MICHIANA ON THE MOVE

transportation plan 2045

MACOG
Michiana Area Council of Governments

MICHIANA ON THE MOVE
2045 TRANSPORTATION PLAN

OCTOBER 2019

Michiana Area Council of Governments
227 W. Jefferson Blvd.
11th Floor County-City Bldg.
South Bend, IN 46601

www.macog.com

RESOLUTION 48-19
A RESOLUTION ENDORSING THE
MICHIANA ON THE MOVE: 2045 TRANSPORTATION PLAN

WHEREAS, the "FAST Act", Fixing America's Surface Transportation Act, requires the development of a Transportation Plan with a minimum 20-year horizon.

WHEREAS, the Michiana Area Council of Governments (MACOG), the duly designated Metropolitan Planning Organization for the South Bend and Elkhart/Goshen Transportation Management Area, and the Rural Planning Organization for Marshall and Kosciusko Counties, has cooperated with local government units and implementing agencies, and coordinated with multi-modal interests and intermodal activities to the best of its ability in developing the 2045 Transportation Plan.

WHEREAS, MACOG has used state of the art network modeling equipment, local input, obtained positive and negative public input and comment from groups and individuals, and has coordinated the activities of all area modes available.

WHEREAS, the MACOG has considered the requirements listed in the FAST Act to the extent possible and has complied with the CAAA requirements as they pertain to the development and conformity of Transportation Plans.

BE IT THEREFORE RESOLVED, that the MACOG Policy Board, after considerable debate, several public input opportunities and a public hearing session, and this final opportunity for public review, finds that the 2045 Transportation Plan meets the requirements set forth in the FAST Act and is hereby endorsed.

RESOLVED THIS 9th Day of October 2019.

Michiana Area Council of Govenments

Phil Jenkins, Policy Board Chair

ACKNOWLEDGMENTS

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ACKNOWLEDGMENTS

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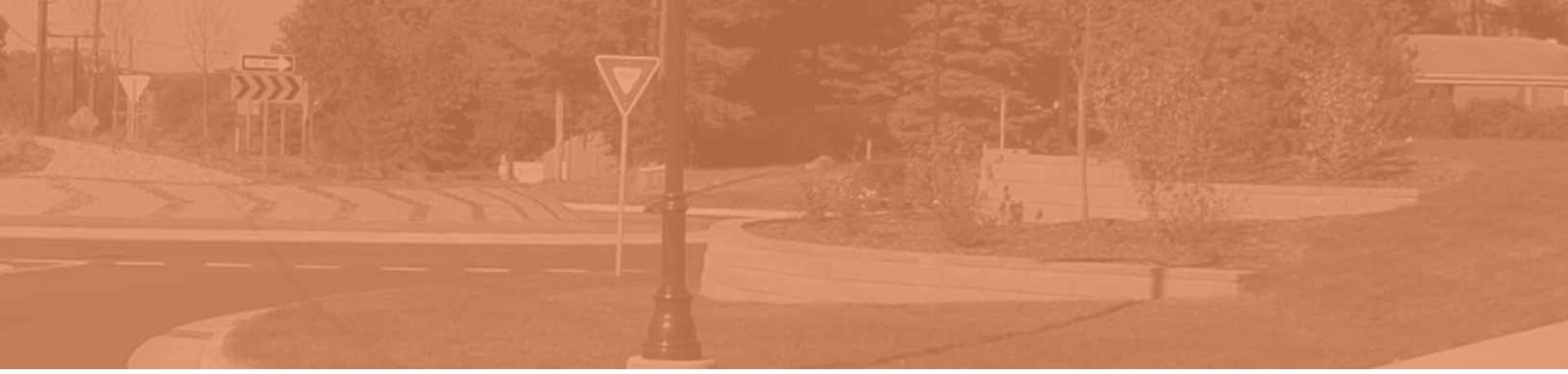


Chapter 1:
Introduction

1

Purpose of the Plan

The Michiana on the Move: 2045 Transportation Plan acts as a blueprint for how the Michiana region will address its transportation needs and how federal, state and local funds will be invested into highways, public transit, freight, bikeways and pedestrian walkways. The Plan also references other local and regional plans in order to coordinate multimodal and intermodal services throughout the community.

Guided by input from public officials, agency staff, key stakeholders, and citizens of the region, Michiana on the Move is a roadmap for implementing multimodal transportation improvements in the Michiana region through the year 2045. The regional transportation system is evaluated in order to identify and formulate the best solutions to topic areas such as safety, congestion, highway, public transit, bike and pedestrian and multi-modal systems for the local communities. The 2045 Transportation Plan emphasizes the use of existing roads and alternate modes of transportation as invaluable in addressing and identifying solutions to congestion problems.

MPO Background

A Metropolitan Planning Organization (MPO) is a transportation policy-making body made up of representatives from local government and transportation agencies with authority and responsibility in metropolitan planning areas. Federal legislation passed in the early 1970's required the formation of an MPO for any urbanized area with a population greater than 50,000 residents. MPOs were created in order to ensure that existing and future expenditures for transportation projects and programs were based on a continuing, cooperative and comprehensive planning process. Federal funding for transportation projects and programs is channeled through the MPO.

The Michiana Area Council of Governments (MACOG) is a regional organization serving Elkhart, Kosciusko, Marshall, and St. Joseph Counties in Indiana. MACOG was originally organized under the 1964 Amendments to the Interlocal Cooperation Act of the Indiana General Assembly, Section 53-1101 to 53-1107 and the Urban Cooperation Act No. 7, Michigan Public Acts of 1967. Bylaws were adopted by the organization on December 2, 1970.

MACOG serves as a forum for regional discussion and cooperation. MACOG, as a regional organization, is the U.S. DOT designated Metropolitan Planning Organization (MPO) for the region's urban counties of Elkhart and St. Joseph and a Rural Planning Organization (RPO) for the region's rural counties of Kosciusko and Marshall. In addition, MACOG operates the Interurban Trolley, a public fixed-route transit service in the cities of Elkhart and Goshen; serves as the designated Economic Development District by the United States Economic Development Administration; and staffs the St. Joseph River Basin Commission representing seven Indiana counties.

MACOG is governed by a Policy Board and Transportation Technical Advisory Committee that provides guidance and assistance to MACOG in its regional planning activities.

The MACOG Policy Board

The Policy Board is the body responsible for policy formulation, project guidance, and administrative coordination of all policy relating to the development of the transportation plan and its implementation within the Michiana region. Official action taken by MACOG must be approved by the Policy Board.

The Policy Board includes elected officials representing the cities and counties within the metropolitan and rural planning areas. A list of the current Policy Board members is included in the acknowledgements.

Transportation Technical Advisory Committee

The Transportation Technical Advisory Committee (TTAC) is comprised of planners, engineers, and other professional staff from various departments representing the local public agencies in the planning area. TTAC serves as the advisory group to the MACOG Policy Board. MACOG staff works closely with TTAC members on project development, planning and oversight. A list of current TTAC members is listed in the acknowledgements.

Planning Area

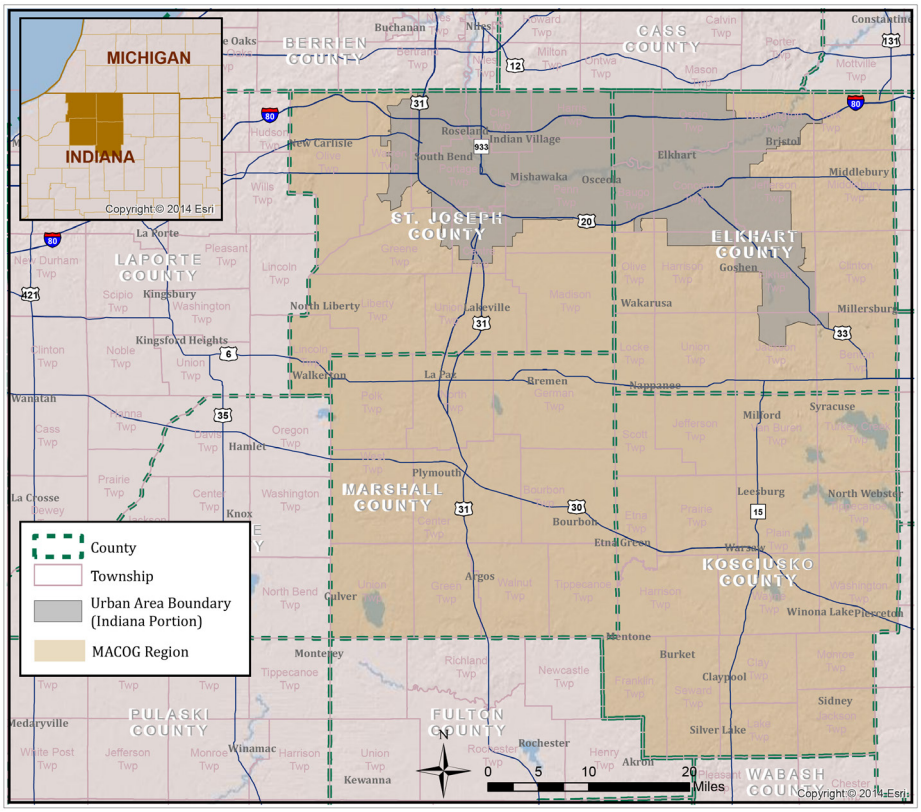
The MACOG planning area consists of the federally designated urbanized areas of Elkhart and St. Joseph Counties. MACOG also serves as a rural planning organization to Kosciusko and Marshall Counties. The 4-county region contains an estimated 601,923 people (2018 Census Population Estimates), covers 1,921 square miles, and includes 35 cities and towns.

MACOG is unique in the sense that it is an MPO representing two urbanized areas (the South Bend Urbanized Area and the Elkhart/Goshen Urbanized Area). In addition to the two urban areas, a portion of the South Bend Urbanized Area extends into Michigan around the City of Niles. MACOG coordinates with the Southwest Michigan Planning Commission (SWMPC) for planning in the Niles area.

Fast Act Planning Factors

Fixing America's Surface Transportation Act was signed into law by President Obama in 2015, building upon much of the former Act's (Moving Ahead for Progress in the 21st Century MAP-21) directive to address transportation infrastructure issues through performance-based planning frameworks. An MPO must have a 20-year long-range transportation plan and a transportation improvement program that implements the plan. Together, the plan and program work on comprehensive development and management

Figure 1-1: MACOG Planning Area



of transportation systems that considers all transportations modes.

The FAST Act lists ten (10) Planning Factors, which MACOG took into consideration during the planning and development of the 2045 Transportation Plan.

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase accessibility and mobility of people and freight.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
- Enhance travel and tourism.

Planning Process

The Michiana on the Move plan was developed through coordination with other plans and agencies including federal, state and local partners. Additionally, an overarching component to the planning process is public participation. The Plan is a reflection of the needs of the public on transportation investments for the future. This plan is required to be realistic and fiscally constrained.

An extensive planning process was followed in the development of the 2045 Transportation Plan. Essential elements included the identification of needed projects and resource allocation. These were supported by the following tasks.

MACOG 2045 Transportation Planning Process

- Public Outreach
- Forecasting socioeconomic data
- Existing conditions and needs analysis
- Forecasting travel demand
- Scenario Planning
- Identification of problem areas and project development
- Red flag analysis
- Title VI and Environmental Justice

Public Outreach

MACOG conducted a variety of public outreach efforts throughout the development of the Michiana on the Move 2045 Transportation Plan. In the Fall of 2018, two surveys were released, gathering input on future development in our region and transportation concerns. Collecting similar input, MACOG staff held a series of pop-up events at 11 locations throughout the region, engaging with over 150 individuals.

MPO staff also held and attended numerous meetings with elected officials, engineers, planners, and other key stakeholders to gather feedback on a vision, goals, and strategies for transportation investments.

MACOG utilized meetings for Policy Board and the Transportation Technical Advisory Committee (TTAC) to provide updates on planning activities for the Michiana on the Move plan. Additionally, information was distributed via social media, email, newsletters, the MACOG website and press releases to inform the public on key milestones.

The public was also given the opportunity to provide comments on the Plan and projects in its final draft state during an open public comment

period from September 3, 2019 to October 2, 2019. An open house was held on September 17th from 3:00 p.m. to 6:00 p.m. in order to provide all a chance to ask questions and give feedback.

Socioeconomic Forecasts

Socioeconomic data such as population, number of households, household income, and employment levels are important to assess the future transportation needs of the MPA. This data can greatly inform future travel behavior. The historic and current socioeconomic data available along with projections developed by Woods & Poole and other economic forecasts were used to develop the future population and employment numbers of the MPA. The regional socioeconomic data was allocated to Traffic Analysis Zones (TAZs) and incorporated into a hybrid travel demand model for the 2045 Transportation Plan. The data was used in the travel demand model to assess the current conditions and future travel demand within the MPA.

Existing Condition and Needs Analysis

MACOG used various planning tools to conduct an existing condition and needs analysis. A detailed description of the region's current conditions, trends and projections are laid out in Chapters 2 and 3. A brief discussion of analysis factors and methodology used to conduct the needs analysis is given below.

Providing safe and efficient movement of goods and people, with access to employment, shopping, recreational and other facilities is the primary role of the transportation system. This system should be available to everyone in the region, which is why the Michiana on the Move plan considers all forms of transportation. The Plan addresses the impact of connectivity between various land uses and between various communities within the region. The safety of individuals using all modes of transportation was considered throughout the Plan.

Forecasting Travel Demand

Forecasting travel demand is an important part of transportation planning. Anticipating the demands of future travel assists local governmental agencies in identifying the future needs of the region and planning to account for and fulfill those needs. The travel demand model not only forecasts the generation of future trips but also forecasts the modal splits based on the affordability of a personal vehicle, availability of alternative modes of transportation, and travel behavior of the users based on time of day, facility types and travel conditions of the roadways.

MACOG uses a hybrid tour based model developed for the 2040 Transportation Plan to forecast future travel demand. For the 2045 Transportation Plan, the model was expanded to not only include Elkhart and St. Joseph Counties, but also Marshall and Kosciusko Counties and Niles, Michigan. The model is sensitive to conditions such as the availability of alternative modes of transportation, urban design elements, types of controls existing at the intersections, speeds and delays, and fuel prices. Unlike the traditional 4-step trip-based travel demand model, MACOG's hybrid model includes 12 steps. A description of the modeling process is provided in Appendix C.

Scenario Planning

Scenario planning was integrated into Michiana on the Move, to be used as a tool to evaluate and recognize how development and land use impact our region's transportation network. Multiple scenarios were developed including high and baseline growth alternatives, as well as urban growth development patterns. These scenarios were not generated to choose a preferred scenario, but rather to attempt to understand the impact of different growth patterns on the transportation network. Scenario planning offers a way to help assess different needs and prepare for possible future conditions.

Identification of Problem Areas

The hybrid travel demand model and scenario development was used to evaluate the existing transportation network's performance with the anticipated alternatives for future population and employment growth. To accomplish this task MACOG conducted no-build scenario model runs with the projected socioeconomic data on the existing transportation network, only including

future projects currently under construction or that have otherwise been listed in the MACOG 2020-2024 Transportation Improvement Program (TIP). Three (3) other scenarios were run including high and low growth, as well as urban growth development patterns. The results of these model runs were examined to identify the areas of the transportation network that are performing at levels of service E and F, which are considered unacceptable driving conditions. Consideration was given to all modes of transportation including auto, freight, transit, bike and pedestrian.

Red Flag Investigation

In order to help determine potential environmental impacts of potential transportation projects, MACOG conducted a red flag analysis on most projects included in the 2045 Transportation Plan. A red flag analysis uses GIS and available datasets compiled by the Office of Environmental Policy at INDOT to identify the existence of environmental items of concern with respect to:

- Infrastructure
- Water Resources
- Mining/Mineral Exploration
- Hazardous Materials
- Ecological Information
- Cultural Resources

An inventory of the Red Flag Investigations are provided in Appendix E.

Title VI and Environmental Justice

MACOG believes that Title VI and Environmental Justice are critical elements to the transportation planning process. Title VI and Environmental Justice are about the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. In Appendix F, MACOG conducted a study on Environmental Justice populations which summarizes the potential impacts of the proposed projects.

Chapter 2:
Regional Profile

2

The MACOG region is located in North Central Indiana and consists of Elkhart, Kosciusko, Marshall and St. Joseph Counties. Two of the four counties (St. Joseph and Elkhart Counties) border the Michigan state line. There are 35 cities and towns in the Michiana Area. Figure 2-1 shows the population estimates for the largest communities in each of the four counties.

As seen in Figure 2-2, the region is centrally located to several major cities in the Midwest. South Bend (the largest city in the region) is located 95 miles or two and a half (2 1/2) hours of drive time east of downtown Chicago, 155 miles or three (3) hours north of downtown Indianapolis, and 215 miles or three and a half (3 1/2) hours southwest of Detroit. Additionally, the region is approximately 35 miles or 45 minutes southeast from Lake Michigan.

The MACOG region is home to several attractive water resources. The region is unique in that its water resources drain into three major water body networks: the Great Lakes, the Mississippi River, and the Ohio River. A large portion of the region's water flows into the St. Joseph River via the Elkhart River and other tributaries, and further drains into Lake Michigan. Over 130 natural lakes occur in the region, more than half being located within Kosciusko County. Many of these lakes are hot spots for recreation, such as Lake Wawasee, the largest lake wholly contained in Indiana. Below the surface, the only sole source aquifer in Indiana is located within Elkhart, Kosciusko, and St. Joseph Counties. This portion of the region is designated as a Wellhead Protection Area, meaning that it receives a special level of protection from groundwater contamination.

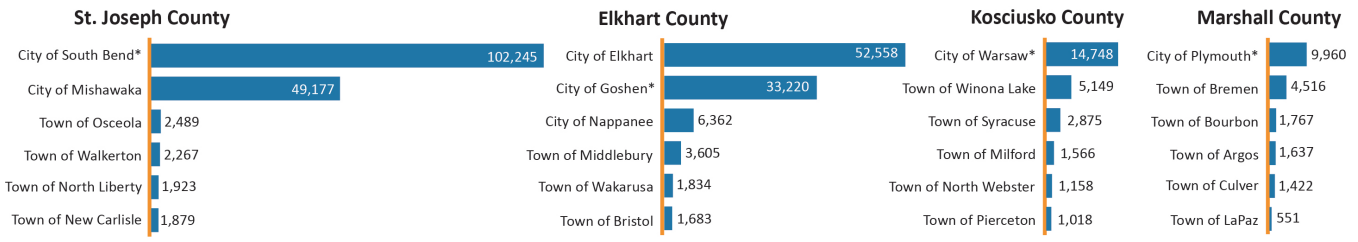
Figure 2-2: MACOG Region Location

Population Trends

Population Growth

Indiana is the 17th most populated state, at 6,691,878 people, according to 2018 population estimates by the U.S. Census Bureau. The population change for Indiana from the 2010 Census to the 2018 estimates was 207,817 individuals at a rate of 3.2%, ranking Indiana 30th in the nation for percent of growth. The overall national growth rate the 2018 U.S. Census Bureau estimates is 6%, with a national population near

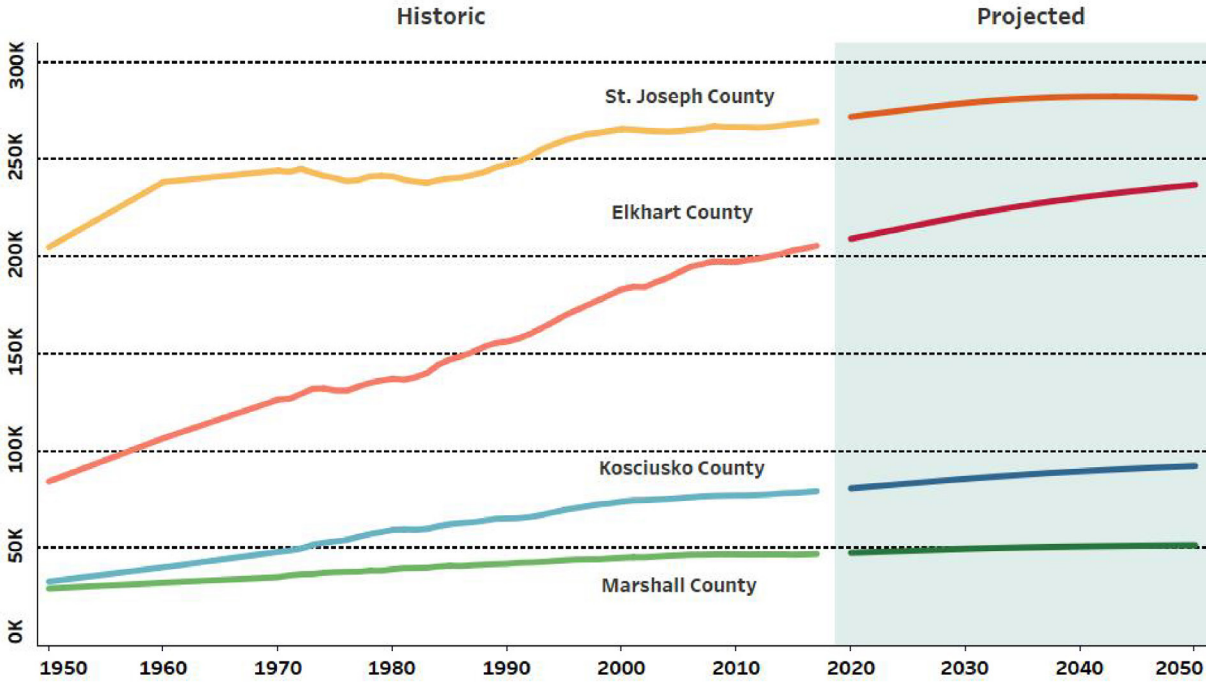
Figure 2-1: Growth of the MACOG Region



Source: 2017 Population STATS Indiana and U.S. Census Bureau

*Indicates the county seat

Figure 2-3: Growth of the MACOG Region



Source: 2017 Woods & Poole Economics and Census Bureau

327,167,434 people. This is an increase of 18,409,329 since the 2010 Census. Though Indiana has a low ranking for population growth, the surrounding states grew at even smaller rates: Michigan at 1.1%, Ohio at 1.3%, Kentucky at 3%, and Illinois lost population at -0.7%.

The region has been continually growing over the past seven decades, from a region of approximately 350,000 people in 1950 to a region of just over 600,000 residents in 2018. As seen in Figure 2-3, the highest growth of the region was between 1990 and 2000. In that timeframe, the region saw population growth increase by 11%, which was the highest percentage increase since 1960. During that time, Elkhart County grew 17%, Kosciusko County grew 13%, and St. Joseph and Marshall Counties grew at 7.5% and 7% respectively. In the last decade, while growth has slowed, the region remains on an upward population trajectory.

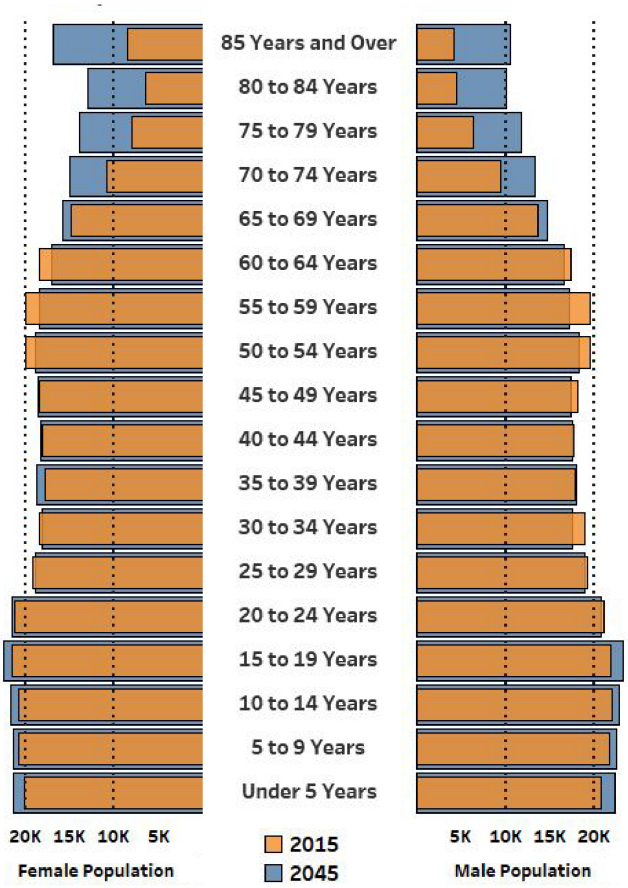
Using Woods and Poole Economic data to project out the regional population to 2045 it is anticipated that the population will increase to 659,000, nearly a 10% increase in population over the next 25 years.

Age and Gender

The median age of an area can be a key underlying economic indicator. Communities with a large populace in the working age groups typically have more economic productivity, with fewer dependents to support. The median age changed from 27.7 in 1970 to 37.7 in 2019. Growing median age is due to factors such as increasing life expectancy and declining fertility rates that have been found to be common in developed countries. This 10-year increase in median age in the MACOG region also aligns with several decades of the regions fastest growth rate, suggesting migration to the region potentially due to economic growth. Also matching the forecast for population in the regions four counties, the median age is anticipated to level out and increase by less than 1 year (38.15) from 2020 to 2045.

A marker of diversity is age groups and gender. In 2015, the MACOG region had large populations under age 25 and in their late 40's to early 60's. The largest group was 15 to 19 years old. In Figure 2-4, the wider sections of the population pyramid around the young and the middle-aged suggest higher birthrates, falling or stable death rates, and the potential for population growth.

Figure 2-4: Populations Pyramid



Source: 2017 Woods & Poole Economics and Census Bureau

The region had a similar balance between female and male populations in 2015. The most pronounced differences between genders is noted with a slightly higher male population at ages 19 and below and higher female population from the age 60 and over. The balance in genders remains similar in projections of 2045; however, the total population from 65 and over is estimated to consist of over 14,000 more females than males.

Furthermore, in 2045, the MACOG region is projected to have a vastly different distribution. This is most noticeable in the aging population groups. The largest group remains between years 15 and 19 and the population under age 25 continues to grow. Ages from 50 to 64 lose population by nearly 8% total, with the biggest loss between 55 to 59 years old at 10%. The largest growth occurs in population 65 years old and older, nearly doubling by 2045.

Race and Ethnicity

One marker of diversity is the racial makeup of communities. St. Joseph County has the highest minority population at approximately 27%. The minority population is similar in Elkhart County at 25% of the population, and lower in Kosciusko and Marshall Counties at 12% of the population. Related to ethnicity, Elkhart County is home to the largest Hispanic population, with 34,678 people which is almost 17% of the population. The next largest Hispanic population is in St. Joseph County at 7% of the total county population.

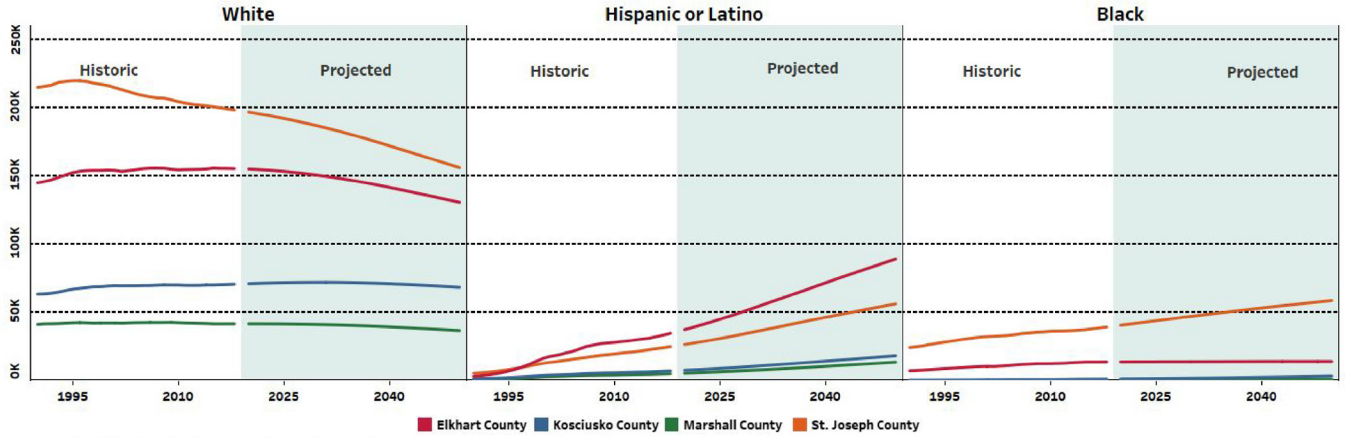
According to the Indiana Business Research Center at Indiana University's Kelly School of Business, "Indiana's population will become increasingly diverse over the next 20 years as the state's Hispanic, 'two or more races,' Asian and Black populations grow rapidly" (2008). In particular, the Hispanic or Latino population is projected to double by 2030 to over 500,000 persons across the state. The Asian population is expected to grow substantially by more than half. While the impact to the region is difficult to project, it is safe to argue the state trend will be reflected in our local figures.

As noted in Figure 2-5, three of the major Race and Ethnicity categories show similar trends. Historically in the region, the White population has either slowly risen or declined. Both St. Joseph and Elkhart Counties are expected to respectively see a decrease of 26% and 15% in the White population through 2045. Marshall and Kosciusko Counties are also projected to see a decrease in the White population, however at a much lower rate.

In contrast, the Latino or Hispanic population has grown at a constant rate since 1995. Notably, Elkhart County may see population for Hispanic or Latino grow as high as 92% from 1995 to 2045, a change from 6,951 to 89,075. The projected growth rate of the Hispanic or Latino people group is similar in St. Joseph County with an 85% increase in the same period. While Marshall and Kosciusko Counties have similarly high percentage increases, their total Hispanic or Latino population is anticipated to remain below 20,000 residents in either county.

Similarly, trends within the Black population show an increasing trajectory with the highest increase in population seen in Elkhart and St.

Figure 2-5: Race and Ethnicity



Source: 2017 Woods & Poole Economics and Census Bureau

Joseph Counties. Elkhart County may see a slight increase in the future forecast at just over 5,000 new Black residents. St. Joseph County however may see an increase of over 50% of the Black population from 1995 to 2045, which equates to 30,000 people.

Language

Spanish is the main non-English language spoken in the region, with the area having a higher percentage of Spanish-speakers at 7.8% as compared to 4.7% of Indiana's population. As seen in Table 2-1, of the population that speaks Spanish, just under half speak English less than very well.

Household Trends

The term household population describes the number of people in a type of housing unit, and it can include groups of related or unrelated people or a single occupant. The region's number of households was estimated at 219,941 for 2018, with most of the households consisting of families. The average regional household size is 2.63 persons. Elkhart County has the largest average household size, at 2.78 persons, and St. Joseph and Kosciusko Counties has the smallest average, at 2.55 persons.

Table 2-1: Household Populations

Area	Population over the age of 5	Speaks Only English		Speaks Spanish					
						Speaks English "very well"		Speaks English less than "very well"	
		Total	Percent	Total	Percent	Total	Percent	Total	Percent
Elkhart	187,563	152,739	81.4%	22,696	12.1%	12,319	54.3%	10,377	45.7%
Kosciusko	73,586	66,271	90.1%	4,214	5.7%	2,341	55.6%	1,873	44.4%
Marshall	43,835	38,971	88.9%	3,063	7.0%	1,466	47.9%	1,597	52.1%
St. Joseph	251,197	227,661	90.6%	13,703	5.5%	8,602	62.8%	5,101	37.2%
Region	556,181	485,642	87.3%	43,676	7.8%	24,728	56.6%	18,948	43.3%
State	6,196,098	5,672,618	91.9	288,236	4.7%	171,534	59.5%	116,702	40.5

Number of Households vs Population

Between 2010 and 2017, the number of households increased 1%, which was quite different from the population growth during that time at 10%. This showed itself in growing average household size. However, in each county the population and number of households in the region grew at differing rates. Elkhart County's population grew at 4% while the number of households grew at 2%. In Kosciusko County, the number of household's fell by 1%, while the population grew at 3%. In Marshall County, the number of households fell 2% as population grew 1%. In St. Joseph County, there was only a slight growth for both population and the number of households at 2% and 1% respectively.

With the varying population and household change, the average household size also changed during this time. Elkhart County had the most number of people per household at 2.78 in 2010 and stayed stagnant with no growth in average household size by 2017. Marshall County has the next highest average household size at 2.67, which was an increase from 2.63 in 2010. Kosciusko County slightly grew the average household size from 2.49 to 2.55. For both Kosciusko and Marshall Counties, the difference in change of population was positive while the change in households decreased showing evidence of growing family sizes. St. Joseph County slightly grew in average household size from 2.52 person per house in 2010 to 2.55 in 2017.

Household Income

Per capita income is often used to measure economic well-being. It is the mean money income for the past 12 months for every person age 15 and older. The national per capita money income is $31,786. Indiana's per capita income is $28,323. The four counties in the region are all under both the United States and Indiana, with a regional average per capita income of $22,945.

Poverty

The U.S. Census determines the poverty status of families by assigning each family to an income threshold based on family size and ages of the members. If a family's income falls below that threshold, the family is considered to be in poverty. The poverty guideline for a household of four is $25,750. For a household of two, it is $16,910 and for a household of three, $21,330. St. Joseph County has the highest percentage of poverty at 12.6%, followed by Elkhart County (10.5%), Marshall County (8.5%), and Kosciusko County (8%).

Table 2-2: Household Populations

Households	Elkhart County	Kosciusko County	Marshall County	St. Joseph County
Total	71,733	30,265	17,249	100,694
Family	72%	71%	70%	64%
Non-family	28%	29%	30%	36%
Average Size	2.78	2.55	2.67	2.55

Table 2-3: Household vs. Population Growth 2010-17

Area	Population	Number of Households
Elkhart	4%	2%
Kosciusko	3%	-1%
Marshall	1%	-2%
St. Joseph	2%	1%
Region	10%	1%

Table 2-4: Household Income

Area	Per Capita money income in past 12 months (2017 dollars), 2013-2017
Elkhart	$22,187
Kosciusko	$24,082
Marshall	$22,493
St. Joseph	$23,082
Indiana	$28,232
United States	$31,486

Economic Trends

Housing Supply and Vacancies

The residential housing supply has grown just over 2% from 2010 to 2017. This is substantially lower than the regional population growth rate. Supply has stayed near 250,000 residential housing supply over the last decade. Due to that trend the 10% population growth in the region shows further evidence of a growing household size.

In 2000, almost 8% of the housing supply was vacant and in 2017, almost 13% was vacant. Since 2010, the rate of vacant homes has been increased by approximately 6,000 homes. In Elkhart County, the number of vacant housing units has stayed almost the same, dropping slightly from 2014 to 2016. In Kosciusko and Marshall Counties, the number of vacant housing units has increased steadily since 2011. Figure 2-10 shows the percentage of vacant homes per county. Very noticeable is the Kosciusko County's 20% vacant rate in 2017. Second homes such as vacation homes are considered by the U.S. Census as vacant, as such the high rate of vacancy in Kosciusko County is likely due to the number of lake homes in which are both second homes and seasonal rentals.

