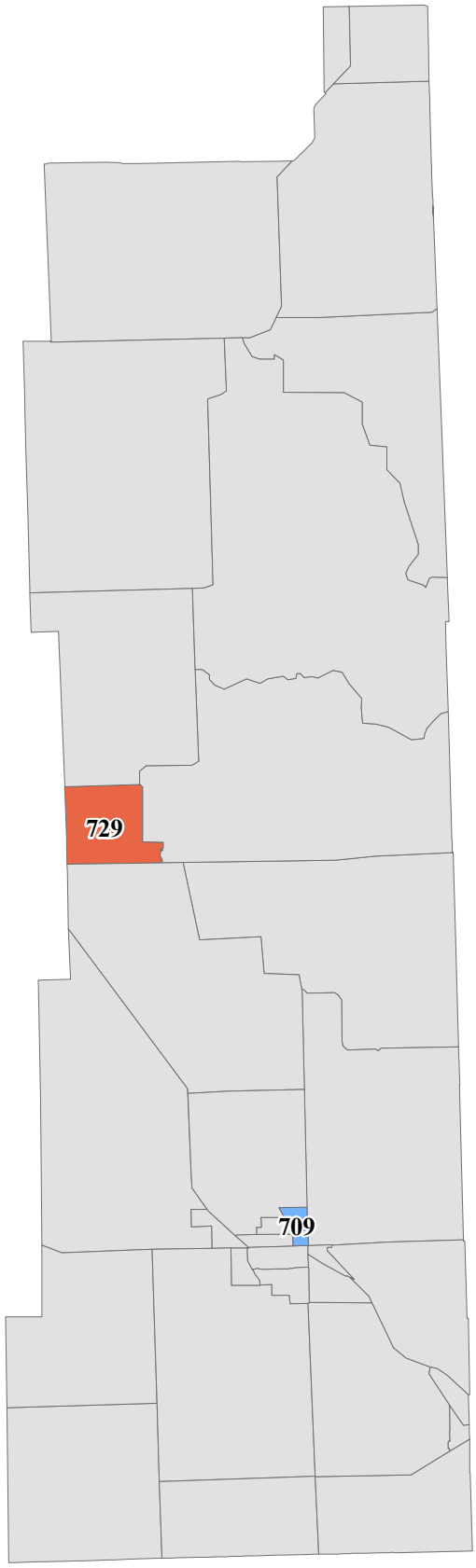
SRF Consulting Group, Inc.

Kewaunee County - Household Change 2005-2035

Figure C.12

Northeast Travel Demand Model

Wisconsin Department of Transportation



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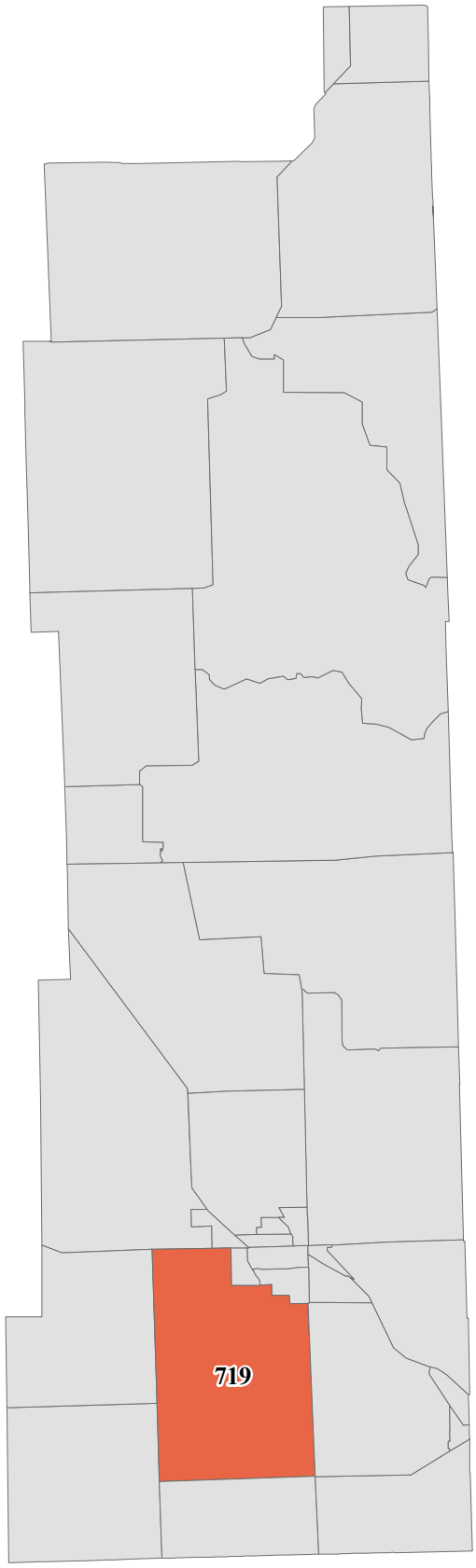
SRF Consulting Group, Inc.

Calumet County - Employment Change 2005-2035

Figure C.13

Northeast Travel Demand Model

Wisconsin Department of Transportation



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SRF Consulting Group, Inc.

Calumet County - Household Change 2005-2035

Figure C.14

Northeast Travel Demand Model

Wisconsin Department of Transportation

APPENDIX D – Wisconsin Department of Administration Forecasts

Table D.1 Wisconsin Department of Administration Minor Civil Division Household Projections 2000-2030

City Village Town	Municipality	County	Muni. Split	Census 2000	2005 Estimate	2010 Projection	2015 Projection	2020 Projection	2025 Projection	2030 Projection	Numeric Change	Percent Change	Rate of Change
Town	New Holstein	Calumet		539	565	588	617	648	677	709	170	31.54%	0.92%
City	New Holstein	Calumet		1,329	1,350	1,370	1,409	1,447	1,487	1,525	196	14.75%	0.46%
Town	Charlestown	Calumet		291	286	274	264	253	241	227	-64	-21.99%	-0.82%
Town	Rantoul	Calumet		253	263	261	262	263	263	264	11	4.35%	0.14%
Village	Potter	Calumet		86	90	100	111	122	134	146	60	69.77%	1.78%
Town	Washington	Door		293	320	344	366	385	397	402	109	37.20%	1.06%
Town	Liberty Grove	Door		824	912	1,006	1,099	1,183	1,243	1,277	453	54.98%	1.47%
Village	Sister Bay	Door		446	497	552	608	660	697	721	275	61.66%	1.61%
Town	Gibraltar	Door		475	553	618	684	743	788	818	343	72.21%	1.83%
Town	Baileys Harbor	Door		483	551	612	675	731	774	801	318	65.84%	1.70%
Town	Egg Harbor	Door		491	578	648	718	782	831	861	370	75.36%	1.89%
Village	Egg Harbor	Door		132	148	163	178	192	201	207	75	56.82%	1.51%
Village	Ephraim	Door		161	166	177	187	195	199	199	38	23.60%	0.71%
Town	Jacksonport	Door		304	329	349	368	384	392	393	89	29.28%	0.86%
Town	Sevastopol	Door		1,076	1,174	1,250	1,323	1,381	1,412	1,417	341	31.69%	0.92%
Town	Sturgeon Bay	Door		356	380	398	413	425	428	424	68	19.10%	0.58%
City	Sturgeon Bay	Door		4,048	4,322	4,559	4,786	4,953	5,025	5,003	955	23.59%	0.71%
Town	Nasewaupee	Door		778	846	892	934	966	977	973	195	25.06%	0.75%
Town	Gardner	Door		493	537	577	619	653	673	682	189	38.34%	1.09%
Town	Union	Door		335	363	394	423	448	465	472	137	40.90%	1.15%
Town	Brussels	Door		403	438	465	490	512	522	522	119	29.53%	0.87%
Town	Forestville	Door		387	426	457	486	511	526	530	143	36.95%	1.05%
Village	Forestville	Door		181	188	194	199	202	200	195	14	7.73%	0.25%
Town	Clay Banks	Door		162	170	177	184	189	190	187	25	15.43%	0.48%
Town	Ahnapee	Kewaunee		371	382	398	416	431	445	458	87	23.45%	0.70%
City	Algoma	Kewaunee		1,493	1,514	1,555	1,591	1,624	1,644	1,666	173	11.59%	0.37%
Town	Lincoln	Kewaunee		334	351	365	382	395	408	419	85	25.45%	0.76%
Town	Red River	Kewaunee		528	562	598	635	669	702	733	205	38.83%	1.10%
Town	Luxemburg	Kewaunee		445	479	506	532	556	579	599	154	34.61%	1.00%
Village	Luxemburg	Kewaunee		719	840	935	1,039	1,140	1,240	1,339	620	86.23%	2.09%
Town	Casco	Kewaunee		385	422	460	499	539	577	613	228	59.22%	1.56%
Village	Casco	Kewaunee		227	235	249	263	276	289	300	73	32.16%	0.93%
Town	Pierce	Kewaunee		329	342	366	393	417	441	463	134	40.73%	1.15%
City	Kewaunee	Kewaunee		1,149	1,199	1,258	1,321	1,376	1,427	1,475	326	28.37%	0.84%
Town	West Kewaunee	Kewaunee		460	480	504	529	553	574	593	133	28.91%	0.85%
Town	Montpelier	Kewaunee		482	508	531	555	577	598	615	133	27.59%	0.82%

City Village Town	Municipality	County	Muni. Split	Census 2000	2005 Estimate	2010 Projection	2015 Projection	2020 Projection	2025 Projection	2030 Projection	Numeric Change	Percent Change	Rate of Change
Town	Franklin	Kewaunee		338	365	386	409	430	450	468	130	38.46%	1.09%
Town	Carlton	Kewaunee		363	381	394	408	420	430	439	76	20.94%	0.64%
Town	Maple Grove	Manitowoc		287	297	302	307	310	312	311	24	8.36%	0.27%
Town	Rockland	Manitowoc		308	328	341	354	367	377	385	77	25.00%	0.75%
Village	Reedsville	Manitowoc		471	478	490	502	512	519	523	52	11.04%	0.35%
Town	Eaton	Manitowoc		270	288	301	314	327	337	346	76	28.15%	0.83%
Village	St. Nazianz	Manitowoc		296	301	309	317	323	327	330	34	11.49%	0.36%
City	Kiel	Total	X	1,425	1,503	1,596	1,699	1,797	1,887	1,969	544	38.18%	1.08%
City	Kiel	Calumet	X	138	136	131	128	125	121	118	-20	-14.49%	-0.52%
City	Kiel	Manitowoc	X	1,287	1,367	1,465	1,571	1,672	1,766	1,851	564	43.82%	1.22%
Town	Schleswig	Manitowoc		697	762	823	884	943	997	1,047	350	50.22%	1.37%
Town	Meeme	Manitowoc		531	542	556	570	582	590	595	64	12.05%	0.38%
Town	Liberty	Manitowoc		456	487	515	544	571	596	617	161	35.31%	1.01%
Village	Valders	Manitowoc		375	400	419	439	458	474	487	112	29.87%	0.87%
Town	Cato	Manitowoc		548	574	598	624	647	667	682	134	24.45%	0.73%
Village	Whitelaw	Manitowoc		278	287	298	311	322	331	339	61	21.94%	0.66%
Town	Franklin	Manitowoc		469	486	498	511	522	530	535	66	14.07%	0.44%
Town	Cooperstown	Manitowoc		471	482	500	519	535	549	559	88	18.68%	0.57%
Town	Two Creeks	Manitowoc		184	187	196	205	214	221	227	43	23.37%	0.70%
Village	Maribel	Manitowoc		104	105	104	103	101	99	95	-9	-8.65%	-0.30%
Town	Gibson	Manitowoc		471	508	528	549	568	585	597	126	26.75%	0.79%
Town	Kossuth	Manitowoc		752	791	824	857	888	914	935	183	24.34%	0.73%
Village	Francis Creek	Manitowoc		266	276	293	310	326	341	354	88	33.08%	0.96%
Village	Kellnersville	Manitowoc		157	154	157	158	160	159	159	2	1.27%	0.04%
Town	Manitowoc Rapids	Manitowoc		809	833	834	824	810	790	765	-44	-5.44%	-0.19%
Town	Newton	Manitowoc		795	837	866	896	922	944	960	165	20.75%	0.63%
Town	Centerville	Manitowoc		239	247	253	259	264	266	269	30	12.55%	0.39%
Village	Cleveland	Manitowoc		536	567	593	619	644	665	682	146	27.24%	0.81%
City	Manitowoc	Manitowoc		14,235	14,838	15,422	16,042	16,606	17,079	17,462	3227	22.67%	0.68%
City	Two Rivers	Manitowoc		5,221	5,281	5,342	5,416	5,467	5,483	5,469	248	4.75%	0.15%
Town	Two Rivers	Manitowoc		734	747	751	743	730	712	689	-45	-6.13%	-0.21%
Town	Mishicot	Manitowoc		474	494	514	534	552	568	580	106	22.36%	0.68%
Village	Mishicot	Manitowoc		582	603	627	652	675	694	709	127	21.82%	0.66%
Town	Manitowoc	Manitowoc		420	453	480	505	528	548	566	146	34.76%	1.00%
Source: Wisconsin Dept. of Administration, Demographic Services Center (2008)													

APPENDIX E – Highway Network Attributes

Table E.1 - Northeast Regional Model Input Network Attributes

Variable	Description	Variable	Description
A	A Node	AM_COUNT	Vehicle Count AM
B	B Node	MD_COUNT	Vehicle Count Mid-day
A_FV	Old NE Model A Node	PM_COUNT	Vehicle Count PM
B_FV	Old NE Model B Node	NT_COUNT	Vehicle Count Night time
LINKCLASS	Link Classification	PROJID	Planned Project ID
LANES	Number of lanes	VMT	Vehicle Miles Traveled
AREA	Area Type	VHT	Vehicl Hours Traveled
CROSS	Cross Type	PLN_LANE	Planned Lanes
NAME	Roadway Name	PLN_FC	Planned Link Classification
MODEL	MPO Model (from old NE Model)	PLN_SIGNAL	Planned Signal Type
DISTANCE	Link Length (miles)	PLN_CROSS	Planned Cross Type
SIGNAL	Signal Type	PLN_P_SPEE	Planned Posted Speed
P_SPEED	Posted Speed	PLN_AREA	Planned Area Type
NEWLINK	New Link Classification	TRKPROH	Truck Prohibitor
CHG_LANE	Change Lane	CAP_LANE	Lane Capacity
CHG_FC	Change Link Classification	CAP_HOUR	Hourly Capacity
CHG_SIGNAL	Change Signal Type	CAPACITY	Daily Capacity
CHG_CROSS	Change Cross Type	SPEED	Free-Flow Traffic Speed
CHG_AREA	Change Area Type	CODEAREA	Code Area
USERSPEED	User defined speed	TABLESPEED	Area/Functional Class Lookup Speed
TAFIS	TAFIS Site ID	LINKGROUP	Link group
CHG_P_SPEE	Change Speed	DAILY	Daily
AVG_DLY_TR	Count Attribute	ALPHA	Alpha
AVG_DLY__1	Average Daily Traffic Count	BETA	Beta
AVG_DLY__2	Average Daily Traffic (Year)	TRAF_SEG	Traffic Segment
COUNT_YEAR	Count Year	TRAF_SITE	Traffic Site
TRADS_NUM	TRADIS Number	TIME_	Link Travel Time
TBCNTID	Tube Count ID	CHG_SUBSYS	Change Subsystem
TURN_M_ID	Turning Movement ID	PLN_SUBSYS	Planned Subsystem
TBCNT_AM	Tube Count AM	COUNT	Vehicle Count
TBCNT_MD	Tube Count Mid-Day	SCREEN	Screenline
TBCNT_PM	Tube Count PM	SUB_SYSTEM	Corridors 2020 Roadway Classification
TBCNT_NT	Tube Count Night Time	COUNTY	County Name (Air Quality Analysis)
TOT_TUBE	Total Tube Count		
TURN_AM	Turning Movement AM	Attribute called in script(s).	
TURN_MD	Turning Movement AM		
TURN_PM	Turning Movement AM		
YEAR_11DEC	USH 41 Count Year		
AADT_11DEC	USH 41 Average Annual Daily Traffic Counts		
PDIR_11DEC	USH 41 Positive Direction Counts		
NDIR_11DEC	USH 41 Negative Direction Counts		
DAILY_41HW	USH 41 Daily Vehicle Count		
AM_41HWY	USH 41 AM Vehicle Count		
MD_41HWY	USH 41 Mid-day Vehicle Count		
PM_41HWY	USH 41 PM Vehicle Count		
NT_41HWY	USH 41 Night time Vehicle Count		
FACTORED_C	Factored Count		