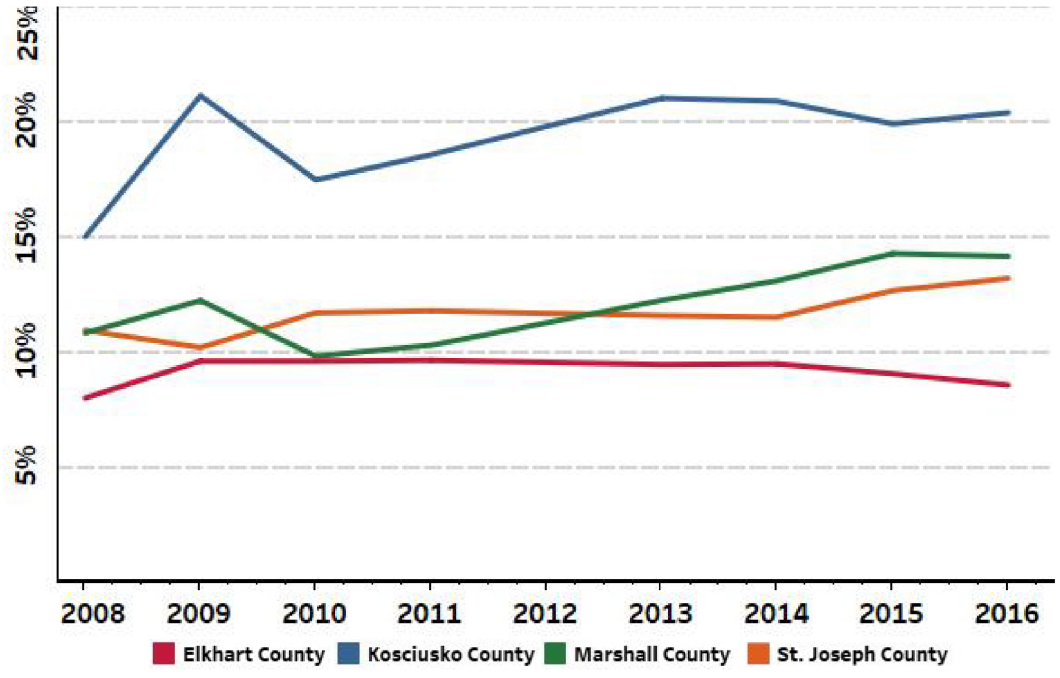
The Great Recession took its toll on a number of economic factors for several years. From 2000 to 2009, there was a decrease of issued residential building permits by 71.84%. Growing into a stronger economic environment since that time, there was an increase in issued permits from 2009 to 2018 of 56.13%. There are initiatives in place by the local communities to address the growing vacant homes and blighted properties. The uptick in new housing could partly be explained by replacing vacant or blighted properties with new residential construction.

Employment

The labor force has been growing since the Great Recession. The region is currently seeing its highest employment rate in history. 2018 was the first year employment had reached and exceeded the 2007 pre-recession records. Figure 2-11 shows the change in employment between 1970 and 2019. The nation has seen several recessions since the Great Depression. The Dot-Com Bubble recession took several years to recover; however, the Great Recession in the 2000's saw drops in employment that hadn't been seen since the recession of the early 1980's.

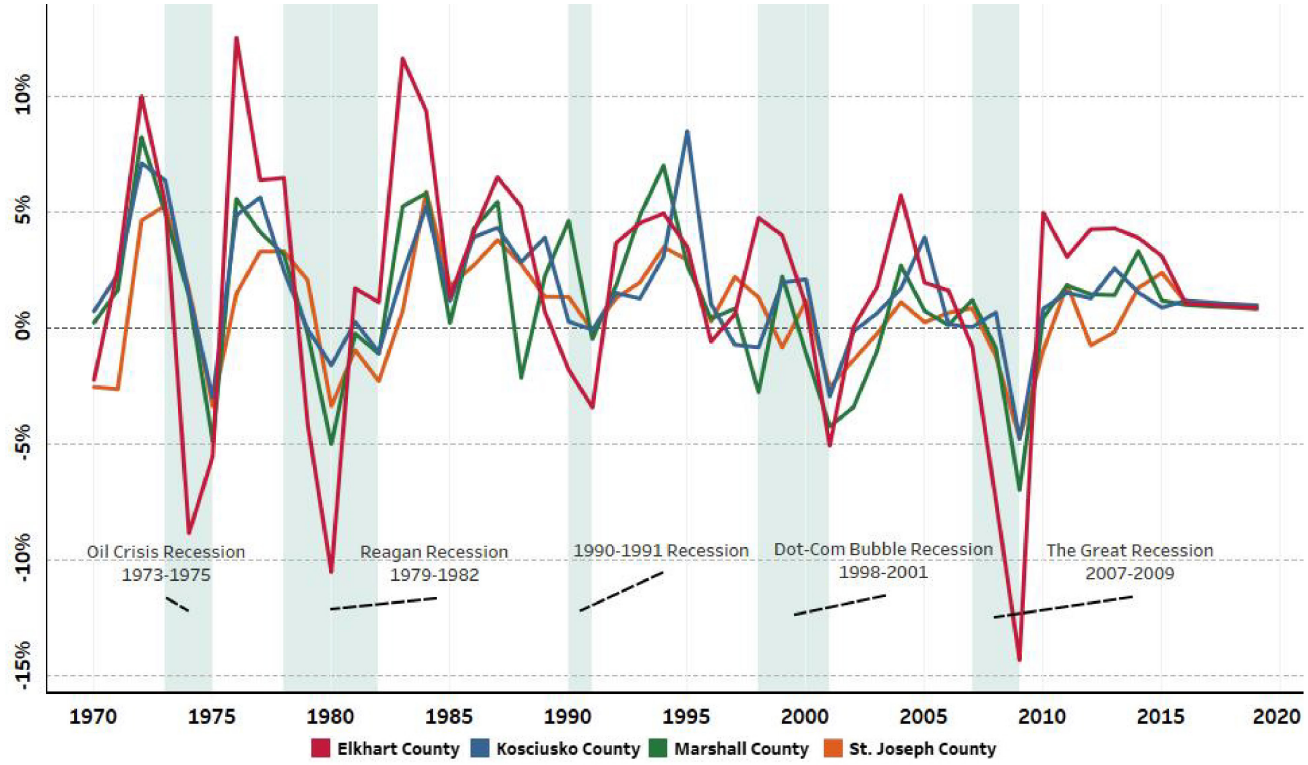
The largest change in employment since the 1980's occurred in 2009 during the national

Figure 2-10: Housing Supply, Percent Vacant Homes



Source: 2008-2012 & 2013-2017 American Community Survey 5-year Estimates

Figure 2-11: Change in Employment



Source: 2017 Woods & Poole Economics

Great Recession. The Michiana area experienced a higher job loss than the nation and the state. Elkhart County lost nearly 15% of their employment opportunities that year.

Regional employment has increased 11% since 2009. Elkhart County saw the most growth at 20%, or 36,299 jobs. The region has seen more employment growth than Indiana and the U.S., though their employment decline was also greater during the recession. St. Joseph County has not recovered like the other counties, with employment falling nearly 5% during the recession and only rising 6% from 2009 to 2018.

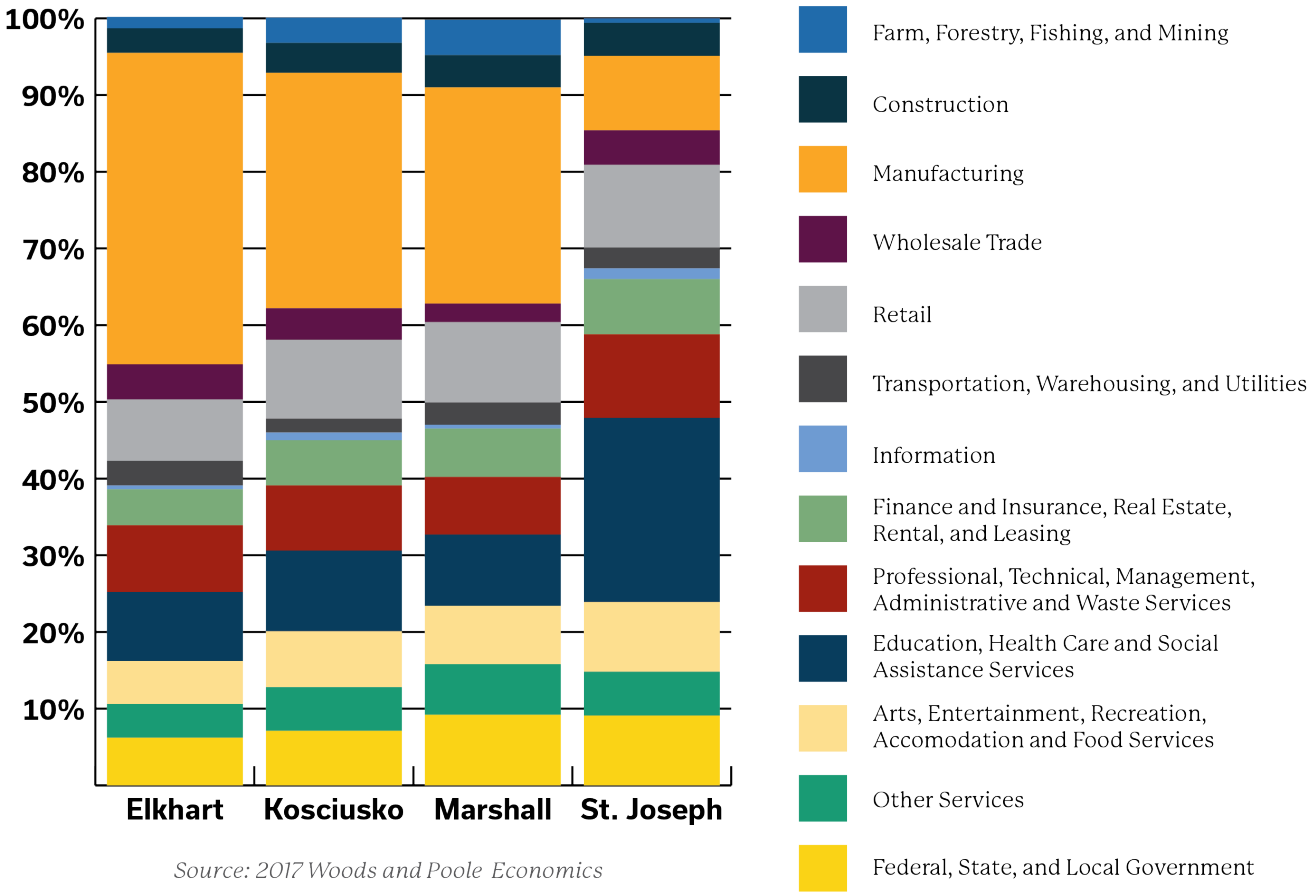
Major Employers

Major employers of the region are in the manufacturing, health, and education sectors. In Elkhart County, the largest employers are Thor Industries, Inc., Forest River, Inc., Lippert Components, Inc., and the Beacon Health System. In Kosciusko County, the three largest are Zimmer Biomet Holdings, Inc., LSC Communications, and Chore Time Brock, Inc. In Marshall County, the Culver Academies, Nishikawa Standard, and Plymouth Community School Corporation are the largest employers. In St. Joseph County, some of the largest employers are Beacon Health System, the University of Notre Dame, and South Bend School Corporation.

Employment by Sector

The predominant job sector in the region is manufacturing making up one quarter of the working population with 102,126 employees in 2019. Elkhart County is comprised of the greatest concentration of jobs in the manufacturing industry at 63,964, or 43% of all the county's workers. Kosciusko County also has a high rate of manufacturing employees at nearly one third of its workers. All counties also have a high rate of health care and social assistance jobs with St. Joseph having the highest number of jobs at 23,989, or 14% in this sector. Educational services, construction, administrative, professional and technical, state and local government, and retail workers make up a substantial working population in the region

Figure 2-12: Percent of Employment by Sector



Source: 2017 Woods and Poole Economics

Source: 2013-2017 American Community Survey 5-year Estimates

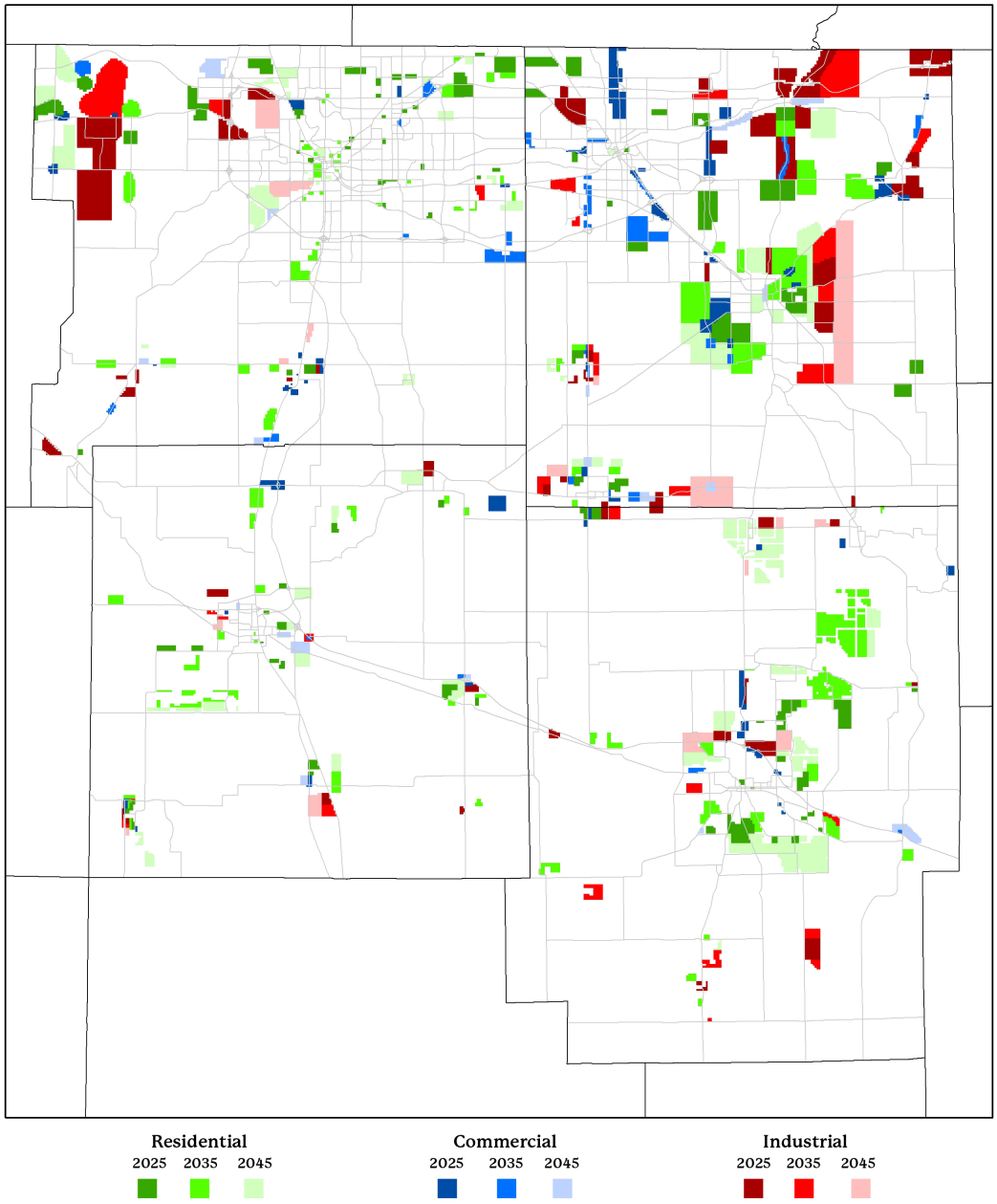
at 175,790 employees. This group consists of nearly 44% of the total worker population in the region.

Land Use Development Patterns

Land use and transportation influence each other. Intense land uses demand transportation services while transportation facilities are capable of being catalysts for development. Automobile travel is encouraged by development patterns that are low-density with separate land uses, and in return, new development is designed around that mode of transportation.

The Land-Based Classification Standards, developed by the American Planners Association in coordination with six federal agencies, is a flexible land use classification system to provide a more comprehensive view of land use than traditional classifications. MACOG uses the "Activity" dimension to classify residential, shopping and business, industrial, social and institutional, travel, mass assembly of people, leisure, natural resources, and unclassifiable land uses.

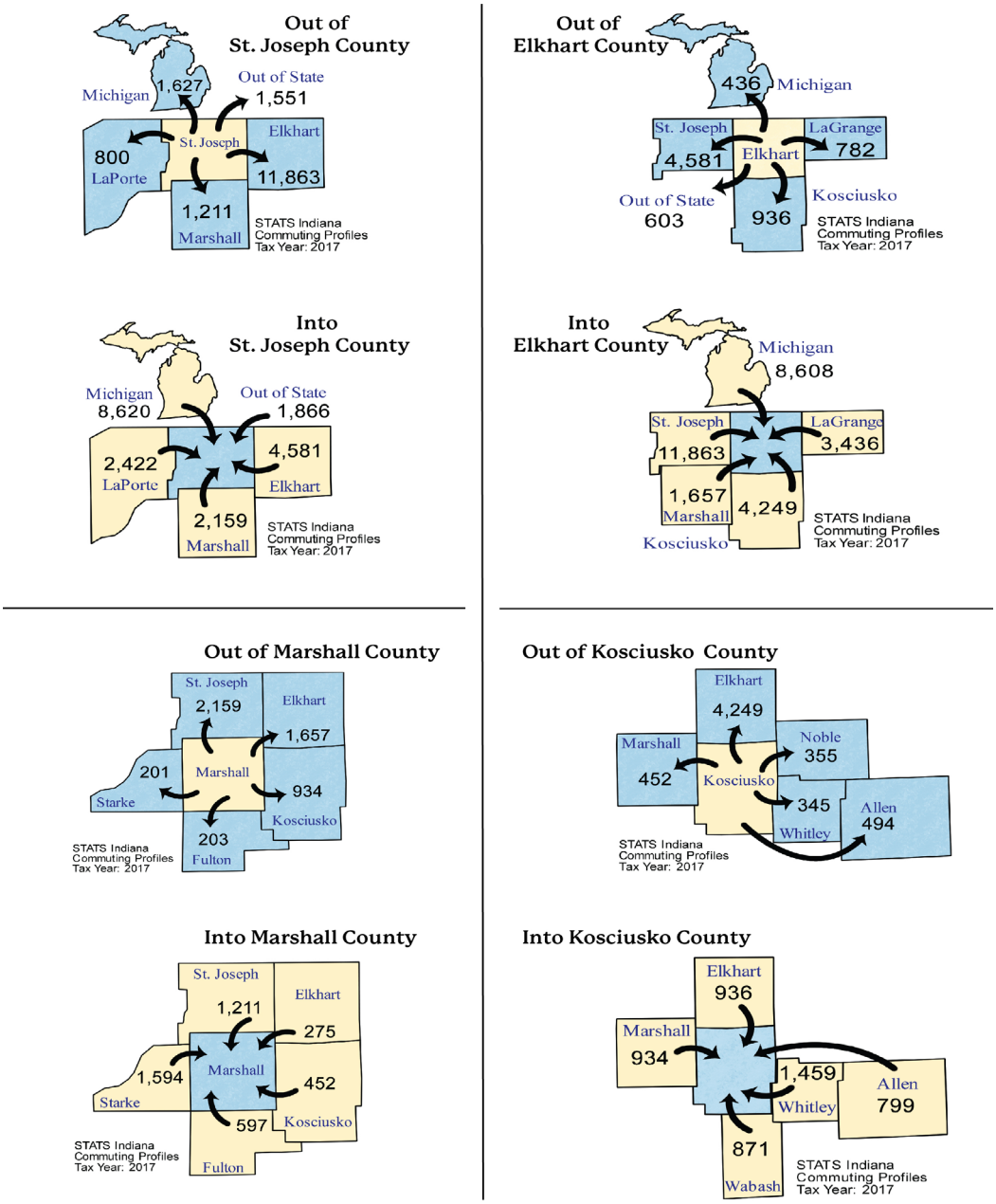
Figure 2-13: Planning Projected Land Use Changes 2025-45



During the development of Michiana on the Move: 2045 Transportation Plan, several sessions were held with stakeholders throughout the MACOG region. Many of these meetings were held with high-ranking officials from municipalities and communities; such as, Mayors, community economic development organization directors, city planners and parties interested in community investment. During the first meeting, a plan was developed to guide the attendee's in developing a strategy for locating where growth would occur in their respective areas. From that meeting MACOG digitized a location map highlighting growth over the decade leading to 2025, the time between then and 2035 and finally what would be built up by 2045.

This meeting generated population densities through projected residential growth areas as well as commercial and industrial goals from the stakeholders for development of land over the same times periods. Figure 2-13 shows the outcome of how those stakeholders envision growth in the MACOG region to develop over the next 20 years.

Figure 2-14: Commuting Flows



Commuting Flows

Traffic flow commuting profiles can be used as one way to understand how traffic moves throughout Elkhart, Kosciusko, Marshall, and St. Joseph County. Understanding traffic flows between counties is important for planning future transportation needs. Elkhart County and St. Joseph County are major employment centers for the region, attracting 29,813 and 19,648 commuters respectively. Based on Indiana IT-40 2017 Tax returns, a little over 82% of Elkhart and St. Joseph County workers have jobs located within their county of residence. Of the remaining 18%, generally 16,444 workers, or 30%, travel between Elkhart and St. Joseph County to work. The remaining workers commute to Michigan and the surrounding counties including LaGrange, Kosciusko, Marshall, and LaPorte Counties.

Marshall and Kosciusko County exhibit different travel patterns, with a slightly higher percentage of workers commuting to other counties. In both, there are more commuters traveling outside the county to work then those traveling into

the county to work. In Marshall County, 83% of workers stay in the county for work. The majority of the remaining workers commute to St. Joseph, Elkhart, and Kosciusko Counties. Kosciusko County retains 86% of workers, while 14% of their workers travel to the surrounding counties with the majority of these workers commuting to Elkhart County. See Figure 2-14 for the maps of the regions commuting patterns.

Households and Vehicles

The majority of the region's households have one or two vehicles available to household members. 86,485 households have two vehicles available, and 70,346 households have only one vehicle available. 45,691 households have three or more vehicles available, while 17,419 households have no vehicle available.

The mean household income was $52,449 for Elkhart County, $57,190 for Kosciusko County, $51,869 for Marshall County, and $45,012 for St. Joseph County. The Federal Highway Administration's publication, 'The Next Generation of Travel Statistical Analysis,' shows the higher a household's income, the higher the number of daily trips. Those trips are also related to automobile access and ownership.

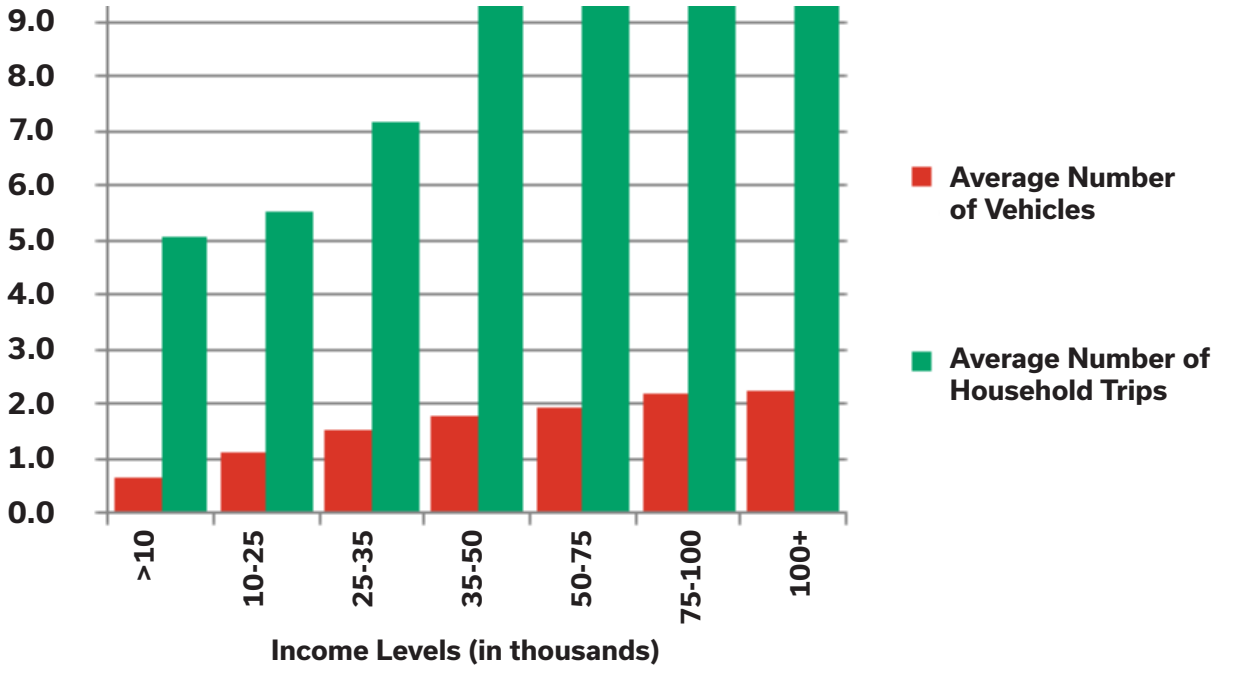
Responses to income and travel trip questions from the Michiana Area Travel Study are shown in Figure 2-15. According to the study, in the Michiana Area car ownership increases as income increases, as expected and number of trips generally increases as well. Households with incomes more than $35,000 a year take approximately the same number of trips, 9.4 trips per day.

Connectivity & Accessibility

Quality of life is greatly impacted by connectivity of a transportation network and how accessible residential neighborhoods, commercials areas, and recreational facilities are to each other. Providing a variety of routes for different modes of transportation can enhance the network by making it last longer and be more reliable and efficient.

The Michiana area falls at a crossroads providing excellent accessibility to larger regional cities including Chicago, Indianapolis, Detroit, Toledo, and Fort Wayne. All of these locations can be traveled to within 3 hours via interstates and highways such as I-80/I-90, US 31, and US 30. This crossroads location not only provides local residents with convenient routes for longer travel, it also is a benefit for manufacturers and warehouses wanting to transport goods to other parts of the country.

Figure 2-15: Household Income vs Household Trips and Vehicles



The region also exhibits a strong local road network; demonstrating commute times lower than the national mean travel time of 25.4 minutes. Within the region, the large majority of commuters experienced a commute of 24 minutes or less. Elkhart County has the shortest mean travel time to work at 19.4 minutes. St. Joseph County had the 2nd lowest mean travel time at 19.9. These commute times correlated to the Michiana Area Travel Study that was conducted in the fall of 2013, where an average commute drive time was found to be 19.6 minutes. For the rural counties, mean travel time to work was slightly higher, 20.5 minutes for Kosciusko County and 21.6 minutes for Marshall County.

Even though the mean travel time was lower in Elkhart and St. Joseph Counties, the largest percentage of workers having a commute time less than 10 minutes were in Kosciusko and Marshall Counties. The largest percentage of workers in Elkhart and St. Joseph has a commute time between 15 and 19 minutes.

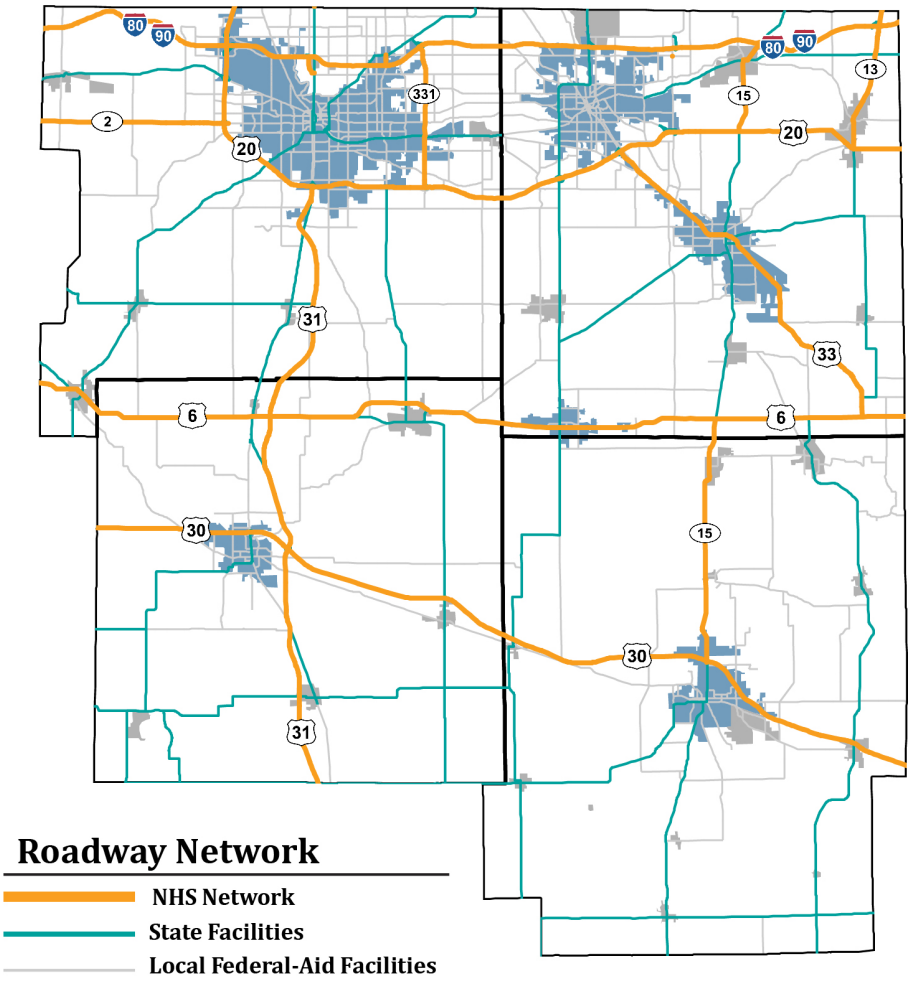
Chapter 3:
Transportation Network

3

Transportation Network

Social and economic characteristics can influence the demand on the transportation system. More people, more jobs, or more economic successes can result in higher traffic volumes and increased development. The 2045 Transportation Plan analyzes the trends and projections of social and economic characteristics, in order to better understand the future demand on the regional transportation system.

Figure 3-1: RoadwayNetwork



The transportation network is more than roads and highways; it includes public transportation, bicycle and pedestrian paths and the movement of freight. It is not just one of these elements, but all of them working together, to create an efficient and effective transportation network for people and products to move throughout the region. Figure 3-1 shows the major roadways within the MACOG region.

Roads and Highways

The MACOG region is comprised of over 6,548 miles of roadway, providing connectivity and access, both locally and regionally. At its most basic, the roadway network can be separated into three categories: the national highway system, state facilities, and local facilities. Furthermore, roadways are functionally classified, based upon their intended character of service, into interstates, expressways, principal and minor arterials, major and minor collectors, and local roads. The transportation network is always evolving and because of this, it is important to identify and address changes, challenges, and opportunities that might occur in the future through the visioning of the transportation planning process.

National Highway System

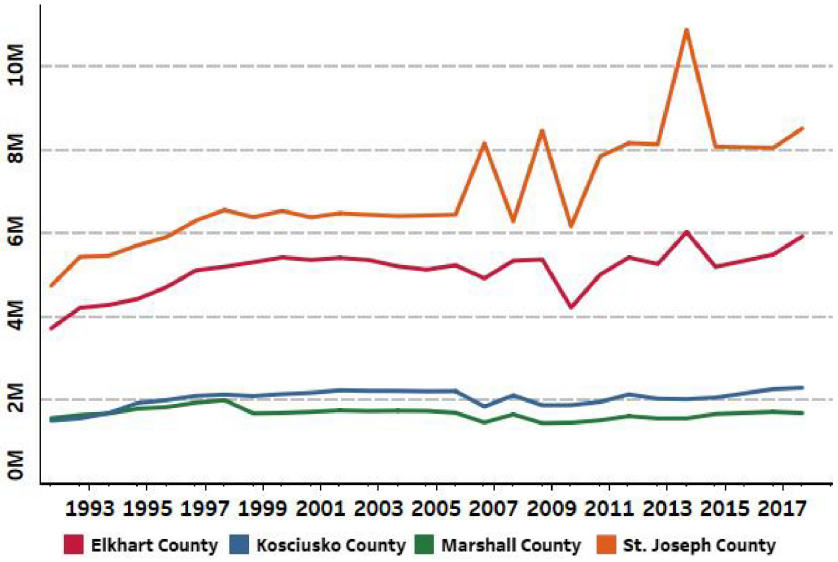
The National Highways System (NHS) contains roads and highways important to the nation's economy, defense, and mobility and therefore should be given the highest priority for improvements and repairs. Within the MACOG region there is one corridor that is part of the Eisenhower Interstate System: I-80/I-90 (Indiana Toll Road). This interstate runs through the northern portion of the region, traveling from California to New York. Other highways that are

part of the NHS include US 6, US 20, US 30, US 31, US 33, SR 2, SR 13, SR 15 and SR 331.

Regional State Facilities

State highways are generally a mixture of primary and secondary roads intended to provide regional connectivity between the cities and towns within the state. For the MACOG region, SR 2, SR 4, SR 10, SR 14, SR 25, SR 110, SR 120, SR 933 (Lincolnway), US 6, US 20 and US 30 provide east-west connections inside and outside the region. For north-south connection, SR 13, SR 15, SR 17, SR 19, SR 23, SR 331, US 31 and US 33 provide connection inside and outside the region.

Figure 3-2: Total Daily VMT by County



Source: 2019 INDOT

Local Facilities

The Michiana area has an extensive network of arterial and collector roadways that provide access and connectivity for a high volume of vehicular traffic. These networks are extended to other smaller incorporated towns and cities, accommodating travel demand. In total, 35 cities and towns are connected by the network within the MACOG region.

Vehicle Miles Traveled

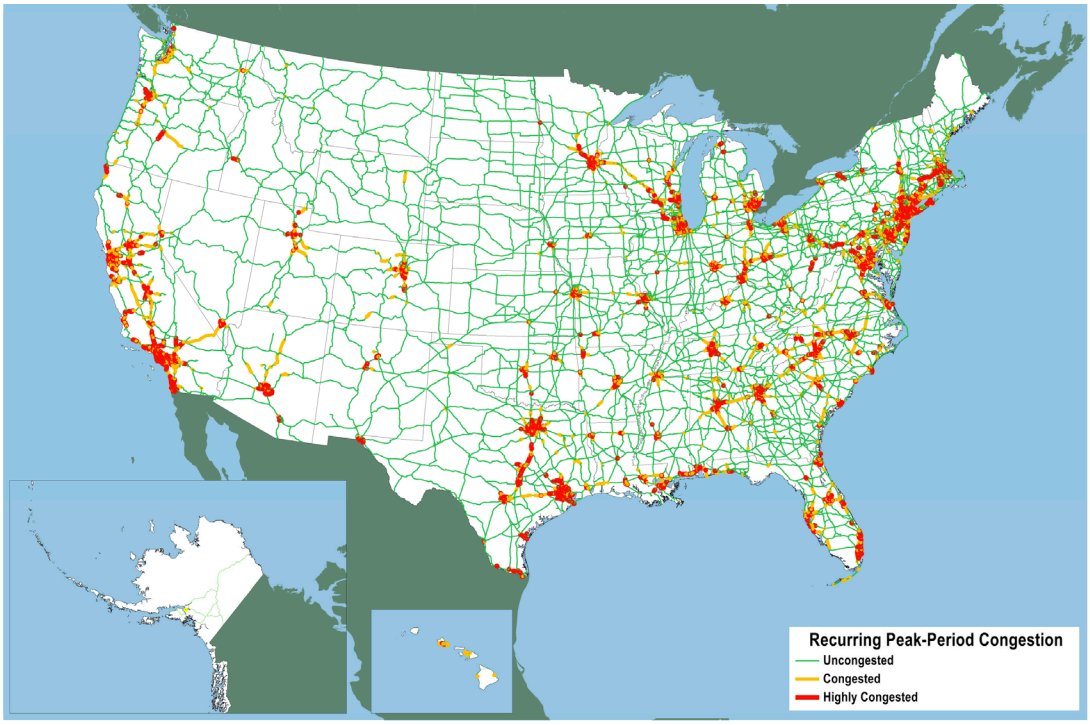
Vehicle-miles travelled (VMT) is an indicator of road network usage as it measures the distance in which vehicles travel over a particular length of time. VMT is a measure used in transportation planning for a variety of purposes. It measures the amount of travel for all vehicles in a geographic region over a given period of time, typically a one-year period. The Federal Highway Administration has kept records of VMT on a monthly basis since 1970. In 2007, the national level of VMT hit an all-time annual high since the start of this record keeping. By 2008, nationwide VMT dropped for the first time since 1980, and continued to flat line due to economic and social factors. Since 2015 however, VMT has steadily been increasing due to a recovering economy .

Until about 1998, all counties in the MACOG region experienced an increase in VMT at a slower rate than the U.S. From 1998 to 2006, VMT stayed at a consistent level. Between 2006 and 2014, Marshall County and Kosciusko County saw a slight decrease in VMT. Elkhart and St. Joseph County showed irregular trends, increasing and decreasing VMT significantly between years. However, all of the counties in the region are showing upward mobility in most recent years. Figure 3-2 shows VMT trends for the four counties in the region.

The latest regional VMT study shows that St. Joseph County saw the highest VMT of 8.5 million miles travelled within the region. Elkhart saw the next highest at 4.9 million miles. Marshall County saw the lowest regional VMT at 1.7 million miles traveled and Kosciusko saw 2.3 million miles. Increases in VMT have an impact on the region. The more miles that are traveled on roads means a higher cost of maintenance, increased traffic and freight congestion, higher vehicular air emissions, and a potential for higher rates of crashes. These factors are all considered when planning for future projects in this plan.

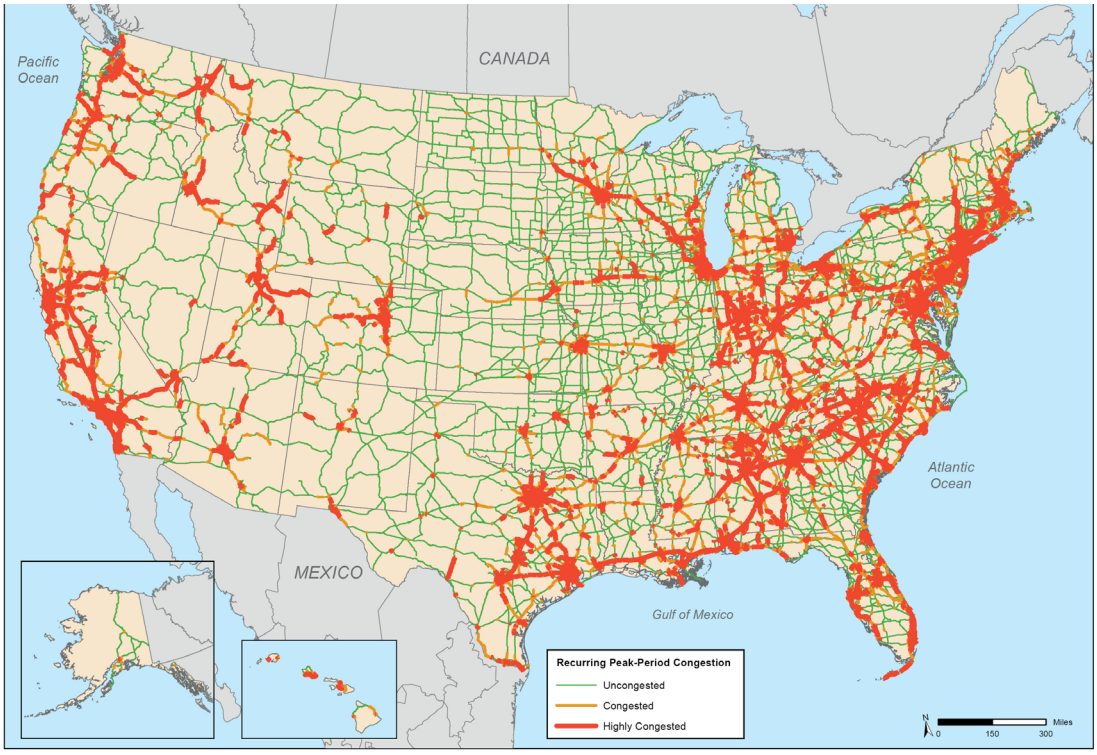
The current vehicle-miles travelled (VMT) in our region for 2018 was 17.4 million miles traveled daily, up from 16.9 million daily miles travelled in 2015. Increases in VMT has an impact on the network that may include increased traffic and freight congestion.

Figure 3-3: Peak Period Congestion on the NHS: 2007



Notes: Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95.The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N.
Source: U. S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012

Figure 3-4: Peak Period Congestion on the NHS: 2040



Notes: AADTT is average annual daily truck traffic and includes all freight-hauling and other trucks with six or more tires. AADT is average annual daily traffic and includes all motor vehicles. NHS mileage as of 2011, prior to MAP-21 system expansion.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Freight Analysis Framework*, version 3.4, 2013.

Figure 3-3 shows the recurring congestion caused by volumes of passenger vehicles and trucks that exceed capacity on roadways during peak periods. In 2007, the recurring congestion is concentrated primarily in major metropolitan areas, especially along the east coast. Also in 2007, peak period congestion resulted in traffic slowing below posted speed limits on 11,700 miles of the NHS and created stop-and-go conditions on an additional 6,700 miles. Assuming no changes in network capacity; increases in truck and passenger vehicle traffic are forecast to expand in areas of recurring peak-period congestion to 36% of the NHS in 2040, Figure 3-4. This compared with 11% of the NHS in 2007.

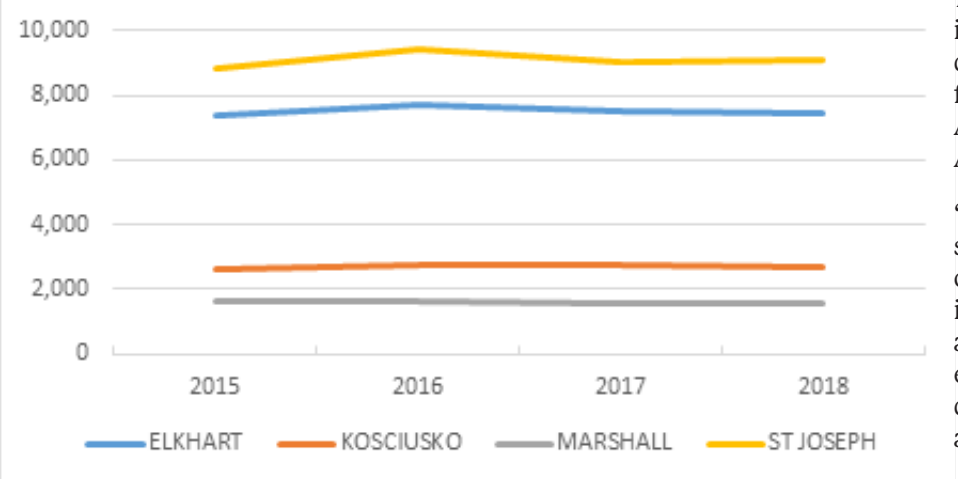
Safety

The region has had a steady crash rate from 2015 to 2018. The largest increase in incidents was in St. Joseph County from 8,810 crashes in 2015 to 9,451 in 2016. However, since that time the county's accident rates have dropped, having 9,092 in 2018. As a whole, the region reflected a similar trend, increasing from 20,443 total crashes in 2015 to 21,506 in 2016. Like St. Joseph County though, the region then began to see a decrease in the rate of collisions to 20,767 in 2018.

Every crash is recorded as either property damage only, fatal crashes, and injury crashes. The large majority of crashes tend to be property damage only crashes, resulting in no fatalities or injuries. In 2018, 86 percent of crashes in Elkhart, Kosciusko and Marshall Counties were property damage only crashes. St. Joseph County had a slightly higher percentage of injury and fatal related crashes with 83 percent of crashes reported as property damage only. St. Joseph County also had the highest number of fatal crashes, 29, in 2018 followed by 18 fatal crashes in Elkhart County, 14 in Kosciusko County and 11 in Marshall County. Both Elkhart and Kosciusko Counties have seen a decline in percentage rates of fatal crashes compared to the total number of crashes from 2015 to 2018, while Marshall and St. Joseph Counties have seen a steady increase of fatal collisions in that same timeframe.

The Fixing America's Surface Transportation Act (FAST Act), continued the Highway Safety Improvement Program (HSIP), emphasizing the importance of dedicating funding to increase safety conditions in the transportation network. This funding is applied to projects that will significantly reduce traffic fatalities and serious injuries. MACOG utilizes the State crash data through the Automated Reporting Information Exchange System (ARIES). Through geographic information system applications, MACOG maps and analyze the location of crashes in order to effectively determine which segments of roadway would most benefit from safety enhancements. MACOG continually strives to improve the safety of the transportation system within the region in order to reverse increasing crash rates.

Figure 3-5: Number of Crashes by County from 2015-2018

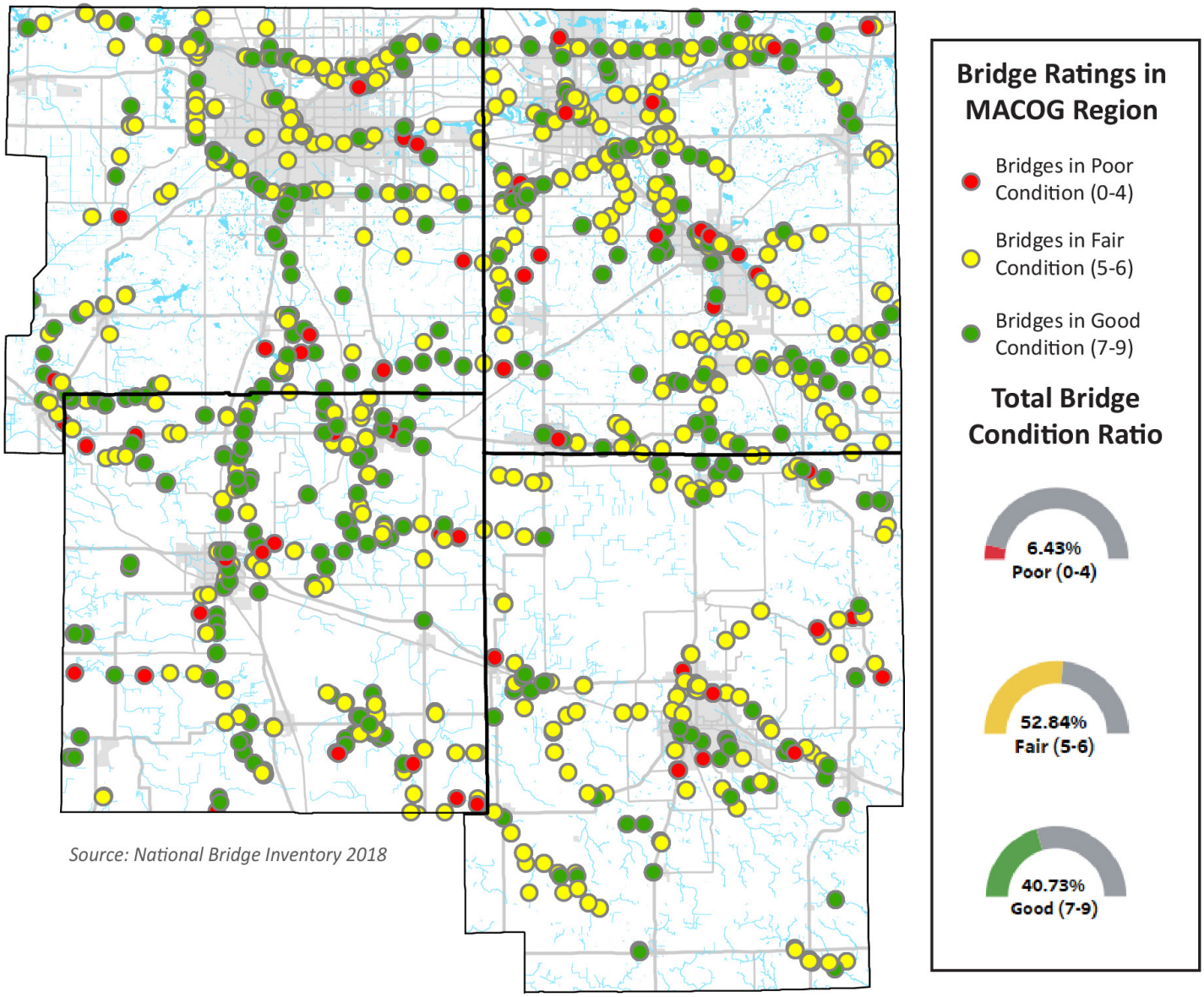


Asset Management

Asset management provides local public agencies a method for compiling important information about their assets in order to be able to formulate quality management strategies for current and future periods. According to Federal Highway Administration (FHWA),

"Asset management is a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of

Figure 3-6: MACOG Region Bridge Ratings



Source: National Bridge Inventory 2018

maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost." (23 U.S.C. 101(a)(2), MAP-21 § 1103)

The transportation network is a critical infrastructure asset for the region and local public agencies. Preservation and maintenance are key for ensuring that the network remains safe for travel, efficient, and reliable. Asset management can maximize life cycle costs, becoming a tool for cost effective practices. INDOT estimates that $1 spent on pavement preservation can save $6 to $14 on future repairs.

In 2016, INDOT introduced the Community Crossing Matching Grant. With this grant, the state began to require asset management as a part of communities planning process in order to receive monies from this grant. Since that time MACOG has trained and developed strategies to provide technical assistance to Local Public Agencies (LPAs) regarding asset management by

teaching LPAs Pavement Surface Evaluation and Rating (PASER) techniques as well as helping them to understand how roadways deteriorate based on the type of wear visible on those roads. MACOG helps LPAs develop 5-year asset management plans in an effort to help the region maintain the roadway network in a strategic manor. With those partnerships, MACOG has worked to develop tools in which LPAs can more quickly visualize road repairs and estimate costs for appropriate fixes to those issues. Figure 3-6 shows road ratings throughout the region.

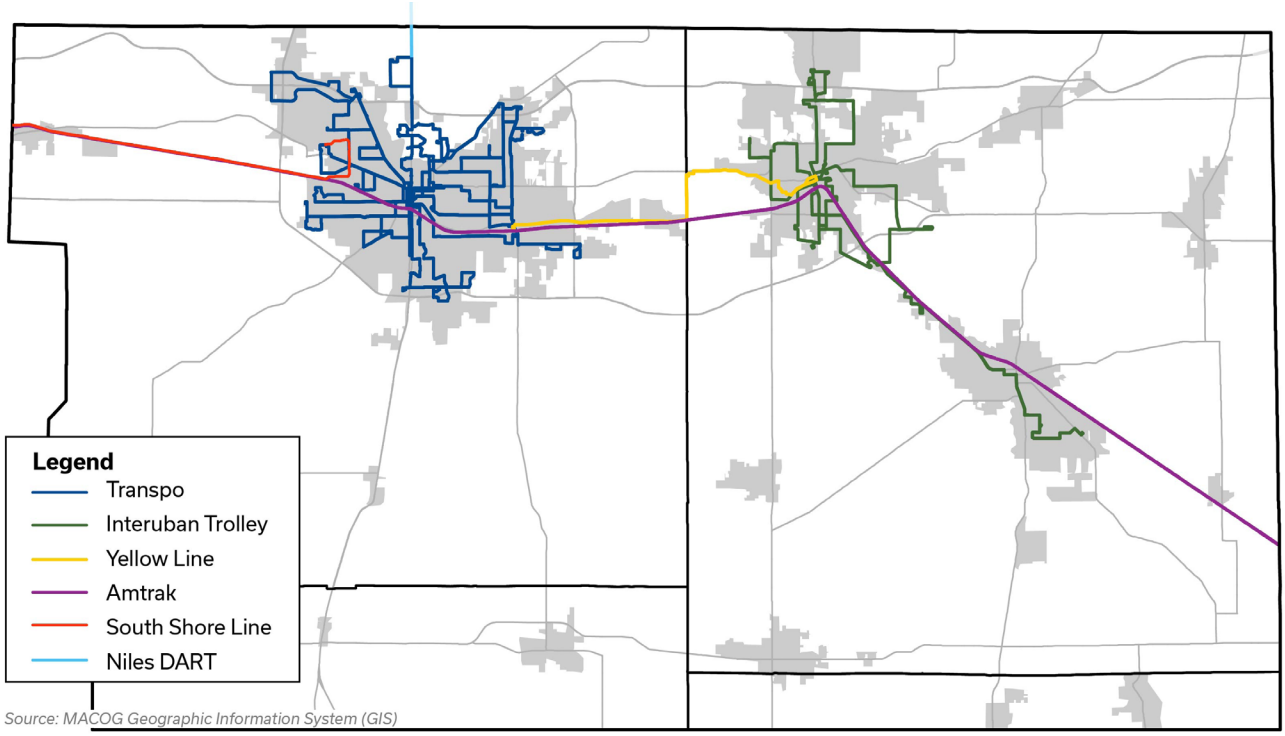
Along with maintaining a regional database for road ratings, MACOG began an initiative in 2019 to maintain current and historical bridge ratings and statistics throughout the Region. In doing so communities are able to quickly reference the status of their bridges while also giving them the opportunity to perform analysis on bridge facilities they own in order to guide their decision making while preparing bridge asset management plans and applying for grants to rehabilitate or replace bridges in the transportation network.

Public Transit

Public transit is an integral part of the transportation system, providing another mode choice for transportation. This includes providing options for senior citizens, the young, disabled and economically disadvantaged populations. Providing efficient public transit allows all populations access to businesses, health care facilities, employment, and recreation. For this reason, public transit is a crucial link to a stable economy and a better quality of life. Choosing public transit can also yield environmental benefits, lowering congestion and lessening automotive emissions.

Currently, the people living in the MACOG region are served by two fixed-route public transit services in the urbanized areas and a variety of travel options. Transpo provides fixed-route bus service throughout South Bend and Mishawaka. Transpo connects with Niles Dial-A-Ride (DART) to provide service into Niles, Michigan. The Interurban Trolley serves Elkhart, Goshen, and major points of commerce in between the two cities. Additionally, varieties of demand response services are available in Elkhart, Kosciusko, and Marshall Counties. Regionally, the Michiana area has access to two rail transit

Figure 3-7: MACOG Region Public Transit



Source: MACOG Geographic Information System (GIS)

services: the South Shore Line and Amtrak. Furthermore, proposed high-speed passenger rail services are being considered throughout the Midwest including through North Central Indiana, as well as a 700 mph Hyperloop route running from Chicago to Cleveland.

Transpo

Transpo operates twenty-one (21) fixed transit routes that serve the cities of South Bend, Mishawaka and Elkhart on 30 minute and 60 minute headways. Service runs Monday through Saturday with no service on Sundays. As of 2019, Transpo operates a fleet of forty-seven (47) revenue vehicles, which now includes twenty-two (22) Compressed Natural Gas (CNG) busses as they continue to convert their fleet. In 2018, the organization received over a 4 million dollar grant award to continue this conversion.

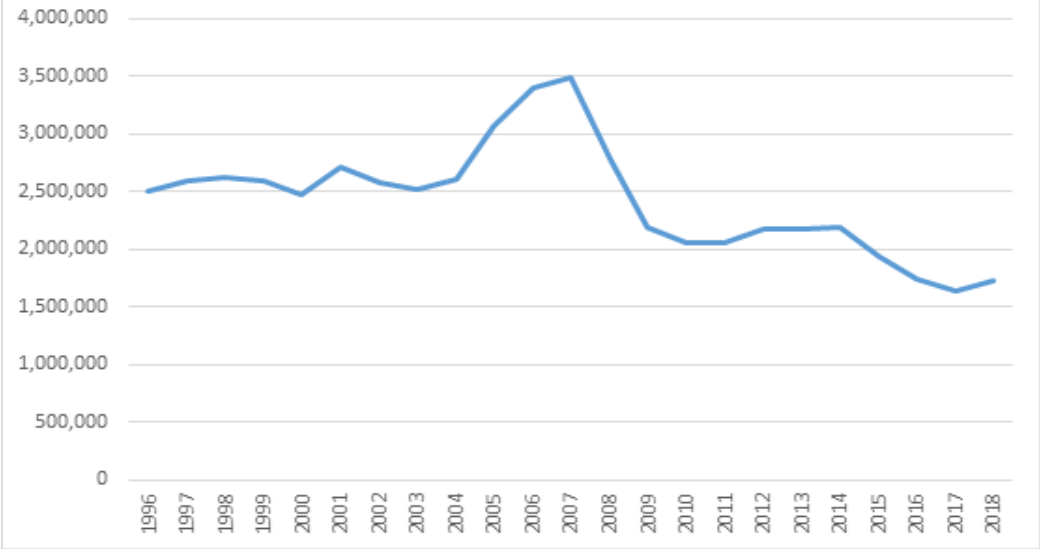
In the summer of 2019, Transpo also completed the installation of Automated Passenger Counters (APCs) on their entire fleet in order to gain more insights per stop for each route, allowing real time understanding of ridership. Another major change with the organization was its transition to a signed stop system. With the sign system fully in place, travel time and more efficient routing have been observed.

Over time, Transpo has seen fluctuations in ridership. This is largely due to economic and social factors as well as changes in service. Figure 3-8 illustrates Transpo's ridership trend since 1999. Transpo reached their highest annual ridership numbers in 2007 at 3,480,510 patrons. Ridership declined from 2007 to 2009 and remained relatively flat until 2018 when Transpo observed an optimistic uptick in ridership.

In addition to offering fixed-route service, Transpo also offers paratransit services, which covers a three-quarter of a mile corridor on either side of the transit routes. Transpo also provides four (4) Mishawaka School Tripper routes offered in mornings and afternoons during the school year. These are tailored towards providing students an opportunity to use public transit to get to school. A program rolled out in 2013 allowed school age children unlimited travel during the summer for a discounted rate of $30. In 2018, in order to introduce more K-12 youth to public transportation and increase access to employment, educational, and recreational opportunities, Transpo's Free K-12 Summer Travel Program was introduced. This service provides free rides to students during the months of June, July and August. The record-setting program provided over 27,000 rides in 2018.

Although bus service in South Bend began in 1923, it was not until 1968, when the City of South Bend purchased the first bus, that Transpo was formed. Since this time, service has continued to expand. In 1998, the South Street Station was built, serving as an intermodal transfer center. A new administrative headquarters was built in 2010 named the Emil "Lucky" Reznik Administration, Maintenance and Operations Facility. This facility is certified LEED Platinum and was the first transit facility in the country to achieve this certification.

Figure 3-8: Transpo Annual Ridership



Interurban Trolley

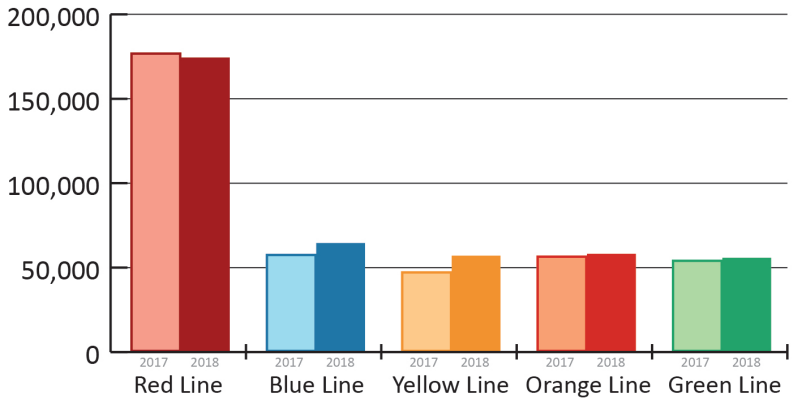
The Interurban Trolley is a fixed-route bus service in Elkhart County, which was introduced in 1999. The Trolley operates a system of five (5) fixed routes, administered by MACOG and operated by a service provider, running on weekdays from 5:00 am to 8:00 pm and Saturdays from 5:00 am to 7:00 pm. The Interurban Trolley provides easy and affordable public transit along the corridors connecting Elkhart and Goshen as well as major points of commerce between the two cities. In 2009, the Interurban Trolley added the Yellow Line, an important route that created a common transfer point to routes operated by Transpo. This route connected public transit from Elkhart/Goshen to South Bend for the first time in over fifty years, which in turn provided access to the South Bend International Airport and Chicago via the South Shore Line.

The five routes share a transfer point in downtown Elkhart. MACOG is in the preliminary stages of planning for a permanent transfer station to be built in downtown Elkhart. This will provide a place to wait comfortably for the Trolley, while serving as a resource center as well. Currently, the corner of Franklin and Third Street has been identified as a potential location for this station. In 2015 and 2018, the Interurban Trolley procured new trolley buses that have allowed for services that are more reliable. These procurements helped replace some of the aging fleet, which now currently consists of thirteen (13) trolley buses. Also in 2019, the K-12 Summer Travel Program went regional with the Interurban Trolley adoption of the Summer Travel Pass allowing free summer rides to students.

As shown in Figure 3-9, the Red Line, which connects Elkhart and Goshen, boards the highest number of riders. The second most frequented line is the Blue Line, which travels to the northern part of Elkhart. From 2017 to 2018, the Red Line saw a decrease in ridership by 2,329 passengers, while the increase in ridership on the Blue, Yellow, Orange and Green Lines totaled 17,479 more unlinked passenger trips. The success of the Interurban Trolley is largely dependent upon accommodating the needs of the residents in Elkhart County. MACOG continually assesses the effectiveness and efficiency of the transit route system to ensure that the community's needs are being met.

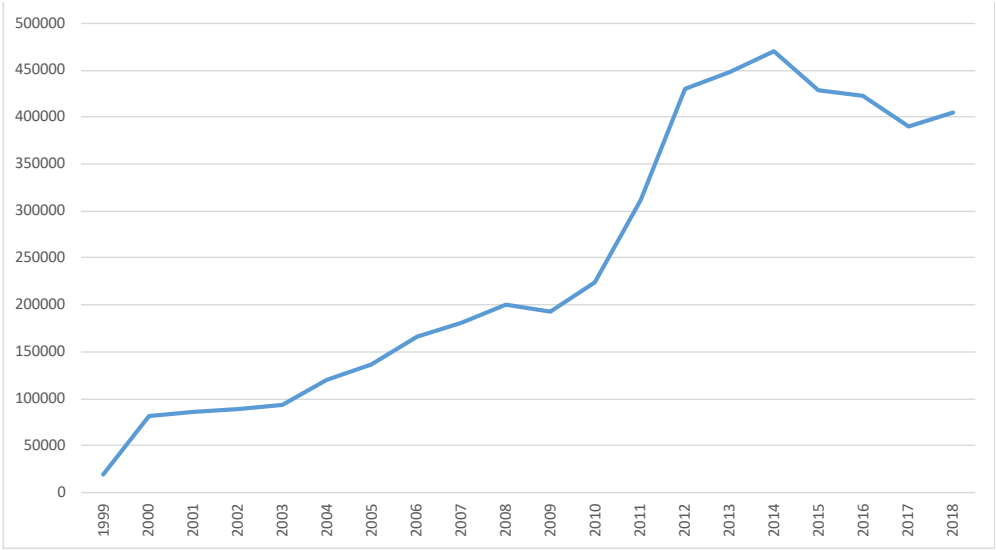
Since 1999, the Trolley has experienced a steady increase in ridership thanks to additional fixed routes and realignments. Figure 3-10 shows the Interurban Trolley provided 470,394 unlinked

Figure 3-9: Interurban Trolley Ridership by Line



Source: The Interurban Trolley Automated Passenger Counters

Figure 3-10: Interurban Trolley Annual Ridership



passenger trips in 2014, the highest annual ridership in its history. While the Trolley saw decreases in ridership from 2015 to 2017, the Interurban Trolley began to see an uptick in 2018.

In addition to offering fixed route service, the Interurban Trolley offers paratransit services in Elkhart and Goshen. In August 2013, the demand response services offered through the Heart City Rider (HCR) and the Goshen Transit Service (GTS) were discontinued, being replaced by what is now the Interurban Trolley Access service. The Interurban Trolley Access provides trips to disabled persons unable to use the Interurban Trolley fixed route system within the ADA Corridor. The ADA Corridor includes a 1.5-mile buffer on either side of the fixed transit routes. Ten (10) ADA accessible vans are currently available for this service, which has provided 145,331 trips to eligible riders since the service began.

Yellow Line Service

In 2018, dedicated bus routes between Elkhart and Mishawaka were formally created transforming the Yellow Line service through an extended partnership between Transpo and the Interurban Trolley. The amplified service now offers a dedicated bus from each agency, providing 30-minute headways on weekdays and 60-minute headways on Saturdays along the route. The Yellow Line collaboration provides service between the Interurban Trolley Transfer Station in the City of Elkhart to the Transpo Mishawaka Transfer Station.

Public Demand Response Services

Demand response service is a non-fixed route system that requires riders to schedule trips ahead of time. There are four of these types of services in the MACOG region provided by the Kosciusko Area Bus Services (KABS), Marshall County Council on Aging, Elkhart County Council on Aging and Elder Haus.

The Kosciusko Area Bus Service (KABS) serves the entire Kosciusko County area. Their service has a fixed route but deviates from that route to requested stops within a pre-defined corridor. KABS operates on weekdays with a peak hour fleet of eight vehicles.

The Marshall County and Elkhart County Councils on Aging operate transit services throughout their counties while Elder Haus provides service in the City of Nappanee. Their services provide trips during the weekdays to older adults who are no longer able to drive themselves. Other organizations, such as ADEC, provide additional transportation services to individuals needing assistance.

South Shore Line

The South Shore Line, operated by the Northern Indiana Commuter Transportation District (NICTD), is a commuter rail service providing access from South Bend to Downtown Chicago. The South Bend boarding site is located at the South Bend International Airport and links the South Shore Line with airline services and other public bus services. Five (5) daily trains leave from South Bend bound to Chicago, with five (5) trains offering return service. According to the South Shore 2018 Annual Ridership report, South Bend ridership decreased from 260,794 in 2017 to 246,661 in 2018, a 5.52% decline. Service improvements such as double tracking and the potential relocation of the South Bend Station aim to make the trip from South Bend to Chicago a 90 minute-commute

Amtrak

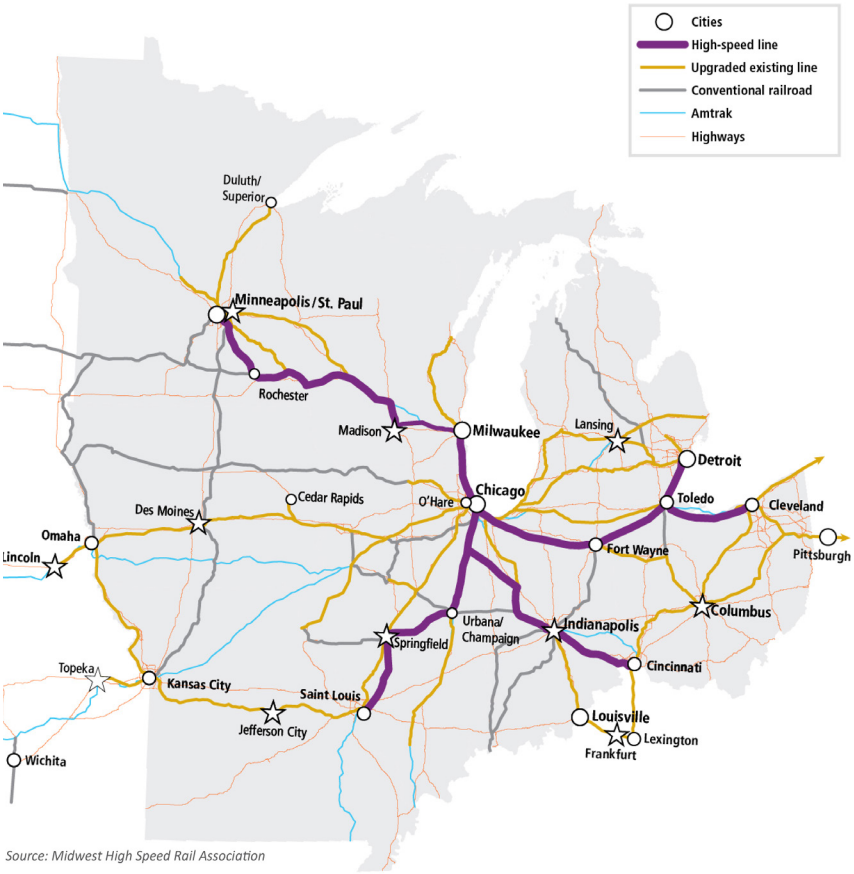
Amtrak provides rail passenger service throughout the United States. Passenger stations within the MACOG region are located in South Bend and Elkhart. Two routes run along this line. Capitol Limited runs from Chicago to Washington D.C stopping at each station daily. Lake Shore Limited has daily service running from Chicago to Boston and New York. Passenger volumes for the South Bend station totaled 21,207, slightly lower than the Elkhart station that had a volume of 21,787 passengers for fiscal year (FY) 2018. Since FY 2015, each station has had opposite trends. The South Bend station has seen a decline of 4% in ridership and the Elkhart station has seen a 6% increase in that time. Both stations primarily serve trips to Chicago and Washington, DC with an average trip distance in South Bend being 369 miles and Elkhart at 299 miles. Both stations also serve 33 cities with direct service.