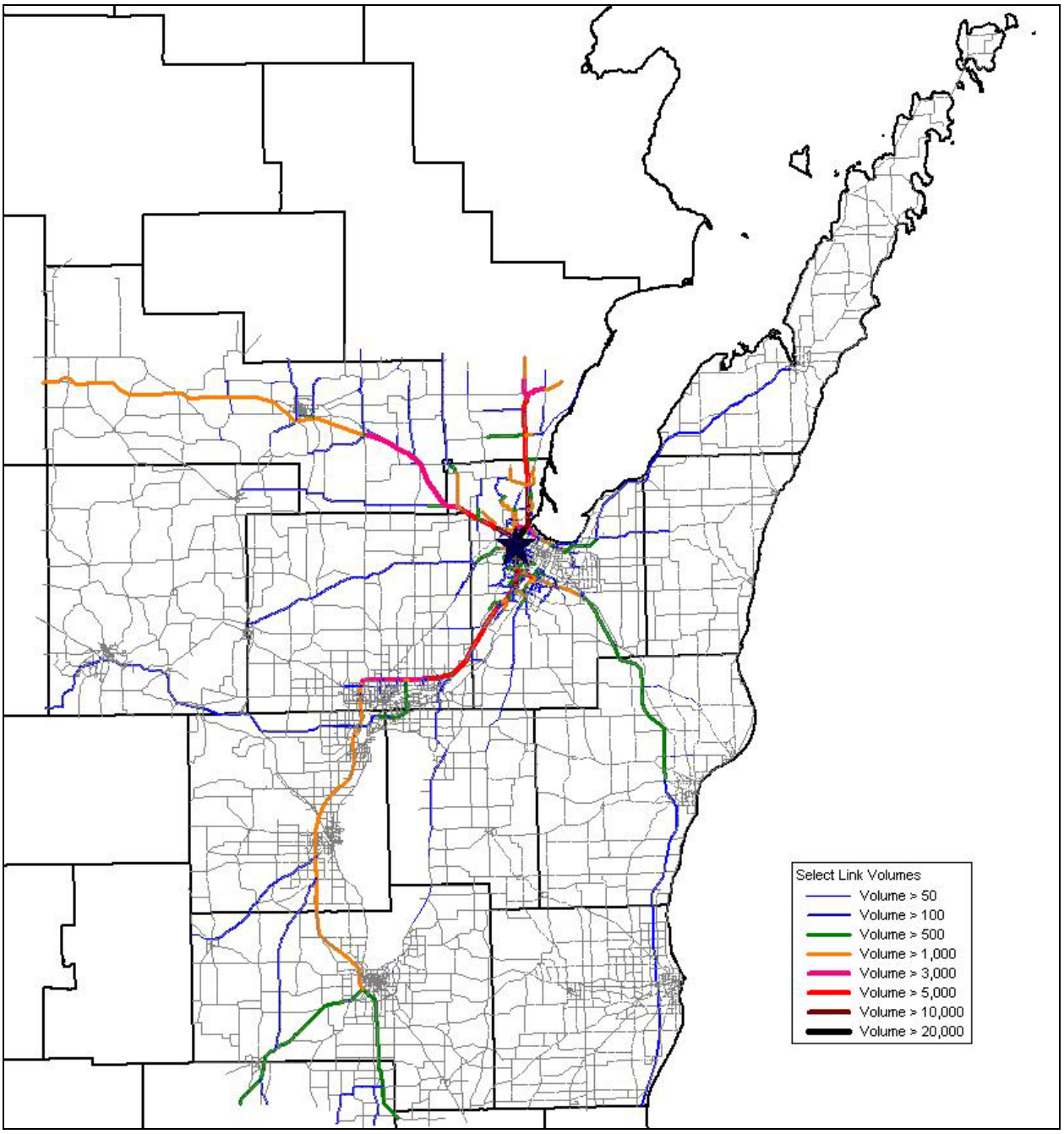
Table E.2 - Northeast Regional Model Summary_MIN Output Network Attributes

Variable	Description
A	A-Node
B	B-Node
LINKCLASS	Link Classification
LANES	Number of lanes
AREA	Area Type
CROSS	Cross Type
NAME	Roadway Name
DISTANCE	Link Length (miles)
SIGNAL	Signal Type
NEWLINK	New Link Classification
CHG_LANE	Change Lane
CHG_FC	Change Link Classification
COUNT_YEAR	Count Year
PROJID	Planned Project ID
PLN_LANE	Planned Lanes
PLN_FC	Planned Link Classification
TRKPROH	Truck Prohibitor
COUNT	Vehicle Count
SCREEN	Screenline
SUB_SYSTEM	Corridors 2020 Roadway Classification
COUNTY	County Name (Air Quality Analysis)
TIME_3	Congested Travel Time
CSPD_3	Congested Speed
NT_AU	Night time Auto Volume
NT_TR	Night time Truck Volume
NT_VOL	Night time Total Volume
PM_AU	PM Auto Volume
PM_TR	PM Truck Volume
PM_VOL	PM Total Volume
MD_AU	Mid-day Auto Volume
MD_TR	Mid-day Truck Volume
MD_VOL	Mid-day Total Volume
AM_AU	AM Auto Volume
AM_TR	AM Truck Volume
AM_VOL	AM Total Volume
TOT_AU	Total Auto Volume
TOT_TR	Total Truck Volume
TOT_VOL	Total Volume

Table E.3 - Northeast Regional Model Combiner Network Attributes

Variable	Description	Scenario	Variable	Explanation	Scenario
A	A-Node	n/a	MDCSPD_20	Congested Speed 9-3pm	2020
B	B-Node	n/a	PMCSPD_20	Congested Speed 3-6pm	2020
NAME	Road Name	n/a	NTCSPD_20	Congested Speed 6am-6pm	2020
MODEL	Original Model	n/a	DIST_20	Link Distance	2020
SPEED	Speed	n/a	EST_20	Forecast Volume Estimate Total	2020
COUNT	Count	n/a	EST_20AUTO	Forecast Volume Estimate Auto	2020
AMCOUNT	Count 6-9am	n/a	EST_20TRUCK	Forecast Volume Estimate Truck	2020
MDCOUNT	Count 9-3pm	n/a	GEH_20	GEH Statistic	2020
PMCOUNT	Count 3-6pm	n/a	F_THRESHOLD	LOS and Deficiency Threshold	2020
NTCOUNT	Count 6pm-6am	n/a	LOS_20	Level of Service Primary	2020
LANES_B	Lanes	Base	LOS_S_20	Level of Service Secondary	2020
AREA_B	Area	Base	F_DEF_P_20	Deficiency Primary	2020
CAP_B	Lookup Capacity	Base	F_DEF_S_20	Deficiency Secondary	2020
LC_B	Linkclass	Base	LANES_35	Lanes	2035
TS_B	Lookup Speed	Base	AREA_35	Area	2035
AMVOL_B	Volume 6-9am	Base	CAP_35	Lookup Capacity	2035
MDVOL_B	Volume 9-3pm	Base	LC_35	Linkclass	2035
PMVOL_B	Volume 3-6pm	Base	TS_35	Lookup Speed	2035
NTVOL_B	Volume 6pm-6am	Base	AMVOL_35	Volume 6-9am	2035
TOTAUTO_B	Daily Volume Auto	Base	MDVOL_35	Volume 9-3pm	2035
TOTTRK_B	Daily Volume Truck	Base	PMVOL_35	Volume 3-6pm	2035
TOTVOL_B	Daily Volume Total	Base	NTVOL_35	Volume 6pm-6am	2035
AMTIME_B	Congested Travel Time 6-9am	Base	TOTAUTO_35	Daily Volume Auto	2035
MDTIME_B	Congested Travel Time 9-3pm	Base	TOTTRK_35	Daily Volume Truck	2035
PMTIME_B	Congested Travel Time 3-6pm	Base	TOTVOL_35	Daily Volume Total	2035
NTTIME_B	Congested Travel Time 6pm-6am	Base	AMTIME_35	Congested Travel Time 6-9am	2035
AMCSPD_B	Congested Speed 6-9am	Base	MDTIME_35	Congested Travel Time 9-3pm	2035
MDCSPD_B	Congested Speed 9-3pm	Base	PMTIME_35	Congested Travel Time 3-6pm	2035
PMCSPD_B	Congested Speed 3-6pm	Base	NTTIME_35	Congested Travel Time 6pm-6am	2035
NTCSPD_B	Congested Speed 6am-6pm	Base	AMCSPD_35	Congested Speed 6-9am	2035
DIST_B	Link Distance	Base	MDCSPD_35	Congested Speed 9-3pm	2035
GEH_B	GEH Statistic	Base	PMCSPD_35	Congested Speed 3-6pm	2035
B_THRESHOLD	LOS and Deficiency Threshold	Base	NTCSPD_35	Congested Speed 6am-6pm	2035
LOS_B	Level of Service Primary	Base	DIST_35	Link Distance	2035
LOS_S_B	Level of Service Secondary	Base	EST_35	Forecast Volume Estimate Total	2035
B_DEF_P	Deficiency Primary	Base	EST_35AUTO	Forecast Volume Estimate Auto	2035
B_DEF_S	Deficiency Secondary	Base	EST_35TRUCK	Forecast Volume Estimate Truck	2035
LANES_20	Lanes	2020	GEH_35	GEH Statistic	2035
AREA_20	Area	2020	F_THRESHOLD	LOS and Deficiency Threshold	2035
CAP_20	Lookup Capacity	2020	LOS_35	Level of Service Primary	2035
LC_20	Linkclass	2020	LOS_S_35	Level of Service Secondary	2035
TS_20	Lookup Speed	2020	F_DEF_P_35	Deficiency Primary	2035
AMVOL_20	Volume 6-9am	2020	F_DEF_S_35	Deficiency Secondary	2035
MDVOL_20	Volume 9-3pm	2020	DIF_B_35	Diff 2005-2035	n/a
PMVOL_20	Volume 3-6pm	2020	DIF_B_20	Diff 2005-2020	n/a
NTVOL_20	Volume 6pm-6am	2020	DIF_20_35	Diff 2020-2035	n/a
TOTAUTO_20	Daily Volume Auto	2020	DIF_A_B35	Diff AM Vol 2005 and AM Vol 2035	n/a
TOTTRK_20	Daily Volume Truck	2020	DIF_P_B35	Diff PM Vol 2005 and PM Vol 2035	n/a
TOTVOL_20	Daily Volume Total	2020	DIF_A_B20	Diff AM Vol 2005 and AM Vol 2020	n/a
AMTIME_20	Congested Travel Time 6-9am	2020	DIF_P_B20	Diff PM Vol 2005 and PM Vol 2020	n/a
MDTIME_20	Congested Travel Time 9-3pm	2020	DIF_A20_35	Diff AM Vol 2020 and AM Vol 2035	n/a
PMTIME_20	Congested Travel Time 3-6pm	2020	DIF_P20_35	Diff PM Vol 2020 and PM Vol 2035	n/a
NTTIME_20	Congested Travel Time 6pm-6am	2020	GR_B_35	Growth Rate 2005-2035	n/a
AMCSPD_20	Congested Speed 6-9am	2020			

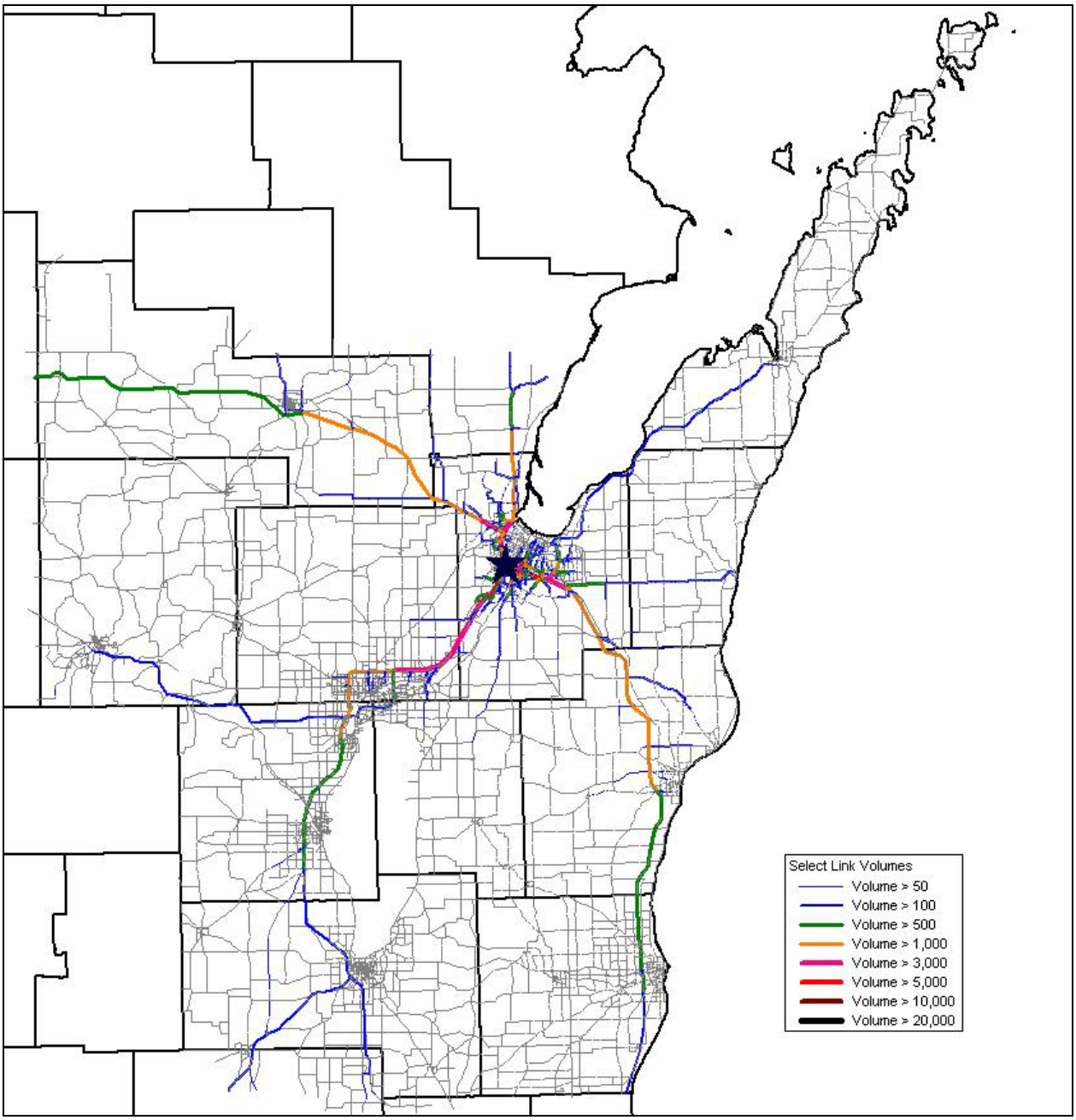
APPENDIX F – Select Link Analysis



Facility: US 41 NB
Location: South of Shawano Avenue
County: Brown County

A-Node: 56311
B-Node: 60083

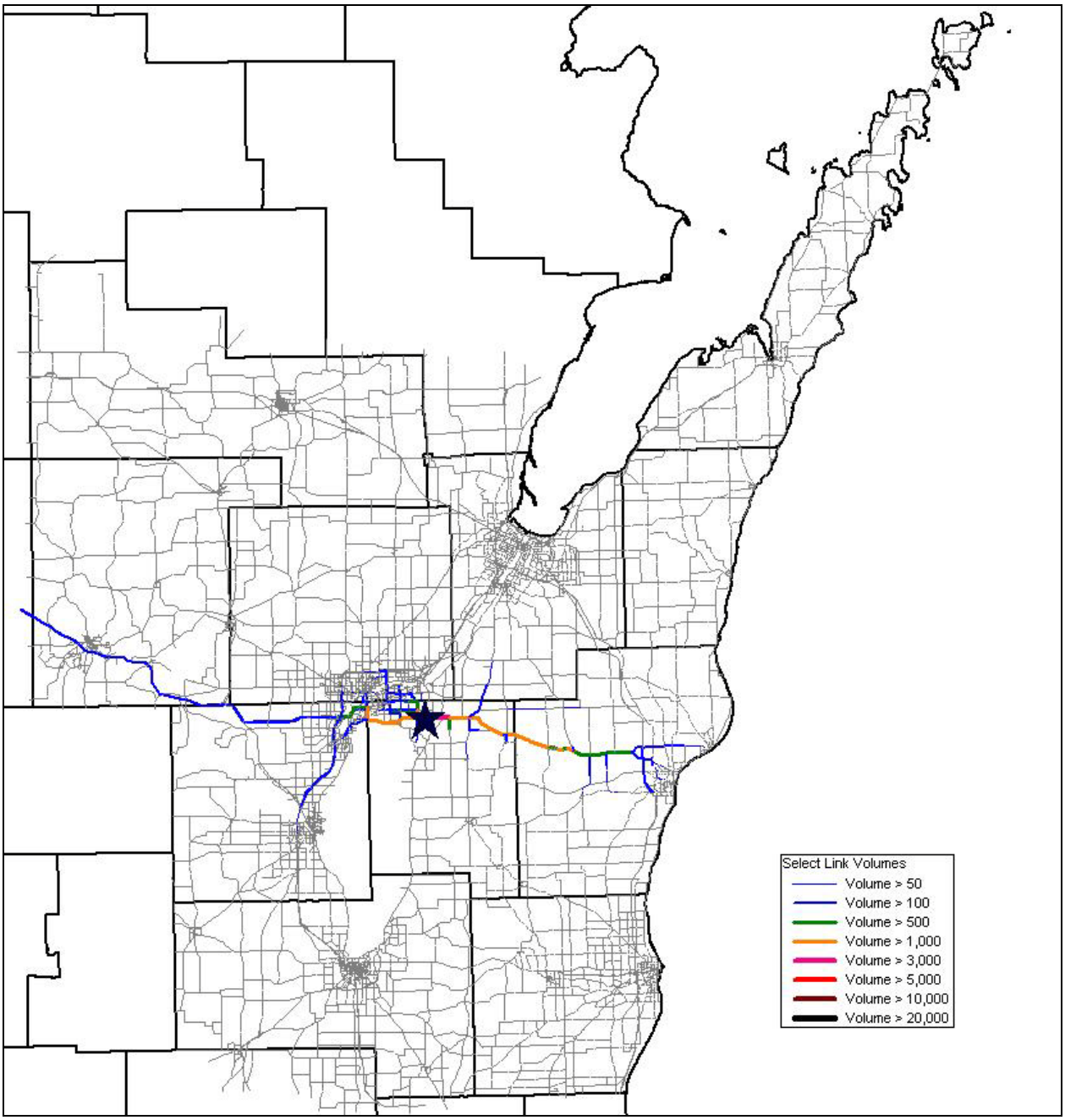
Analysis: This select link analysis provides an overview for the northbound movement on US 41 just south of the WIS 29 interchange. A majority of the traffic comes from the Fox Cities and destined for the greater Green Bay metro area, making Outagamie County to Brown County the most predominant trip pattern. Significant portions of traffic using this roadway service the area via I-43, US 41 and WIS 29, re-affirming the regional influence of US 41 in the model.