High Speed Rail

An important development occurring in the Region and the Midwest is the configuration of a high-speed rail system. Studies are still being conducted as far as which tracks will be used, but the proposed system would connect Cleveland, Cincinnati, Detroit, Indianapolis, St. Louis, the Quad Cities, Milwaukee, and Minneapolis-St. Paul to a hub in Chicago with various stops in between, including stops in North Central Indiana. The goal of the system as identified by the Indiana High Speed Rail Alliance is to reduce travel time for passengers needing to connect to cities, airports, and other forms of transportation. The majority of high-speed trains on this network would travel at 110 miles per hour, consuming less fuel than slower rail and air transportation, and be a self-sufficient system unsubsidized by the government. Amtrack service through Niles, Michigan has already been upgraded with track and signal improvements to provide high speed service (110 mph) on parts of the route.

As far as economic development is concerned, several factors make high-speed rail a lucrative addition to the region's intermodal capabilities. The construction of the system also creates jobs and revenue for companies supplying equipment and services to the project. In addition, the operation of a high-speed rail corridor would create permanent jobs and revenue for companies supplying equipment and services to it. Finally, high-speed rail offers decreased travel time, which means increased connectedness between the Region and nearby major cities – an attractive proposition for employers, employees, families, and travelers.

Figure 3-11: Proposed High Speed Rail



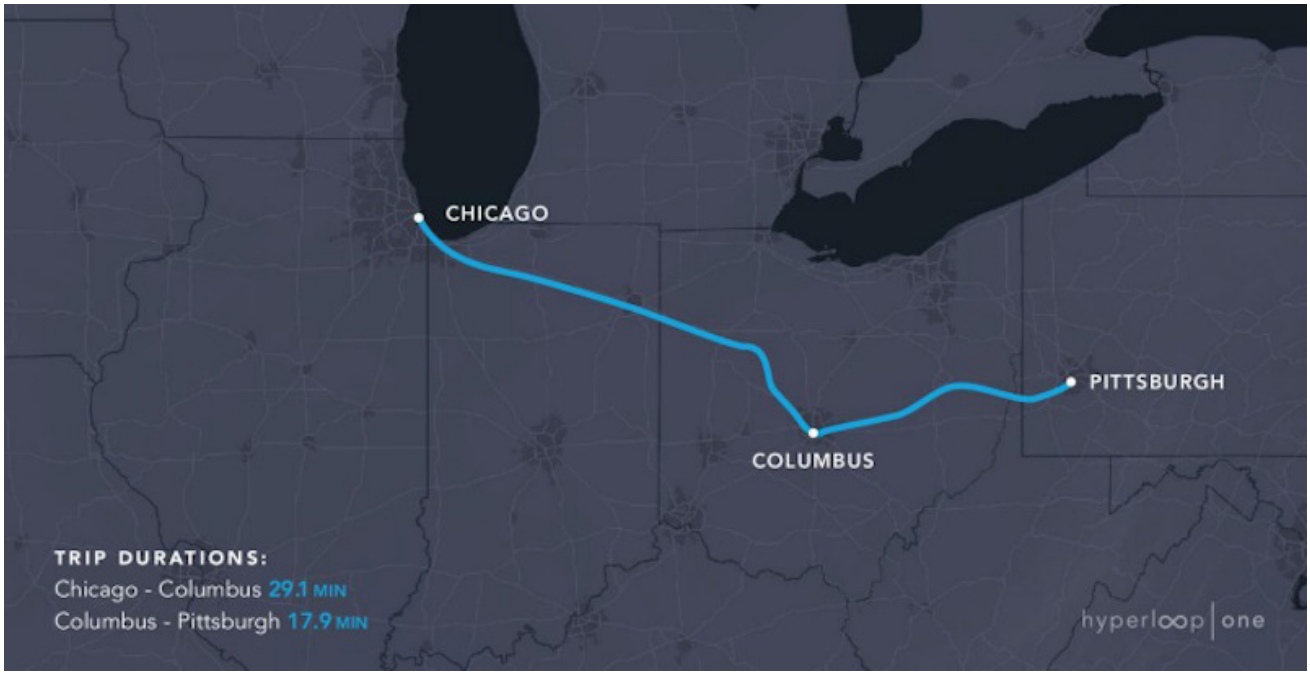
Source: Midwest High Speed Rail Association

Hyperloop Corridor

On February 21, 2018, the Mid-Ohio Regional Planning Commission (MORPC) launched a Rapid-Speed Transportation Initiative (RSTI) to explore intercity routes that could utilize two rapid-speed transportation technology options – traditional passenger rail and /or Hyperloop technology – between Chicago, Columbus and Pittsburgh. This was the first time in history that a Hyperloop had been included as an alternative in an Environmental Impact Study. The winner of the U.S. Government's $40M Smart City Challenge, Columbus has drawn much attention to the Hyperloop project nationwide. Support for this initiative included Virgin Hyperloop One with more to be seen.

If the Hyperloop were constructed, it would be about 488-miles long, consisting of 306 miles of tube from Chicago to Columbus and an additional 181 miles of tube from Columbus to Pittsburgh. It is anticipated by Virgin Hyperloop One that the pods will eventually reach traveling speeds over 600 miles per hour within

Figure 3-12: Midwest Hyperloop



these tubes, which would result in travel time from Chicago to Columbus of twenty-nine (29) minutes with only another eighteen (18) minutes to get to Pittsburgh.

An added benefit to a Hyperloop connection is the reduction of freight traffic on the road network through the MACOG region. According to the Department of Transportation, in 2015, there were 5.9 million tons of freight worth $16.7 billion that moved between Chicago, Columbus, and Pittsburgh. By 2040, this tonnage is expected to increase to 9 million tons at nearly double the value. As there is currently no direct path to these cities from Chicago, the current freight traffic passes along east-west roadways in the MACOG region like I-80/I-90, US 20 and US 30. Utilizing the Hyperloop to reduce freight traffic along these corridors will greatly enhance the level of service throughout the MACOG region.

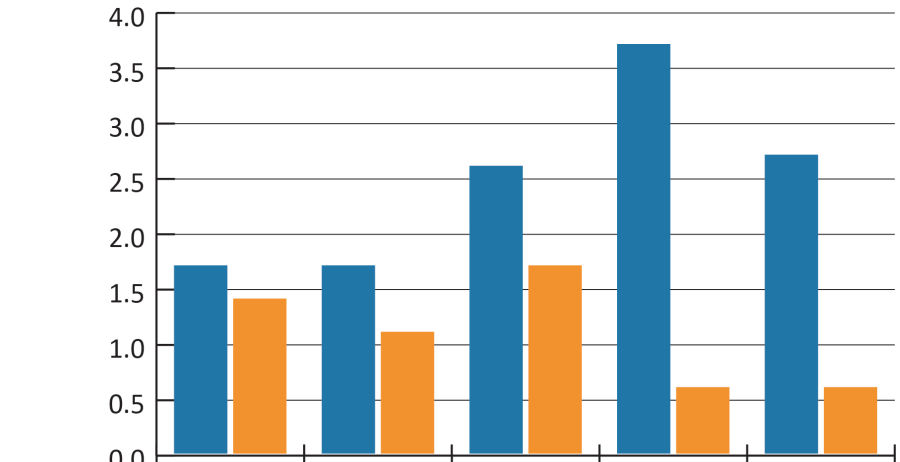
Another Hyperloop corridor being studied by the Northeast Ohio Areawide Coordinating Agency (NOACA) working with Hyperloop Transportation Technologies (HTT) stretches along a 313-mile long section connecting Cleveland to Chicago. This corridor would result in travel time from Cleveland to Chicago of less than a half hour.

Bicycle and Pedestrian

Bicycle and pedestrian projects are an important and integral component of transportation planning. A transportation system that supports bicycling and walking expands residents' mobility options and can complement multiple forms of transportation. A strong bicycle and pedestrian network can enhance a community's quality of life by providing great economic, environmental, social and health benefits. By reducing single-occupant vehicle travel, air quality improves and users can lead healthier lifestyles.

Despite the low percentage of commuters that walk and bike to work nationally, new trends identified through the 2013-2017 American Community Survey suggest that these modes of transportation are becoming increasingly popular. When comparing the number of U.S. workers who traveled to work by bicycle from 2010 to 2017, the increase was larger than any other commuting mode; a change of 696,276 workers to 890,593 workers. About 2.7% of commuters in the United States walk to work, and about 0.6% bike to work. Most counties in the MACOG region document an even higher rate of walking and bicycling to work. Figure 3-13 includes estimates by county of the percentage

Figure 3-13: % of Workers Who Commute



	Elkhart	Kosciusko	Marshall	St. Joseph	Nation
Walk	1.7%	1.7%	2.6%	3.7%	2.7%
Bike	1.4%	1.1%	1.7%	0.6%	0.6%

Source: 2013-2017 American Community Survey

of workers who commute by walking or bicycling. Elkhart, Kosciusko, and Marshall Counties all fall below the national rates for walking to work. In both Elkhart and Kosciusko Counties, 1.7% of workers commute by walking, while in Marshall County the rate is much higher at 2.6%. St. Joseph County experiences rather high rates of walking to work at 3.7%. It is estimated that all counties experience high rates of bicycling to work, ranging between 0.6% in St. Joseph County to 1.7% in Marshall County. This finding is significant, particularly to the region, because it shows that there is an interest in alternative commuting methods.

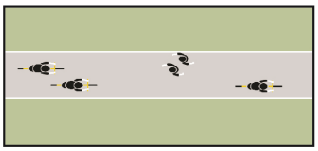
Bike Friendly Communities

Every year the League of American Bicyclists assess voluntary applications from communities, businesses, and universities through their Bicycle Friendly America (BFA) program. Applications are reviewed based upon key benchmarks that concern bicycling including law enforcement, education, engineering, outcomes, evaluations, and encouragement. There are five levels for which Bicycle Friendly Communities (BFC) can achieve: Bronze, Silver, Gold, Platinum, and Diamond. The BFC program is meant to support communities with a mission of providing better conditions for biking and guidance for turning visions into reality.

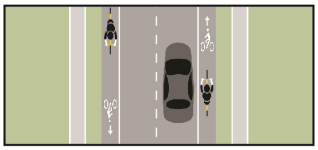
Three (3) communities in the MACOG region currently have a Bicycle Friendly status. South Bend recently achieved the Silver Bicycle Friendly Community designation in 2018, while Goshen and Warsaw/Winona Lake were designated as Bronze. These communities were designated because they demonstrated their ability in providing safe accommodation for cycling and encouraging residents to bike for transportation and recreation.

Types of Facilities

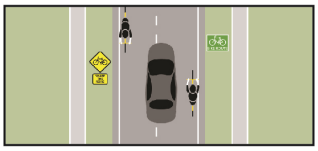
The MACOG region has several types of facilities constructed to accommodate bicyclists and pedestrians:



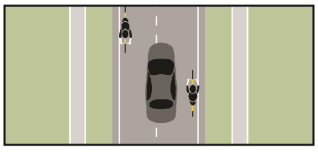
Shared-Use Paths are separated facilities used by bikers, walkers, runners, and skaters. They may follow a road or take their own path.



Bike lanes are 5' -6' lanes marked in the pavement specifically reserved for bicyclists, usually on high-traffic streets. The lane is generally marked with a white line and a bicycle icon.



Signed Routes are roads where bicycles and vehicles must share the same lane, but will include "Bike Route" or "Share the Road" signs.



Unsigned Routes are roads that have not been formally identified, but are acceptable for biking due to lower traffic conditions and wider roads.

Regionally Significant Trails

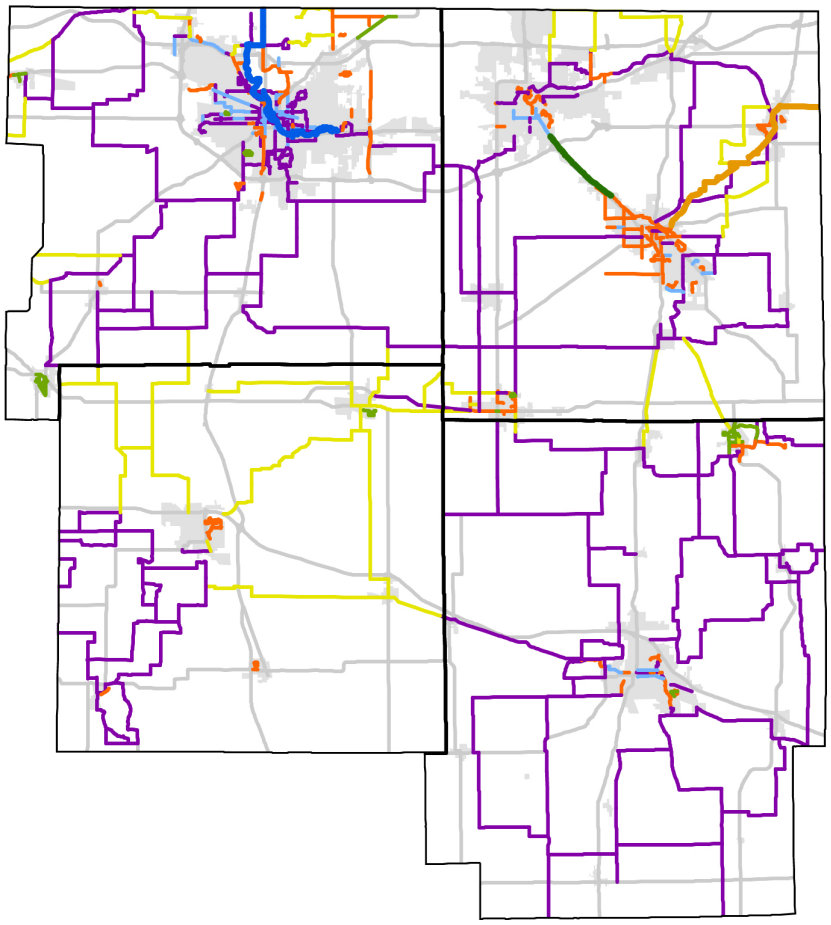
There are three regionally significant bikeways that have been constructed or are under development in the region: the Pumpkinvine Nature Trail, MapleHeart Trail, and the Indiana Michigan River Valley Trail.

The Pumpkinvine Nature Trail is a 16.5-mile trail that connects Goshen, Middlebury and Shipshewana. This trail was built on the abandoned Pumpkin Vine Rail corridor, which was purchased from Penn Central in 1993 by Friends of the Pumpkinvine Nature Trail, Inc. Most of the trail consists of asphalt paths, however 2.25 miles currently follow country roads and 1.7 miles is packed limestone.

The MapleHeart Trail is a 4.8-mile path that connects Elkhart and Goshen. The Trail runs along CR 45 from Hively Avenue in Elkhart to the Goshen City Limits. Both ends of the trail tie into local trail systems. In total, the MapleHeart Trail, Goshen's local trail system, the Maple City Greenway, and the Pumpkinvine Nature Trail, create over 25 miles of connected trails that link Elkhart to Shipshewana.

Finally, another significant bikeway includes a variety of trails found along the St. Joseph River including the Riverwalk in Mishawaka, East Bank and Northside Trails in South Bend, and trails extending into Niles, Michigan. All of these trails are combined into one system named the Indiana Michigan River Valley Trail. Much of the trails currently exist in the city limits of South Bend, Mishawaka, and Niles; however, connections at the county level still need to be made. In total, this trail will create a 34-mile system connecting universities and schools, city centers, parks and recreational areas, hospitals, and several historical/cultural attractions.

Figure 3-14: Trail and Facilities



Source: Regional Bicycle and Pedestrian Facilities Map

Sidewalks and Accessibility

Sidewalks are an important component of the transportation network because no matter the destination, every trip starts and ends with pedestrian travel. Sidewalks should be connected and accessible. MACOG has worked with many Local Public Agencies (LPAs) in the region to adopt Americans with Disabilities Act (ADA) Transition Plans for the Public Right-of-Way, which addresses sidewalk accessibility. The purpose of these plans is to ensure communities are creating reasonable, accessible paths of travel in the public right-of-ways for everyone, including people with disabilities. These plans provide a schedule for communities on how they should address and improve sidewalk accessibility.

As part of the plan, communities have adopted Accessibility Guidelines for Pedestrian Facilities in the Public Right-of Way. These guidelines suggest that whenever there is an intersection

improvement project or new construction project, any affected curb ramps, sidewalks, and crosswalks will be rebuilt to these ADA design guidelines, where feasible and reasonable. MACOG has created an ADA inventory database that can be used as a guide for sidewalk improvements and a resource for creating a better pedestrian network.

Aviation

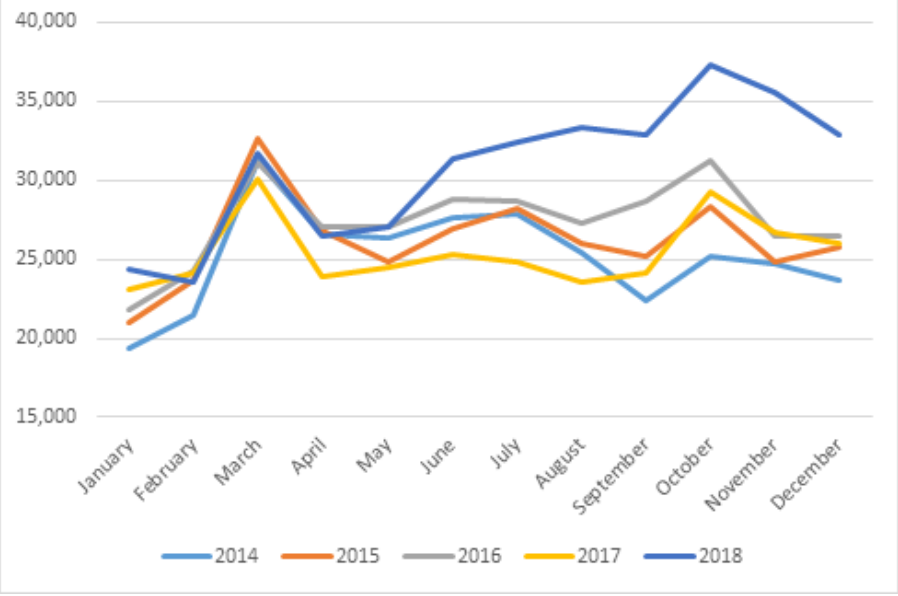
There are a variety of airports located in the Region serving different purposes within the State and the Nation. There are five (5) general aviation airports, three (3) of which are regional, and two (2) of which are local. The regional airports are located in Elkhart, Goshen, and Warsaw and serve both regional and national markets with around 90 total base aircrafts. The local airports are located in Plymouth and Nappanee, serving local and regional markets with smaller aircraft.

The only commercial service airport within the region is located in South Bend. The South Bend International Airport (SBN) is also the only multimodal passenger facility operating in the Michiana area. In a true coordination of travel modes, the South Shore Line boarding station for train passengers is located at the east end of the SBN facility, while three inter-city bus lines; Greyhound, Hoosier Ride and Coach USA, board riders from the west side of the airport terminal. Transpo city buses and private taxicabs board passengers along the arrival/departure drive. SBN is a full service commercial airport categorized as a Small Hub by the Federal Aviation Administration and consists of three active runways. Four commercial airlines operate from SBN providing links to hubs and destinations such as Atlanta, Chicago, New York City, Dallas, Detroit, Fort Myers/Punta Gorda, Las Vegas, Minneapolis, Orlando/Sanford, Phoenix/Mesa, Charlotte and Tampa Bay/St. Petersburg.

From 2014 to 2018, there was a steady increase in enplanements, growing by nearly 67,000 passengers. Looking at monthly trends it can be noticed that there is heavy traffic around spring break and there is consistently a spike in enplanements in October. The South Bend International Airport has seen substantial growth in regular commuting for most months out of the year.

The South Bend International Airport provides a great impact to the region. It is estimated the Airport provides an economic benefit to the community in excess of $1.7 Billion per year. With the change in designation from a regional to an international airport in April 2014, an even greater impact is being be seen.

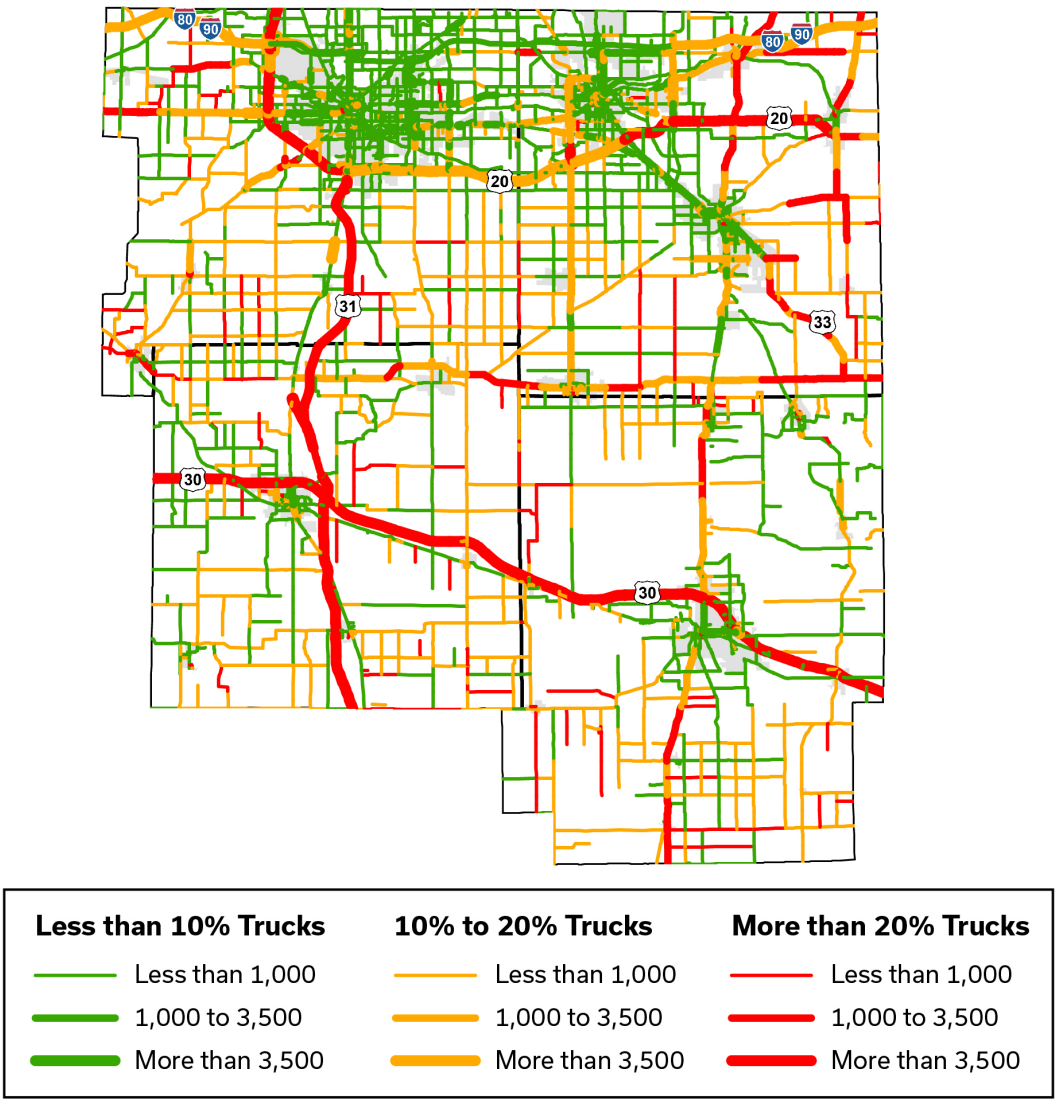
Figure 3-15: South Bend International Airport Enplanements



Freight & Logistics

Road, rail, and air networks in the region serve freight and goods movement as well as passenger travel. Being able to provide a network that accommodates these movements efficiently is critical to the region's economic well-being. In the Indiana Multimodal Freight and Mobility Plan updated in 2014, Indiana is described as a "strategic location in close proximity to larger consumer markets and an excellent multimodal transportation network." The MACOG region in particular experiences a high volume of freight traffic due to its highway and rail infrastructure.

Figure 3-16: Truck Traffic Numbers



Source: MACOG Traffic Counting Program

Roadways

The MACOG region has many heavily traveled roadways especially relating to freight movement. According to the 2014 Indiana Multimodal Freight and Mobility Plan, "Indiana's freight flow is projected to continue to grow substantially over the coming decades (close to 60% by 2040)." The overlying indication in such a finding is that the region can, and does, benefit greatly by being able to access important routes in the freight movement industry. The other indication is that much thought should be put into these routes when planning for future transportation projects.

Figure 3-16 is a map of truck volumes and comparisons to total traffic for the region. Roadways where trucks make up more than 20% of all traffic include US 31, US 30, US 20 east of Elkhart, US 33 south of Goshen US 6, SR 2, segments of SR 15 and SR 13, as well as some local county roads throughout the region. The Toll Road heading east and west from the region is made up of 10-20% truck traffic with more than 3,500 daily trucks; others include SR 19, SR 15 and US 20 between South Bend and Elkhart.

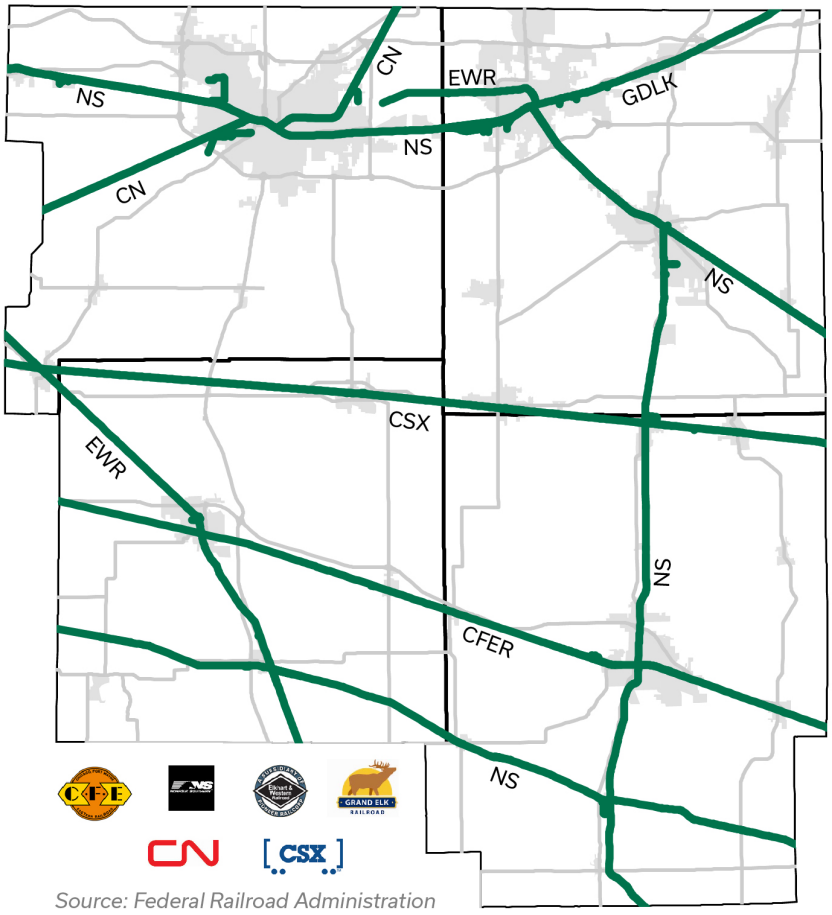
Designated Truck Routes

While most commercial vehicles are permitted on the majority of roadways, the Regional Truck Network identifies signed roadways geared towards efficient transportation of goods. The network includes both the National Truck Network routes and local truck routes, and follows many of the before mentioned Highways: I-80/I-90, US 20, SR 2, US 31, US 30. Other important routes include SR 23, SR 15, SR 19, US 33 and other small local segments.

Rail

CSX Transportation (CSX), Norfolk Southern (NS), Canadian National (CN), South Shore Freight (operated by NICTD), Elkhart & Western (EWR), Grand Elk (GDLK), and Chicago, Ft. Wayne & Eastern (CFER) all own tracks and operate freight trains within the region.

Figure 3-17: Tracks in the MACOG Region



Source: Federal Railroad Administration

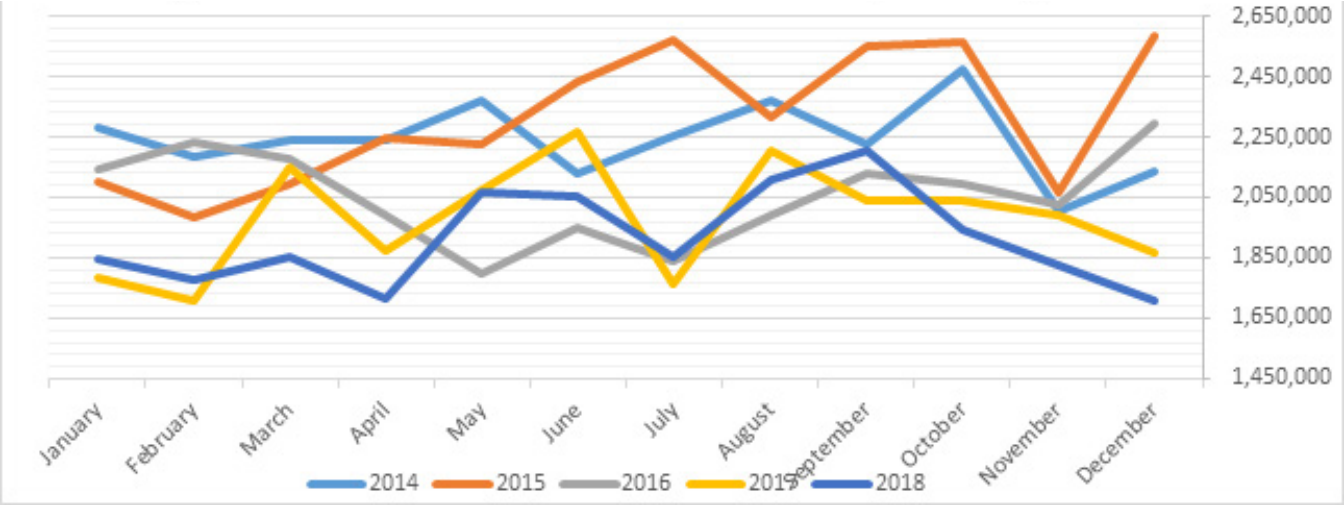
Norfolk Southern operates the most miles of rail in the four counties, with east/west lines through South Bend and Elkhart as well as the southern part of Marshall and Kosciusko County. Norfolk Southern also operates a north/south line that splits into two sections in Goshen.

Canadian National, Grand Elk, and Elkhart & Western operate in the northern sections of St. Joseph and Elkhart Counties. Both Canadian National and Grand Elk connect to areas of Michigan. Elkhart & Western operates locally from Elkhart to the eastern portion of St. Joseph County.

Lastly, there are two more east/west railroads operating south of the urbanized area. CSX Transportation operates an east/west railroad that intersects smaller communities such as La Paz, Bremen, Nappanee, and Syracuse. Chicago, Ft. Wayne & Eastern operates a line parallel and south of CSX travelling through the middle of Marshall and Kosciusko counties, intersecting communities such as Plymouth and Warsaw.

Due to increases in population, freight travel is also expected to increase, putting additional strain on existing transportation systems. In 2007, the Association of American Railroad National Rail Infrastructure Capacity and Investment Study stated primary rail facilities in the region were functioning below capacity, providing a level of service A, B, or C. The report continued by saying if there were no improvements made to the primary rail facilities, large portions will be functioning above capacity, at a level of service F.

Figure 3-18: South Bend International Airport Cargo in Tons



Air

Airports also play a part in the movement of freight. The South Bend International Airport serves as the only commercial airport within MACOG's boundaries and transports a significant amount of freight into and out of the region. FedEx and UPS use the South Bend International Airport for air and ground parcel distribution.

DHL formerly used the airport as a major terminal, however in late 2008 they terminated services throughout the United States. Figure 3-18 provides a monthly tracking of total cargo at the South Bend International Airport from 2014 to 2018. The chart shows a steep drop in freight shipments by May 2016. That rate of decay has slightly increased, however in both 2017 and 2018 cargo shipments around the Christmas holiday has declined from previous months as well as a steep decay from years prior.

According to a white paper developed by the International Air Transport Association (IATA), due to the nature of more online retail, cross-boarder e-commerce volumes are growing. The International Post Corporation (IPC) suggests that global internet sales have grown 25% annually on average. This is causing a shift in cargo tonnage, supplementing heavier cargo with light-weight packages. This trend will likely impact the future of air cargo and the logistics and supply chain dynamic that accompany.

Priority Recommendations and Future Network

Regional input into the Transportation Network

As part of the development of Michiana on the Move: 2045 Transportation Plan a series of stakeholder meetings and public surveys were held. The first stakeholder meeting was designed to identify the locations of residential, commercial and industrial growth anticipated to occur over the next 20 years. Based on the information collected an additional meeting was held with transportation stakeholders, planners and officials in which meeting the transportation needs of the previously defined growth was emphasized. During which, an activity took place where those involved could identify transportation projects that would accommodate the population growth and identify illustrative projects that would add desired additions to the transportation network; whether it be roads, trails, bridges or sidewalks. During this meeting, a project list, along with accompanying maps were developed and can be found in Appendix A. This list is federally required to show projects that may negatively affect air quality or that are regional in nature in order to include them in the Transportation Improvement Program (TIP).

From the list, MACOG was able to perform various types of analysis on how the additional projects would affect the regional transportation and address a growing population and demand on the transportation network. Several scenarios were developed to test the projects provided by the stakeholders. By investigating these projects, MACOG can collaborate with municipalities to further assist with project development by providing current traffic volumes, crash data, network performance and asset plan analysis.

State Transportation Programs

The Indiana Department of Transportation (INDOT) and MACOG are required to establish a State TIP and Regional TIP. Exchange of information during the development of these programs benefits the commuting public. While INDOT has performance measures and goals in which they develop project lists, it is important that localized input be considered during program development. For both programs, public input hearings and comment periods help shape the transportation network's future.

The INDOT 2045 Long Range Transportation Plan is a broad-based policy document that is used to guide the development of Indiana's transportation system. The purpose of the Long Range Transportation Plan is to assure that the transportation infrastructure network will adequately serve future 2045 needs. By way of this plan, INDOT identifies existing and emerging transportation challenges; establishes long-term goals and performance measures; defines what is needed to meet such future transportation demands over the forthcoming 20-plus years; recommends strategies to ensure regional mobility; and maps a course for meeting Indiana's transportation vision.

Local Priorities for State Projects

Through the various meetings conducted for the Michiana on the Move: 2045 Transportation Plan, various local priorities on State owned facilities were discussed. At this time, the following projects are local priorities to further develop the regional transportation network.

- Upgrade US 30 to a Freeway from Ft. Wayne to Valparaiso
- Update US 31 to a Freeway from Indianapolis to US 30
- Improve traffic flow on SR 13 through Middlebury
- Improve traffic flow on SR 15 through Goshen and Warsaw
- Continue a north-south route from SR 15 (south of Warsaw) to US 6

Chapter 4:
Scenario Analysis

4

There are a variety of trends seen in the region as well as across the nation that will influence the transportation network and future investment decisions. Development, demographic and socioeconomic characteristics all impact how people are able to and choose to travel to access the goods and services they need. Other items such as personal preferences, culture, and technology may also impact the future of our transportation network. This chapter serves to highlight recommendations that provide decision-makers with important information that will shape future transportation policies and investment decisions.