Facility: WIS 172 - WB Off Ramp
Location: US 41 Interchange
County: Brown County

A-Node: 55849
B-Node: 55855

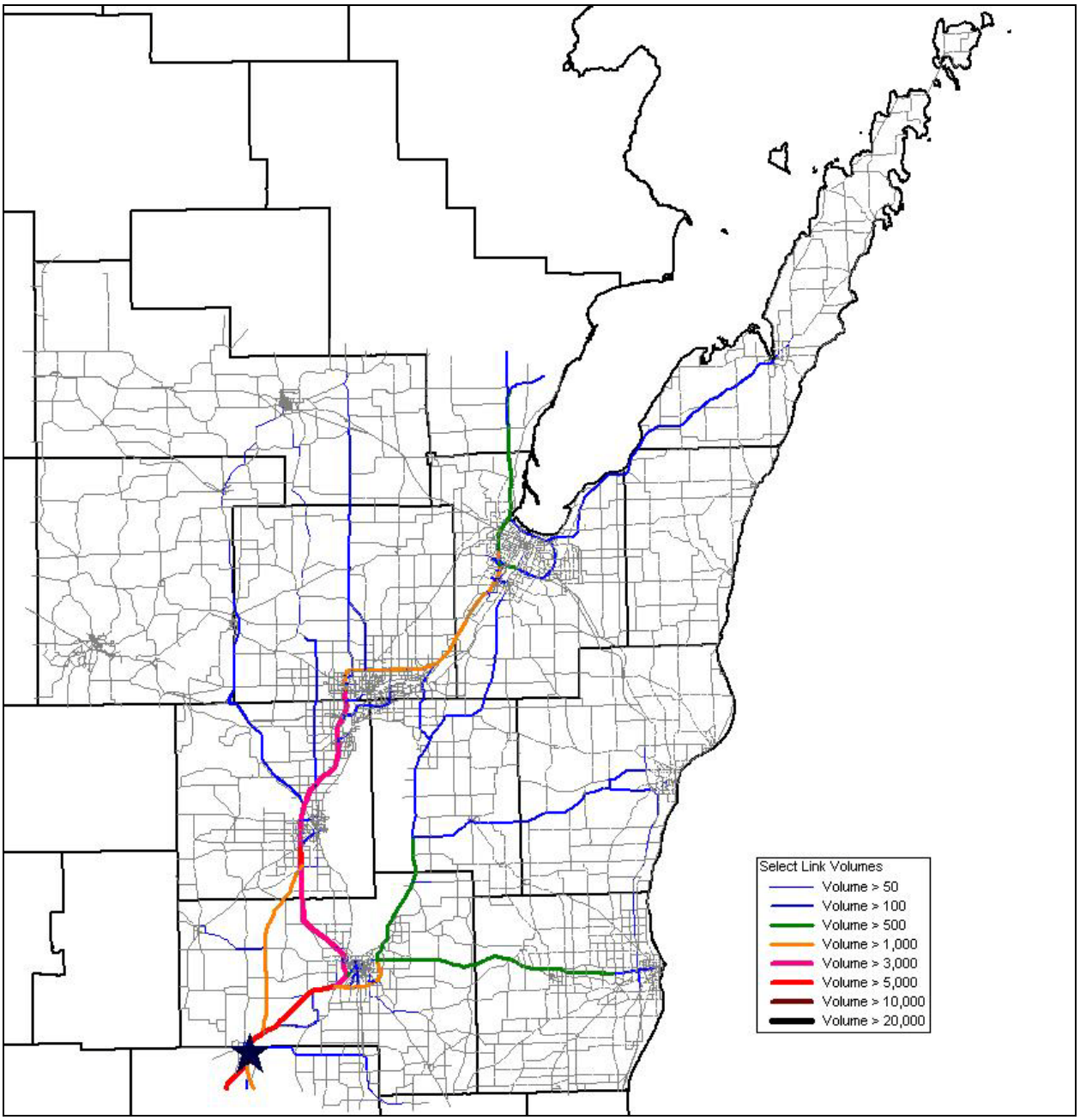
Analysis: This select link analysis provides an overview for the westbound WIS 172 off ramp at the US 41 interchange. A large portion of the trips from this location are spread from across the region, as the regional corridors such as I-43, US 41 and WIS 29 funnel traffic into the Green Bay Metro area. This analysis highlighted the regional influence that Green Bay has on surrounding urban areas like the Fox Cities, Manitowoc, Sheboygan, Sturgeon Bay, Waupaca and Shawano.



Facility: US 10
Location: East of WIS 55
County: Calumet County

A-Node: 78103
B-Node: 78134

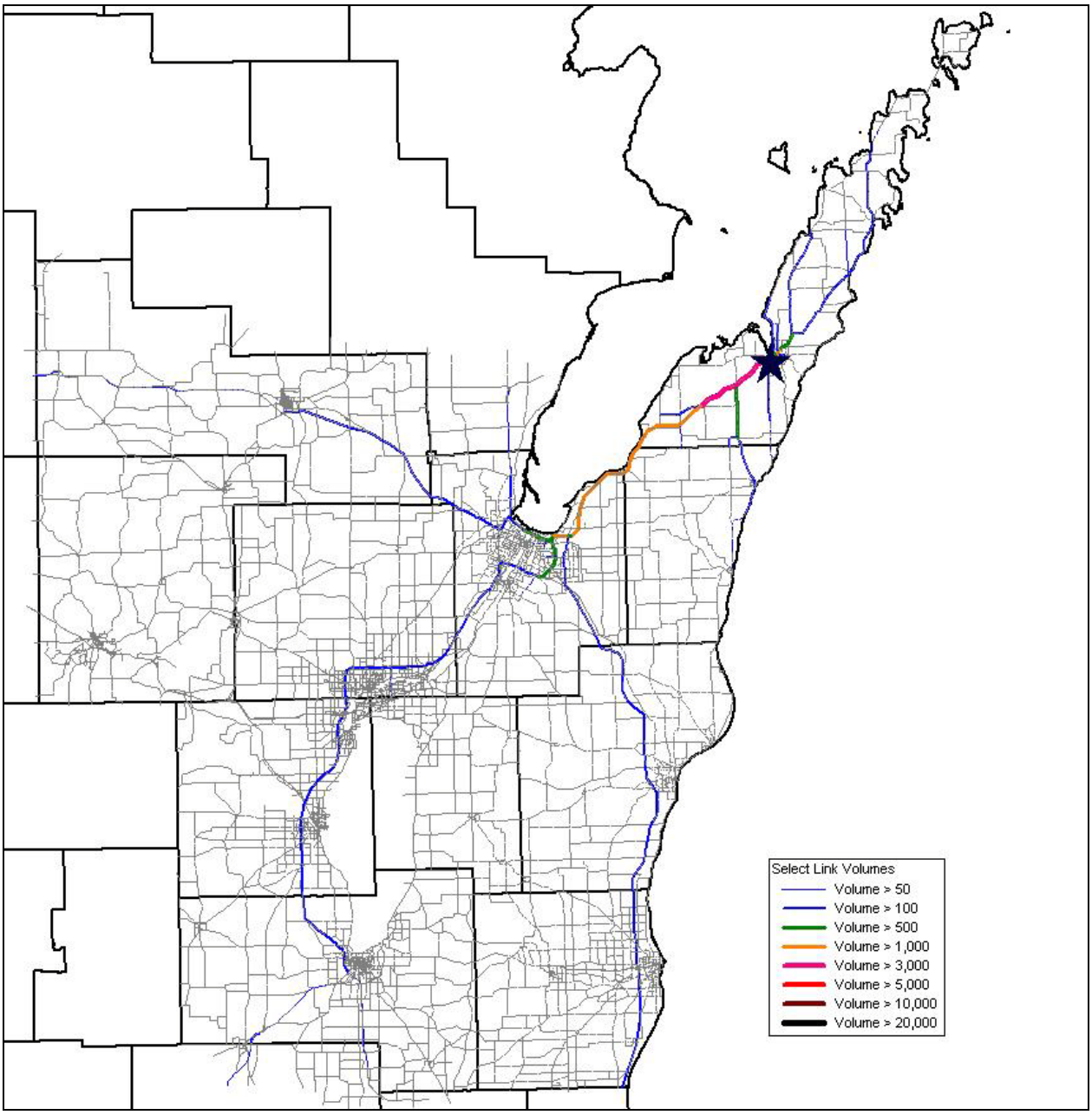
Analysis: This select link analysis provides an overview for the traffic movements on US 10 just east of WIS 55 near Darboy. Trips at this location are moving in a predominant east-west pattern, highlighting the interaction between the Fox Cities and Manitowoc. Due to the location of this link, it was not expected to be influenced by major roadways throughout the region; rather, it sought to define function of the US 10 corridor.



Facility: US 151
Location: West of WIS 49
County: Dodge County

A-Node: 101385
B-Node: 101414

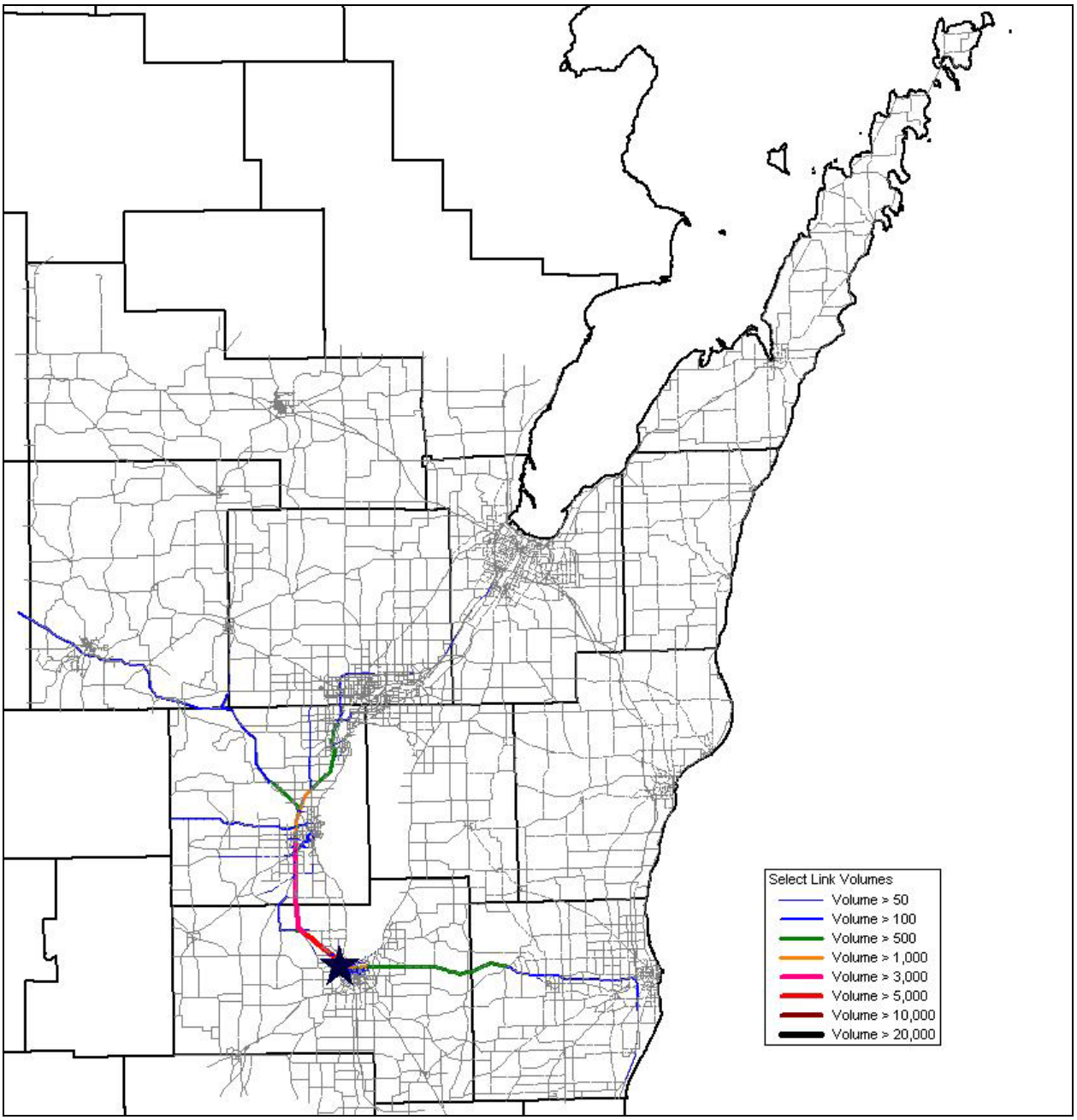
Analysis: This select link analysis provides an overview for the traffic movements on US 151 just west of the WIS 49 interchange in Waupun. The location of this site allows for an evaluation of the regional influence of the US 151 corridor. Much of the traffic from this location is serviced via regionally-significant routes that connect Madison to the Fox Valley. As would be expected, urban areas located closer to the site have more interaction, but this analysis also verified that the long distance trip purpose is performing as intended.



Facility: WIS 57 - NB Off Ramp
Location: Green Bay Road Interchange
County: Door County

A-Node: 179284
B-Node: 208846

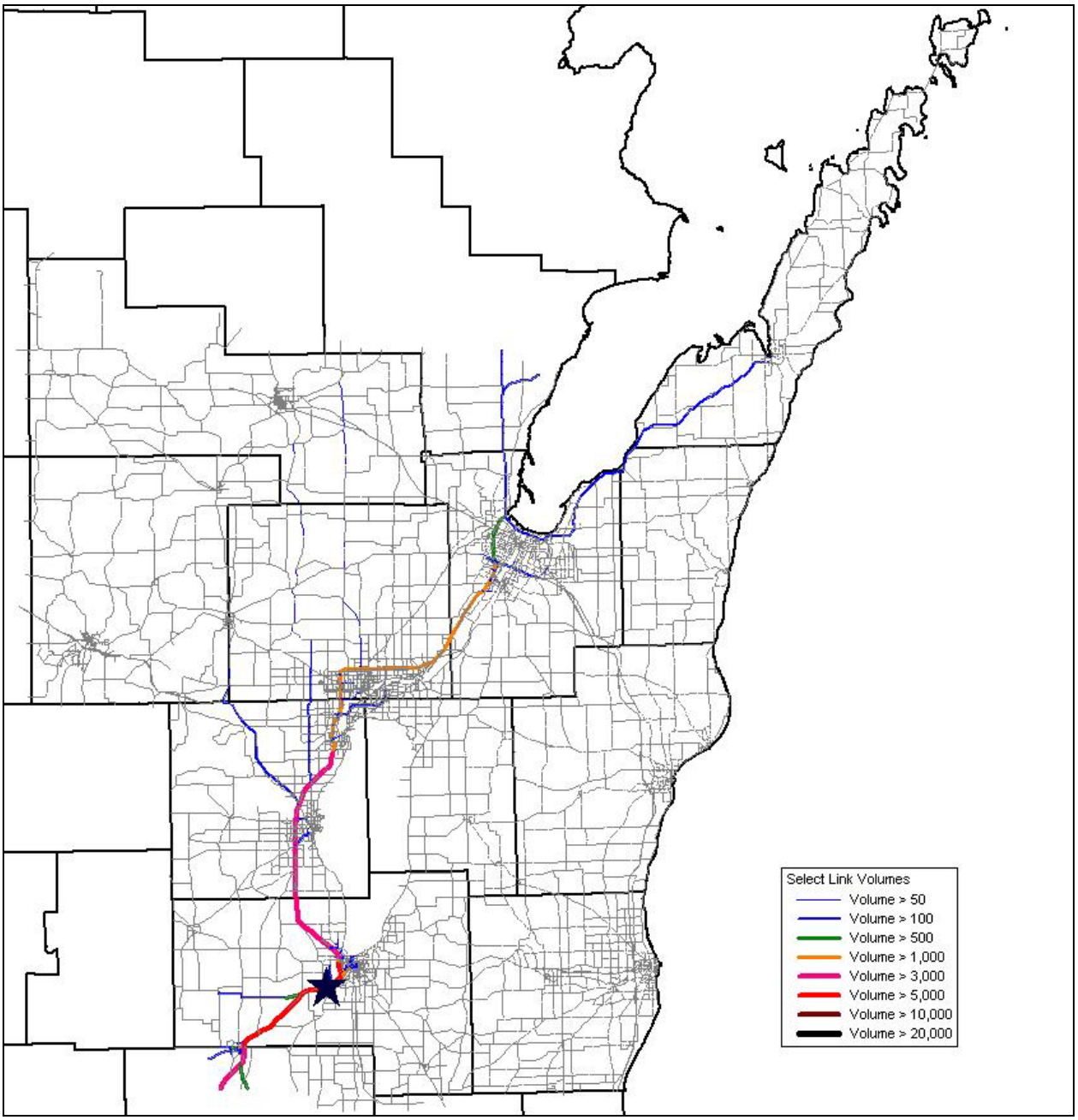
Analysis: This select link analysis provides an overview for the northbound WIS 57 off ramp at Green Bay Road in Sturgeon Bay. This site was chosen to verify the interaction between Sturgeon Bay and northern Door County with the Green Bay metro area. In addition to verifying the interaction with Brown County, this analysis was able to identify regional, long-range trips that utilize this particular corridor. The select link analysis at this site highlights the fact that Door County's trips are not isolated from the entirety of the model.



Facility: US 41 - SB Off Ramp
Location: US 23 Interchange
County: Fond du Lac County

A-Node: 98685
B-Node: 98983

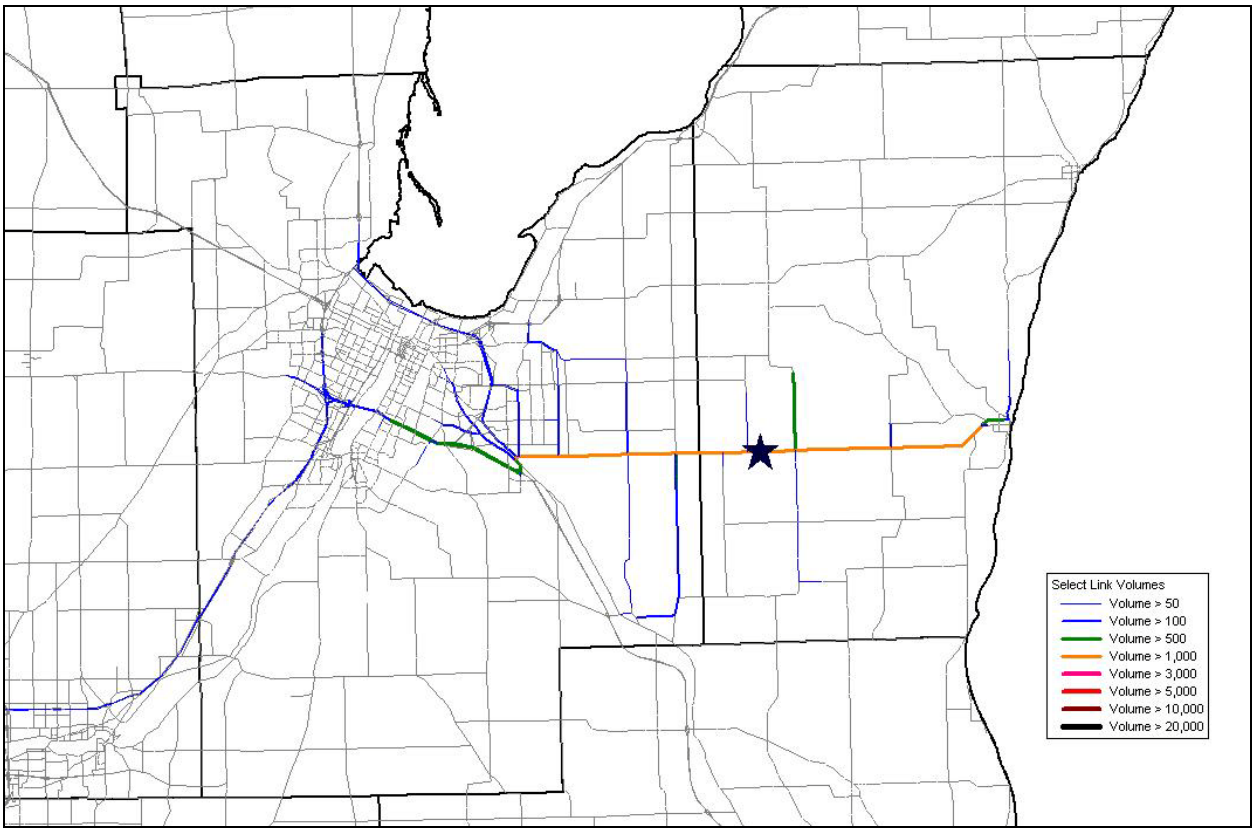
Analysis: This select link analysis provides an overview for the southbound US 41 off ramp at the WIS 23 interchange in Fond du Lac. A majority of the trips accessing this interchange are originating in Waupaca and Winnebago Counties. This pattern should be expected, as trips from the eastern portion of the model (i.e. Brown County and the Eastern Fox Cities) have access to other major facilities on the east side of Lake Winnebago to get to similar destinations.