Scenario Analysis & Recommendations

Scenario Analysis

When planning for the future transportation network it is important to analyze various complex and rapidly changing forces that affect growth and development. Looking at population projections to the year 2045, the region may see an increase in population of over 66,390 residents (659,266 total), which is more than a 10% total increase in population. At the same time, aging Baby Boomers are downsizing and homeownership demand from younger generations, such as Millennials, is insufficient to fill the void. This is often attributed to younger generations renting for longer periods and often making different housing choices than their parents. These factors and many others impact the way that the region may grow.

For the 2045 Transportation Plan, MACOG utilized scenario planning to identify the performance implications on multiple scenarios. These assumed several potential future changes to the region including the impacts of significant historical growth compared to flat line future growth as well as varying the density of growth compared to traditional trends. The ultimate goal for the transportation plan was to build a knowledgebase of the ways that scenario planning methods, metrics, processes, and outcomes can enhance transportation decision making in the region.

Development of the scenarios for the long range plan began with public outreach where staff visited local events and farmer's markets to administer surveys and collect public input. Online surveys asked individuals how they felt the region is developing and what were the major issues or drivers influencing growth and development. The following section provides a brief description of the scenarios and the outcomes related to each scenario.

High Growth Scenario

For the development of the high growth scenario, historical growth rates from the decennial Censuses dating back to the 70's were reviewed to determine the highest compounded annual growth rates covering any 10-year period for each county, city, and town. The population growth rate was carried forward to 2045 and represents the potential extremes of population growth over the next 25 years of the transportation plan. The 2045 population control totals for the 4-counties was based on an annual growth rate of 1.7% in Elkhart County, 2.2% in Kosciusko County, 1.1% in Marshall County, and 0.7% in St. Joseph County. This resulted in a regional population of 879,323 by 2045.

With this growth in mind, MACOG held stakeholder meetings where elected officials, community planners, economic development corporations, and others were asked where growth was likely to occur in the areas they represented. Representatives of the counties, cities, and towns in attendance were given a number of blocks to represent the population growth they might see as predicted by the high growth calculations. These blocks were issued to them in 10-year increments (2015-2025, 2025-2035, and 2035-2045) to simulate incremental growth. After each round of distributing

the population growth for a 10-year period, stakeholders were then tasked with identifying areas of commercial, retail, and industrial growth in response to the assigned populations. With each round compounding on the last, distributing the population associated with the high growth scenario often resulted with representatives focusing on higher densities of residential development, especially in larger cities.

These maps from the stakeholder meetings were then digitized, with the data being used as inputs to the HelpVIZ land use model for Elkhart and St. Joseph County. Control totals for the combined future population of the two counties were calculated for 2025, 2035, and 2045 as well as the estimation of future trends in employment adjusted from Woods and Poole forecasts for each of the three horizon years.

For Kosciusko and Marshall County, the data was processed based on a methodology developed by the Hillsborough County MPO in Tampa, Florida. Allocation of population and employment to vacant developable lands was accomplished using a multi-step process that culminated in the allocation of growth based on the results of a gravity model. The gravity model distributed growth based on the attractiveness of Census Blocks multiplied by the attractiveness of an activity centroid, divided by the square of the distance between the two blocks. This process was repeated for each city and town within the rural counties after which the control totals for the cities and towns were subtracted from the control totals for each county and the process was repeated one additional time for each county. Figure 4-1 at the end of the chapter, highlights the population changes and development trends for the high-growth scenario.

Figure 4-2 is the level of service map for the high-growth scenario resulting from a no build modeling run of the travel demand model. Only programmed projects already completed or included in the 2020-24 TIP are included in the no build model.

Baseline Scenario

The baseline scenario represents the traditional socioeconomic data used by the travel demand model, essentially the preferred scenario. The Baseline scenario utilizes future growth forecasts as predicted by Woods and Poole. This scenario represents a conservative population growth based on traditional socioeconomic data. The growth includes an additional 66,390 people in the region over the next 25 years.

The forecasted population and employment data was fed into the land use model for Elkhart and St. Joseph County and for Kosciusko and Marshall County the data was processed based on a methodology originally developed by the Hillsborough County MPO in Tampa, Florida. Figure 4-3 highlights the population changes and development trends for the baseline scenario.

The level of service map depicted in Figure 4-4, shows the baseline scenario resulting from a no build modeling run of the travel demand model. Again, only programmed projects already completed or included in the 2020-24 TIP are included in the no build model.

Low Growth Scenario

A similar process was used for the low growth scenario, reviewing historical growth rates from the decennial Censuses to identify times of the lowest population growth in the region. This included at times, even a decline in population for some areas. Again, once the annual growth rates were estimated, the results were entered into the HelpVIZ land use model and the Hillsborough County MPO's population distribution practice in order to grow 2015 model population inputs to 2045 population forecasts.

After extensive review and analysis of the low growth scenario against the baseline scenario, numerous similarities between the two scenarios were noted. With similar population and employment forecasts, it was decided to remove the low growth scenario from the final tabulation of scenarios.

Urban Growth Scenario

A different approach was utilized for the urban growth scenario, which represented a focused development pattern geared toward infill. The base methodology employed for this scenario involved dividing the traffic analysis zones (TAZ)

for the baseline scenario into four categories - an urban core, a halo area surrounding the urban core, and rural areas of the region. Annual growth rates for each TAZ were then estimated, allowing the calculation of the standard deviation of growth by each category. As a starting point to synthesize high-density development, twice the standard deviation was added to each TAZ growth rate in the urban core, twice the standard deviation was subtracted from each TAZ growth rate in the rural areas, and a fraction of the standard deviation was used in the halo zones to keep the population growth in line with the total population of the baseline scenario.

After multiple iterations of the concept, a fourth category was added representing the central business district (CBD) of the major cities in the region. The final multipliers used added a standard deviation to the CBD and 0.25 standard deviations to the urban core. To balance the population growth, a single standard deviation was subtracted from the halo zones and two standard deviations were subtracted from the rural areas, keeping the overall total population similar to the total population of the baseline scenario. Figure 4-5 highlights the population changes and development trends for the urban growth scenario.

The level of service map, Figure 4-6, shows the urban growth scenario resulting from a no build modeling run of the travel demand model.

Results of the Scenario Analysis

The scenario planning results show how different growth trends and land use patterns impact the transportation network. Ultimately, MACOG is not selecting a preferred scenario but rather will use these results in conjunction with other information, such as further data analysis and public feedback, to answer policy questions and prioritize projects for the Transportation Improvement Plan over the next 25 years.

Not only is it informative to see a regional level of service map, understanding how each project performs in these scenarios provides additional details. The 2045 Transportation Plan project list was calculated with the outputs for each scenario in order to classify the worst level of service of each segment of a project by 2045. This resulted in a chart of transportation plan projects with a single, worst-case level of service for each of the three scenarios - baseline, high-growth, and urban growth, which can be found in Appendix H. These scenarios enable planners, the public, and decision makers to consider jointly the different variables that influence and are influenced by transportation to ensure careful consideration of different public policy and investment decisions to support a broader set of community goals.

Scenario Planning Maps

Figure 4-1: High Growth Scenario Population Map

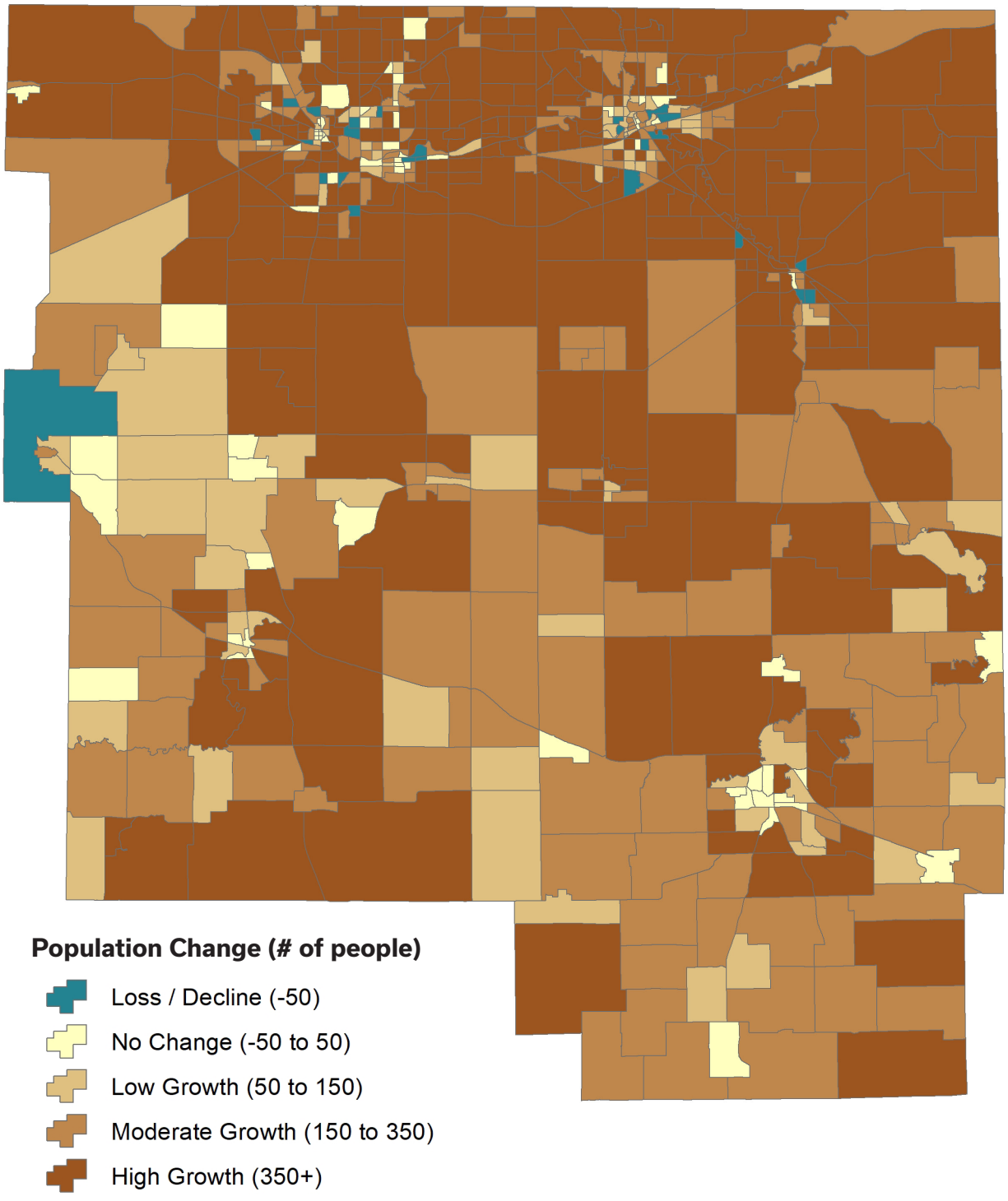


Figure 4-2: Level of Service Map - High-Growth Scenario

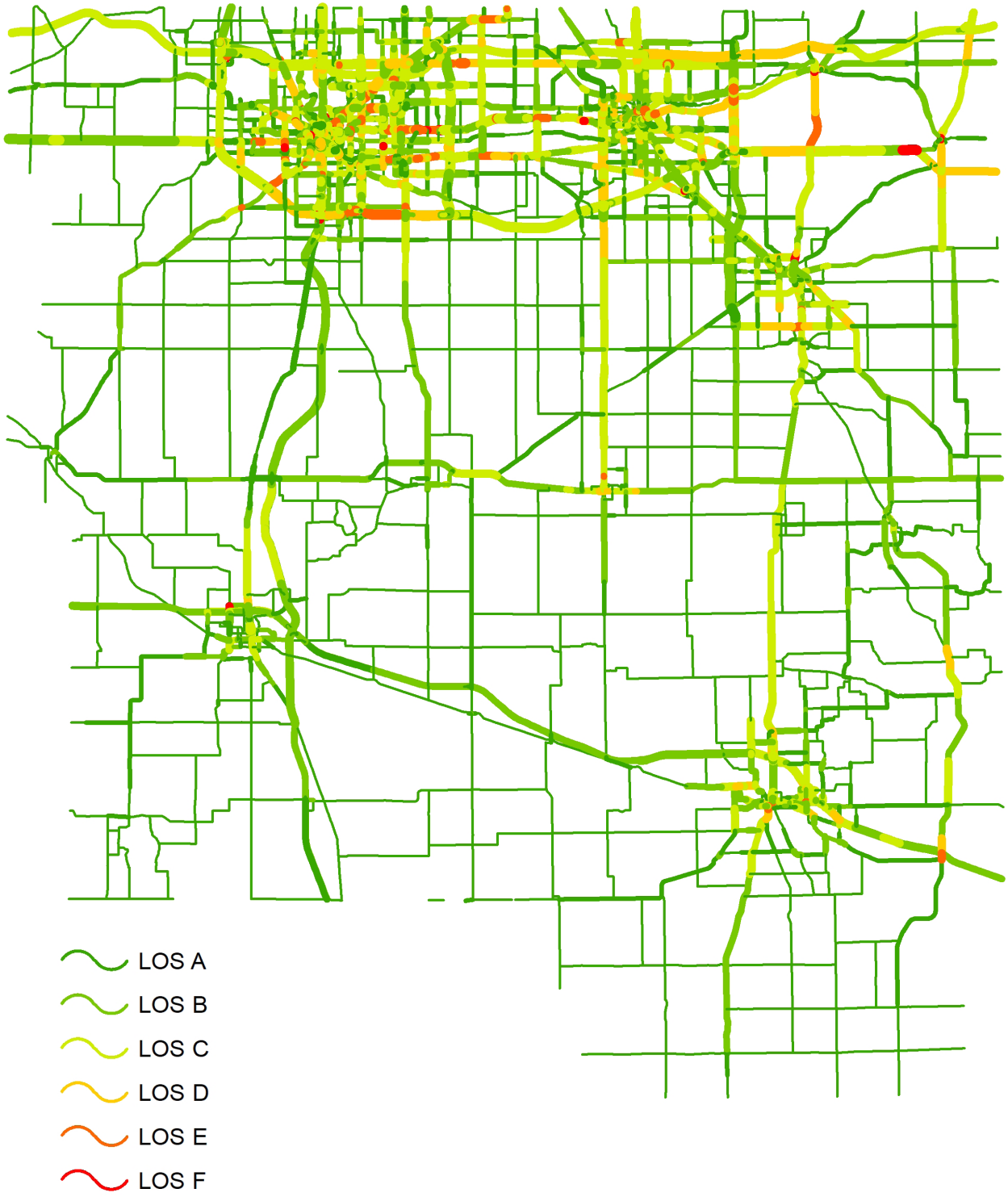


Figure 4-3: Baseline Scenario Population Map

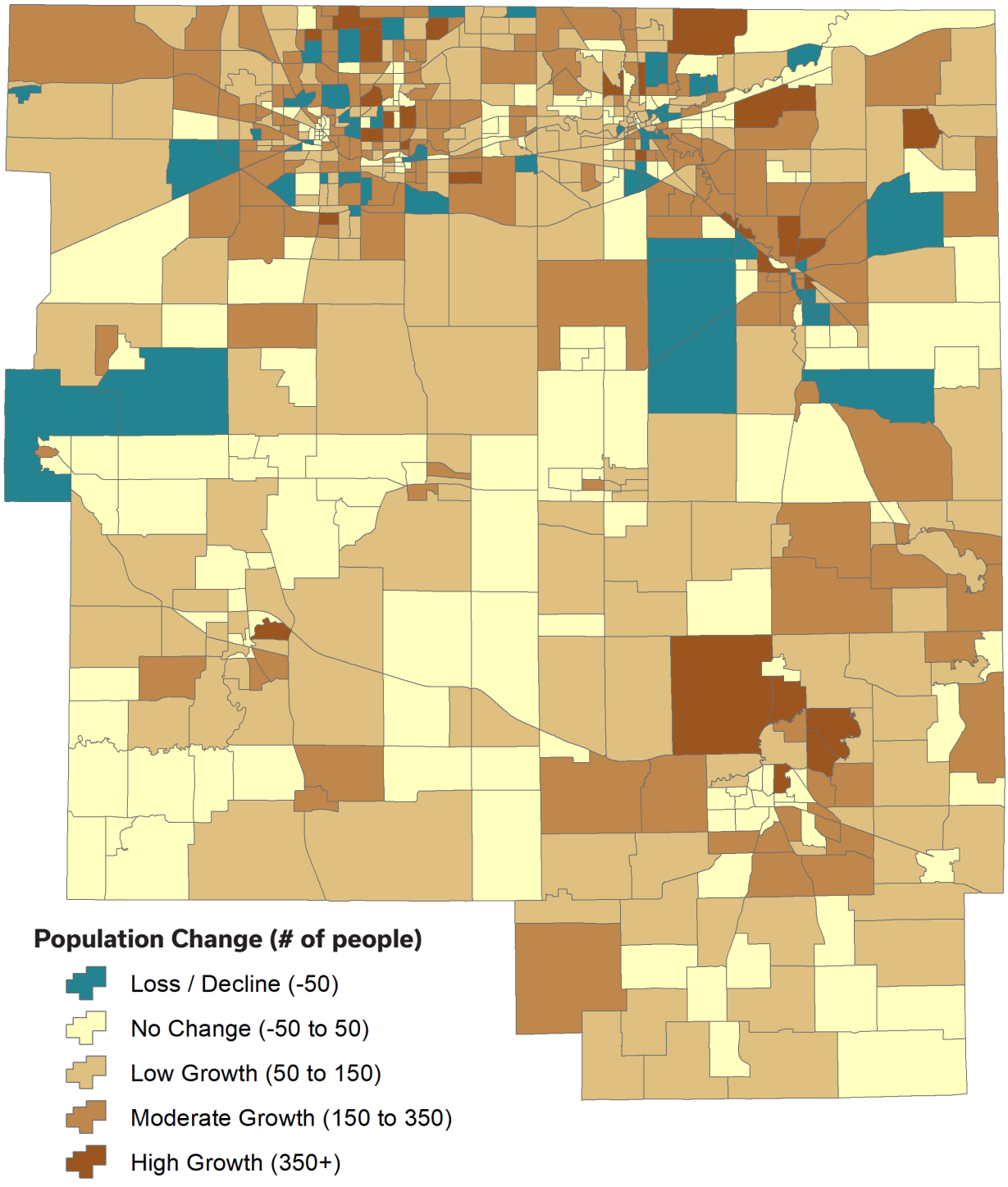


Figure 4-4: Level of Service Map - Baseline Scenario

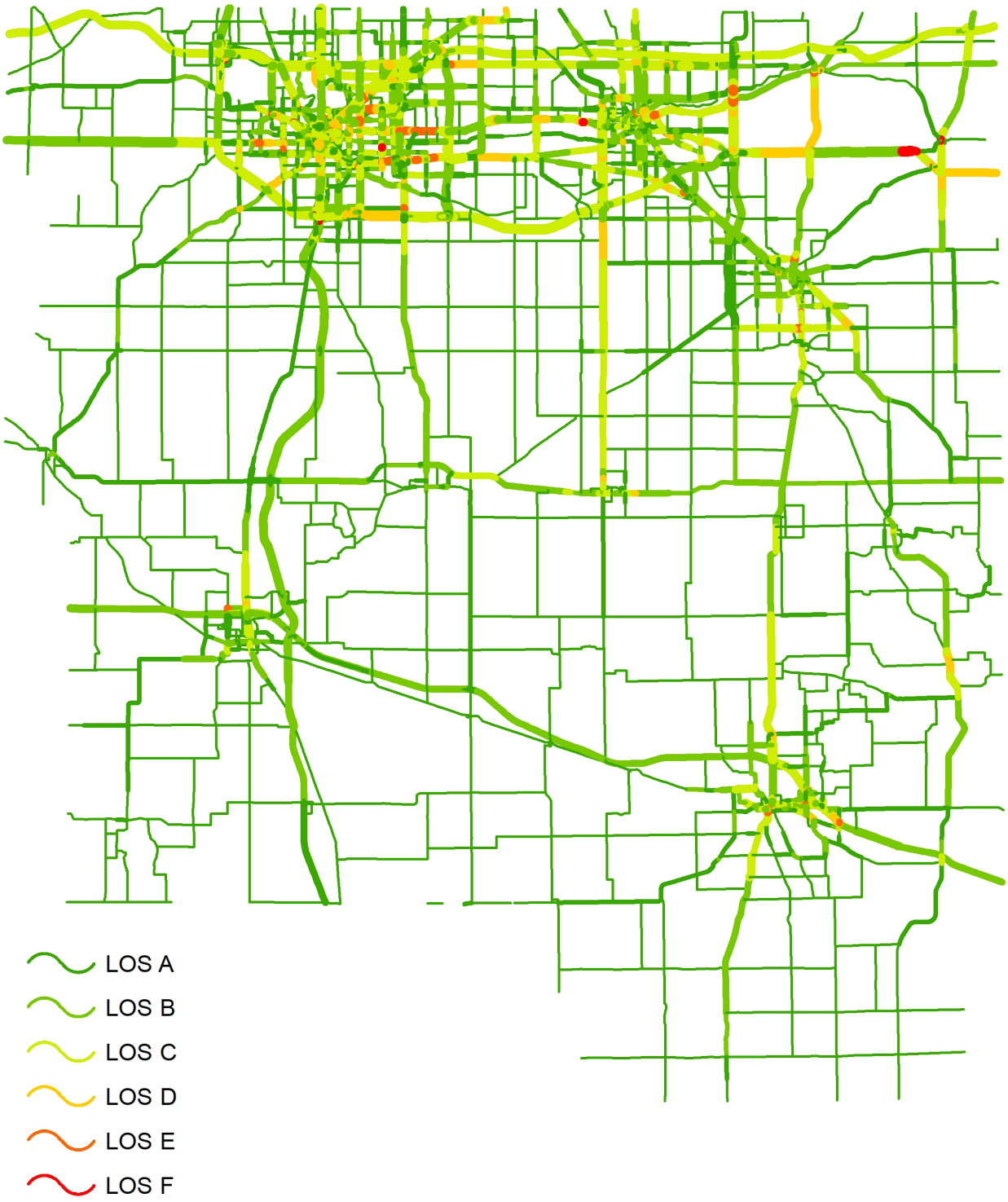


Figure 4-5: Urban Growth Scenario

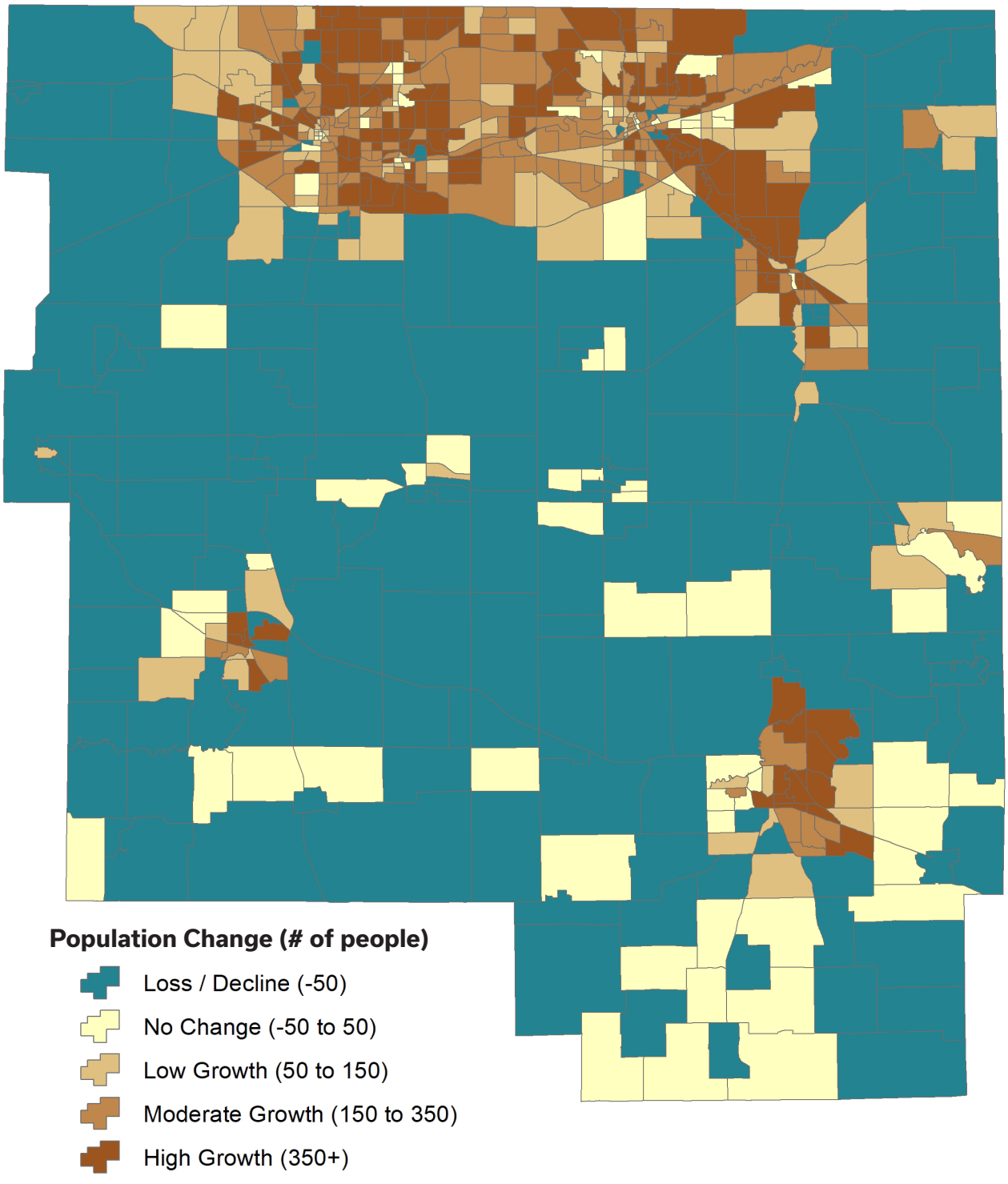
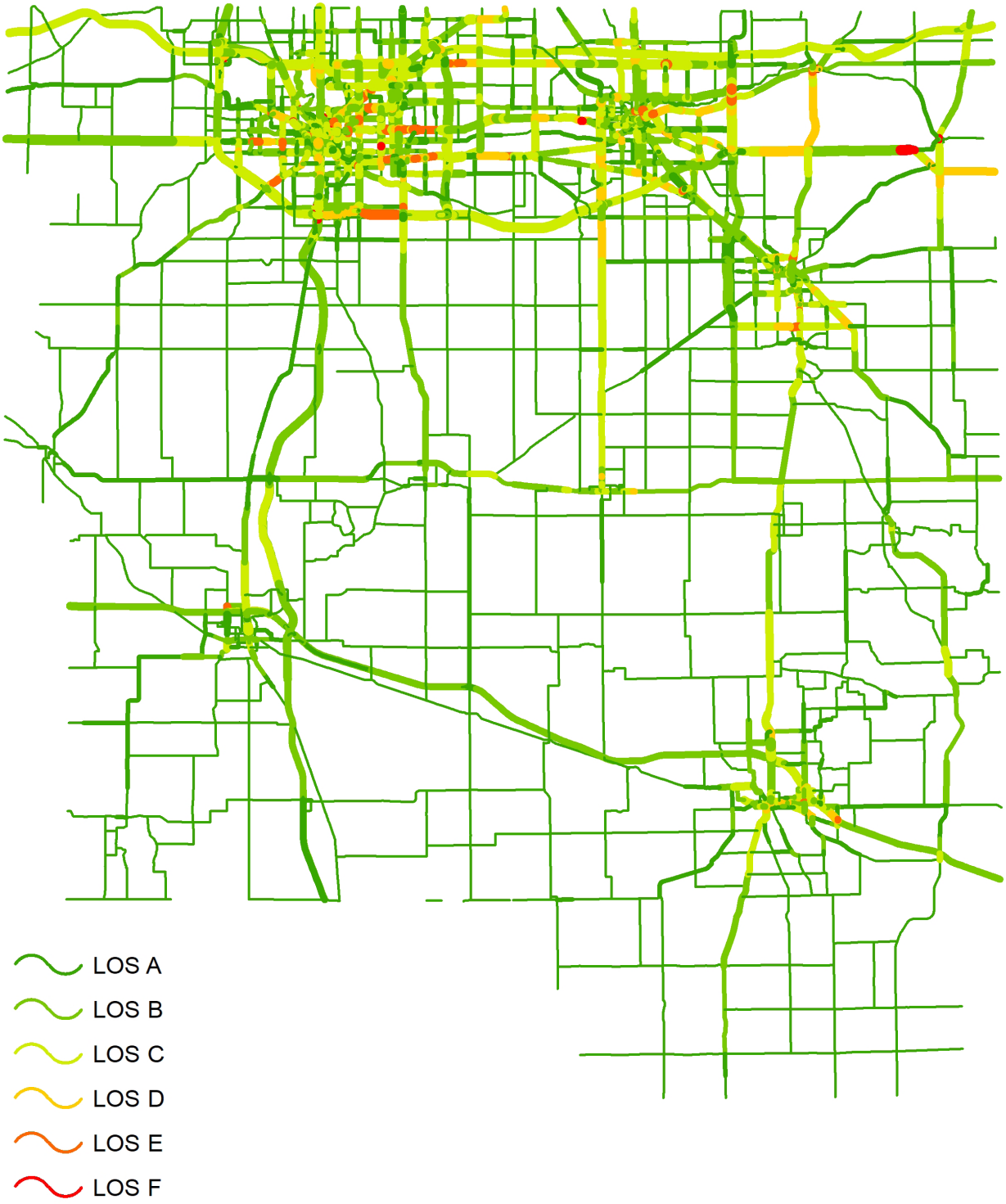


Figure 4-6: Level of Service Map - Urban Growth Scenario



Chapter 5:
Goals and Performance Measures

5

The FAST Act continues MAP-21's focus on performance based transportation planning, and outlines goals for which State DOT's, MPOs, and local road agencies should be held accountable for during the development and maintenance of the federally funded transportation system. Performance Based Planning and Programming (PBPP) attempts to ensure that both long-term and short-term transportation investment decisions are made based on their ability to meet established goals for improving the overall transportation system. Furthermore, it involves measuring progress toward meeting goals and using information on past and anticipated future performance trends to inform investment decisions.

National Goals

The current transportation legislation outlines seven (7) national goals for which state DOTs and transit agencies, in cooperation with MPO's should establish targets for performance measures.

- Safety - to achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition - to maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction - to achieve a significant reduction in congestion on the National Highway System
- System Reliability - to improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality - to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability - to enhance the performance of the transportation system while protecting and enhancing the natural environment
- Reduced Project Delivery Delays - to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

Federal Performance Measures and State Targets

Reflecting the above goals, are national performance measures for which to track progress:

Area	Measures
Safety	• Number of fatalities and serious injuries • Rate of fatalities and serious injuries • Number of non-motorized fatalities and serious injuries
Pavement and Bridge Condition	• Percent Interstate pavement in good and poor condition • Percent Non-Interstate NHS pavement in good and poor condition • Percent National Highway System (NHS) bridges in good and poor condition

continued

Area	Measures
System Performance	• Interstate and Non-Interstate travel time reliability • Truck travel time reliability
Congestion Mitigation and Air Quality	• Peak Hour Excessive Delay • Non-Single Occupancy Vehicle (SOV) Travel • On-Road Mobile Source Emissions
Transit Asset Management	• Transit Asset Management (TAM) Plans • State of Good Repair Measures • Percent of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB) • Public Transportation Agency Safety Plans

MPO's are required to establish targets for the above performance measures by either agreeing to plan and program projects so that they contribute toward the accomplishment of the relevant State DOT target for the performance measure, or commit to a quantifiable target for that performance measure for their metropolitan planning area. MACOG has elected to support INDOT's established targets and are evaluating the inclusion of additional regional targets in the future.

Safety

INDOT, the MPOs, FHWA, and the Indiana Criminal Justice Institute (ICJI) collaborated on the Safety Performance Measures and Safety Performance Targets, which were set in 2018. The Highway Safety Improvement Program (HSIP) is a primary source of federal funds for qualifying safety improvement projects. HSIP along with other funding sources are used to implement safety improvements with the purpose to reduce roadway crashes, and a corresponding reduction in fatalities and serious injuries on all public roads and directly supports the Indiana Strategic Highway Safety Plan.

2019 Safety Targets	
Number of Fatalities	889.6
Fatality Rate (per 100M VMT)	1.087
Number of Serious Injuries	3,501.9
Serious Injury Rate (per 100M VMT)	4.234
Number of Non-Motorized Fatalities and Serious Injuries	393.6

MACOG will contribute to the achievement of these targets by:

- Working with local road and transit agencies to identify problematic areas in the region for which to improve safety
- Reviewing crash reports submitted to the Indiana State Police for accuracy and analysis
- Support training for Traffic Incident Management and first responders
- Promote driver education through DriveSafeMichiana.com
- Support communities in the completion of ADA Transition Plans

Pavement and Bridge

The pavement and bridge condition performance measures are applicable to the Interstate and non-Interstate Highways that comprise the National Highway System (NHS). The NHS includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The measures are focused on the condition of pavement and bridges, including ramps utilized to access the system and directly support the Indiana Transportation Asset Management Plan (TAMP). There are four measures to assess pavement condition and two measures for assessing

bridge condition. INDOT, the MPO's, and FHWA collectively developed targets for the pavement and bridge performance measures. The National Highway Performance Program is a core Federal-aid highway program that provides financial support to improve the condition and performance of the NHS, and the construction of new NHS facilities. INDOT utilizes these funds for maintenance activities on the NHS.

Pavement Condition Targets		
	2- year	4-year
Percent of Interstate Pavements in Good Condition	84.24	84.24
Percent of Interstate Pavements in Poor Condition	0.8	0.8
Percent of Non-Interstate NHS pavements in Good Condition	78.71	78.71
Percent of Non-Interstate NHS pavements in Poor Condition	3.1	3.1

Bridge Condition Targets		
	2- year	4-year
Percent of NHS bridges by deck area classified in Good Condition	48.32	48.32
Percent of NHS bridges by deck area classified in Poor Condition	2.63	2.63

MACOG will contribute to the achievement of these targets by:

- Sharing resources related to design and engineering best practice
- Support local jurisdictions through the collection of PASER ratings and development of local asset management plans
- Develop and maintain a bridge inventory for assessment and recommendations regarding bridge conditions

System Performance

The system performance measures are also applicable to the Interstate and non-Interstate NHS. These performance measures assess system reliability and freight movement. This is measured using data from FHWA's National Performance Management Research Data Set (NPMRDS), and is the ratio of longer travel times (80th percentile) to normal travel times (50th percentile). Truck Travel Time Reliability is calculated in a similar fashion, however longer travel times are found using the 95th percentile travel time.