Facility: US 151 - WB On Ramp
Location: Military Rd Interchange
County: Fond du Lac County

A-Node: 91353
B-Node: 95344

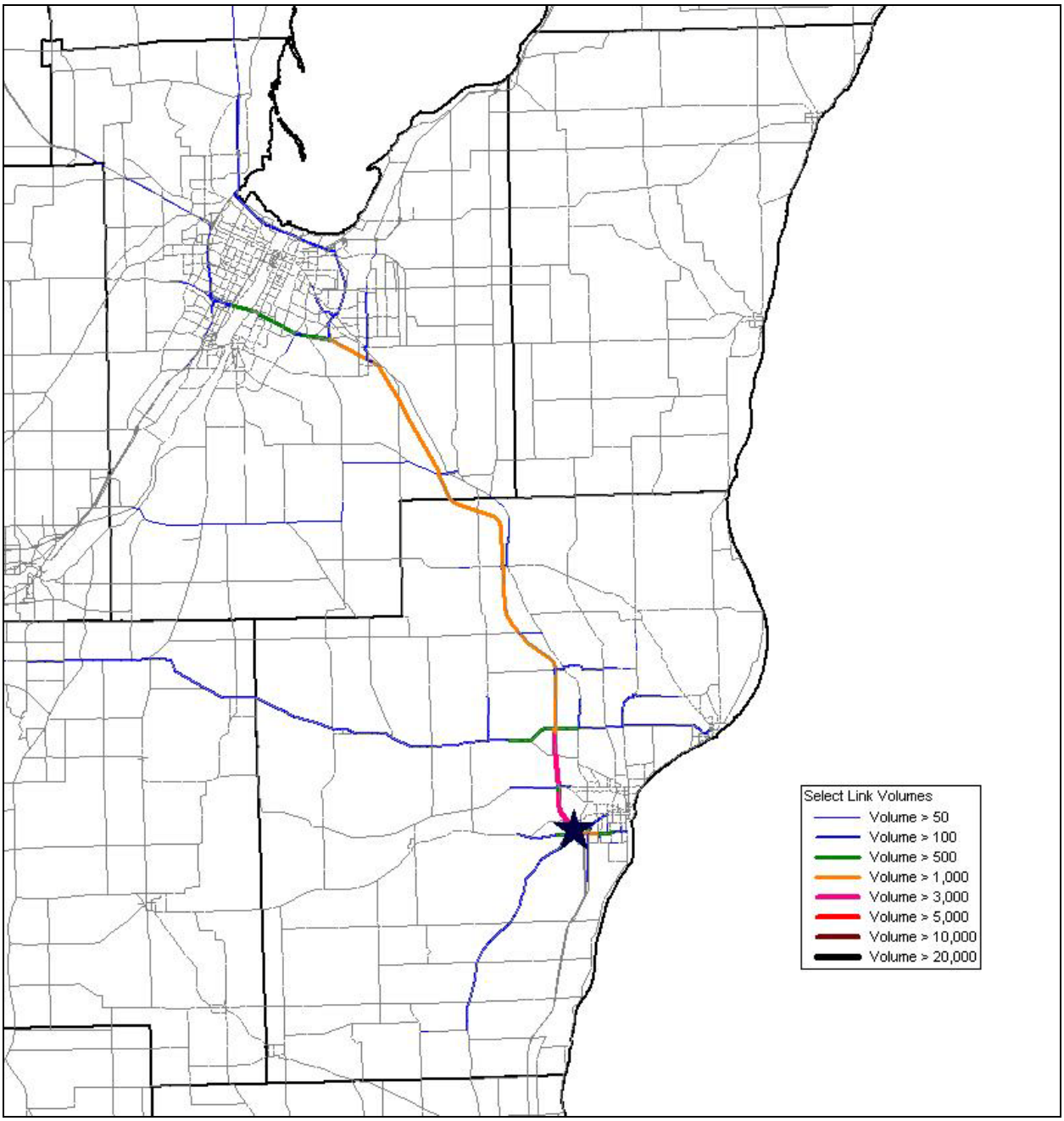
Analysis: This select link analysis provides an overview for the westbound US 151 on ramp at the Military Road interchange on the southwest side of Fond du Lac. The location of this site allows for a more specific evaluation of the US 151 corridor's regional influence. Much of the traffic from this location is serviced via US 41 from Outagamie and Winnebago Counties. Trips from the eastern portion of the model are no longer utilizing this interchange due to the functionality and location of the US 151 bypass in Fond du Lac.



Facility: WIS 29
Location: East of County V
County: Kewaunee County

A-Node: 160825
B-Node: 160826

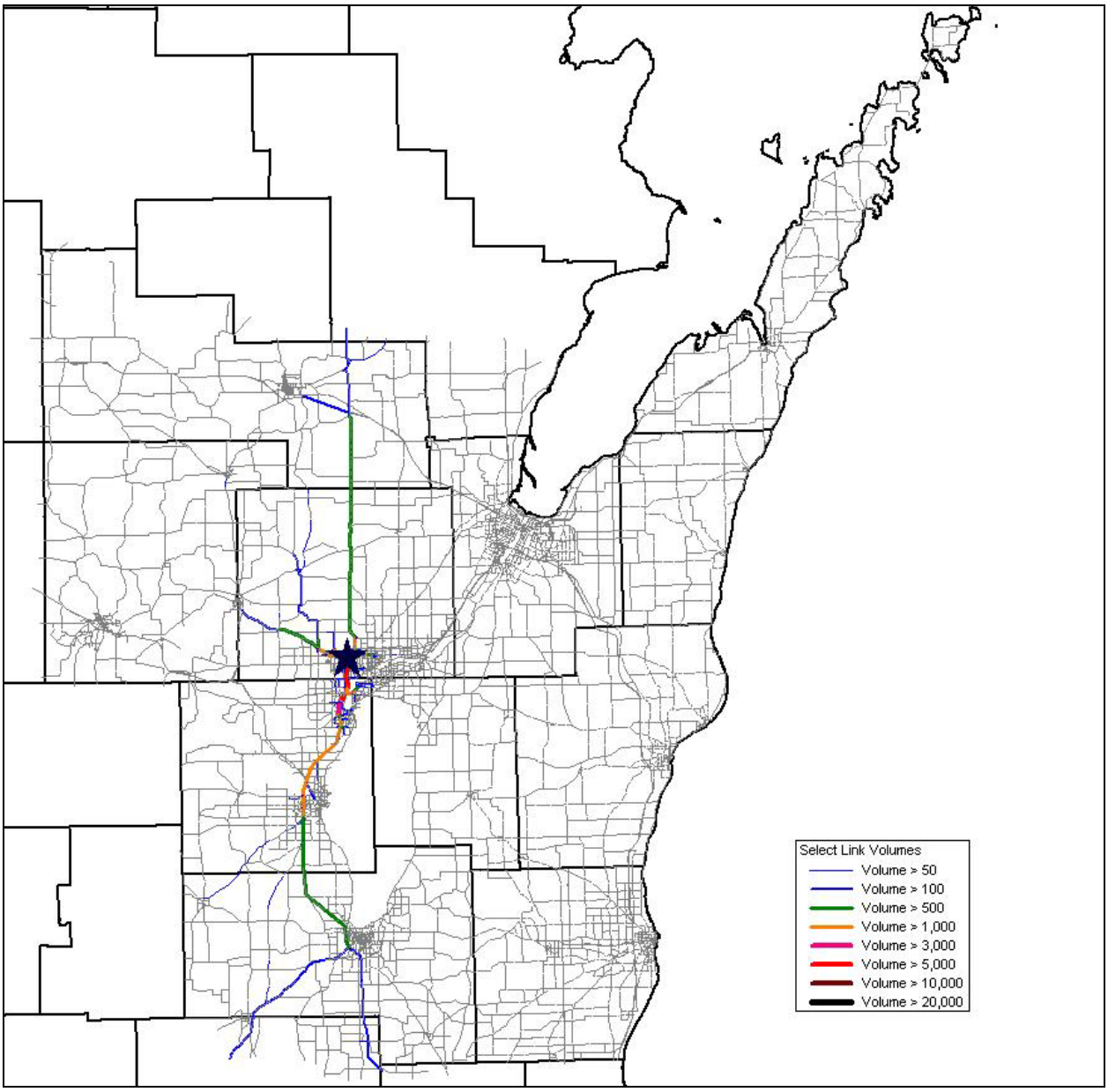
Analysis: This select link analysis provides an overview for the traffic movements on WIS 29 just east of the County V in Kewaunee County. A great majority of the traffic along the WIS 29 corridor serves to connect Kewaunee County to the Green Bay metro area. This site highlights the influence that the Green Bay metro has on the rural communities of Kewaunee County.



Facility: I-43 - SB Off Ramp
Location: US 151 Interchange
County: Manitowoc County

A-Node: 209412
B-Node: 157947

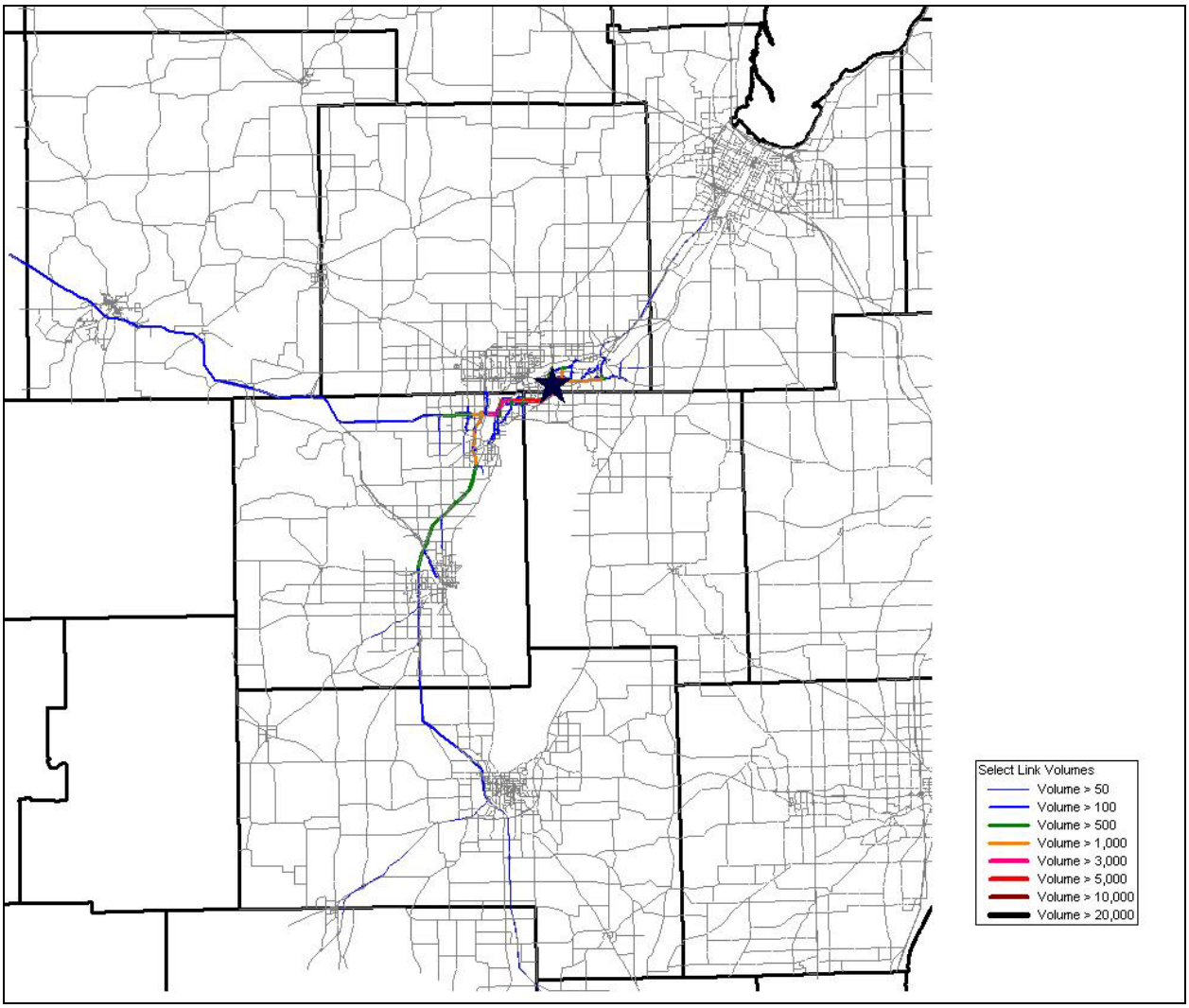
Analysis: This select link analysis provides an overview for the southbound I-43 off ramp at the US 151 interchange in Manitowoc. The location of this site allowed for the analysis to define the relationship between Manitowoc and the surrounding urban areas. A vast majority of the trips accessing Manitowoc via I-43 originate in Brown County. However, the influence between the Manitowoc and Fox Cities should not be discounted by this analysis due to greater abundance of commuting options between the urban areas.



Facility: US 41 - NB Off Ramp
Location: WIS 15 Interchange
County: Outagamie County

A-Node: 70781
B-Node: 70558

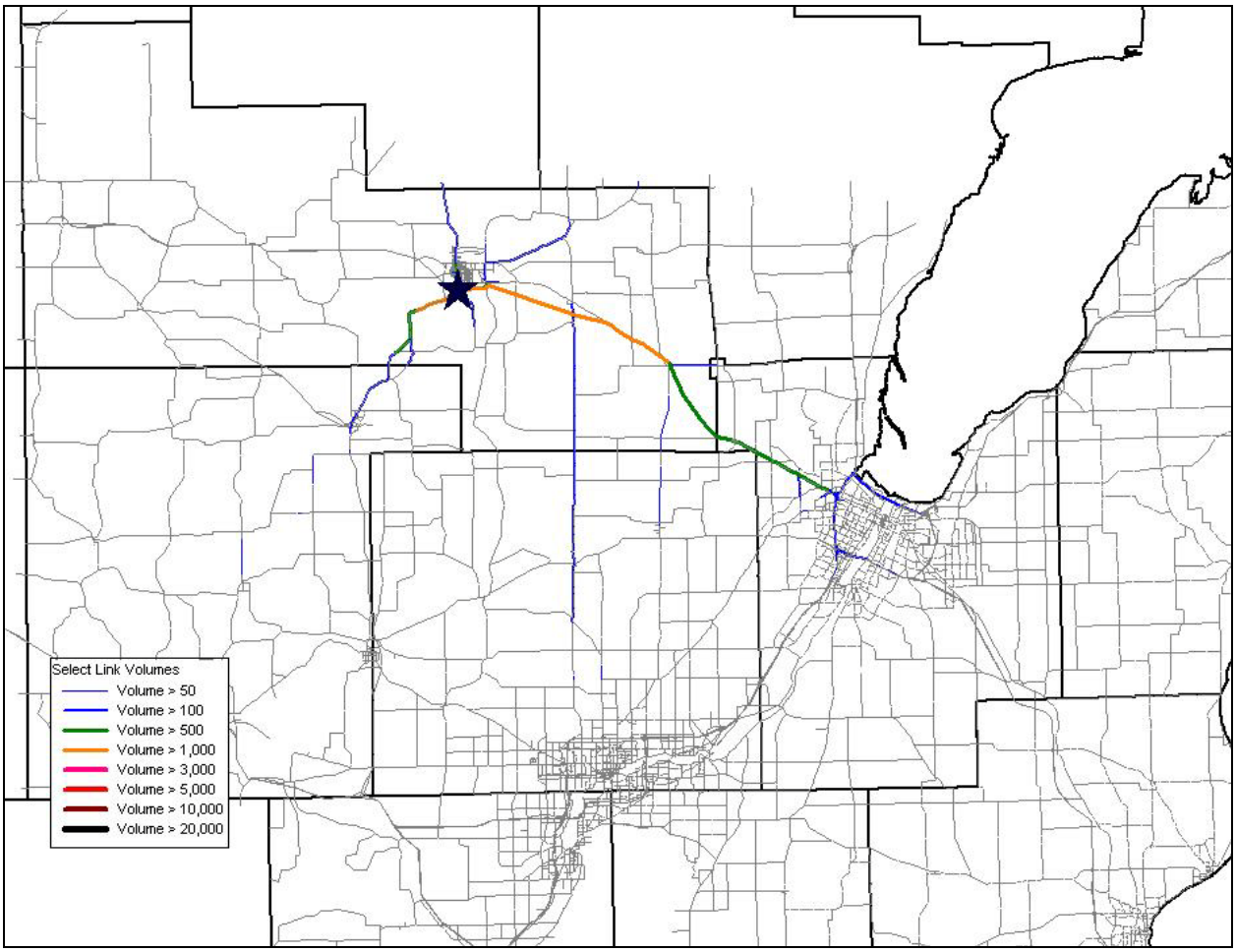
Analysis: This select link analysis provides an overview for the northbound US 41 off ramp at the WIS 15 interchange. The US 41 ramp analysis highlighted the regional influence of the US 41 corridor. Much of the traffic from this location is serviced via US 41 and US 151 from Fond du Lac and Winnebago Counties. Trips from the eastern portion of the model are no longer utilizing this interchange due to the functionality and location of the WIS 441 bypass in the Fox Cities.



Facility: WIS 441 - WB On Ramp
Location: College Avenue Interchange
County: Outagamie County

A-Node: 74131
B-Node: 74714

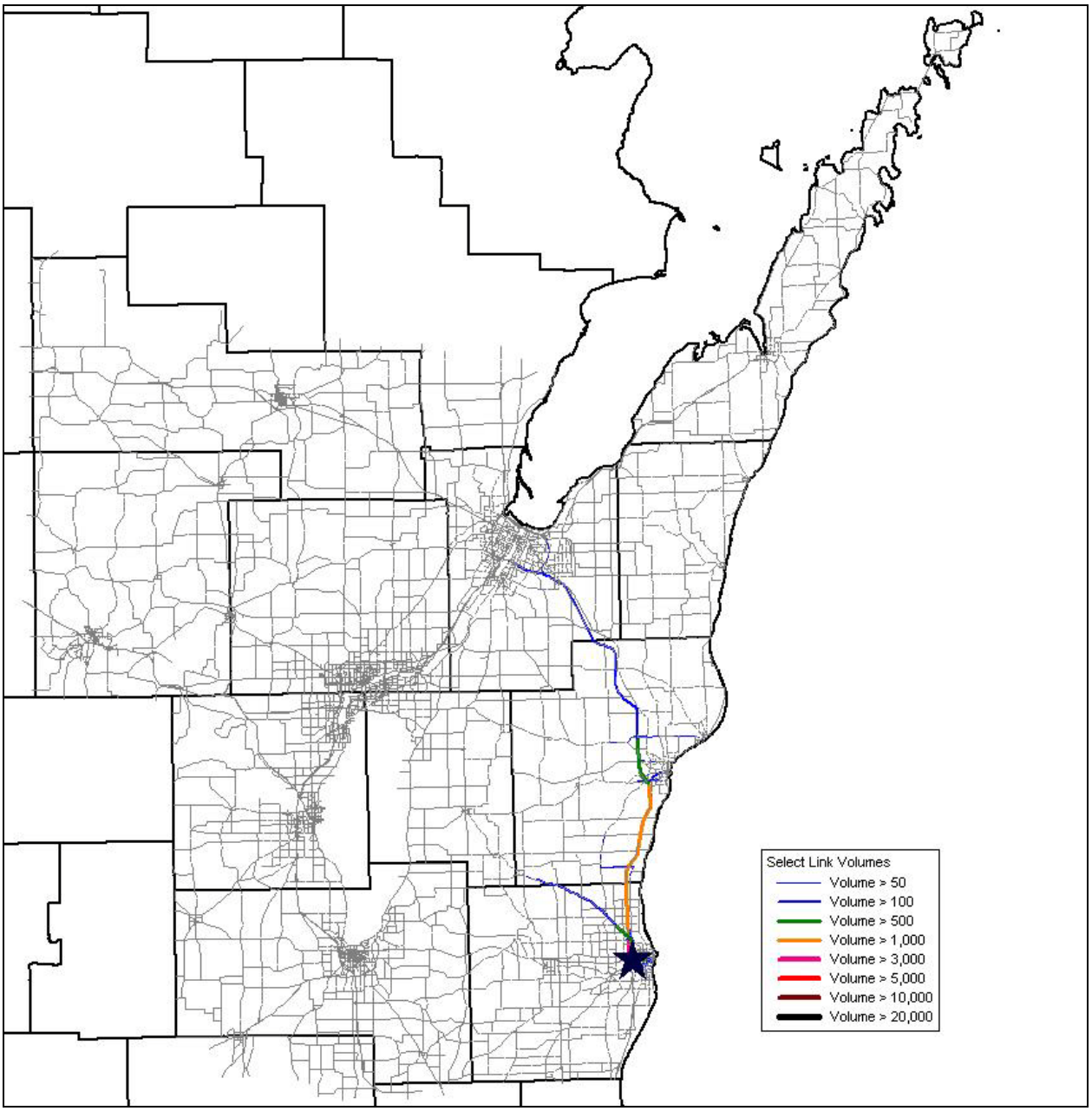
Analysis: This select link analysis provides an overview for the westbound WIS 441 on ramp at the US 41 interchange. Unlike the select link analyses performed on US 41, trips utilizing the WIS 441 corridor are more localized and less likely to involve long-distance trips. This select link analysis highlights the localized pattern of trips, as most trips are beginning and ending within the Fox Cities. Longer trips are being observed from Waupaca and Fond du Lac Counties, but these are less significant in volume.



Facility: WIS 29 - WB Off Ramp
Location: WIS 22 Interchange
County: Shawano County

A-Node: 108753
B-Node: 108650

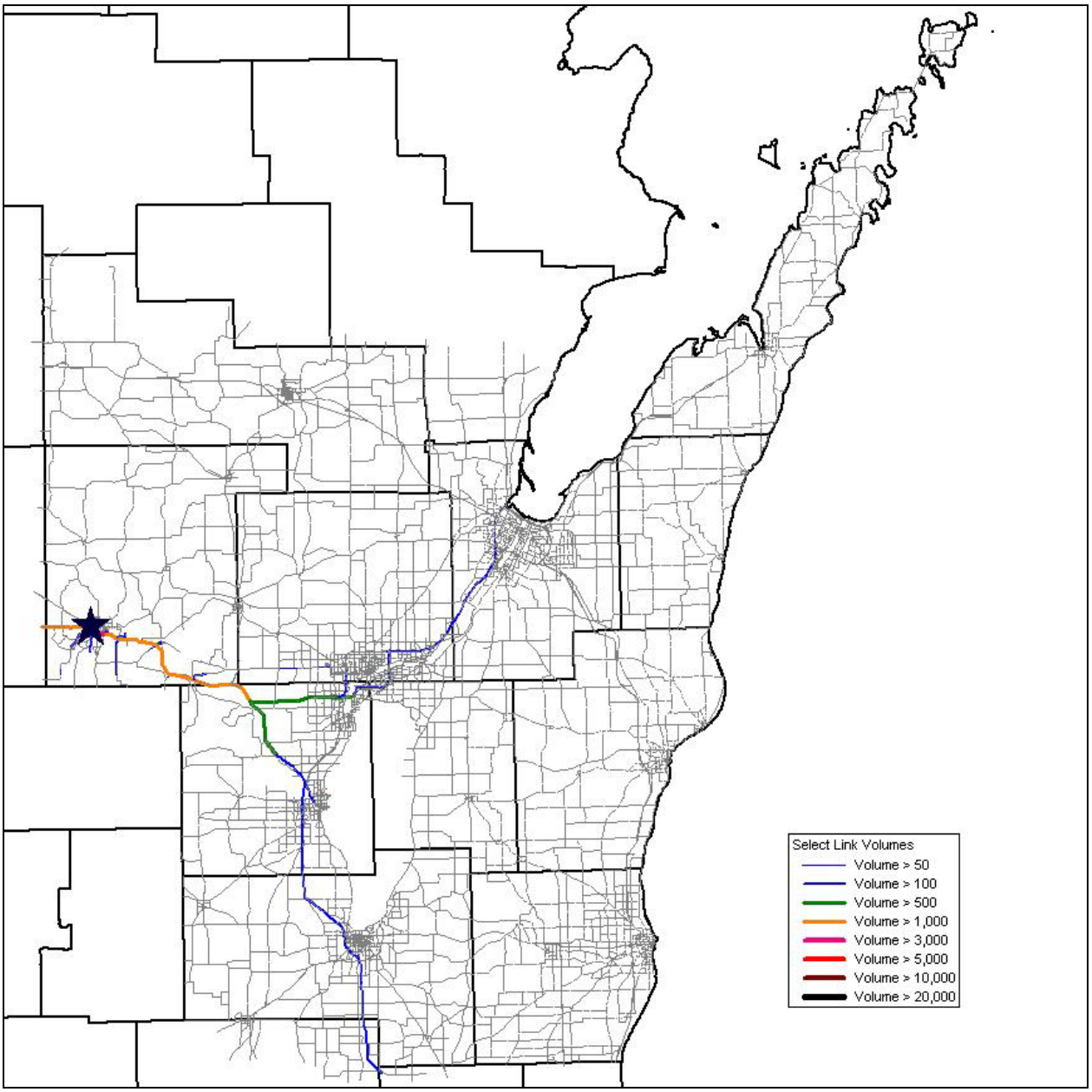
Analysis: This select link analysis provides an overview for the westbound WIS 29 off ramp at the WIS 22 interchange in Shawano. The location of this site allowed for the analysis to define the relationship between the Shawano and the surrounding urban areas. A vast majority of the trips accessing Shawano via WIS 29 originate in Brown County. The influence between the Shawano and the Fox Cities should not be discounted by this analysis due to prominence of multiple commuting options between the urban areas.



Facility: I-43 - NB On Ramp
Location: WIS 23 Interchange
County: Sheboygan County

A-Node: 115722
B-Node: 116231

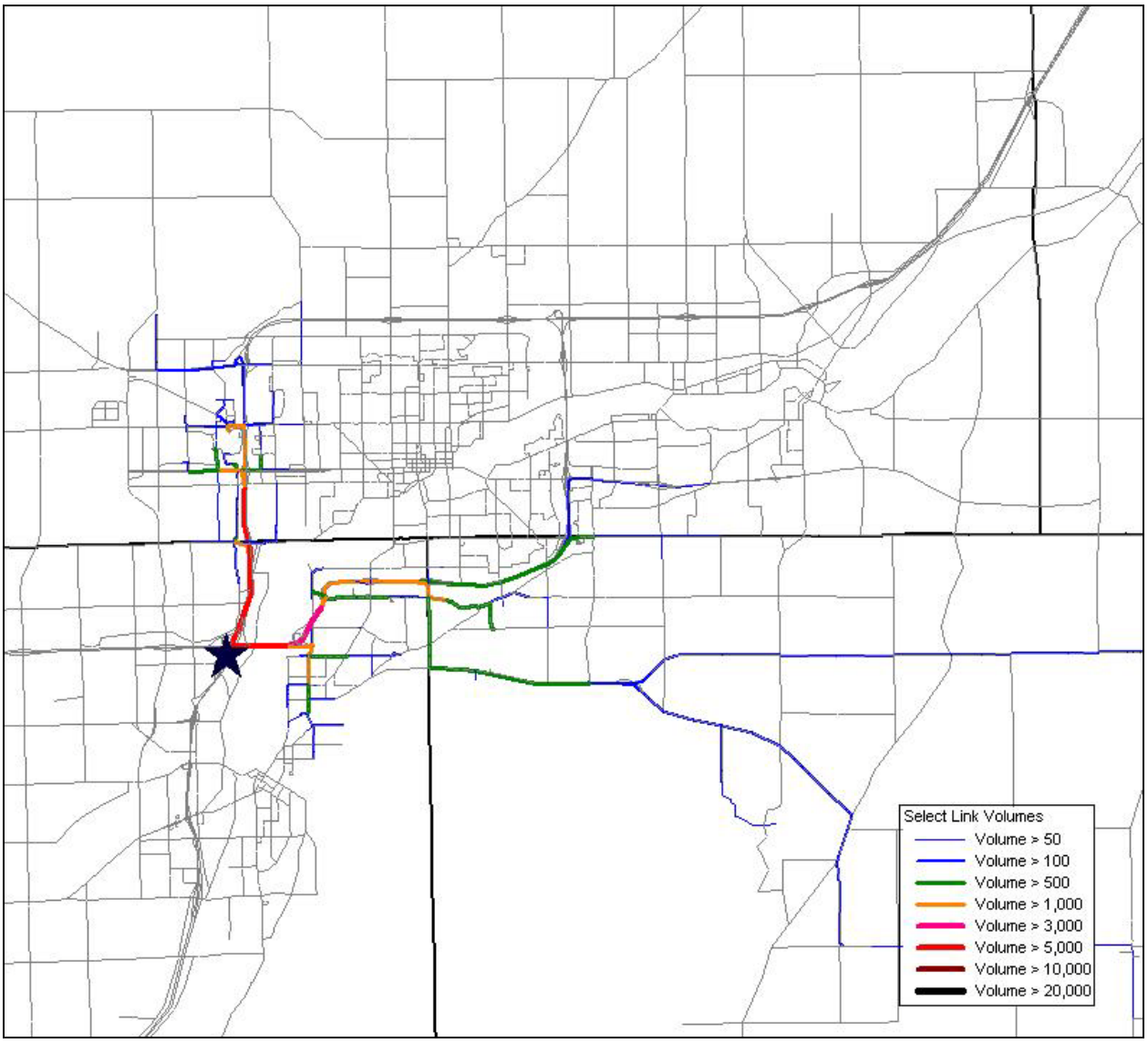
Analysis: This select link analysis provides an overview for the northbound I-43 on ramp at the WIS 23 interchange in Sheboygan. The location of this site allowed for the analysis to define the relationship between Sheboygan and the urban areas located to the north. A vast majority of the trips accessing Sheboygan via I-43 originate in Brown and Manitowoc Counties. However, the influence between the Sheboygan and Fox Cities should not be discounted by this analysis due to location of this select link analysis.



Facility: US 10 - WB Off Ramp
Location: WIS 49 / 54 Interchange
County: Waupaca County

A-Node: 106690
B-Node: 106668

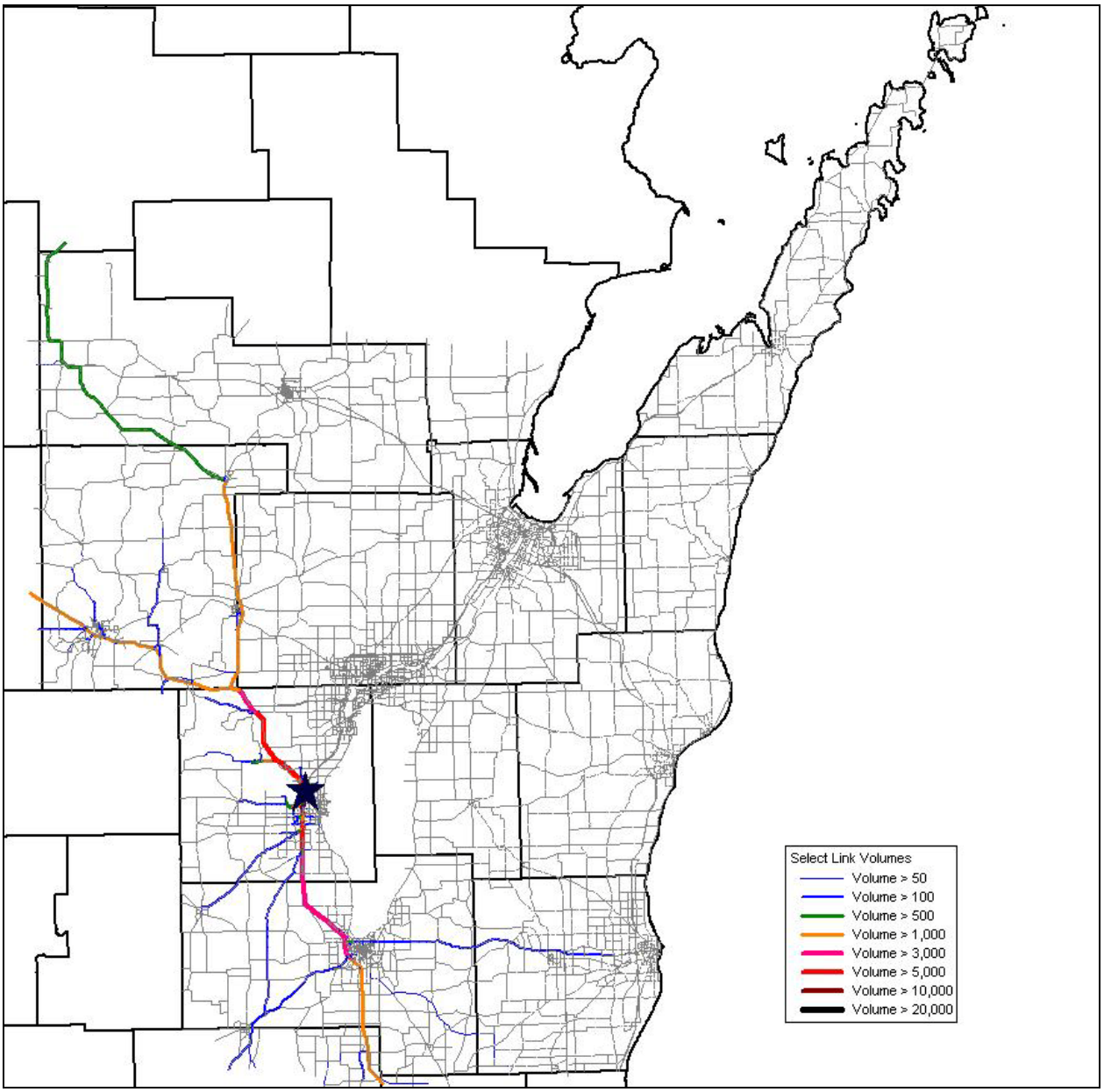
Analysis: This select link analysis provides an overview for the westbound US 10 off ramp at the WIS 49 / 54 interchange in Waupaca. The location of this site allows for an evaluation of the Waupaca's regional influence on the US 10 corridor. Much of the traffic destined for Waupaca is serviced via US 45 and US 41 from the Fox Cities, Green Bay and Fond du Lac. As would be expected, urban areas located closer to the site had more interaction, but this analysis also verified that the long distance trip purpose is performing as intended.