Travel Time Reliability Targets		
	2- year	4-year
Level of Travel Time Reliability on Interstates	90.5	92.8
Level of Travel Time Reliability on non-Interstate NHS	-	89.8

Truck Travel Time Reliability Targets		
	2- year	4-year
Truck Travel Time Reliability on Interstates	1.27	1.24

MACOG will contribute to the achievement of these targets by:

- Conducting travel time studies of major corridors to evaluate congestion and traffic flow
- Utilize the Travel Demand Model to forecast future congestion and assist communities in evaluating project effectiveness
- Assist in sharing resources between local jurisdictions and first responders

Congestion Mitigation and Air Quality

Several measures related to congestion mitigation and air quality have been identified including non-Single Occupancy Vehicle (SOV) travel and annual hours of peak hour excessive delay per capita, as well as on-Road Mobile

emissions. Currently this rule only applies to urbanized areas of more than 1 million in population that are in nonattainment or maintenance areas for ozone, carbon monoxide or particulate matter. Starting in 2022, areas of population of more than 200,000 are required. States and MPOS for which this applies will coordinate on a single, unified target. There are no targets that relate to MACOG for these performance measures at this time.

On-Road Mobile Source emissions is another performance measure established for the Congestion Mitigation and Air Quality (CMAQ) program, and applies to State DOT's with areas designated as nonattainment or maintenance for ozone, carbon monoxide, or particulate matter.

On-Road Mobile Source Targets		
	2- year	4-year
CMAQ volatile organic compounds	1,600	2,600
CMAQ carbon monoxide (CO)	200	400
CMAQ oxides of nitrogen (NO)	1,600	2,200
CMAQ project reduction particulate mater less than 10 microns (PM10)	0.3	0.5
CMAQ project reduction particulate matter less than 2.5 microns (PM2.5)	20	30

MACOG will contribute to the achievement of these targets by:

- Continuing the Clean Air Program to education citizens and business about air quality.
- Working with local jurisdictions to identify CMAQ eligible projects.

Transit Asset Management (TAM) and Public Transportation Safety Program

Under the TAM Final Rule, FTA established four performance measures to approximate the State of Good Repair (SGR) for categories of capital assets including rolling stock, equipment and facilities. These targets are included in Transit Asset Management Plans which provides an overview of the strategic and systematic practices that transit providers put forth to ensure proper management of public transportation capital assets. MACOG administers the Interurban Trolley in Elkhart and Goshen, and coordinates with other transit providers including the South Bend Public Transportation Corporation (Transpo) to ensure targets are set for applicable assets.

Transit Asset Management Targets			
Asset Category	**Asset Class**		**2018 Target**
Rolling Stock Age - % of revenue vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Automobile	Transpo	50%
	Bus	Transpo	45%
		Interurban Trolley	0%
	Cutaway Bus	Transpo	40%
	Mini-Van	Interurban Trolley	20%
Equipment Age- % of non-revenue vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Steel Wheel Vehicles	Transpo	50%
Facilities Condition - % of facilities with a condition rating below 3 on the FTA Transit Economic Requirement Model (TERM) Scale	Admin.	Transpo	0%
	Maintenance		0%
	Parking Structures		0%
	Passenger Facilities		0%

In 2016, a final rule was published for the Public Transportation Safety Program, establishing substantive and procedural rules for enforcement of FTA's safety programs. The Public Transportation Agency Safety Plan (PTASP) Final Rule requires public transportation agencies to develop safety plans based on Safety Management Systems (SMS) principals, and

must be completed by July 2020. SMS is an organizational approach to managing safety and includes four components including a safety management policy, safety risk management, safety assurance, and safety promotion.

Locally Established Performance Measures

MACOG recognizes that there are additional goals that are not fully addressed by Federal performance measures, including but not limited to those related to economic vitality, active transportation, equity and quality of life. Because of this, following the adoption of this plan, MACOG will expand upon these goals and establish regional measures to better reflect the values, needs, and conditions of the transportation network in the MACOG region.

Chapter 6:
Recommendations

6

The culmination of the long range planning process is the selection of projects and policies for the transportation network, (i.e. roadway, public transit, and pedestrian/bicycle. Information from the previous chapters, public engagement, stakeholder consultation and the scenario analysis led to the following recommendation that constitute the long range plan for transportation the MACOG Region.

Roadway Transportation Recommendations

The 2045 Transportation Plan recommends a program of projects and strategies intended to reduce existing and projected congestion, support increased mode choice, and address deficiencies within the network. The fiscally reasonable roadway recommendations will improve the existing and future network by upgrading or adding new roadways. A map of the roadway transportation project is shown below and a full listing of the projects can be found in Appendix A.

Implementing these recommendations will help the region achieve the goals, objectives, and performance targets discussed in previous chapters. However, future deficiencies cannot always be precisely or accurately modeled or predicted. Therefore, the 2045 Transportation Plan is a dynamic document, one that will undergo future updates to reflect changing conditions and needs. This is why MACOG continually monitors the transportation network and works to implement short-term improvements.

Active and Public Transportation Recommendations

Our transportation network is more than just roads for vehicles. It also incorporates sidewalks, bike lanes, trails and other facilities for pedestrians, bicyclists, and transit users. The desire for more transportation options continues to grow for both an increasing aging population as well as younger generations. Both these populations value quality places and proximity to community amenities (AARP Public Policy Institute Research Report 2014). Based on changing demographics and development preferences, communities are looking for ways to better accommodate choice in travel options be that walking, biking, or using public transit.

Development preferences are also in support of multi-modal choice as many communities are seeing denser, mix used development in urban cores and downtown areas. Based on MACOG's How We Grow survey, 90% of people support re-development of vacant property versus 35% who would like to see new subdivisions. Additionally, 70% of people prefer residential zoning mixed with commercial development and over 52% support higher density housing such as townhomes and condominiums. In our region, the preference for transportation choice is being supported by the adoption of Complete Streets Policies and multi-modal projects which are meant to accommodate the needs of all users of the roadway network.

- Nearly half of people who participated in MACOG's How We Grow Survey identified the ability to walk, bike or take public transit to daily activities as a top reason for choosing to live in a community.
- Over 90% of people supported transportation investments that make streets complete and functional for all modes of transportation

Figure 6-1: Roadway Projects

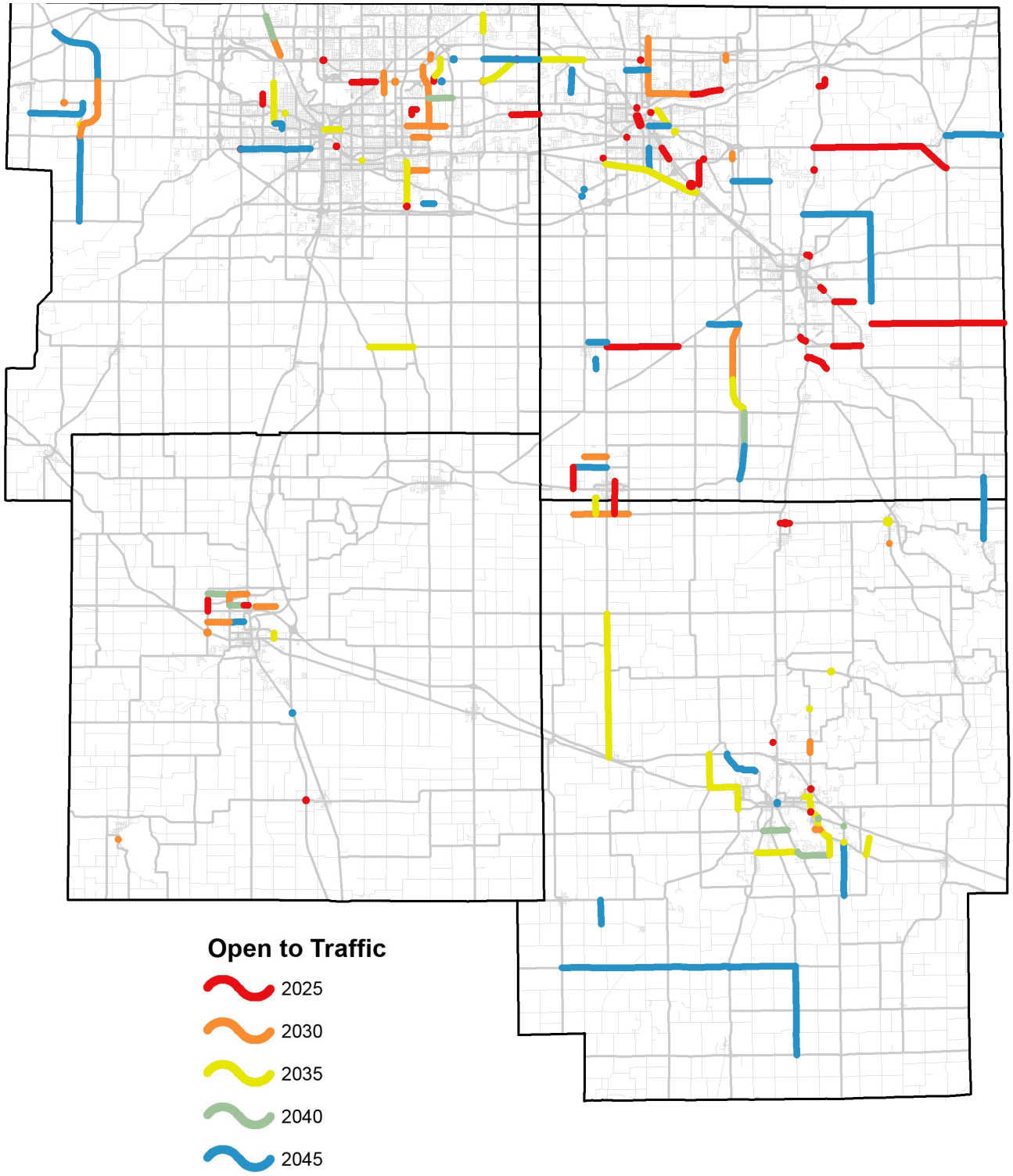
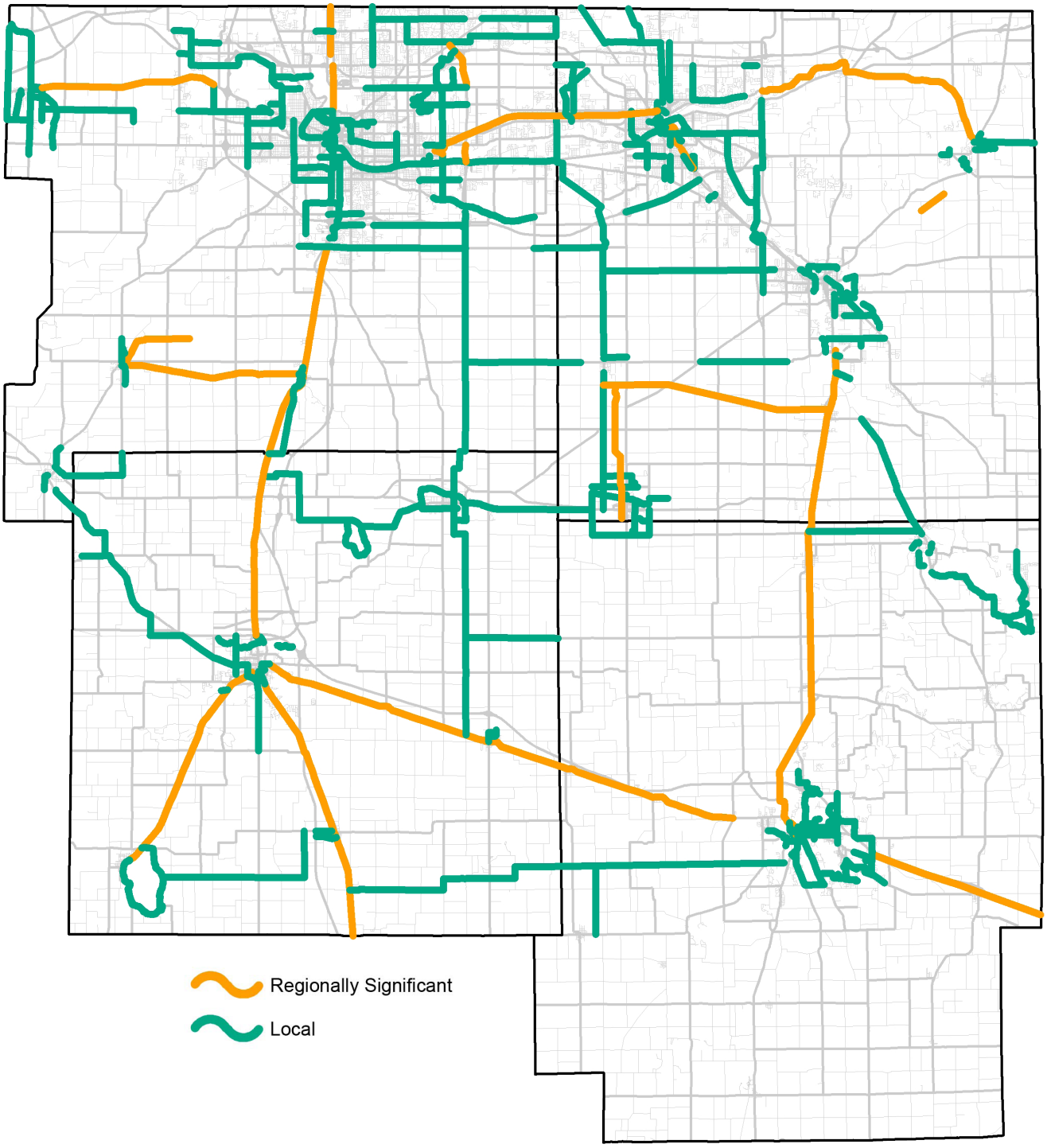


Figure 6-2: Active Transportation Projects



In response to these trends, MACOG has employed numerous efforts focused supporting additional modes of transportation. In July 2016, MACOG adopted the Active Transportation Plan for the region. That plan is intended to identify needs, resources, and strategies to encourage and enhance bicycle, pedestrian, and transit travel within the Michiana region. The intent of the plan is not to secure funding for every project. Instead, the recommendations contained established a shared vision for the region and as a guide for local jurisdictions. A map of the active transportation projects is shown in Figure 6-2 and the full project listing of the Active Transportation Plan can be found in Appendix B.

The public transportation system continues to grow and evolve to meet the needs of the region. On August 20, 2018 the Interurban Trolley and the Transpo, launched the new Yellow Line Mishawaka/Elkhart route. The new route improves regional connections by running between the Interurban Trolley's Transfer Center in downtown Elkhart and Transpo's Mishawaka Transfer Center in downtown Mishawaka. The new route also runs more frequently providing 30 minute headways. In 2019, significant progress was made on the South Shore Line's double track project from Michigan City to Gary, which would cut commute times between South Bend and Chicago to 90 minutes. These improvements are examples of the key policy objectives for public transportation in the region.

Active Transportation Policy Objectives

1. Make improvements to better connect residents and visitors to each of the major communities and destinations within and surrounding the region
2. Improve connectivity between bicycling, walking, public transit and other modes of transportation.
3. Integrate transportation and land use policies to encourage sustainable growth that encourages walking, bicycling, and transit.
4. Form, maintain, and grow public and private partnerships to encourage development and connectivity of active transportation facilities.
5. Create an active transportation network and programs that will make the Michiana region known as a walk- and bike-friendly destination.
6. Work with partners to ensure that outreach efforts have a consistent message to educate community members on safe and courteous walking, bicycling, and driving habits for children and adults.
7. Utilize national best practice guides in network planning, infrastructure design, project management, and maintenance procedure to ensure that facilities provide an accessible transportation network.
8. Work with partners to build awareness about the personal and community benefits and advantages of using active transportation with public transit, especially for everyday trips
9. Promote the accessibility and availability of destinations using active transportation, particularly in areas with a higher demand for walking, bicycling, and public transit.
10. Provide training and best practice information to law enforcement and public officials to enforce and enact pedestrian and bicycling friendly laws and policies throughout the region.
11. Promote the proper use and installation of safety equipment, such as lights, helmets, and reflective clothing.
12. Organize and support programs and events that promote safe active transportation year-round.

Public Transportation Policy Objectives

1. Maintain a state of good repair through proper asset management practices, which will assist in replacing transit vehicles, facilities or equipment that are beyond their useful life as funding becomes available
2. Increase transit ridership by expanding transit coverage, rider accessibility and bus stop proximity.
3. Attract choice riders by increasing route frequency, expanding hours to include weekends and overnight, improving bus stop shelters and benches, reducing travel time, and by making buses safe, clean and comfortable.
4. Increase regional connectivity among the transit providers.
5. Transportation services should be coordinated with all providers (public, human service, and private) to maximize efficiency and utilize all available resources.

Transpo and MACOG are currently considering an updated Comprehensive Operational Analysis (COA). If this is completed, recommendations from the COA that are endorsed and approved will be amended into this plan.

Additionally, MACOG is working to complete an update to the Coordinated Public Transit – Human Services Transportation Plan. Any new recommendations from this plan that are endorsed and approved will be amended into this plan

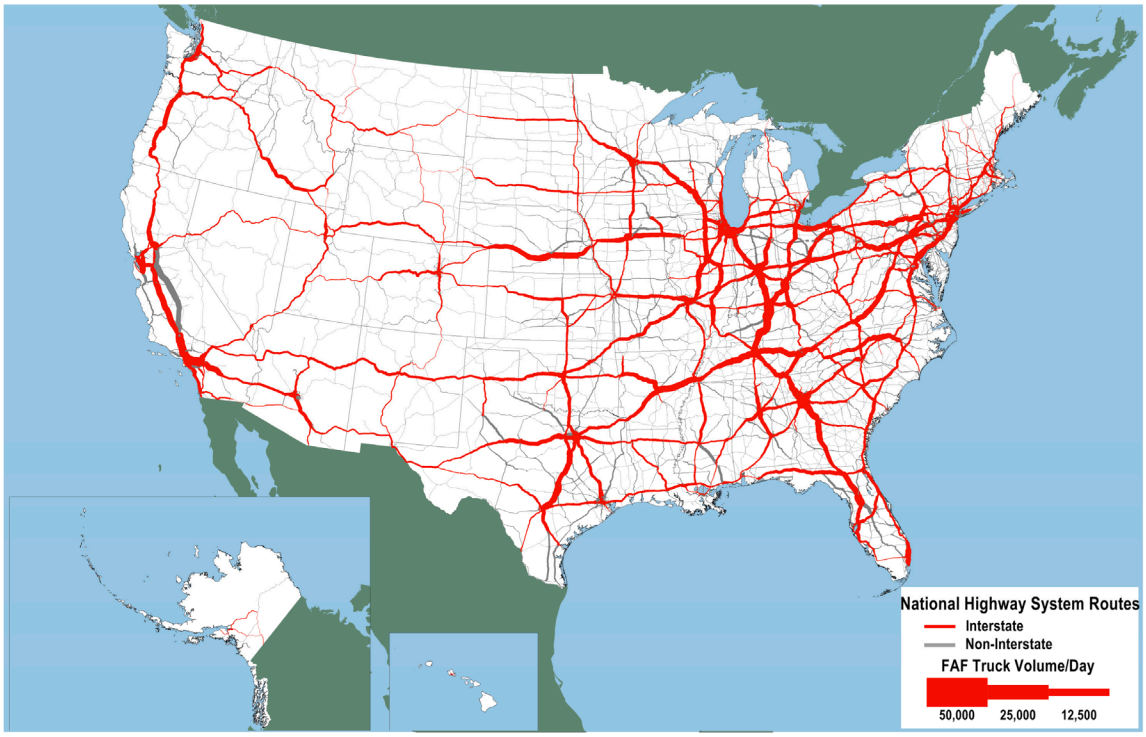
Freight Recommendations

It is anticipated in the Indiana Multimodal Freight and Mobility Plan that, "Indiana's freight flow is projected to continue to grow substantially over the coming decades (close to 60% by 2040)." Therefore, considerations must be made on the potential impacts to our transportation network.

Long-haul freight truck traffic in the United States is concentrated on major routes connecting population centers, ports, border crossings, and other major hubs of activity. Except for Route 99 in California and a few toll roads and border connections, most of the heaviest traveled routes are on the interstate system. By 2040, long-haul freight truck traffic in the United States is expected to increase dramatically on Interstate highways and other arterials throughout the nation. Forecast data indicates that truck travel may reach 622 million miles per day.

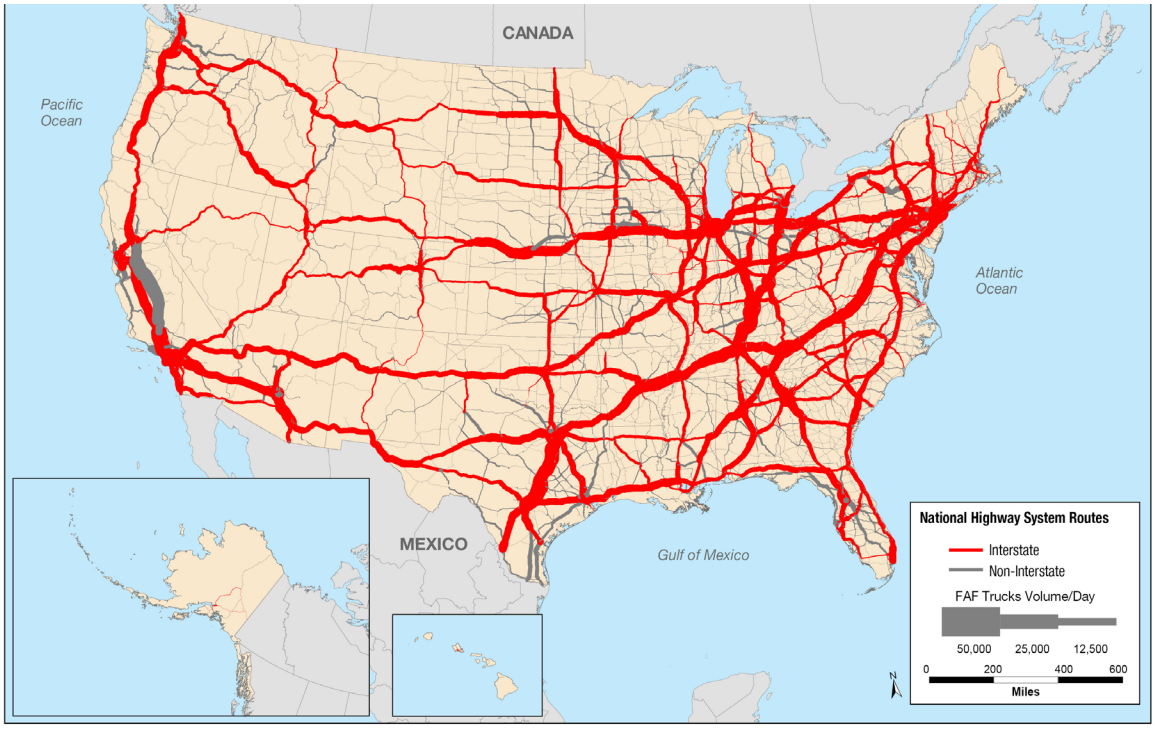
Additionally, congested highways carrying a large number of trucks substantially impede interstate commerce, and trucks on those segments contribute significantly to congestion. Recurring congestion slows traffic on 4,700 miles and creates stop-and-go conditions on 3,700 miles of the NHS that carry more than 8,500 trucks per day. Assuming no change in network capacity, the number of NHS miles with recurring congestion and a large number of trucks is forecasted to increase nearly four-fold between 2007 and 2040. On highways carrying more than 8,500 trucks per day, recurring congestion will slow traffic on close to 7,200 miles and create stop-and-go conditions on an additional 23,500 miles of highways by 2040, see Figures 6-3, 6-4, 6-5 & 6-6. The increased freight traffic and increased congestion will impact the regional transportation network, especially I-80/90, US 31, US 30 and US 20.

Figure 6-3: Average Daily Long-Haul Traffic on the NHS: 2007



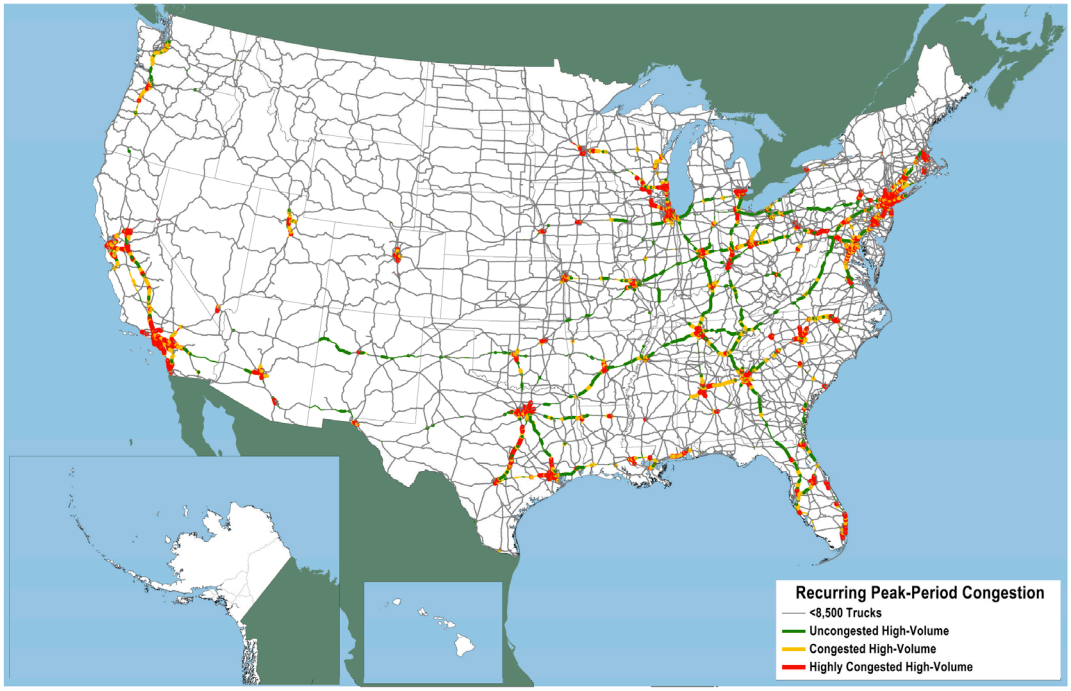
Note: Long-haul freight trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012.

Figure 6-4: Average Daily Long-Haul Traffic on the NHS: 2040



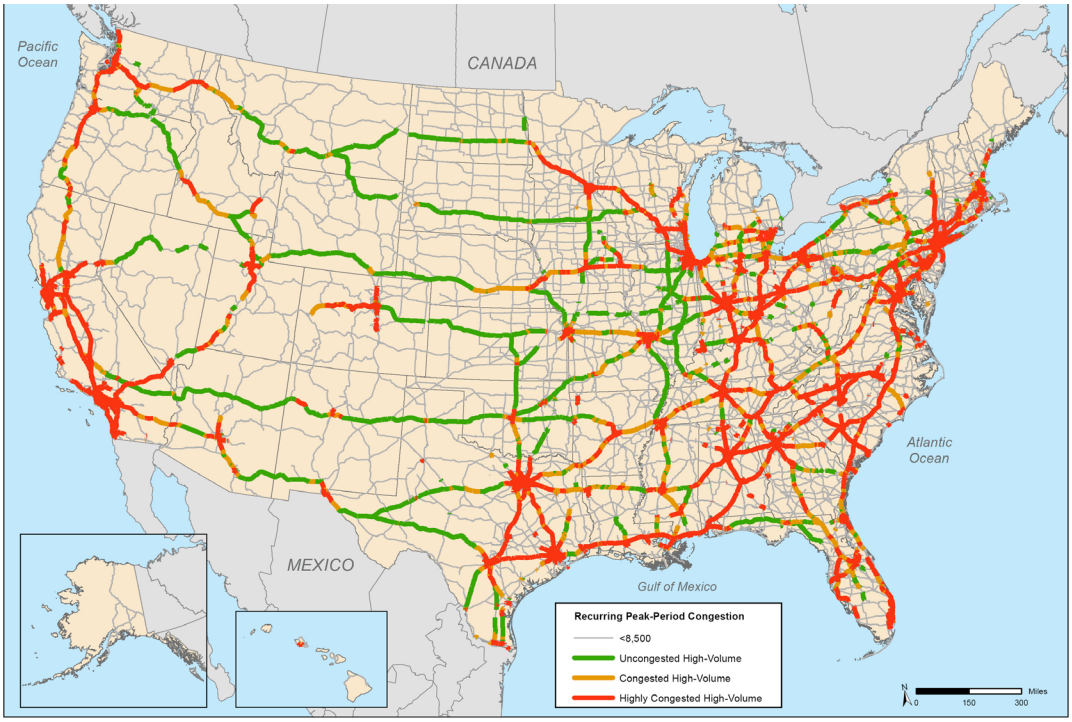
Notes: Long-haul freight trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail. NHS mileage as of 2011, prior to MAP-21 system expansion.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Freight Analysis Framework*, version 3.4, 2013.

Figure 6-5: Peak Period Congestion on High-Volume Truck Portions on the NHS: 2007



Notes: High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N
Source: U. S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System, and Office of Freight Management and Operations, Freight Analysis Framework, version 3.4, 2012

Figure 6-6: Peak Period Congestion on High-Volume Truck Portions on the NHS: 2040



Notes: High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service flow ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N. NHS mileage as of 2011, prior to MAP-21 system expansion.
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, *Freight Analysis Framework*, version 3.4, 2013.

Understanding these forecasts and how to address them is critical to the efficiency movement of goods. During the planning process, MACOG consulted with freight stakeholders such as the Conexus North Central Regional Logistics Council (Conexus). Through this consultation a list of priority projects with freight and logistics emphasis were developed. The projects include:

1. Completing US 31 from I-94 and I-96 in Benton Harbor, MI to I-465 in Indianapolis
2. US 30 limited access
3. SR15/CR17 four-lane corridor from the I-80/I-90 Toll Road to US 30 in Warsaw

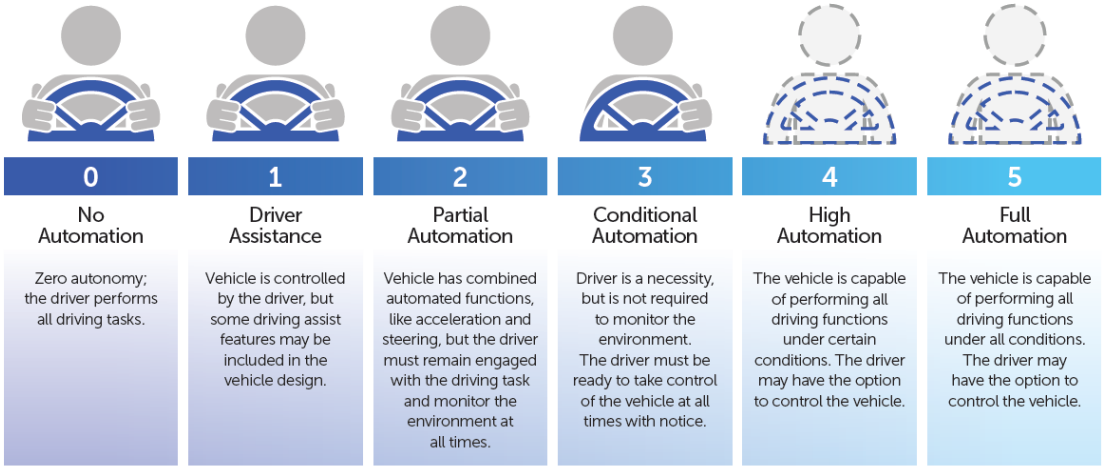
Additionally, MACOG is working to complete a regional Freight Mobility Study in 2020. Any new recommendations from this plan that are endorsed and approved will be amended into this plan

Connected and Autonomous Vehicles

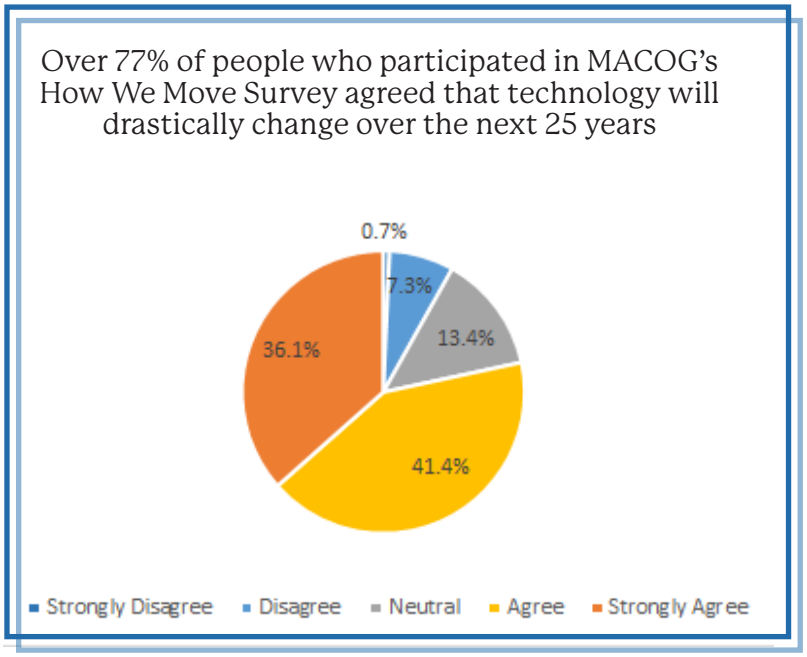
With the adoption and utilization of new technologies, our transportation system is expected to experience significant change in the coming decade. Most significant of these technologies includes Connected and Autonomous Vehicles (CAVs), increased adoption of electric vehicles (EVs), and ridesharing and other Mobility as a Service (MaaS) models such as Lyft, Uber, as well as scooters and bike sharing. The continuing development of these technologies and services will play a considerable role in the future of mobility for people and freight, and as such should be considered in on-going planning efforts in the region.

The U.S. Department of Transportation defines vehicle automation as vehicles that have some control functions that are safety-critical, such as steering, throttle, and breaking. There are six levels of vehicle automation that are depicted below. Connected vehicles refer to those that can communicate with other vehicles or devices along the roadway, while autonomous vehicles are those that can maneuver without driver assistance.

Figure 6-7: Vehicle Automation



Source: U.S. Department of Transportation, Automated Driving Systems 2.0, A Vision for Safety



The availability and prevalence of CAVs may require changes to transportation law, policies, current infrastructure design, and access management. While traffic may flow more efficiently with the presence of CAVs, the change in Vehicle Miles Traveled (VMT) could either increase or decrease due to a variety of factors such as mode shifts, impacts on development and commuting patterns, as well as accessibility to non-drivers.

Currently, the impact of CAVs is largely unknown due to their limited deployment in testing locations. To better understand the range of uncertainty, MACOG worked with RSG to develop three (3) CAV/MaaS modeling scenarios, which will better inform future planning as this technology advances. To view the scenarios, see Appendix I.

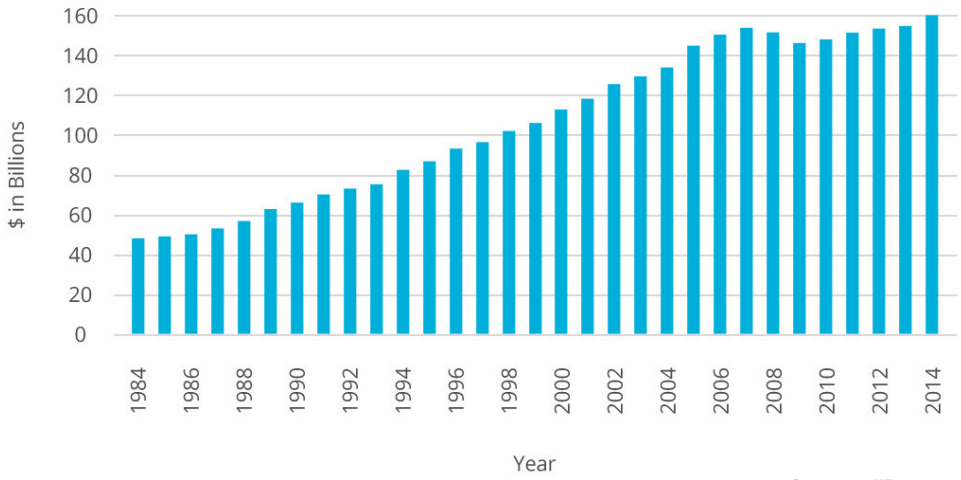
CAVs are just one form of Intelligent Transportation System (ITS) technology. ITS represents the use of technology to modernize the transportation system and created a safer and more efficient transportation network. MACOG is working to completed an update to the ITS Architecture Plan, and any recommendation made will be amended into this plan.

Aging Infrastructure

Given traffic forecasts and the information presented in Chapter 3: Transportation Network, maintaining and modernizing the region's transportation network is not only critical to the local economy but also the national economy. One challenge is that our nation's infrastructure is aging; especially considering the Interstate system was primarily created in the 1950's under the Eisenhower administration.

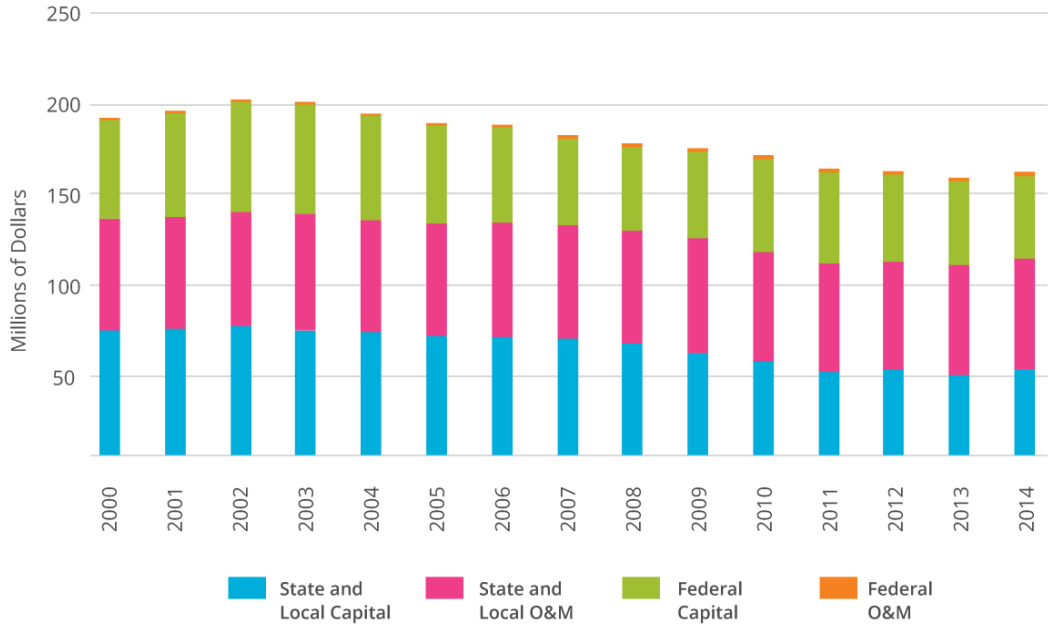
Every four years, America's civil engineers provide a comprehensive assessment of the nation's major infrastructure categories in the American Society of Civil Engineer's Report Card for America's Infrastructure. Using a simple A to F letter grade format, the Report Card provides a comprehensive assessment of current infrastructure conditions and needs, both assigning grades and making recommendations for how to raise the grades. These grades are assigned based on: capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation.

Figure 6-8: Total Cost of Congestion (2014 Dollars)



Source: "Report Card"

Figure 6-9: Public Spending on Highway Infrastructure



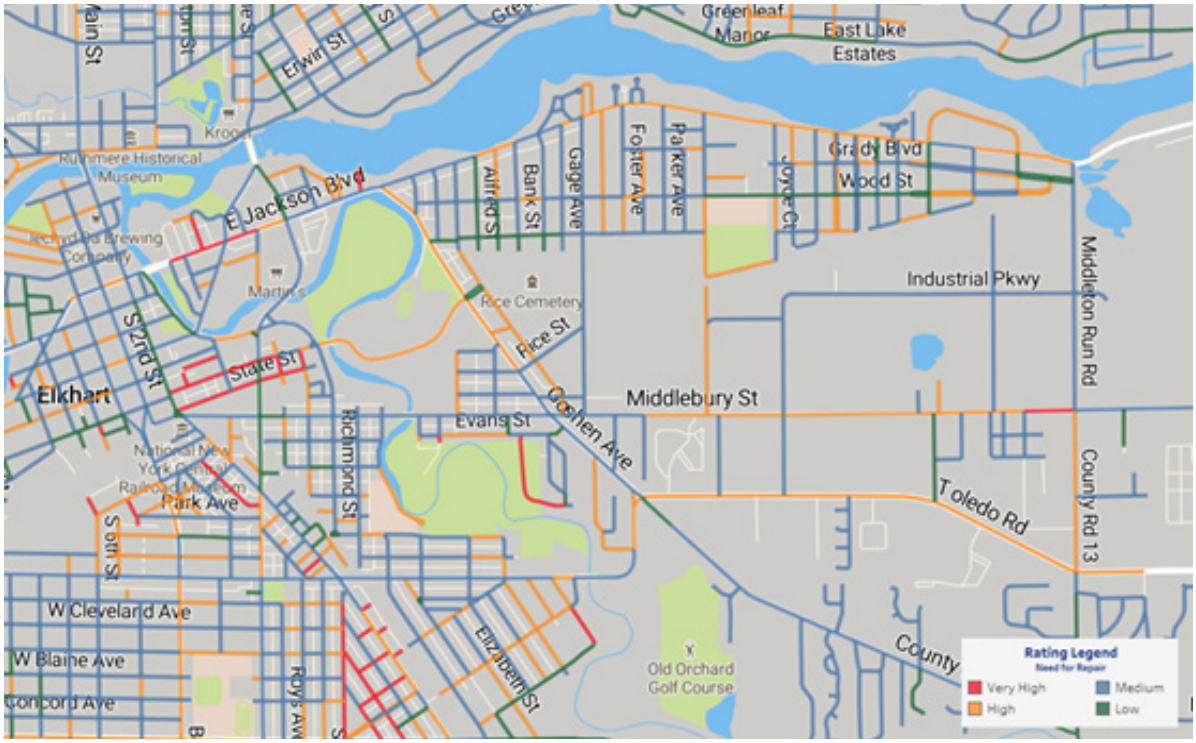
Source: "Report Card"

Since 1998, the grades for our nation's infrastructure have been near failing, averaging only Ds, due to delayed maintenance and underinvestment across most categories. America's cumulative GPA for infrastructure dropped to a D in the 2017 Report Card. The grades in 2017 ranged from a B for rail infrastructure to a D- in transit.

Moreover, 42% of America's major urban highways remain congested, creating 6.9 billion hours of delayed traffic (42 hours per driver), creating a waste of 3.1 billion gallons of fuel, and costing $160 billion of lost time and wasted fuel combined (Figure 6-8). While these costs continue to increase the U.S. has been underfunding its highway system for years (Figure 6-9), resulting in a $836 billion backlog of highway and bridge capital needs.

The Report Card's recommendations to raise the grade: are first to, increase funding from all

Figure 6-10: 2018 PASER Evaluation Sample



Source: MACOG

levels of government, fixing the Federal Highway Trust Fund by raising motor fuels taxes, tackle congestion through policy and technology, prioritize maintenance to maximize the lifespan of roads and the creation of a miles based user fee. With a lower grade than the 2013 report, it is clear that we have a significant backlog of overdue maintenance across our infrastructure systems, a pressing need for modernization, and an immense opportunity to create reliable, long-term funding sources.

In light of the aging infrastructure, effective and efficient strategies need to be implemented. A transportation asset management policy can be implemented by a stepped process developed by the Local Technical Assistance Program (LTAP) at Purdue University. When executed consistently, these steps have proven to enhance infrastructure maintenance, give a more robust knowledge based on budget, and further help plan for infrastructure expansion. The steps in the process are as follows:

- Step 1 - Know what you have by building an asset inventory
- Step 2 - Assess current conditions by consistently rating your assets
- Step 3 - Set the targeted level of service by evaluating what can be achieved with available funding
- Step 4 - Develop a program by identifying the projects and treatments that make the most sense.
- Step 5 - Report the results in a 5-year asset management plan

The State of Indiana requires communities to employ the Pavement Surface Evaluation and Rating (PASER) system to maintain up-to-date assessments. This system is based on a scale from 1-10 that can be translated into the severity of work needed to be performed on any given roadway segment. Observing and scoring roadway segments is the beginning to understanding how the infrastructure deteriorates. As an example, cracking in a block formation at the edge of shoulders indicates water seepage under the base of the road coming from the pavement edge where traffic may travel more frequently when the shoulders are narrow. When left unchecked this deterioration will continue to work its way into the base, creating more cracking into gradually smaller and smaller

Figure 6-11: Degradation Curve of Different Types of Fixes

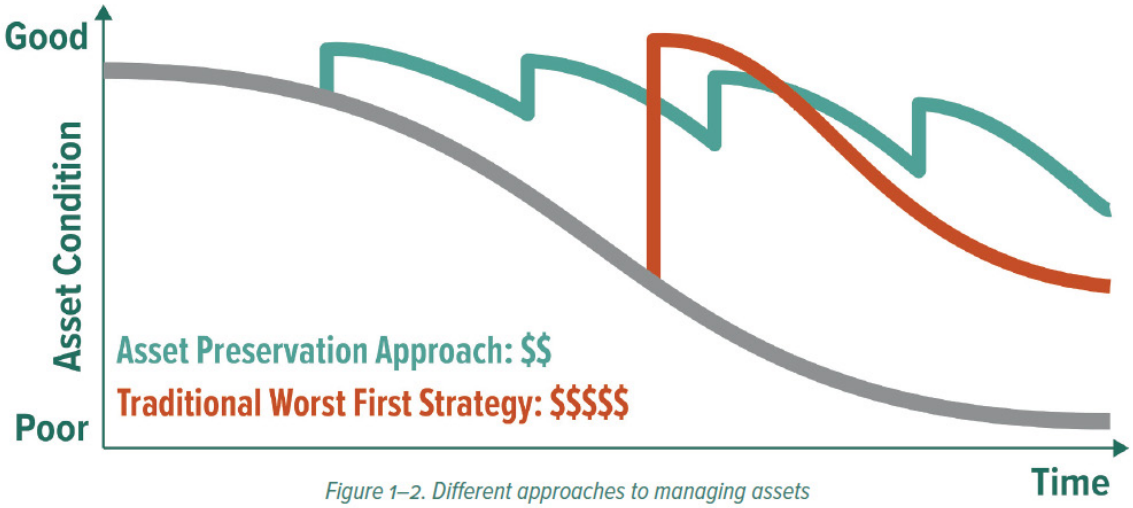


Figure 1–2. Different approaches to managing assets

Source: LTAP, Indiana Local Roads, 2017

blocks. This will then eventually will creep toward the centerline of the road as water has more cracks to seep through.

Once a community has a system in place for rating their roads, analysis can be performed on what type of fix will best solve issues and maintain the integrity of a roadway for longer periods. Above, in Figure 6-11, is what is known as a degradation curve. The image shows two different types of roadway fixes occurring at different points in time for different dollar amounts. The traditional method shows a reconstruction project in orange, when its condition has lost much integrity. While this fix brings the roadway back to its former state, one might note that the asset preservation approach, in green, is cheaper and maintains the roadway at a higher rating for longer. To preserve roadways for a sustained period of time a mix of fixes can be employed, such as crack sealing, micro surfacing, chip sealing, etc. These are less expensive than a full depth reconstruction or even milling and resurfacing that in turn preserves more lane miles of roadway.

Therefore, asset management is an essential tool that brings together planning, construction, maintenance, and operation to improve performance of the transportation network. Extending the life of a road or bridge can be a complex, but by balancing the expensive capital improvements with the less expensive preventative treatments, overtime the region may see funding cover more lane miles. MACOG will continue to support and assist communities in collecting asset data and establishing asset management plans.

Chapter 7:
Financial Plan

7

Under federal regulations, the 2045 Transportation Plan must include a financial plan that demonstrates how the adopted plan can be implemented. The financial plan shall compare the estimates of funds that are reasonably expected to be available for transportation uses, including transit, and the cost of constructing, maintaining and operating the total (existing, plus planned) transportation system over the period of the plan. As such, the development of reasonable funding estimates and costs is essential to the development of a transportation plan that is consistent with the federal requirements for fiscal constraint.

Federal Funding Programs

The Federal Highway Administration (FHWA) allocates federal funds through Congressional legislation. The most recent transportation legislation is Fixing America's Surface Transportation Act (FAST). FAST Act allocation of federal funds in MPO areas may only be spent if it is included as part of the transportation planning process and only if they are included in an approved TIP. These funds may be used on functionally classified system of federal, state, and local roadways throughout the United States.

In the FAST Act these funds are divided into the following categories:

- National Highway Performance Program (NHPP)
- Surface Transportation Block Grant Program (STBG)
- Congestion Mitigation & Air Quality Improvement Program (CMAQ)
- Highway Safety Improvement Program (HSIP)
- Transportation Alternatives (TA, Set-Aside from STBG)

Indiana Department of Transportation (INDOT) is responsible for projects on its State and Federal facilities. All federal aid eligible roads are functionally classified by agreement between the State, MPOs, and LPAs (Local Public Agencies) based on Federal Highway Administration (FHWA) guidelines for functional classification. All roads classified at major collector or higher may receive Federal Surface Transportation Program (STBG) funds. The selection of projects to be developed using STBG funds in the South Bend and Elkhart/Goshen Urbanized Areas under the requirements of FAST Act are to be made by the MPO in consultation with the State.

The FAST Act continues the Highway Safety Improvement Program (HSIP) to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. The CMAQ program is continued in FAST to provide a flexible funding source to States, MPOs and LPAs for transportation projects and programs to help meet the requirements of the Clean Air Act. Active Transportation projects are able to utilize STBG, as well as a Transportation Alternatives set-aside from STBG.

The current federal legislation funds include several formula based calculations defined by Congress, which are distributed to urban areas based on population and by a funding agreement between the MPO and INDOT. Currently, funding is available in rural areas on a competitive first come, first served basis at INDOT's discretion.

Local Funding Programs

The following accounts serve as the local source of revenue for highway project implementation; each of these sources can be used as the local match for Federal funds:

- Local Road and Street Account (LR&S)
- Motor Vehicle Highway Account (MVHA)
- Bonding Capabilities
- Tax Increment Financing (TIF)
- Cumulative Bridge Funds
- Major Bridge Funds
- Capital Improvement Cumulative Funds
- Wheel Tax
- Economic Development Tax (EDIT)

Local Road and Street Account (LR&S)

LR&S funds provide an important source of revenue for both city and county highway departments. The funds are dedicated for engineering, construction, or reconstruction of roads or streets, as well as for the payment of bond and interest to finance a project of this type.

Motor Vehicle Highway Account (MVHA)

MVHA revenue is an account of the General Fund of the State of Indiana, which, by statute, is credited with the collection of the first six cents of the motor fuel and fuel use taxes, plus the statutory fees for motor vehicle registration and operation. These highway user taxes are collected by the State and then a portion is distributed back to the cities and counties for administration. The MVHA is the principal source of revenue for the overall operation of street and highway departments. MVHAs uses include the purchase of materials, labor costs, and/or equipment purchases required in the maintenance and construction of streets and roads.

Bonding Capabilities

The two major categories of debt financing are:

- Revenue bonds
- General obligation bonds

Revenue bonds in Indiana are used for proprietary function such as sewage treatment and refuse disposal equipment by all levels and types of local governments. Governments are not limited in the amount of revenue bond debt they may incur. Revenue bonds hold no pertinent place in a discussion of finances for our purposes, and will no longer be referred to in this report.

General obligation bonds are used for debt financing of non-proprietary functional expenditures such as roads and schools. The amount of general obligation debt, which local governments and special districts may incur, is limited to two percent (2%) of net locally assessed property value. (This limit is set and may be altered by the Indiana State Legislature)

Tax Incremental Financing (TIF)

TIF funds are used to pay off bonds, or are used to pay directly for infrastructure projects in a particular area of a city or county. These funds are collected from a particular area and are spent in a particular area to increase the tax base and encourage future development. TIF funds may also be used as local match for federal and state projects.

Cumulative Bridge Funds (CBF)

Cumulative Bridge Funds are a supplementary source of revenue for the construction and repair of highway bridges and grade separations. Indiana statutes authorize the county commissioners of the individual county units to establish a county-wide tax levy not to exceed ten cents ($0.10) on each one hundred dollars ($100) assessed valuation of all taxable personal and real property within the county and municipalities for the purpose of accumulating funds for the construction and repair of highway bridges.

Major Bridge Funds

Major Bridge Funds are local county revenues available to counties for longer span bridges. Counties with populations between 100,000 and 700,000 are eligible to establish this fund. Those county's are eligible as long as there is are major obstructions (physical barrier such as rivers that inhibits to the passage of motor vehicle traffic) between commercial or population centers are eligible. The county may levy a tax in compliance with Indiana statutes not to exceed three and thirty-three hundredths cents ($0.0333) on each one hundred dollars ($100) assessed valuation of all taxable personal and real property within the county to provide for the major bridge fund. Funds may be used for major bridges, defined as 200 feet or more in length with special exceptions for bridges within cities. As of 2010, four counties in Indiana had Major Bridge Funds.

Capital Improvement Cumulative Funds

All cities and towns in Indiana may establish Capital Improvement Cumulative Funds to provide monies for any or all ten purposes

expressed in Chapter 226, Section 1, Acts 1965. This fund then receives the allotment of the state-collected cigarette tax. The ten purposes include the acquisition of land or right-of-way to be used for streets, roads, alleys, sidewalks, or thoroughfares, and the maintenance of these facilities. Capital Improvement Cumulative Funds may also be used toward the retirement of general obligation bonds. Traditionally, limited amounts of this money have been used in transportation areas.

Wheel Tax (Local Option Highway User Tax)

The Local Option Highway User Tax is available to all counties. It requires that the County Council and County Commissioners approve the tax. St. Joseph and Elkhart Counties approved the tax in 2003. Kosciusko County approved a Wheel Tax in June 2014. Distributions are made to the cities and towns as well as the counties.

Economic Development Income Tax (EDIT)

The Economic Development Income Tax is an optional tax available to all counties in Indiana. It must be passed by the County Council and approved by the County Commissioners. This tax is also known as CEDIT, County Economic Development Tax. It can be adopted by the County Council if the county has the County Adjusted Gross Income Tax (CAGIT), or by the County Commissioners if the county has County Option Income Tax (COIT), or either body if the county has neither CAGIT nor COIT. Most counties that use CEDIT also have either CAGIT or COIT. CEDIT generally can be adopted at rates up to 0.5%, but the combined CAGIT and CEDIT rates in counties with both taxes cannot exceed 1.25%, and the combined COIT and CEDIT rates cannot exceed 1%. Revenue is divided among the county, cities and towns, and must be used for economic development or public capital projects. CEDIT revenue is collected by the state Department of Revenue and distributed back to the adopting counties. St. Joseph and Kosciusko County have adopted COIT and CEDIT. Elkhart County has adopted CAGIT and CEDIT. Marshall County has adopted CAGIT.

Transit Funding Programs

The Federal Transit Administration (FTA) apportions grant funds, which can be used in urbanized areas of 50,000 or more persons as defined by the decennial census. In order to use these funds, the Governor must have previously authorized a designated recipient to receive said funds and comply with all FTA operating, planning, and capital equipment requirements. In the South Bend and Elkhart-Goshen urbanized areas, there are three designated recipients, MACOG, the South Bend PTC and NICTD. MACOG has dual designation as a designated recipient in South Bend as well as in Elkhart-Goshen. The City of Niles is the designated recipient for Niles Dial-A-Ride System.

Urban Funds

Section 5307 funds are formula funds used for transit planning, operating, and capital equipment purchases. Section 5307 recipients include TRANSPO, the City of Niles (South Bend portion of the TMA), NICTD, and MACOG, which operates the Interurban Trolley and the Interurban Trolley Access Service. Section 5337 and 5339 are also formula based funding programs. Section 5337 is FTA's first stand-alone initiative written into law that is dedicated to repairing and upgrading the nation's rail transit systems. NICTD uses these funds to maintain its fixed guideway in a state of good. Section 5339 provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities. Section 5310 provides formula funding to large urbanized areas over 200,000 (South Bend Urban Area) to increase the mobility of seniors and persons with disabilities.

Rural Funds

Section 5311 provides financial assistance in rural and small urban areas (areas of 5,000 to 50,000 persons) through a formula grant program administered by INDOT. These funds do not require a designated recipient and may be used by local public agencies, non-profit organizations, and operators of public transit for operating and capital equipment purchases. A Section 5311 program recipient in the MACOG

region is the Marshall County Council on Aging and Kosciusko Area Bus System (KABS). Prior to 2008, MACOG was the recipient of the funds. Section 5310 is also available for all areas under 200,000 in population from a discretionary program funded by FTA through the INDOT and is a capital equipment program available to non-profit agencies.

Financial Plan

Transportation

Under federal regulations, the 2045 Transportation Plan must include a financial plan to demonstrate how the adopted transportation plan can be implemented. The following charts demonstrate the financial feasibility of the Plan and how projects could be funded.

Local Revenue Estimates total $59,603,104 per year in the urbanized area based on 2018 DLGF receipts. These funds are available for all aspects of operating, maintaining, and constructing the transportation network. It is assumed that available revenues for projects listed in the plan represent only a portion of total local revenue, to account for expenditures of operations and maintenance. While the amount of funds spent on transportation changes year to year, it is expected that local governments spend at least $5.5 million a year for construction and reconstruction projects. This leaves the majority of funds, $54.1 million, annually for maintenance and operations. In order to match the Federal Funds provided to the urban area the local governments would need to provide the 20% match which is $85,381,446 or 7% of the 20-year Local Revenue Estimates for the urbanized area. It is fiscally reasonable then to assume that the local governments are able to provide the local match for these projects.

Table 7-1: Estimated Annual Local Public Agency Revenue (in Millions)

LPA	MVHA	LRSA	LOHUT	CBF	MBF	Total	Projected Revenue to 2045
Elkhart County	$17.79	$3.80	$0.54	$1.04	$2.62	$25.79	**$257.91**
St. Joseph County	$23.97	$6.73	$0.55	$0.97	$1.59	$33.81	**$338.12**
Urban Area Total	**$41.75**	**$10.53**	**$1.09**	**$2.01**	**$4.21**	**$59.60**	**$596.03**

MACOG is responsible for prioritizing and distributing federal funds in the urbanized area. Under the current transportation legislation, MACOG receives approximately $13 million for both the Elkhart and South Bend Urbanized area (Table 7-2). This demonstration assumes that federal funds are applied only to construction costs that reflect the year of expenditure. The assumed federal/local split for transportation projects is 80% federal and 20% local, unless the project is known to be completely funded locally. It is also assumed that the growth rate for Federal Funds in the urbanized areas will remain flat-line (0%) at 2019 amounts for St. Joseph and Elkhart Counties. Both Marshall and Kosciusko Counties are considered rural and do not directly receive a federal allocation for transportation projects. Therefore, they are not included in the financial plan. We have included the projects in this plan if reasonable additional resources (ie. Group III or Group IV funds from the State, competitive grants, etc) were available.

Tables 7-3 through 7-5, demonstrates the financial reasonableness of the Michiana on the Move: 2045 Transportation Plan. For each funding period, the urban area federal funding allocations remain above the needed federal funding for projects in this plan.

Table 7-2: Estimated Federal Funds Allocation (in Millions)

County	Total	2020-2025	2026-2035	2036-2045
Elkhart Co	$124.89	$28.82	$48.03	$48.03
St. Joseph	$216.64	$49.99	$83.32	$83.32
Urban Area Total	**$341.53**	**$78.81**	**$131.36**	**$131.36**

Table 7-3: Estimated Total Project Costs (in Millions)

County	Total	2020-2025	2026-2035	2036-2045
Elkhart Co	$155.01	$65.12	$67.70	$22.19
St. Joseph	$219.49	$23.05	$75.76	$120.68
Urban Area Total	**$374.50**	**$88.17**	**$143.46**	**$142.87**

Table 7-4: Estimated Federal Funds Needed (in Millions)

County	Total	2020-2025	2026-2035	2036-2045
Elkhart Co	$124.01	$52.10	$54.16	$17.75
St. Joseph	$175.59	$18.44	$60.61	$96.55
Urban Area Total	**$299.60**	**$70.54**	**$114.77**	**$114.30**

Table 7-5: Estimated Matching Funds Needed (in Millions)

County	Total	2020-2025	2026-2035	2036-2045
Elkhart Co	$31.00	$13.02	$13.54	$4.44
St. Joseph	$43.90	$4.61	$15.15	$24.14
Urban Area Total	**$74.90**	**$17.63**	**$28.69**	**$28.57**

Public Transportation

It is anticipated that Transpo, NICTD and Niles Dial-a-Ride will continue to receive Section 5307 Urbanized Area Formula funds in the South Bend Urbanized Area. Additionally, Transpo receives Section 5339 Bus and Bus Facilities funds and NICTD receives 5337 Status of Good Repair funds to assist with capital costs in providing transit services in the area. Section 5310 provides formula funding to large urbanized areas over 200,000 (South Bend Urbanized Area) and is a statewide competitive grant process for urbanized areas between 50,000 to 200,000 (Elkhart-Goshen Urbanized Area). The goal of the 5310 program is to increase the mobility of seniors and persons with disabilities. In the Elkhart-Goshen Urbanized Area it is anticipated that Interurban Trolley will continue to receive Section 5307 Urbanized Area Formula funds.

Based on the FY2018 annual allocation for these programs and assuming that the allocation is flat, the South Bend Urbanized is anticipated to receive $204.4 million in Federal Transit Administration funds for 2020 through 2045. During the same time period, the Elkhart-Goshen Urbanized Area would receive $53.1 million in Federal Transit Administration funds. These funds would be used for capital projects or operating expenses.

Table 7-6: Estimated Federal Transit Funds

County	Category	Annual Allocation	Federal Funds (2020-2045)
Elkhart Co	5307	$2,044,263	$ 53,150,838
	5310	$ -	$ -
	5337	$ -	$ -
	5339	$ -	$ -
	Total Funds	**$2,044,263**	**$ 53,150,838**
St. Joseph	5307	$4,188,603.00	$108,903,678.00
	5310	$267,892.00	$6,965,192.00
	5337	$3,077,281.00	$80,009,306.00
	5339	$327,638.00	$8,518,588.00
	Total	**$7,861,414**	**$204,396,764**

Appendix A:
List of Proposed Projects

A

Figure A-1: Elkhart County Proposed Project Map

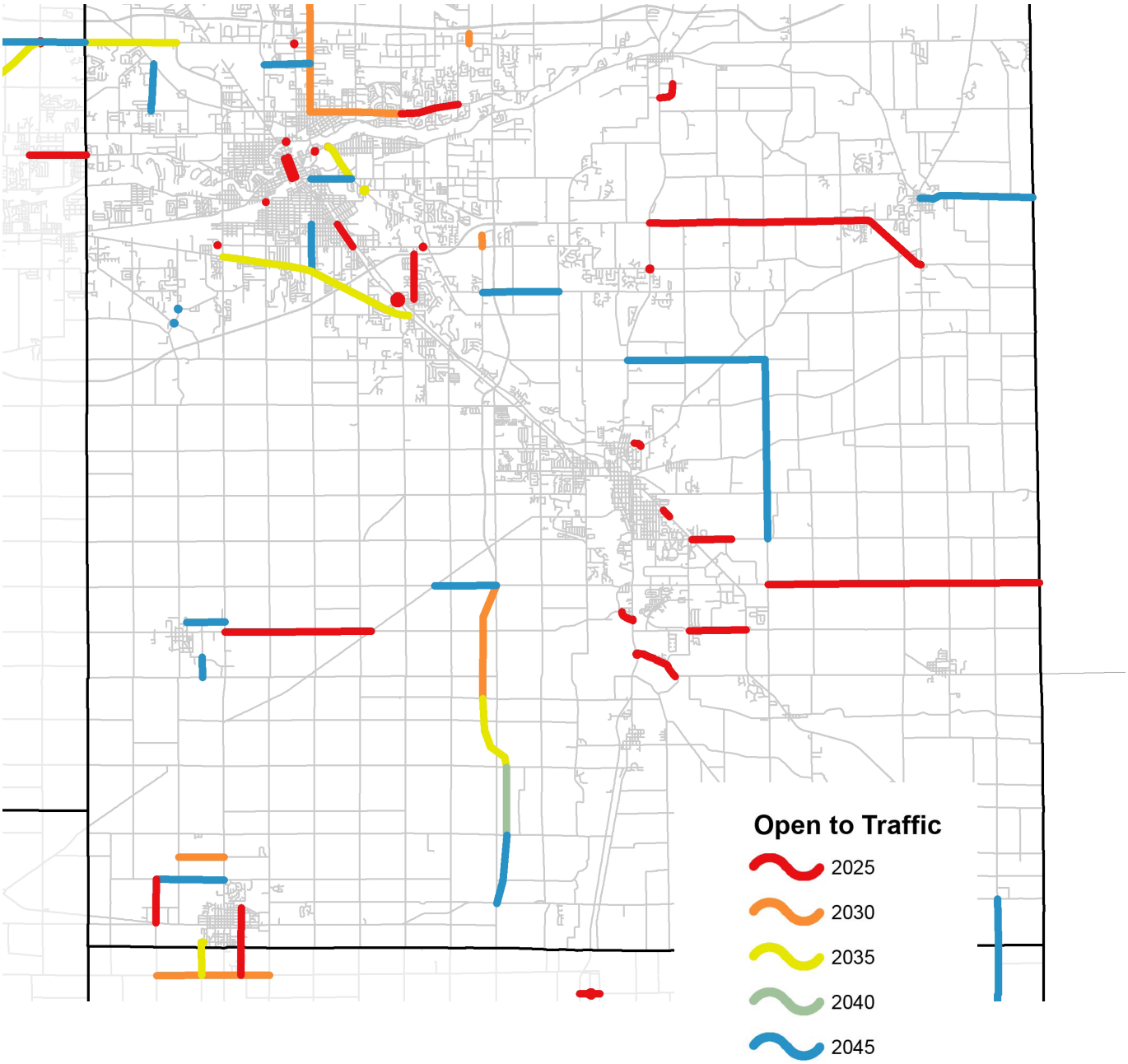


Table A-1: Elkhart County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
Bristol	2025	Bristol Bypass	Bloomingdale Dr	Industrial Dr	New Road Construction	0.52
Elkhart	2025	Bristol St (CR 10)	Jeanwood Dr	CR 15	Added Travel Lanes	1.10
Elkhart	2025	Hively Ave	Norfolk Southern Railroad (#510012C)		Grade Separation	1.17
Elkhart	2025	CR 6	Cassopolis St (SR 19)		Intersection Improvement	0.26
Elkhart	2025	Indiana Ave	Oakland Ave			0.27
Elkhart	2025	Main St	Beardsley Ave		Intersection Improvement	
Elkhart	2025	2nd St	Harrison St	Jefferson St	One-Way to Two-Way	0.50
Elkhart	2025	3rd St	Harrison St	Jefferson St	One-Way to Two-Way	0.50
Elkhart	2025	Main St	Hively Ave	Lusher Ave	Road Diet	0.60
Elkhart	2030	Jackson Blvd	Goshen Ave		Intersection Improvement	
Elkhart	2030	Bristol St	Johnson St	Jeanwood Dr	Road Diet	1.30
Elkhart	2035	Toledo Rd	Goshen Ave	Indiana Ave	Intersection Improvement	
Elkhart	2035	Goshen Ave	Jackson Blvd	Middlebury St	Road Reconstruction	0.89
Elkhart	2045	Middlebury St	Prairie St	Goshen Ave	Added Travel Lanes	0.89
Elkhart	2045	Prairie St	Mishawaka Rd	Lusher Ave	Auxiliary Lanes	1.04
Elkhart	2045	Northside Connector	Adamsville Rd (CR 7)	Johnson St (CR 9)	New Road Construction	1.01
Elkhart	2025	Jackson Blvd	Johnson St		Intersection Improvement	
Elkhart County	2025	CR 13	Sunnyside Ave	US 20	Added Travel Lanes	1.02
Elkhart County	2025	CR 38 (Kercher Rd)	CR 31	County Line Rd	Added Travel Lanes	5.98
Elkhart County	2025	Sunnyside Ave	US 33/Norfolk Southern Railroad (#533510B)	CR 13	Grade Separation	0.35

Table A-1: Elkhart County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
Elkhart County	2025	CR 18	CR 13	CR 115	Intersection Improvement	
Elkhart County	2025	CR 40	SR 19	SR 119	Road Reconstruction	3.19
Elkhart County	2030	Johnson St (CR 9)	Bristol St (CR 10)	CR 4	Added Travel Lanes	2.50
Elkhart County	2030	CR 15	CR 6	CR 104	New Road Construction	0.23
Elkhart County	2030	Old CR 17	CR 18	Love's Dr	New Road Construction	0.26
Elkhart County	2030	CR 17	CR 142	CR 38	New Road Construction	1.72
Elkhart County	2035	CR 6	Ash Rd	CR 10	Added Travel Lanes	1.14
Elkhart County	2035	CR 6	CR 10	John Weaver Parkway	Added Travel Lanes	0.88
Elkhart County	2035	CR 20 (Mishawaka Rd)	SR 19 (Nappanee S)	US 33	Auxiliary Lanes	4.35
Elkhart County	2035	CR 20	CR 111		Intersection Improvement	
Elkhart County	2035	CR 17	CR 46	CR 142	New Road Construction	1.50
Elkhart County	2040	CR 17	CR 50	CR 46	New Road Construction	1.50
Elkhart County	2045	CR 43	County Line Rd (1400 N)	US 6	Added Travel Lanes	1.02
Elkhart County	2045	CR 38	SR 119	CR 17	Auxiliary Lanes	1.35
Elkhart County	2045	CR 22	CR 3		Intersection Improvement	
Elkhart County	2045	CR 24	CR 3		Intersection Improvement	
Elkhart County	2045	CR 17	US 6	CR 50	New Road Construction	1.53
Elkhart County	2045	CR 118	Old CR 17	CR 19	New Road Construction	1.68
Elkhart County	2045	CR 26	SR 15	CR 31	New Road Construction	3.04
Elkhart County	2045	CR 31	CR 36	CR 26	New Road Construction	3.95