Facility: US 41 - SB Off Ramp
Location: WIS 441 Interchange
County: Winnebago County

A-Node: 78054
B-Node: 87390

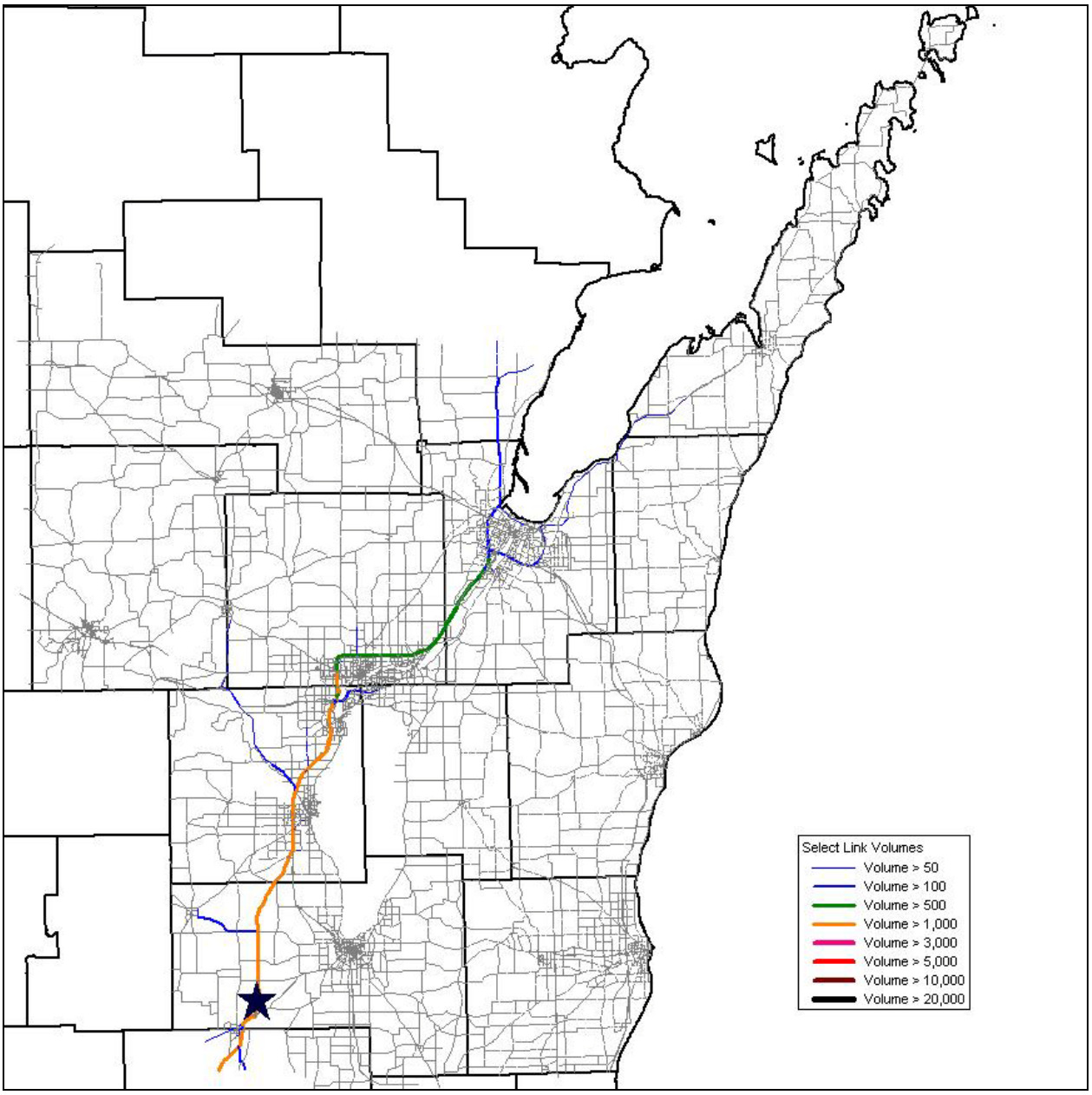
Analysis: This select link analysis provides an overview for the southbound US 41 off ramp that provides access to WIS 441 south of Appleton. Much like site 11, this select link analysis of WIS 441 highlights the localized nature of the WIS 441 corridor. Trips are less likely to be long distance and have a highly localized trip distribution. Most trips are originating around the College Avenue interchange and destined for Menasha or the eastern portion of the Fox Cities.



Facility: US 41 - SB On Ramp
Location: US 45 Interchange
County: Winnebago County

A-Node: 82899
B-Node: 82975

Analysis: This select link analysis provides an overview for the southbound US 41 on ramp at the US 45 interchange in Oshkosh. Similar to site 10, this ramp analysis highlighted the regional influence of the US 41 corridor. Much of the traffic from this location is serviced via US 45 and US 10 from Waupaca and Winnebago Counties. This analysis served to test the operations and functionality of the improved US 45 corridor. Most of the trips accessing US 41 from US 45 are longer distance, in nature, and are destined for Fond du Lac or locations external to the NE Regional Model study area.



Facility: WIS 26
Location: North of US 151
County: Fond du Lac County

A-Node: 101591
B-Node: 101599

Analysis: This select link analysis provides an overview for the traffic movements on the north leg of WIS 26 just north of the US 151 interchange. Similar to site 16, this analysis highlighted the operations of a roadway near an improved facility. The regional importance of WIS 26 has declined due to the operational and functional improvements to the US 151 corridor. Much of the traffic from this location originates from the external station near Waupun and services Winnebago, Outagamie and Brown Counties via US 41.

APPENDIX G – Socio-economic Data Updates (Validation)

PROGRESS MEETING #2

Downloaded Census 2000 data (model-wide) at the block level to verify and update Village of Rosendale's Household data.

Used Wisconsin's DPI website to download and verify Fond du Lac County's school and college enrollments.

Used the downloaded Census 2000 data at the block level to verify and update the City of New London's HH data.

Updated employment data in the City of Fond du Lac, (Zone=1074) Mercury Marine employment was misplaced. Reviewed the employment data of all surrounding zones to verify the accuracy of the employment data.

Reviewed Sturgeon Bay employment and the location/placement of centroid connectors near the Target and Wal-Mart. Verified correct allocation of service and retail employment in the Target and Wal-Mart zones.

Implemented household control totals on a countywide basis using WisDOA data. Household data was updated to 2005 where needed by rationing growth by TAZ in zones that realized growth between 2005 and 2020.

Updated employment data model-wide to make sure that the sum of the retail and service employment did not exceed the total employment. These cases were limited, but aerial imagery was used to verify employment on a zone to zone basis.

PROGRESS MEETING #3

Socio-economic data for zones 2773, 2775 and 2776 were removed, which were potentially double-counting zonal trips and external zone trips.

PROGRESS MEETING #4

Reviewed employment and household data for 2005, 2020 and 2035 for zones 449-454.

Reviewed employment and household data along the Ballard Rd. corridor in northeast Appleton.

PROGRESS MEETING #5

Airport enplanement was verified for existing airports (Outagamie and Austin Straubel) and investigated the potential for municipal airports in Fond du Lac, Oshkosh and Sheboygan. The airport enplanement for the smaller municipal airports did not warrant additional trip generation data outside the airport-related employment estimates.

Updated Mall special generator in Green Bay, Bay Park Square Mall (2346) was being coded to an incorrect adjacent zone (2431).

Updated employment at zones 1206 and 1207 in Fond du Lac to account for recent commercial and retail development.

Updated employment at zone 1211 to reflect 2005 data (initial over-estimate), but did not alter 2020, 2035 estimates.

Updated base year employment and households for all years at zone 450.

Adjusted base year household and employment data for zone 434.

Adjusted base year and year 2020 employment data at zones 449 and 454 to phase in current development.

PROGRESS MEETING #6

Located and estimated employment for all zones with "big box" retail stores that were considered for the special generator input.

Reviewed employment for all zones adjacent or near "big box" retail stores.

Updated the school enrollment for Calumet, Outagamie, Shawano, Waupaca and Winnebago County.

Reviewed land use in Southwest Oshkosh and updated zones 721, 855 (YMCA and large employer), including employment at zone 727 (Mercy Medical).

Reviewed employment and household data along the USH 41 corridor in Oshkosh.

Updated zone 2375 in Howard to include the YMCA.

Updated zone 2384 in Howard to include the new Shopko and Suamico Ale House.

Reviewed employment data along the Velp Ave. corridor in Howard.

Reviewed, verified and re-allocated employment in Waupaca for 2005, 2020 and 2035.

Reviewed, updated and re-allocated households and employment in Ripon for 2005, 2020 and 2035. (Old HH=1493, New HH=2922 and Old Emp=3012, New Emp=5550)

Reviewed and verified households and employment for Shawano, Clintonville and New London.

Reviewed, verified and re-allocated households in Northwest Fond du Lac for 2005, 2020 and 2035. (Zones= 1181-1196)

PROJECT REVIEW #1

Updated the 2020 and 2035 household control totals for Shawano County.

Updated the 2020 and 2035 household control totals for Waupaca County.

Added Home Depot special generator to base year only, zone 1056 (closed in May 2008) and revised mall special generator to be in zone 1162.

Reviewed largest employers lists for Green Bay and Fox Cities using Economic Development and Chamber of Commerce data.

Revised zones: 429 (Thrivent Financial for Lutherans), 340 (Appleton Medical Center) and 784 (Kimberly Clark).

Reviewed all zones with job or housing decreases, specifically in Fond du Lac (zones: 1007, 1056, 1078, 1082, 1163).

Reviewed the following zones with high residential development potential and low future household growth: 471, 472, 473, 475, 1924, 1925, 1927 and 1928.

Adjusted 2020 and 2035 household totals throughout Brown County for built-out zones.

Adjusted future housing growth for Village of Lomira to match DOA control totals (zone 2772).

PROGRESS MEETING #7

Reviewed the 2005-2035 household growth patterns and eliminated future growth in built out zones.

Redistributed growth from built-out zones to peripheral or developing zones using comprehensive plans and aerial imagery.

Updated the 2020 and 2035 household control totals for Brown, Outagamie and Winnebago County.

APPENDIX H – Network Updates (Validation)

PROGRESS MEETING #2

Reviewed the Village of Howard/Suamico's area type, linkclass and count data. [1]

Reviewed the Village of Algoma, Kewaunee, Luxemburg and Casco's area type, linkclass and count data.

Updated counts, functional class, AREA, and LANES for the Village of Plymouth.

Ran a select link analysis at STH 57 on/off ramps at Bay Settlement – Resulting fix consisted of adjusting centroid connector 2357 and area type.

Ran a select link analyses for Velp Ave at USH 41in Brown County - No solution yet

Ran a select link analyses for STH 67 at CTH B Sheboygan - No solution yet

Updated the STH 441 Westbound off-ramp to reduce distance and re-coded the first portion of the ramp to LINKCLASS=2 to be consistent with the mainline. Without this update trips were exiting at Midway and not using the STH 441 exit at Racine Rd, which is more realistic.

Improved the calibration of the E. Mason St. corridor by adjusting the centroid connectors (2262, 2263, 2271 and 2272). Assignments more closely represent the observed ground counts.

Implemented userspeeds along Revere Dr and Maritime Dr in downtown Manitowoc to encourage the use of the one-way streets (8^{th} and 11^{th} Streets).

PROGRESS MEETING #3

The input network was updated in the Sheboygan Falls, Kohler and Plymouth regions to more accurately reflect the actual area types.

STH 175, running north/south in Fond du Lac and Dodge Counties, was switched from linkclass 22 to 21. This change more accurately reflects the utility of the facility and has helped increase the trips that use the roadway.

Outagamie County's rural linkclasses were updated to reflect that actual functional classification designations, as set by WisDOT. Most of the state and county highways were not consistent with WisDOT classifications.

Both congested time and distance paths were tested on a output network to verify trip characteristics. The Sheboygan to Fox Cities and Oshkosh to New London/Shawano paths were analyzed to determine if trips were taking the appropriate routes. These longer routes were

[1] All linkclasses are reviewed using the most recent version of WisDOT's published functional classification maps.

identified to analyze highway skims and determine if errors existed in area type or linkclass designations.

PROGRESS MEETING #4

Ongoing review of the STH 23 corridor between downtown Sheboygan and Kohler. Addressing the directional flow issues and attempting to calibrate the parallel east-west corridors.

Re-classified STH 57 in Sheboygan County as a rural expressway due to many parallel facilities drawing too many trips of the arterial. This classification more accurately reflected the functionality of this rural 4 lane divided highway between Random Lake and Plymouth.

Reviewed the City of Shawano's area type, linkclass and count data.

Reviewed the City of Waupaca's area type, linkclass and count data.

Reviewed the Village of New London's area type, linkclass and count data.

Reviewed the Village of Clintonville's area type, linkclass and count data.

Reviewed the Village of Wittenberg's area type, linkclass and count data.

Reviewed the City of Pulaski's area type, linkclass and count data.

Reviewed the City of Waupun's area type, linkclass and count data.

Reviewed the implementation of Green Bay's downtown userspeeds, which existed prior to the Lakeshore Model expansion.

Reviewed the implementation of Sheboygan's downtown userspeeds, which existed prior to the Lakeshore Model expansion.

Edited Green Bay's downtown area types, which may be causing a number of circulation problems. Updated the Mason Street ramps at Jefferson and Madison Streets, removing a non-existent ramp and improving alignment to remove potential "short-cuts".

Removed non-functionally classified streets (Cherry and Pine) between Webster and Monroe Streets in downtown Green Bay. This was accompanied by an adjustment to the centroid connectors of zone 2236.

Switched Gray St in Green Bay from a minor arterial to a major collector.

Extend Pilgram Way between Ashland Ave and S. Broadway St.

Re-coded Ashland Ave between USH 41 and Vanderperren Way as LC=4 and Area=30, this method or a userspeed could be applied. As a principal arterial, this divided four lane facility is not getting as nearly as much traffic as it should.

Re-adjusted centroid connectors: 1849, 2285, 2287, 2278, 2284, 2321, 2318 and 2316 for loading improvements.

Monroe and Webster Streets in downtown Green Bay were re-coded to Area=30. Too much traffic was taking slower, less prominent streets.

CTH PP was re-coded to Area=20 between CTH Y and Taylor Dr.

Re-coded 9th St in downtown Sheboygan to Area=40 to bring it in line with adjacent streets.

Converted 7th and 9th St in downtown Sheboygan to 2-way streets in the future year scenarios.

Added CTH AB (west of Taylor Dr.) in Sheboygan to Linkclass=13, Area=20.

Added 17th St (south of STH 23) in Sheboygan to Linkclass=13, Area=30.

Removed "double-counts" through-out Sheboygan County that were the result of link splits, count updates, etc.

PROGRESS MEETING #5

Isabell and Lambeau St transit routes were converted from LC=13 to LC=14, preventing cut-through traffic of autos. These streets were only intended for transit.

Kewaunee and Calumet County linkclasses were update in the municipalities to reflect urban travel speeds.

Sheboygan's downtown area types were reviewed to aid in the validation of the downtown volumes.

Reviewed every site in the model that contained a Count>0 and a TOT_VOL=0 to check loading points within the model.

Re-evaluated the conversion of the downtown Sheboygan one-way pairs.

Removed the CTH EE frontage road along USH 41 in Oconto County.

Extended CTH D to the east of USH 41 in Oconto County.

Fixed Chicago St. in downtown Green Bay, it now has a proper one-way on-ramp to Mason St.

Connected Bomier to Broadway St in De Pere.

Converted Cook St to two-way street near Broadway St in De Pere.

Updated centroid connections for Green Bay's Bay Park Square Mall (2346)

Re-align USH 45 Interchange at USH 10 and convert USH 45 from LC=4 to LC=11.

Connected Greenville Dr to CTH CB near STH 15 in Greenville.

Coded CTH CB extension in Greenville as a Newlink=1 and fix connection to Mayflower Rd.

Add missing link to Wisconsin St in Little Chute and coverted to LC=14 from Buchanan to Riverside.

Converted STH 116 in rural Winnebago County from LC=12 to LC=13.

Updated Omro and Winneconne Linkclass and Area.

Adjusted connections for zones 437 and 438 near Fox River Mall and convert mall transit loop connections to LC=13.

Adjusted interchange alignments on STH 23 at CTH Y and IH 43in Sheboygan County.

PROGRESS MEETING #6

Analyzed USH 441-Racine/Midway connection

Reviewed Green Bay's near east side zone loadings.

Reviewed Green Bay's near east side zone loadings.

Connected Pleasant View Rd to WIS 23 in Plymouth.

Adjusted centroids near all new special generator sites.

Updated and veriry Lanes for Fond du Lac, Two Rivers, New London, Waupaca, Shawano, Ripon, Waupun and Oshkosh.

Evaluated Shawano area types.

Adjusted the STH 55/29 Interchange in Shawano to match counts better along corridor and ramps.

Fixed College Ave Interchange and adjacent loading along corridor in Appleton.

Fixed area types and linkclass on Oshkosh's northside.

Reviewed traffic patterns between Algoma Blvd and Jackson St in Oshkosh.

Changed USH 45 northwest of Oshkosh to LC=11 and review area type.

Reviewed all Waupaca and Ripon zone loadings.

Added new future year zone centroid connectors for zones 1727 and 1584, where a Menard's and Wal-Mart were built after the base year (include in SG inputs).

Updated the future year alignment of Main Ave (bridge) and Broadway St in De Pere.

Added Doty St (LC=13, Area=40) in downtown Green Bay.

Fixed Riverdale/WIS 29 Intersection, eliminates left turns onto WIS 29 in base year.

PROJECT REVIEW #1

Added auxiliary lanes in Green Bay on USH 41, WIS 172 and IH 43.

Added auxiliary/passing lanes in Fond du Lac and Winnebago County on WIS 26.

Updated/verified lanes using WisDOT state highway shapefile.

PROGRESS MEETING #7

Adjusted centroid connections near Luxemburg in Kewaunee County.

Updated counts on USH 41, STH 172 and IH 43 in Brown County using WisDOT's ATR continuous count (2005-2008).

Adjusted centroid connections near Gibraltar/Ephraim/Sister Bay and Sturgeon Bay in Door County.

APPENDIX I – Validation Statistics (Validation)

Northeast Regional Travel Demand Model - Validation Statistics

Model Area: Total

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 7, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-3.99		-2.74		-3.39		-3.34		-3.22		-3.05		-3.22		-3.05		-3.08		-3.43	
GEH > 10 =	0.40	0.62		0.60		0.60		0.59		0.58		0.57		0.56		0.56		0.56		0.56	
GEH > 20 =	0.30	0.34		0.32		0.31		0.31		0.30		0.29		0.29		0.28		0.28		0.28	
GEH > 30 =	0.15	0.17		0.15		0.14		0.14		0.13		0.13		0.13		0.13		0.13		0.13	
GEH > 40 =	0.05	0.07		0.06		0.06		0.06		0.06		0.05		0.05		0.05		0.05		0.05	
R-SQUARED =	>0.88	0.91		0.92		0.92		0.92		0.92		0.93		0.93		0.93		0.93		0.93	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	4,755	77.02	4,675	74.78	4,671	71.50	4,625	70.99	4,550	69.08	4,546	68.62	4,541	68.20	4,543	67.93	4,543	67.94	4,543	66.89
2,001 - 5,000	45-55	2,329	39.11	2,293	38.62	2,297	38.51	2,270	37.68	2,267	36.43	2,267	35.55	2,269	34.98	2,275	34.81	2,275	34.79	2,275	34.40
5,001 - 10,000	35-45	1,245	27.85	1,245	25.97	1,247	26.04	1,244	25.06	1,243	24.99	1,233	24.17	1,225	23.50	1,225	23.75	1,225	23.77	1,225	23.33
10,001 - 20,000	27-35	322	16.88	311	15.20	310	15.03	310	15.90	308	14.32	310	13.93	310	14.53	310	14.27	310	13.89	310	14.21
20,001 - 30,000	24-27	39	11.34	42	12.30	39	12.38	39	12.34	39	10.51	42	9.87	42	9.65	42	9.76	45	9.23	45	9.17
30,001 - 100,000	24-27	40	11.96	38	10.51	40	10.57	40	10.43	40	10.86	36	9.16	36	8.39	36	8.42	35	8.27	35	7.76
0 - 100,000	32-39	8,730	39.92	8,604	37.85	8,604	37.58	8,528	36.93	8,447	35.76	8,434	34.65	8,423	34.15	8,431	34.15	8,433	33.95	8,427	33.52
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified airport data				• Created new SG files • Updated School Enrollments							

Northeast Regional Travel Demand Model - Validation Statistics

Model Area: Brown

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-6.23		-3.51		-3.38		-2.4		-3		-3.66		-3.70		-4.31		-4.38		-4.78	
GEH > 10 =	0.40	0.67		0.64		0.64		0.62		0.60		0.61		0.60		0.59		0.59		0.61	
GEH > 20 =	0.30	0.40		0.36		0.37		0.35		0.34		0.37		0.35		0.36		0.35		0.34	
GEH > 30 =	0.15	0.21		0.19		0.19		0.18		0.18		0.19		0.19		0.19		0.19		0.19	
GEH > 40 =	0.05	0.12		0.09		0.09		0.09		0.08		0.09		0.09		0.09		0.09		0.09	
R-SQUARED =	>0.88	0.90		0.91		0.91		0.92		0.93		0.92		0.92		0.92		0.93		0.93	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	483	84.05	497	75.03	497	74.90	491	76.63	490	72.74	494	73.00	496	70.09	496	69.55	496	69.43	496	68.65
2,001 - 5,000	45-55	383	41.46	385	40.57	385	40.71	383	37.83	380	36.62	382	38.63	384	38.13	384	38.76	384	38.80	386	38.73
5,001 - 10,000	35-45	321	30.14	322	27.51	322	27.62	326	23.57	327	24.55	330	25.20	331	24.55	331	24.98	331	24.98	331	24.81
10,001 - 20,000	27-35	121	19.54	112	16.37	114	16.51	114	16.40	112	15.66	113	15.40	113	16.40	113	16.04	113	15.14	113	15.55
20,001 - 30,000	24-27	25	14.18	18	11.68	16	10.15	16	9.72	16	7.63	14	10.53	14	9.20	14	8.95	17	7.56	17	7.43
30,001 - 100,000	24-27	11	13.23	10	11.56	10	11.04	10	11.92	10	11.54	12	14.12	12	13.52	12	12.98	11	12.92	11	11.97
0 - 100,000	32-39	1344	34.61	1344	32.07	1344	32.01	1340	29.62	1335	29.19	1345	30.56	1350	30.16	1,350	30.19	1,352	29.55	1,354	29.38
Key Updates										• Updated Mall SG zone • Reviewed loadings on W Mason St • Updated downtown street network				• Created new SG files • Review east-west corridor loadings • Analyze NW Green Bay (Howard) zones				• Update USH 41 counts using ATR station data • Update Howard employment • Analyze NW Green Bay (Howard) zones		• Verified base year household totals	

Northeast Regional Travel Demand Model - Validation Statistics

Model Area: Calumet

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		1.76		8.07		5.25		5.19		8.46		9.7		9.48		9.67		9.69		8.95	
GEH > 10 =	0.40	0.61		0.50		0.46		0.47		0.46		0.49		0.49		0.49		0.49		0.48	
GEH > 20 =	0.30	0.30		0.29		0.29		0.29		0.26		0.25		0.24		0.24		0.25		0.23	
GEH > 30 =	0.15	0.11		0.10		0.09		0.10		0.07		0.07		0.06		0.07		0.07		0.06	
GEH > 40 =	0.05	0.03		0.04		0.03		0.03		0.02		0.02		0.02		0.02		0.02		0.02	
R-SQUARED =	>0.88	0.91		0.91		0.91		0.91		0.90		0.92		0.92		0.92		0.92		0.92	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	184	63.14	186	62.61	186	58.11	182	57.73	172	67.95	172	72.23	172	70.91	172	70.98	172	70.99	172	69.60
2,001 - 5,000	45-55	75	26.76	77	36.72	77	36.03	77	36.22	77	35.68	77	29.05	77	28.80	77	29.12	77	29.14	77	28.81
5,001 - 10,000	35-45	27	22.67	27	20.23	27	20.68	27	21.31	27	19.22	27	17.27	27	16.91	27	16.77	27	16.80	27	16.54
10,001 - 20,000	27-35	5	8.01	5	9.54	5	9.46	5	9.41	5	8.97	5	8.43	5	8.32	5	8.53	5	8.56	5	7.99
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	291	34.93	295	38.48	295	37.66	291	37.84	281	37.7	281	34.32	281	33.98	281	34.12	281	34.15	281	33.55
Key Updates										• Reviewed Chilton zones • Reviewed every site with Count>0 and Tot_Vol=0				• Created new SG files • Updated School Enrollments						• Verified base year household totals	

Northeast Regional Travel Demand Model - Validation Statistics

Model Area: Dodge

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-6.05		8.95		4.15		4.11		4.14		3.77		3.74		4.16		4.18		3.74	
GEH > 10 =	0.40	0.54		0.36		0.36		0.35		0.35		0.33		0.34		0.33		0.33		0.33	
GEH > 20 =	0.30	0.14		0.18		0.12		0.12		0.13		0.11		0.12		0.11		0.11		0.15	
GEH > 30 =	0.15	0.06		0.11		0.05		0.05		0.04		0.05		0.04		0.06		0.06		0.05	
GEH > 40 =	0.05	0.02		0.07		0.02		0.02		0.02		0.02		0.02		0.02		0.02		0.02	
R-SQUARED =	>0.88	0.96		0.92		0.96		0.96		0.95		0.96		0.96		0.96		0.96		0.96	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	74	52.84	72	77.09	72	45.83	72	47.17	72	45.61	72	45.59	72	44.98	72	46.18	72	46.15	72	46.27
2,001 - 5,000	45-55	14	34.08	18	45.01	18	39.39	18	37.8	18	40.05	18	39.44	18	37.16	18	39.57	18	39.71	18	37.61
5,001 - 10,000	35-45	6	3.89	6	3.35	6	3.12	6	3.09	6	3.07	6	3.16	6	3.21	6	3.05	6	3.05	6	3.06
10,001 - 20,000	27-35	3	11.81	3	6.00	3	5.91	3	4.97	3	6.35	3	5.69	3	5.70	3	5.26	3	5.31	3	4.64
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	97	32.21	99	40.6	99	28.78	99	28.34	99	29.09	99	28.65	99	27.72	99	28.72	99	28.77	99	27.91
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0				• Created new SG files • Reviewed zone loadings and counts							

Model Area: Door

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-21.83		-24.92		-24.9		-24.91		-23.57		-21.35		-21.45		-21.39		-21.40		-20.96	
GEH > 10 =	0.40	0.63		0.59		0.59		0.59		0.59		0.56		0.55		0.56		0.56		0.53	
GEH > 20 =	0.30	0.27		0.26		0.26		0.27		0.22		0.21		0.21		0.21		0.21		0.23	
GEH > 30 =	0.15	0.12		0.07		0.07		0.07		0.08		0.07		0.07		0.07		0.07		0.05	
GEH > 40 =	0.05	0.06		0.02		0.02		0.02		0.03		0.02		0.02		0.02		0.02		0.01	
R-SQUARED =	>0.88	0.72		0.86		0.86		0.86		0.86		0.87		0.87		0.87		0.87		0.89	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	256	58.16	256	57.07	256	57.09	256	57.04	244	56.5	244	54.77	244	54.81	244	54.89	244	54.89	240	49.63
2,001 - 5,000	45-55	57	50.29	57	32.57	57	32.57	57	32.57	57	31.19	57	29.75	57	29.74	57	29.80	57	29.80	57	28.49
5,001 - 10,000	35-45	9	21.6	8	17.39	8	17.52	8	17.53	8	16.31	8	12.89	8	12.93	8	12.55	8	12.55	8	12.72
10,001 - 20,000	27-35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	322	62.28	321	46.43	321	46.46	321	46.44	309	44.57	309	42.36	309	42.37	309	42.39	309	42.39	305	39.64
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified counts and their location				• Created new SG files • Reviewed zone loadings and counts						• Reviewed zone loadings and counts	

Northeast Regional Travel Demand Model - Validation Statistics

Model Area: Fond du Lac

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-5.69		-1.49		-3.57		-3.56		-3.65		-2.12		-2.38		-2.34		-2.34		-3.64	
GEH > 10 =	0.40	0.61		0.62		0.61		0.60		0.59		0.59		0.58		0.58		0.58		0.58	
GEH > 20 =	0.30	0.32		0.32		0.31		0.31		0.30		0.30		0.28		0.28		0.28		0.28	
GEH > 30 =	0.15	0.16		0.16		0.15		0.15		0.14		0.14		0.13		0.14		0.13		0.13	
GEH > 40 =	0.05	0.08		0.07		0.07		0.07		0.07		0.06		0.06		0.05		0.05		0.06	
R-SQUARED =	>0.88	0.87		0.87		0.88		0.88		0.88		0.89		0.90		0.90		0.90		0.90	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	506	78.69	472	79.06	472	69.39	472	69.37	470	69.11	474	72.36	474	71.45	474	70.98	474	70.98	474	70.44
2,001 - 5,000	45-55	223	38.5	221	40.19	221	39.72	221	39.69	223	39.20	225	38.89	225	35.80	225	35.98	225	35.98	225	35.75
5,001 - 10,000	35-45	102	34.61	101	33.29	101	32.8	101	32.88	99	31.58	99	31.34	99	29.08	99	29.51	99	29.51	99	29.15
10,001 - 20,000	27-35	36	12.09	34	12.10	34	11.43	34	11.69	34	10.65	34	9.61	34	8.87	34	9.06	34	9.05	34	8.63
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	867	43.53	828	43.13	828	41.53	828	41.64	826	40.47	832	40.33	832	37.76	832	38.04	832	38.04	832	37.61
Key Updates										• Reviewed EMP and HH data for zones: 1206, 1207 and 1211				• Created new SG files • Updated School Enrollments • Verify lanes and reviewed area types							

Model Area: Kewaunee

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-14.63		-9.53		-9.71		-9.71		-7.64		-7.93		-7.89		-7.8		-9.04		-8.95	
GEH > 10 =	0.40	0.52		0.52		0.52		0.53		0.46		0.45		0.44		0.44		0.46		0.44	
GEH > 20 =	0.30	0.16		0.15		0.15		0.15		0.15		0.15		0.15		0.15		0.15		0.14	
GEH > 30 =	0.15	0.07		0.07		0.07		0.07		0.03		0.03		0.03		0.03		0.03		0.02	
GEH > 40 =	0.05	0.02		0.03		0.03		0.03		0.01		0.01		0.01		0.01		0.00		0.00	
R-SQUARED =	>0.88	0.72		0.74		0.74		0.74		0.82		0.82		0.82		0.81		0.83		0.84	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	220	53.84	212	59.69	212	59.42	212	59.41	214	47.77	214	48.07	214	48.08	214	48.13	214	48.51	214	46.89
2,001 - 5,000	45-55	26	33.75	28	29.22	28	29.13	28	29.13	28	24.56	28	25.13	28	25.19	28	25.24	28	21.49	28	20.93
5,001 - 10,000	35-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10,001 - 20,000	27-35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	246	50.97	240	50.99	240	50.79	240	50.79	242	41.57	242	42.09	242	42.13	242	42.20	242	40.18	240	38.88
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified counts and their location				• Created new SG files • Reviewed zone loadings and counts				• Reviewed zone loadings and counts near Luxemburg		• Reviewed zone loadings and counts near Luxemburg	

Model Area: Manitowoc

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-5.27		-2.19		-2.56		-2.54		-1.4		-0.76		-0.59		-1.09		-1.09		-1.37	
GEH > 10 =	0.40	0.63		0.60		0.60		0.60		0.57		0.58		0.56		0.51		0.52		0.52	
GEH > 20 =	0.30	0.35		0.30		0.30		0.31		0.28		0.28		0.27		0.24		0.24		0.24	
GEH > 30 =	0.15	0.17		0.14		0.14		0.14		0.14		0.13		0.11		0.10		0.10		0.10	
GEH > 40 =	0.05	0.07		0.05		0.05		0.05		0.05		0.05		0.05		0.04		0.04		0.04	
R-SQUARED =	>0.88	0.83		0.87		0.87		0.87		0.88		0.89		0.89		0.90		0.90		0.90	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	498	71.79	480	64.56	480	64.18	478	64.29	478	62.50	478	61.69	472	58.89	474	55.77	474	55.78	472	55.63
2,001 - 5,000	45-55	172	37.42	168	35.81	168	36.03	168	35.78	164	34.30	164	35.48	162	34.38	168	30.43	168	30.48	168	30.98
5,001 - 10,000	35-45	81	32.88	79	29.36	81	28.72	81	29.19	83	28.03	83	27.91	83	27.5	83	26.54	83	26.55	83	26.47
10,001 - 20,000	27-35	14	9.57	16	9.26	14	8.74	14	8.89	14	8.08	14	8.19	14	8.05	14	8.24	14	8.23	14	8.16
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	765	47.72	743	43.06	743	43.02	741	43.23	739	41.56	739	41.78	731	40.58	739	38.00	739	38.03	739	38.09
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified counts and their location				• Created new SG files • Reviewed zone loadings and counts							

Model Area: Oconto

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		10.65		-2.45		-3.46		-3.46		-3.2		-3.32		-3.36		-3.37		-3.38		-3.36	
GEH > 10 =	0.40	0.57		0.44		0.45		0.45		0.37		0.39		0.39		0.39		0.39		0.39	
GEH > 20 =	0.30	0.32		0.17		0.20		0.20		0.18		0.21		0.21		0.21		0.21		0.21	
GEH > 30 =	0.15	0.13		0.06		0.06		0.06		0.05		0.05		0.05		0.05		0.05		0.05	
GEH > 40 =	0.05	0.03		0.00		0.00		0.00		0.02		0.02		0.02		0.02		0.02		0.02	
R-SQUARED =	>0.88	0.97		0.99		0.99		0.99		0.99		0.99		0.99		0.99		0.99		0.99	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	50	98.37	48	62.94	48	64.07	48	64.3	44	72.12	44	73.26	44	73.59	44	73.40	44	73.44	44	73.59
2,001 - 5,000	45-55	4	44.59	4	30.19	4	38.13	4	38.38	4	16.29	4	14.62	4	14.77	4	14.98	4	15.04	4	14.70
5,001 - 10,000	35-45	8	15.01	8	4.69	8	4.35	8	4.06	8	1.80	8	2.08	8	2.19	8	2.17	8	2.17	8	2.17
10,001 - 20,000	27-35	6	15.69	6	5.20	6	5.73	6	5.81	6	5.45	6	5.44	6	5.45	6	5.45	6	5.45	6	5.42
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	68	35.88	66	16.75	66	17.71	66	17.78	62	16.42	62	16.55	62	16.62	62	16.60	62	16.61	62	16.59
Key Updates										• Removed CTH EE frontage road • Extended CTH D to the east of USH 41				• Created new SG files • Reviewed zone loadings and counts							

Model Area: Outagamie

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-3.71		-0.49		-1.17		-1.12		-1.58		-2.66		-3.06		-1.96		-1.95		-2.73	
GEH > 10 =	0.40	0.66		0.63		0.63		0.62		0.61		0.60		0.60		0.59		0.60		0.61	
GEH > 20 =	0.30	0.36		0.33		0.33		0.33		0.32		0.30		0.30		0.30		0.30		0.30	
GEH > 30 =	0.15	0.18		0.14		0.14		0.15		0.13		0.12		0.12		0.12		0.12		0.12	
GEH > 40 =	0.05	0.06		0.04		0.04		0.04		0.04		0.04		0.04		0.04		0.04		0.04	
R-SQUARED =	>0.88	0.92		0.93		0.93		0.92		0.92		0.94		0.93		0.93		0.93		0.94	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	524	70.43	530	67.65	526	66.24	526	67.88	516	67.51	520	65.1	520	64.32	520	69.09	520	69.22	520	65.80
2,001 - 5,000	45-55	363	33.36	370	33.22	374	32.75	374	33.39	376	32.23	376	30.41	376	29.14	376	30.44	376	30.45	376	28.71
5,001 - 10,000	35-45	227	27	221	24.65	221	25.35	221	24.88	221	25.45	221	23.75	221	23.84	215	24.03	215	24.12	215	22.47
10,001 - 20,000	27-35	71	16.44	69	15.37	68	14.80	68	18.72	68	14.91	69	15.46	69	16.85	69	15.88	69	15.83	69	16.62
20,001 - 30,000	24-27	13	14	14	13.59	13	15.55	13	15.88	13	13.52	17	9.80	17	10.02	17	10.65	17	10.66	17	10.51
30,001 - 100,000	24-27	9	16.15	7	13.83	9	13.85	9	12.37	9	15.40	4	6.24	4	6.96	4	5.38	4	5.38	4	5.84
0 - 100,000	32-39	1207	34.01	0	32.06	1211	32.36	1211	33.26	1203	32.33	1207	29.32	1207	29.55	1,201	30.04	1,201	30.08	1,201	28.95
Key Updates										• Updated centroid loadings near Fox River Mall • Fixed the CTH CB/Greenville Dr/Mayflower Rd intersection • Updated EMP and HH at zones: 434, 449, 450 and 454				• Created new SG files • Updated School Enrollments						• Verified base year household totals	

Northeast Regional Travel Demand Model - Validation Statistics

Model Area: Shawano

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-4.04		-3.93		-3.5		-3.5		-3.77		-3.12		-3.27		-3.34		-3.33		-3.35	
GEH > 10 =	0.40	0.59		0.54		0.54		0.54		0.53		0.54		0.54		0.54		0.54		0.54	
GEH > 20 =	0.30	0.27		0.24		0.24		0.24		0.23		0.23		0.23		0.23		0.23		0.23	
GEH > 30 =	0.15	0.10		0.08		0.08		0.08		0.08		0.10		0.09		0.09		0.09		0.09	
GEH > 40 =	0.05	0.03		0.02		0.02		0.02		0.05		0.05		0.05		0.05		0.05		0.05	
R-SQUARED =	>0.88	0.81		0.85		0.84		0.84		0.83		0.83		0.83		0.83		0.83		0.83	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	421	76.08	411	73.34	411	74.68	411	74.71	395	74.38	395	72.28	395	72.16	395	72.20	395	72.27	395	72.20
2,001 - 5,000	45-55	109	20.57	109	21.58	109	21.61	109	21.62	109	20.17	109	19.04	109	19.10	109	19.10	109	19.11	109	19.09
5,001 - 10,000	35-45	25	35.42	25	25.36	25	26.56	25	26.49	25	31.63	25	33.6	25	33.29	25	33.17	25	33.19	25	33.14
10,001 - 20,000	27-35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	555	48.97	545	43.22	545	44.17	545	44.16	529	45.59	529	45.66	529	45.48	529	45.42	529	45.45	529	45.40
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified counts and their location				• Created new SG files • Reviewed zone loadings, counts and area types • Reviewed zone loadings, counts and area types							

Model Area: Sheboygan

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		2.85		5.88		3.9		2.55		2.48		3.37		3.17		3.08		3.11		2.85	
GEH > 10 =	0.40	0.62		0.61		0.60		0.58		0.57		0.55		0.55		0.55		0.55		0.55	
GEH > 20 =	0.30	0.34		0.32		0.31		0.30		0.28		0.28		0.27		0.28		0.27		0.27	
GEH > 30 =	0.15	0.17		0.15		0.13		0.12		0.11		0.11		0.11		0.11		0.11		0.11	
GEH > 40 =	0.05	0.07		0.07		0.06		0.05		0.04		0.04		0.04		0.04		0.04		0.04	
R-SQUARED =	>0.88	0.84		0.84		0.84		0.85		0.88		0.88		0.88		0.88		0.88		0.88	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	638	86.44	608	85.39	608	80.03	574	74.2	572	68.60	572	68.57	572	68.56	572	68.58	572	68.60	572	68.10
2,001 - 5,000	45-55	342	41.31	324	41.78	324	41.82	301	39.23	301	37.93	297	37.68	297	37.45	297	37.61	297	37.57	297	37.55
5,001 - 10,000	35-45	115	21.14	115	19.85	115	20.09	106	21.64	104	18.75	102	19.35	102	19.14	102	19.20	102	19.15	102	18.98
10,001 - 20,000	27-35	34	18.89	26	14.75	26	14.32	26	14.74	26	11.20	26	9.45	26	9.56	26	9.77	26	9.77	26	9.82
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	1129	43.85	1073	42.83	1073	42.01	1007	40.65	1003	37.37	997	37.31	997	37.13	997	37.25	997	37.22	997	37.06
Key Updates										• Adjust STH 23 Interchanges at CTH Y and IH 43 • Review DT Sheboygan area types • Verify operation of one-way streets in DT Sheboygan				• Created new SG files • Reviewed zone loadings and counts							

Model Area: Washington

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		35.01		23.77		23.78		23.81		23.71		23.1		23.07		23.19		23.19		23.18	
GEH > 10 =	0.40	0.57		0.57		0.43		0.43		0.43		0.43		0.50		0.40		0.50		0.57	
GEH > 20 =	0.30	0.43		0.14		0.14		0.14		0.14		0.14		0.14		0.30		0.14		0.14	
GEH > 30 =	0.15	0.14		0.00		0.14		0.14		0.14		0.14		0.14		0.15		0.14		0.14	
GEH > 40 =	0.05	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.05		0.00		0.00	
R-SQUARED =	>0.88	0.86		0.93		0.93		0.93		0.93		0.93		0.93		0.88		0.93		0.93	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	10	83.18	10	61.98	10	64.95	10	65.05	10	64.69	10	63.04	10	62.69	10	62.52	10	62.53	10	62.26
2,001 - 5,000	45-55	4	30.33	4	18.43	4	18.24	4	18.27	4	18.26	4	18.03	4	18.03	4	18.34	4	18.34	4	18.56
5,001 - 10,000	35-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10,001 - 20,000	27-35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	14	50.28	14	33.84	14	34.61	14	34.66	14	34.54	14	33.85	14	33.74	14	33.94	14	33.94	14	34.04
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified counts and their location				• Created new SG files • Reviewed zone loadings and counts							

Model Area: Waupaca

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-9.14		-11.66		-11.49		-11.43		-9.17		-10.57		-10.57		-10.31		-10.32		-10.3	
GEH > 10 =	0.40	0.60		0.59		0.58		0.58		0.55		0.57		0.57		0.57		0.57		0.57	
GEH > 20 =	0.30	0.34		0.28		0.28		0.28		0.25		0.29		0.29		0.28		0.28		0.28	
GEH > 30 =	0.15	0.15		0.12		0.12		0.12		0.11		0.13		0.13		0.13		0.13		0.13	
GEH > 40 =	0.05	0.06		0.05		0.04		0.04		0.04		0.06		0.06		0.06		0.06		0.06	
R-SQUARED =	>0.88	0.73		0.78		0.79		0.79		0.80		0.79		0.79		0.79		0.79		0.79	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	374	74.09	374	65.28	374	65.23	374	65.22	362	66.41	348	67.76	348	67.36	348	67.49	348	67.52	348	67.42
2,001 - 5,000	45-55	107	39.16	107	40.38	107	40.15	107	40.16	107	32.6	109	34.49	109	34.32	109	34.21	109	34.22	109	34.25
5,001 - 10,000	35-45	53	34.46	57	29.64	57	29.21	57	29.14	57	29.88	51	29.19	51	29.38	51	29.17	51	29.18	51	29.17
10,001 - 20,000	27-35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20,001 - 30,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30,001 - 100,000	24-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 - 100,000	32-39	534	55.85	538	50.87	538	50.44	538	50.39	526	47.66	508	48.04	508	48.03	508	47.85	508	47.87	508	47.86
Key Updates										• Reviewed every site with Count>0 and Tot_Vol=0 • Verified counts and their location				• Created new SG files • Updated School Enrollments • Updated and re-allocated Wauapca employment							

Model Area: Winnebago

	Acceptable Ranges	Original		July 20, 2010		July 23, 2010		August 3, 2010		August 14, 2010		August 26, 2010		September 1, 2010		September 10, 2010		September 13, 2010		September 17, 2010	
ADT Total 0 - 100,000		-8.64		-7.55		-7.8		-7.85		-7.46		-6.32		-6.03		-5.84		-5.85		-5.55	
GEH > 10 =	0.40	0.64		0.65		0.64		0.64		0.64		0.60		0.61		0.61		0.61		0.60	
GEH > 20 =	0.30	0.40		0.39		0.40		0.40		0.38		0.35		0.34		0.33		0.33		0.33	
GEH > 30 =	0.15	0.22		0.21		0.21		0.21		0.20		0.19		0.19		0.18		0.18		0.18	
GEH > 40 =	0.05	0.09		0.10		0.10		0.10		0.10		0.07		0.08		0.07		0.07		0.07	
R-SQUARED =	>0.88	0.94		0.94		0.94		0.94		0.94		0.95		0.95		0.96		0.96		0.96	
RMSE		Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %	Links	RMSE %
0 - 2,000	N/A	455	77.11	453	79.22	453	79.28	453	79.05	445	77.14	443	73.87	443	74.39	442	73.81	442	73.80	442	73.71
2,001 - 5,000	45-55	406	44.87	404	43.83	404	43.95	404	43.85	404	43.53	402	39.87	402	39.98	404	39.34	404	39.31	404	38.93
5,001 - 10,000	35-45	256	24.22	258	24.41	258	24.2	258	24.62	258	24.04	253	20.22	253	20.02	250	19.46	250	19.46	250	19.24
10,001 - 20,000	27-35	38	20.86	36	19.45	36	19.22	36	19.14	36	18.75	36	17.11	36	17.09	36	17.15	36	17.15	36	17.24
20,001 - 30,000	24-27	10	9.01	10	11.39	10	11.22	10	11.09	10	10.30	11	9.01	11	9.18	11	9.19	11	9.20	11	9.42
30,001 - 100,000	24-27	21	9.99	21	8.71	21	8.76	21	8.81	21	8.06	20	5.04	20	5.06	20	4.70	20	4.70	20	4.48
0 - 100,000	32-39	1186	33.85	1182	33.25	1182	33.16	1182	33.31	1174	32.44	1165	28.53	1165	28.54	1,163	28.06	1,163	28.05	1,163	27.84
Key Updates										• Changed WIS 116 to LC=13 • Updated USH 441/Racine/Midway Interchanges and counts				• Created new SG files • Updated School Enrollments • Verify lanes, update, SE data in west Oshkosh and review Algoma Blvd/Jackson St in North Oshkosh						• Verified base year household totals	

APPENDIX J – Progress and Project Review Meeting Minutes (Validation)

NORTHEAST REGIONAL MODEL (Amendment 5)
Progress Meeting #1
July 13, 2010 – 8:00 AM – 9:00 AM
WisDOT – Hill Farms Office
Meeting Record

Meeting Attendees:

Nathan Koster (SRF Consulting)
Joleen Nelson (WisDOT Central Office)

1. Model Version Control

WisDOT is requesting the latest model with the working count/forecast estimation script incorporated into the combiner model run. This request is being made to SRF. Nathan agreed to track down a version of this model and circulate the most recent files to the group.

2. Sub-Area Validation

Joleen provided her version of the county sub-area validation statistic scripts to Nathan for use in sub-area validation. This script will be used to pinpoint areas of the model that will need further attention placed on validation. Joleen indicated that the network's "Model" attribute should be set-up to delineate the model by MPO regions, while a new attribute will be set-up to delineate the model by urban and rural areas. These attributes will allow for more specific parameters to be input into the sub-area validation scripts. Upcoming sub-area validation efforts will be concentrated on MPO and urban areas, and rural and low volume areas will receive less attention.

3. Training

SRF will prepare meeting materials and present Cube training to both Bay-Lake RPC and Brown County Planning staff. Both sessions will be attended by WisDOT's Central Office forecasting section staff. Joleen Nelson and Kurt Miller will assist in the training session, while Mike Schumacher will partake in the training sessions.

4. Schedule Review

Progress meeting #2 scheduled to occur July 22nd at SRF's Madison office and is expected to last one hour. Each successive weekly progress meeting will be scheduled for Wednesday afternoon.

5. Questions and Comments

Amendment 5 results, model updates or questions will be circulated to the group via email on an as-needed basis.

These brief meeting minutes were prepared by Nathan Koster and intended to document project progress meeting occurrences and significant project decisions or future action items for WisDOT and/or SRF Consulting Group.

NORTHEAST REGIONAL MODEL (Amendment 5)
Progress Meeting #2
July 21, 2010 – 2:00 PM – 3:00 PM
SRF Office – Madison, WI
Meeting Record

Meeting Attendees:

Derek Hungness (SRF Consulting)
Steve Wilson (SRF Consulting)
Nathan Koster (SRF Consulting)
Alex Fox (SRF Consulting)
Matt Halada (WisDOT NE Region Office)
Jennifer Murray (WisDOT Central Office)
Kurt Miller (WisDOT Central Office)
Joleen Nelson (WisDOT Central Office)

1. NE Model Training

Derek coordinated with Bay-Lake RPC and WisDOT staff to schedule and determine the content of a training seminar to take place at Bay-Lake RPC's Green Bay office. Joleen provided SRF with specific training needs requested by Bay-Lake RPC staff.

2. Work completed to date

Nathan and Alex presented the work performed to date on the NE Model. Nathan discussed the review and verification household and employment data for the peripheral and under-performing areas of the model. In addition to the socio-economic data, Nathan has also been performing a systematic review of the network's functional classification, area type and centroid connections. The review of the network has focused on under-performing areas of the model that have been highlighted in output statistics and major corridors that are currently under-performing. Alex discussed the on-going review of the special-generator portion of the trip generation step of the model, focusing on the mall purpose and reviewing zones with high-density retail near under-performing roadways.

WisDOT provided a "to-do" list that was generated from the recent user's group meeting. SRF will investigate the path builds, time of day capacities, congested time/speed attributes and post updates to the model at least every 2 weeks.

3. Model Output Statistics

SRF provided WisDOT with the statistics from the submitted model (March 31, 2010) and the most recent model output statistics (July 20, 2010). The two statistical reports produced total results and were also delineated by county sub-areas to track the "to-date" validation progress. The statistics provided included count/ADT comparison, R^2, GEH and RMSE output reports. Joleen requested that the RMSE reports break down the volume bins into two smaller categories for the 0-5,000 segment in or order to de-emphasize validation on links with 0-2,000 vehicles per day.

4. Schedule Review

SRF will coordinate with Bay-Lake RPC and WisDOT staff to schedule a training seminar that will take place within the next 2-3 weeks in Green Bay. Progress meeting #3 scheduled to occur July 28nd at SRF's Madison office and is expected to last one hour. Each successive weekly progress meeting will be scheduled for Wednesday afternoon.

5. Questions and Comments

Amendment 5 results, model updates or questions will be circulated to everyone in the user's group via email on an as-needed basis.

These brief meeting minutes were prepared by Nathan Koster and intended to document project progress meeting occurrences and significant project decisions or future action items for WisDOT and/or SRF Consulting Group.

NORTHEAST REGIONAL MODEL (Amendment 5)
Project Review Meeting #1
September 9, 2010 – 2:00 PM – 4:00 PM
SRF Office – Madison, WI
Meeting Minutes

Meeting Attendees:

Derek Hungness (SRF Consulting)
Nathan Koster (SRF Consulting)
Alex Fox (SRF Consulting)
Matt Halada (WisDOT NE Region)
Derek Weyer (WisDOT NE Region)
Jennifer Murray (WisDOT Central Office)
Kurt Miller (WisDOT Central Office)
Joleen Nelson (WisDOT Central Office)
Kim Tran (WisDOT Central Office)
Josh Schedler (Bay Lake RPC)
Walt Raith (East Central RPC)
Cole Runge (Brown County Planning)

1. Welcome and Introductions

Derek welcomed the group and thanked everyone for attending the first project review meeting. Nathan provided an overview of the agenda, laid out what was going to be discussed during the meeting, and highlighted the project tasks.

2. Work completed to date

Nathan and Alex presented the work performed to-date on the NE Model. Nathan discussed the review and verification of the household and employment data for the peripheral and under-performing areas of the model. To highlight the socio-economic data, Nathan and Alex displayed GIS maps showing household and employment growth trends. The model's household data was brought in-line with WisDOA projections (used as control totals) on a county-by-county basis. In addition to household and employment data, the model's school, college, airport and mall data were verified to maintain consistency throughout the model.

Alex discussed the process used to review and improve the model validation near high-density retail stores ("big boxes"). A comparison between the assumed retail employment factor of 1.7 and the InfoUSA employment data was presented. It was agreed that the assumed employment factor was relatively consistent with InfoUSA data. Alex also presented the methodology used to generate and compare various special generator scenarios. Qualitative and quantitative measures were presented to explain the logic used in determining the preferred special generator factors. It was agreed that the process and results were on target with the scope and goals of the project.

SRF also reported on the systematic review of the network's attributes, centroid connections and committed projects throughout the validation process. The review of the network focused on under-performing areas of the model that were highlighted in output statistics and major corridors classified as under-performing. Nathan and Alex will continue to analyze future year traffic forecasts, following the staff group's agreement with the socio-economic dataset adjustments as presented. In further discussion, Kurt said he would like SRF to develop a new set of screenlines that would produce additional validation statistics.

WisDOT had previously provided a "to-do" list of specific corridors needing improvement that was generated from a previous user's group meeting. SRF is investigating the user's group questions about path builds, time-of-day capacities and congested time/speed attributes. Model updates are currently being posted on almost a weekly basis for the user group to review and a new update was provided to address recent print output file size errors.

3. Model Output Statistics

SRF provided statistics from initial model results (dated March 31) through the most recent model run (dated September 7). The statistical reports indicated model results on a regional basis, as well as on a county or MPO level. The statistics included count/ADT comparison, R^2, GEH and RMSE output reports.

Matt asked if the group was satisfied with SRF's work to-date. Joleen noted the validation statistics have been heading in a positive direction since the start of the project.

4. Schedule Review

SRF will continue to coordinate with Brown County staff to schedule an on-site training session that will take place within the next 2-3 weeks in Green Bay. Cole indicated that IT issues have precluded him having access to Cube software, but the County was continuing to look into the issue. Progress meeting #8 was scheduled to occur September 15th at SRF's Madison office. The September 22nd meeting is scheduled to be the last progress meeting, as the September 29th meeting would be cancelled. The project is on-schedule to be completed on-time with documentation being finalized by October 31st.

5. Questions and Comments

Further model updates or additional questions and answers will be circulated to everyone in the user's group via email as-needed.

These meeting minutes were prepared by Nathan Koster and intended to document project progress meeting occurrences and significant project decisions or future action items for WisDOT and/or SRF Consulting Group.

As a part of the Model Validation and Refinement project, the project team was required to hold weekly progress meetings and one project review meeting with the NE Regional Travel Demand Model user's group. Table D.1 provides a list of all the formal meetings, dates and locations.

Table J.1 – Northeast Regional Model Project Meetings

Meeting	*Date*	*Location*
Progress Meeting #1	7/13/2010	WisDOT - Central Office
Progress Meeting #2	7/21/2010	SRF - Madison, WI
Progress Meeting #3	7/28/2010	SRF - Madison, WI
Progress Meeting #4	8/4/2010	SRF - Madison, WI
NE Model Training	8/9/2010	Bay Lake RPC - Green Bay, WI
Progress Meeting #5	8/18/2010	SRF - Madison, WI
Progress Meeting #6	9/1/2010	SRF - Madison, WI
Project Review #1	9/9/2010	SRF - Madison, WI
Progress Meeting #7	9/15/2010	WisDOT - Central Office