Table A-1: Elkhart County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
Elkhart County	2045	Kerryhaven Dr	Current Termini	CR 10	New Road Construction	0.78
Elkhart County	2045	CR 52	CR 101	SR 19 (Main St)	Road Reconstruction	1.50
Goshen	2025	US 33	Fairfield Ave	Plymouth Ave	Auxiliary Lanes	0.20
Goshen	2025	College Ave	US 33	Century Dr	Auxiliary Lanes	0.87
Goshen	2025	Waterford Mills Parkway	CR 40	SR 15	New Road Construction	0.32
Goshen	2025	Wilden Ave	Current Terminus	Middlebury St	New Road Construction	0.18
Goshen	2030	CR 40	Dierdorff Rd (CR 27)	US 33	Auxiliary Lanes	1.25
INDOT	2020	SR 15	SR 120		Intersection Improvement	
INDOT	2020	US 33	CR 36 (College Ave)		Intersection Improvement	
INDOT	2020	US 6	SR 13/US 33		Intersection Improvement	
INDOT	2020	US 6	CR 29		Intersection Improvement	
INDOT	2025	US 20	SR 15	CR 35	Added Travel Lanes	4.23
INDOT	2025	US 20	CR 35	SR 13	Added Travel Lanes	2.13
INDOT	2025	SR 15	CR 42 North Junction		Auxiliary Lanes	1.03
INDOT	2025	SR 15	CR 142		Intersection Improvement	
INDOT	2025	SR 15	CR 18		Intersection Improvement	
Middlebury/ Elkhart County	2045	CR 16 (Warren St)	SR 13 (Main St)	County Line Rd	Auxiliary Lanes	2.51
Nappanee	2025	CR 101	Market St (US 6)	CR 52	Road Reconstruction	0.96
Nappanee/ Elkhart County	2030	CR 150	SR 19	CR 3	New Road Construction	1.00

Table A-1: Elkhart County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
Wakarusa	2045	Maple Ln (CR 103)	CR 42	Wabash Ave	Auxiliary Lanes	0.45
Wakarusa	2045	Orchard Park Dr	Current Termini	SR 19 (Nappanee Street)	New Road Construction	1.03

Figure A-2: Kosciusko County Proposed Project Map

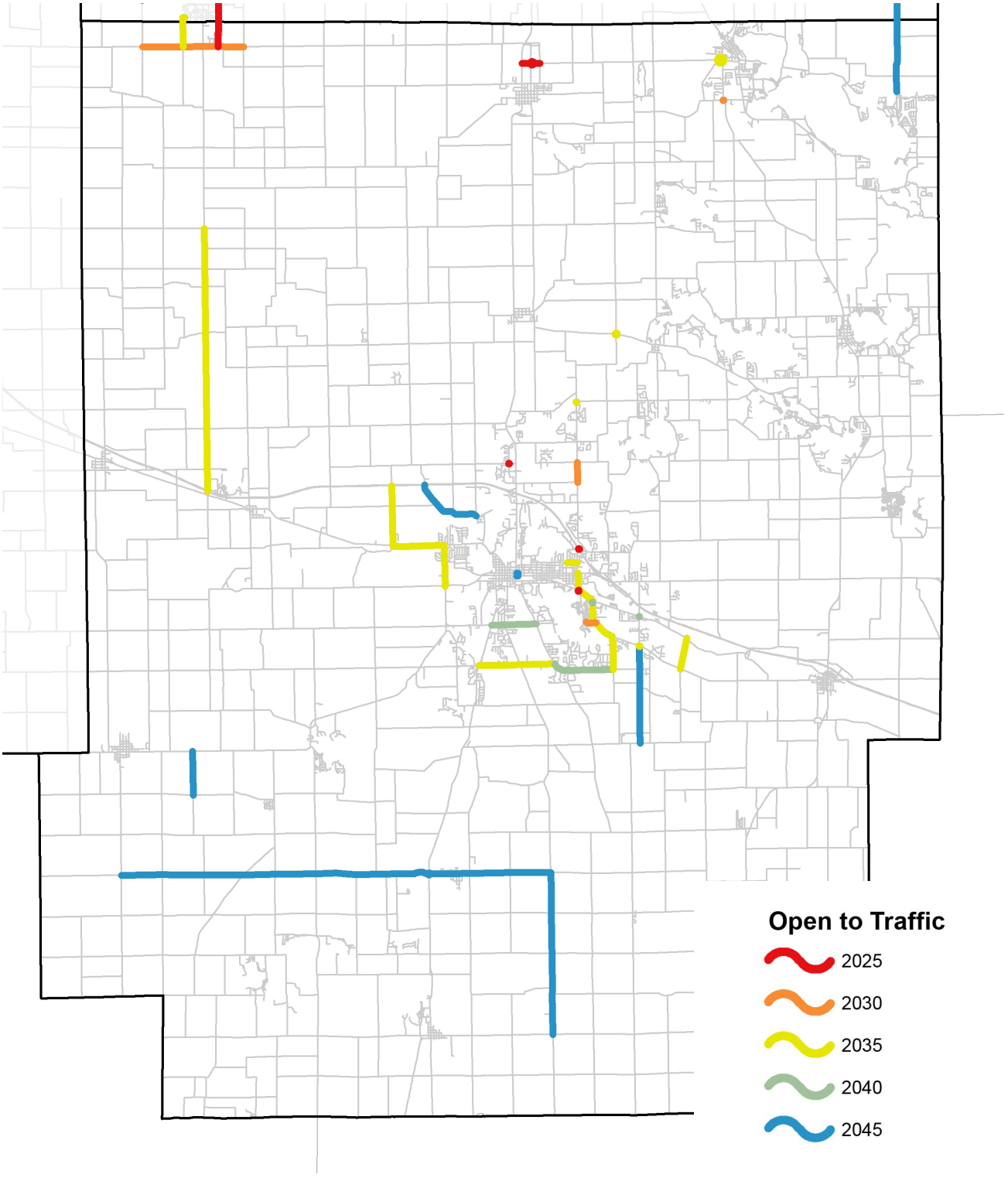


Table A-2: Kosciusko County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
INDOT	2025	US 30	Parker St		Intersection Improvement	
Kosciusko County	2025	CR 1300 N	Norfolk Southern Railroad (New Crossing)		Grade Separation	1.06
Kosciusko County	2025	CR 1300 N	SR 15	Old SR 15	New Road Construction	0.44
Kosciusko County	2030	E 1200 N	Syracuse Webster Rd		Intersection Improvement	
Kosciusko County	2030	W 1350 N	N 700 W	W 950 N	Road Reconstruction	2.49
Kosciusko County	2035	N 800 W	US 30	SR 19 / W 900 N	Added Travel Lanes	6.49
Kosciusko County	2035	Pierceton Rd	Parckerton Rd	Market St	Added Travel Lanes	5.28
Kosciusko County	2035	CR 200 S	SR 15	Country Club Rd	Auxiliary Lanes	1.86
Kosciusko County	2035	CR 350 W	Old US 30	US 30	Auxiliary Lanes	1.49
Kosciusko County	2035	Old US 30	CR 350 W	N Zimmer Rd	Auxiliary Lanes	1.25
Kosciusko County	2035	Armstrong Rd	N 200 E		Intersection Improvement	
Kosciusko County	2035	E 1300 N	Kern Rd	Syracuse Webster Rd	Intersection Improvement	
Kosciusko County	2035	E 450 N	N 100 E		Intersection Improvement	
Kosciusko County	2035	Old US 30	CR 350 W		Intersection Improvement	
Kosciusko County	2035	New Road (N 850 W)	W 1350 N	Indiana Ave	New Road Construction	0.78
Kosciusko County	2035	New Road (350 E)	Pierceton Rd	Wooster Rd	New Road Construction	0.85
Kosciusko County	2040	CR 225 S	CR 200 S	Packerton Rd	Auxiliary Lanes	1.50
Kosciusko County	2045	County Farm Rd	SR 14	CR 700 S	Added Travel Lanes	4.02
Kosciusko County	2045	CR 700 S	SR 19	County Farm Rd	Added Travel Lanes	10.59
Kosciusko County	2045	CR 900 W	CR 500 S	SR 25	Added Travel Lanes	1.09

Table A-2: Kosciusko County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
Kosciusko County	2045	N Fox Farm Rd	CR 150 W	US 30	Added Travel Lanes	2.19
Kosciusko County	2045	Wawasee Dr (CR 900 E)	Morris Rd	County Line Rd	Added Travel Lanes	1.78
Kosciusko County	2045	250 E	CR 400 S	Pierceton Rd	New Road Construction	2.43
Nappanee	2025	Jackson St	W 1350 N	Current Termini	New Road Construction	0.26
Warsaw	2025	CR 300 N	Shelden Dr		Intersection Improvement	
Warsaw	2030	CR 100 E	CR 250 N	CR 300 N	Road Reconfiguration	0.50
Warsaw	2035	Parker St	Center St		Intersection Improvement	
Warsaw	2035	Zimmer Rd	Winona Ave		Intersection Improvement	
Warsaw	2035	Sheridan St	Parker St	Harrison St	New Road Construction	0.24
Warsaw	2040	100 S (Rozella Rd)	SR 15	Country Club Rd	New Road Construction	1.10
Warsaw	2045	Center St	Norfolk Southern		Grade Separation	0.26
Warsaw	2045	Market St	Norfolk Southern		Grade Separation	0.28
Warsaw		N 150 W	Lake St	US 30	Added Travel Lanes	1.65
Warsaw/ Kosciusko County	2035	Zimmer Rd (CR 225 W)	SR 25 (Crystal Lake Rd)	Old US 30	Auxiliary Lanes	1.01
Winona Lake	2025	Kings Hwy/ Winona Ave	Parke Ave/ Argonne Rd		Intersection Improvement	
Winona Lake	2030	Columbia Dr	Pierceton Rd	Chestnut St	New Road Construction	0.28
Winona Lake	2035	Packerton Rd	CR 225 S	Pierceton Rd	Auxiliary Lanes	0.83
Winona Lake	2035	Pierceton Rd	CR 250 E		Intersection Improvement	
Winona Lake	2035	Pierceton Rd	Packerton Rd		Intersection Improvement	
Winona Lake	2040	Wooster Rd	CR 250 E		Intersection Improvement	
Winona Lake	2040	Wooster Rd	Kings Hwy		Intersection Improvement	

Figure A-3: Marshall County Proposed Project Map

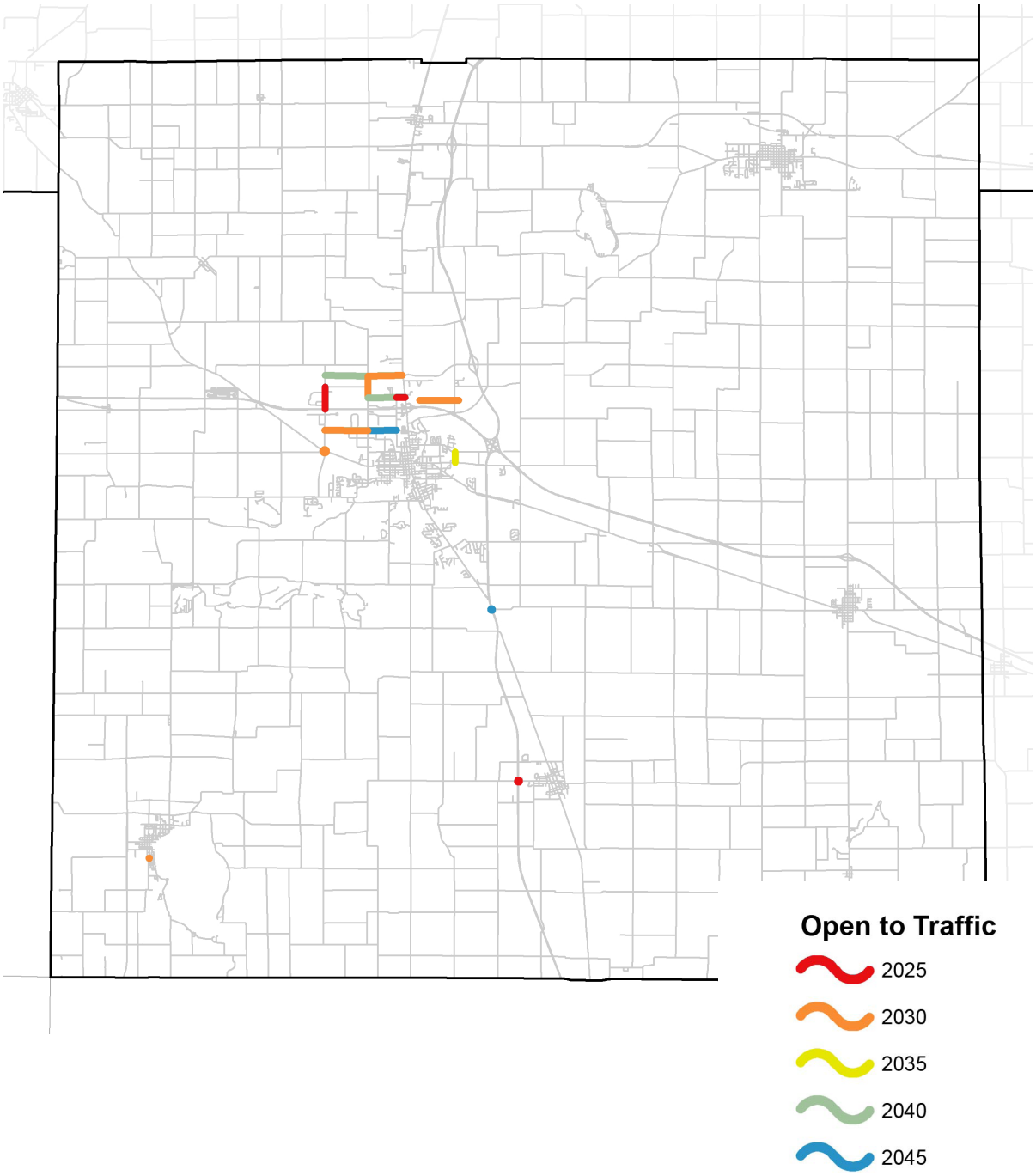


Table A-3: Marshall County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
Culver	2030	Main St	Davis St		Intersection Improvement	
INDOT	2025	US 31	SR 10		New Interchange Construction	
Marshall County	2030	Lincoln Hwy	Pioneer Dr		Intersection Improvement	
Marshall County	2030	Veterans Pkwy	Michigan Rd	Oak Dr	New Road Construction	1.86
Marshall County	2040	Veterans Pkwy	Oak Dr	Pioneer Dr	New Road Construction	1.86
Marshall County	2045	Michigan Rd	12B	US 31	Intersection Improvement	
Plymouth	2025	Hoham Dr	Michigan St	Western Ave	Auxiliary Lanes	0.02
Plymouth	2030	Oak Dr	Hoham Dr	Veterans Parkway (Future Ph)	Added Travel Lanes	0.51
Plymouth	2030	Jim Neu Dr	Pioneer Dr	Oak Dr	Road Reconstruction	0.99
Plymouth	2030	Plymouth Municipal Airport			Runway Extension	0.90
Plymouth	2035	Pioneer Dr	US 30	7B Rd	Added Travel Lanes	0.51
Plymouth	2035	Richter Rd	Jefferson St	Baker St	Road Reconstruction	0.25
Plymouth	2040	Hoham Dr	Western Ave	Oak Rd	Auxiliary Lanes	0.65
Plymouth	2045	Jim Neu Dr	Western Ave	Oak Dr	New Road Construction	0.66

Figure A-4: St. Joseph County Proposed Project Map

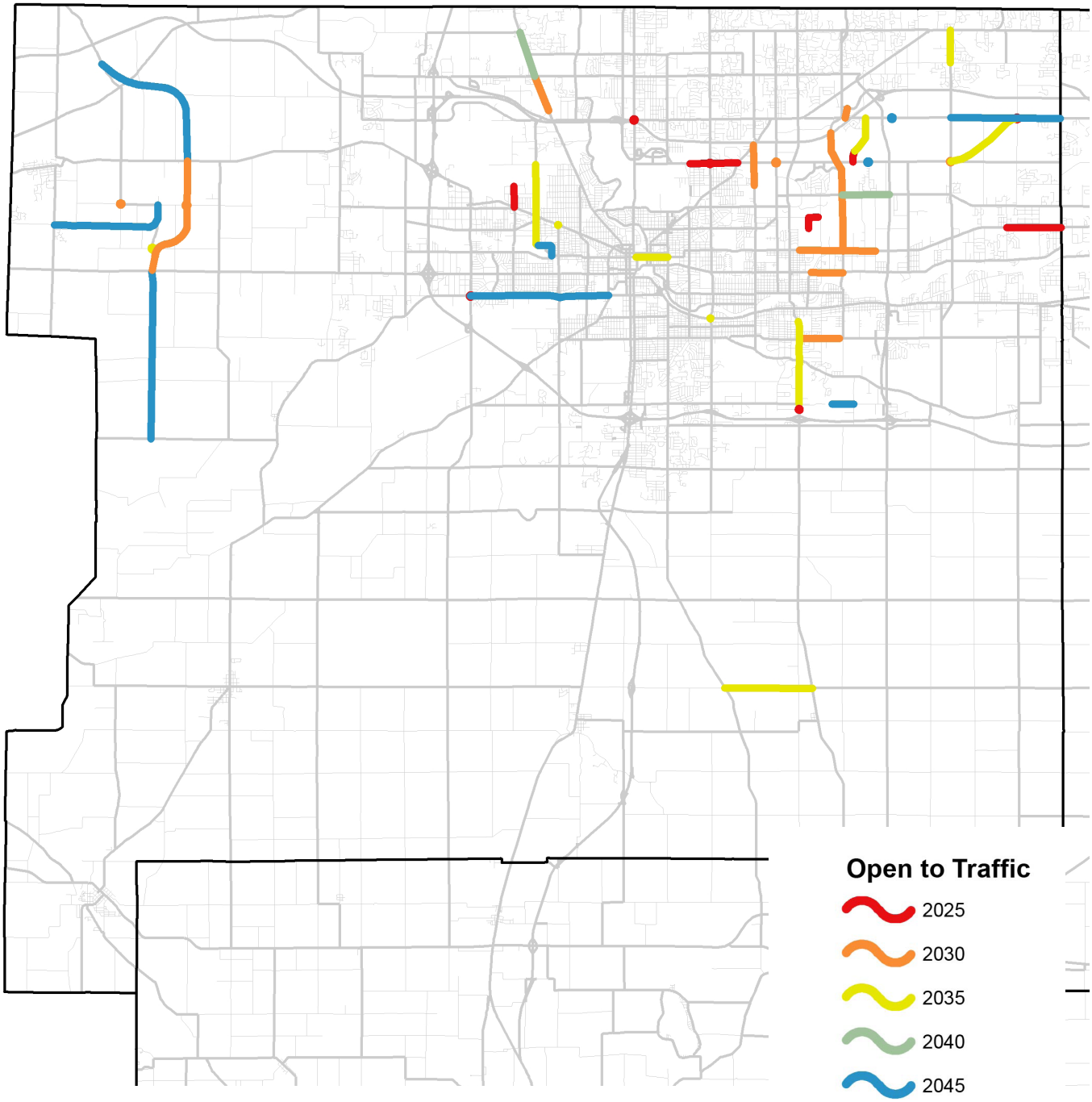


Table A-4: St. Joseph County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
INDOT	2025	SR 933	Cleveland Rd		Intersection Improvement	
INDOT	2025	SR 23	SR 933 (Main St)		Intersection Improvement	
Mishawaka	2025	Elmwood Ave	SR 331		Intersection Improvement	
Mishawaka	2025	Veteran's Pkwy	Douglas Rd	Cul de sac	New Road Construction	0.27
Mishawaka	2025	Catalpa Ave	Filbert Rd	Catalpa Ave	New Road Construction	0.30
Mishawaka	2025	Division St	Current Terminus	Catalpa Ave	New Road Construction	0.26
Mishawaka	2030	Twelfth St	Campbell St	Dodge St	Added Travel Lanes	0.86
Mishawaka	2030	Fir Rd	McKinley Ave	I-80/90	Auxiliary Lanes	2.75
Mishawaka	2030	Jefferson Blvd	Byrkit St	Cedar St	Auxiliary Lanes	0.73
Mishawaka	2030	Grape Rd	Douglas Rd		Intersection Improvement	
Mishawaka	2030	Beacon Pkwy Connector	Cleveland Rd	Beacon Pkwy	New Road Construction	0.22
Mishawaka	2030	McKinley Ave	Elder Rd	Division St	Added Travel Lanes	1.74
Mishawaka	2035	Union St	Ireland Dr	Sixth St	Added Travel Lanes	1.88
Mishawaka	2035	Lincolnway East	Ironwood Rd		Intersection Improvement	
Mishawaka	2035	Veteran's Pkwy	Cul de sac	Cleveland Rd	New Road Construction	0.84
Mishawaka	2045	Fulmer Rd	Current Terminus	Clover Rd	New Road Construction	0.49
South Bend	2025	Sample St	Mayflower Rd		Intersection Improvement	
South Bend	2025	Sheridan St	Lincolnway West	Progress Dr	Road Reconstruction	0.50
South Bend	2030	Hickory Rd	Helper St	SR 23	New Road Construction	0.85
South Bend	2035	Colfax	SR 23	Colfax Bridge	Auxiliary Lanes	0.62
South Bend	2035	Lincolnway West	Olive St		Intersection Improvement	

Table A-4: St. Joseph County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
South Bend	2035	Bendix Dr	Bertrand Rd	Lathrop Dr	Road Diet	3.07
South Bend	2045	Bertrand Rd	Meade St	Bendix Dr	Road Diet	0.34
South Bend	2045	Meade St	Orange Rd	Bertrand Rd	Road Diet	0.24
South Bend	2045	Sample St	SR 23	Mayflower Rd	Road Diet	3.16
St. Joseph County	2025	Douglas Rd	Ivy Rd	SR 23	Added Travel Lanes	1.09
St. Joseph County	2025	Mckinley Ave	Birch Rd	Ash Rd	Added Travel Lanes	1.25
St. Joseph County	2025	Douglas Rd	Ironwood Rd		Intersection Improvement	
St. Joseph County	2025	Cleveland Rd	Beech Rd		Intersection Improvement	
St. Joseph County	2025	Edison Rd	Walnut Rd		Intersection Improvement	
St. Joseph County	2030	Portage Rd	Bendix Dr	Brick Rd	Added Travel Lanes	0.84
St. Joseph County	2030	Douglas Rd	Bittersweet Rd		Intersection Improvement	
St. Joseph County	2030	Edison Rd	Smilax Rd		Intersection Improvement	
St. Joseph County	2030	Larrison Rd	Filmore Rd		Intersection Improvement	
St. Joseph County	2030	Larrison/ Snowberry Rd	SR 2	US 20	New Road Construction	2.51
St. Joseph County	2035	Bittersweet	Anderson	SR 23	Added Travel Lanes	0.75
St. Joseph County	2035	Edison Rd/ Early Rd Connector	Walnut Rd	Timothy Rd	New Road Construction	1.66
St. Joseph County	2035	Pierce Rd	Miami Rd	SR 331	New Road Construction	2.00
St. Joseph County	2040	Portage Rd	Brick Rd	Adams Rd	Added Travel Lanes	1.06
St. Joseph County	2040	Day Rd	Fir Rd	SR 331	Added Travel Lanes	1.10
St. Joseph County	2045	Cleveland Rd	Bittersweet Rd	Ash Rd	Added Travel Lanes	2.50
St. Joseph County	2045	Cleveland Rd	Canadian National		Grade Separation	

Table A-4: St. Joseph County Proposed Project List

Sponsor	Open to Traffic By	Project Route	Beginning Termini	Ending Termini	Type of Work	Length (Miles)
St. Joseph County	2045	Douglas Rd	Canadian National		Grade Separation	
St. Joseph County	2045	Douglas Rd / Cleveland Rd Connector	Beech Rd	Bittersweet Rd	New Road Construction	1.87
St. Joseph County	2045	Larrison/ Snowberry Rd	Johnson St	SR 2	New Road Construction	4.02
St. Joseph County	2045	Larrison/ Snowberry Rd	US 20	Hamilton Trl	New Road Construction	3.48

Appendix B:
Active Transportation Project List

B

MACOG finalized the Active Transportation Plan in 2016, which identified needs, resources, and strategies to increase walking abd bicycling in the MACOG region. The intent of the plan was not to secure funding - but instead using recommendation as a guide for local jurisdications when opportunities become available. During the Michiana on the Move: 2045 Transportation Plan development, additional active transportation projects were identified. Tables B-1 reflect new projects added into the Active Transportation Plan.

Figure B-1: MACOG Active Transportation Projects

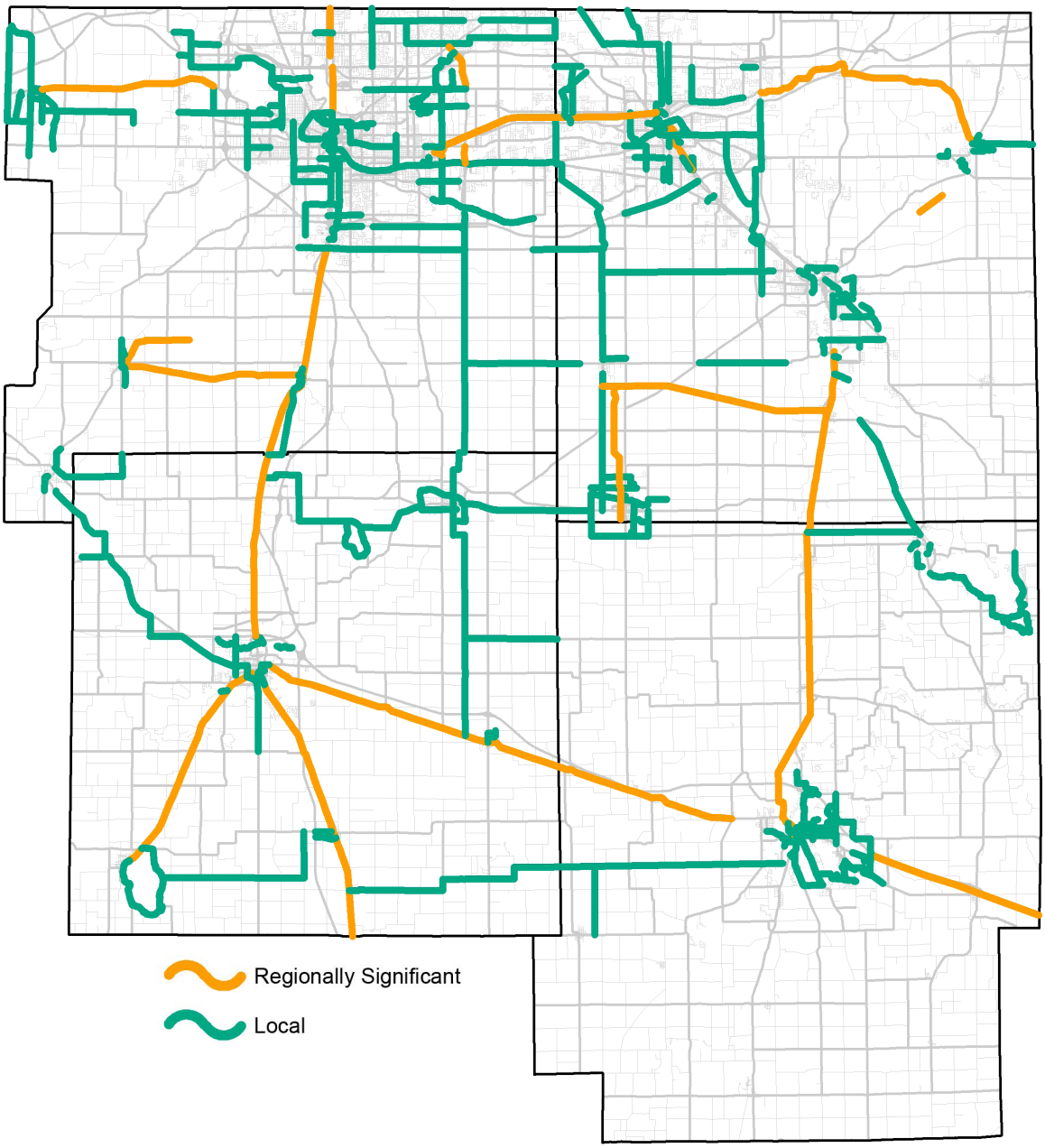


Table B-1: Newly Identified Active Transportation Projects

Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
Elkhart	Main St	Hively Ave	Lusher Ave	Multi-Use Path	High
Elkhart	Benham Ave	Mishawaka Rd (CR 20)	Hively Ave	Multi-Use Path	High
Elkhart	Goshen Ave	Jackson Blvd	Middlebury St	Multi-Use Path	Medium
Elkhart	Bristol St (CR 10)	Osolo Rd	CR 15	Multi-Use Path	Medium
Elkhart	Prairie St	Mishawaka Rd	Lusher Ave	Multi-Use Path	Low
Elkhart	Osolo Rd (CR 11)	Bristol St	CR 6	Multi-Use Path	Medium
Elkhart County	Johnson St (CR 9)	Bristol St (CR 10)	CR 4	Multi-Use Path	Medium
Elkhart County	CR 20 (Mishawaka Rd)	SR 19 (Nappanee St)	US 33	Multi-Use Path	Medium
Elkhart County	CR 6	Ash Rd	CR 10	Multi-Use Path	Medium
Elkhart County	CR 1	CR 12	CR 10	Bike Lanes	Low
Elkhart County	CR 115/ CR 13	Old CR 17	Middlebury St (CR 14)	Bike Lanes	Low
Elkhart County	CR 52	CR 101	SR 19 (Main St)	Bike Lanes	Low
Elkhart County	CR 6	CR 15	Elkhart Blvd	Multi-Use Path	Low
Elkhart County	Nappanee/ Wakarusa Trail	Chippewa Dr	CR 42	Multi-Use Path	Low
Elkhart County	Cobus Creek Trail	Old US 20	CR 6	Multi-Use Path	Low
Goshen	Lincoln Ave	Pumpkinvine Trail	Blackport Dr	Multi-Use Path	Medium
INDOT/ Elkhart County	SR 119 / CR 40	SR 19	CR 19	Multi-Use Path	Medium
Nappanee	Arnott St	Market St (US 6)	CR 52	Bike Lanes	Medium
Nappanee	Nappanee St	Indiana Ave	Chippewa Dr	Multi-Use Path	Medium
Nappanee	Jackson St	W 1350 N	Derksen Rd	Multi-Use Path	Medium
Nappanee/ Kociusko County	W 950 N	W 1350 N	US 6	Bike Lanes	Low
Wakarusa	Orchard Park Dr	CR 3	SR 19 (Nappanee Street)	Bike Lanes	Low

Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
Kosciusko County	N 700 W	W 1350 N	Market Street (US 6)	Bike Lanes	Medium
Kosciusko County	W 1350 N	N 700 W	W 950 N	Bike Lanes	Medium
Warsaw	Market St	Detroit St	Argonne Rd	Multi-Use Path	High
Warsaw	Colfax St	Market St	Sheridan St	Bike Lanes	High
Warsaw	Grant St	Market St	Sheridan St	Bike Lanes	High
Warsaw	Harrision St	Dubois Dr	Market St	Bike Lanes	High
Warsaw	Bronson St	Center St	Clark St	Bike Lanes	Medium
Warsaw	Main St	Cook St	Colfax St	Bike Lanes	Medium
Warsaw	Maple Ave	Center St	Clark St	Bike Lanes	Medium
Warsaw	Sheridan St	Cook St	Grant St	Bike Lanes	Medium
Warsaw	Sherman St	Center St	Clark St	Bike Lanes	Medium
Warsaw	Center St	Hepler Dr	Hand Ave	Multi-Use Path	Medium
Warsaw	Dubois Dr	Parker St	Harrison St	Multi-Use Path	Medium
Winona Lake	Southfield Rd	Winona Beach Dr	Dead End (Western Dr)	Bike Lanes	Medium
Winona Lake	Lake City Greenway	Roy St	Pierceton Rd	Multi-Use Path	Medium
Winona Lake	Oak St	Winona Beach Rd	Country Club Dr E	Multi-Use Path	Low
Winona Lake	Pierceton Rd	Freedom Ln	Packerton Rd	Multi-Use Path	Low
Winona Lake	Roy St/ Southfield Rd	Packerton Rd	Winona Beach Dr	Multi-Use Path	Low
Winona Lake	Winona Beach Dr	Country Club Rd	Wildwood Ln	Multi-Use Path	Low
Plymouth	Oak Dr	SR 17	US 30	Multi-Use Path	Medium
Plymouth	Schuh Canal	Michigan Rd	Race St	Multi-Use Path	Medium
Plymouth	Plymouth-Goshen Trail	Chuck Glaub Dr	Michigan Rd (SR 17)	Multi-Use Path	High

Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
Mishawaka	Cedar St	Lincolnway	Madison	Multi-Use Path	High
Mishawaka	Lincolnway East	Cedar St	Race St	Multi-Use Path	High
Mishawaka	Douglas Rd	Captial Ave	SR 23	Multi-Use Path	Low
Mishawaka	Day Rd	SR 331	Main St	Multi-Use Path	Medium
Mishawaka	Edgewater Dr	Mishawaka Ave	Cedar St	Multi-Use Path	Low
South Bend	North Shore Dr	Michigan St	Angela Blvd	Multi-Use Path	Medium
South Bend	Ireland Rd	York St	Lafayette Blvd	Multi-Use Path	Medium
South Bend	Colfax St/ Orange St	College St	Charles Martin Sr Dr	Multi-Use Path	Low
South Bend	Riverside Dr	Michigan St	Angela Blvd	Multi-Use Path	Low
St. Joseph County	Kern Rd	Elm Rd	York Rd	Multi-Use Path	Low
St. Joseph County	Pine Rd	Edison Rd	Lincolnway West	Multi-Use Path	Low
St. Joseph County	Lincolnway West	Wintergreen Rd	Pine Rd	Multi-Use Path	Low
St. Joseph County	County Parks Connector	Bendix Woods Park	Spicer Lake Park	Multi-Use Path	Medium

Figure B-2: Elkhart County Active Transportation

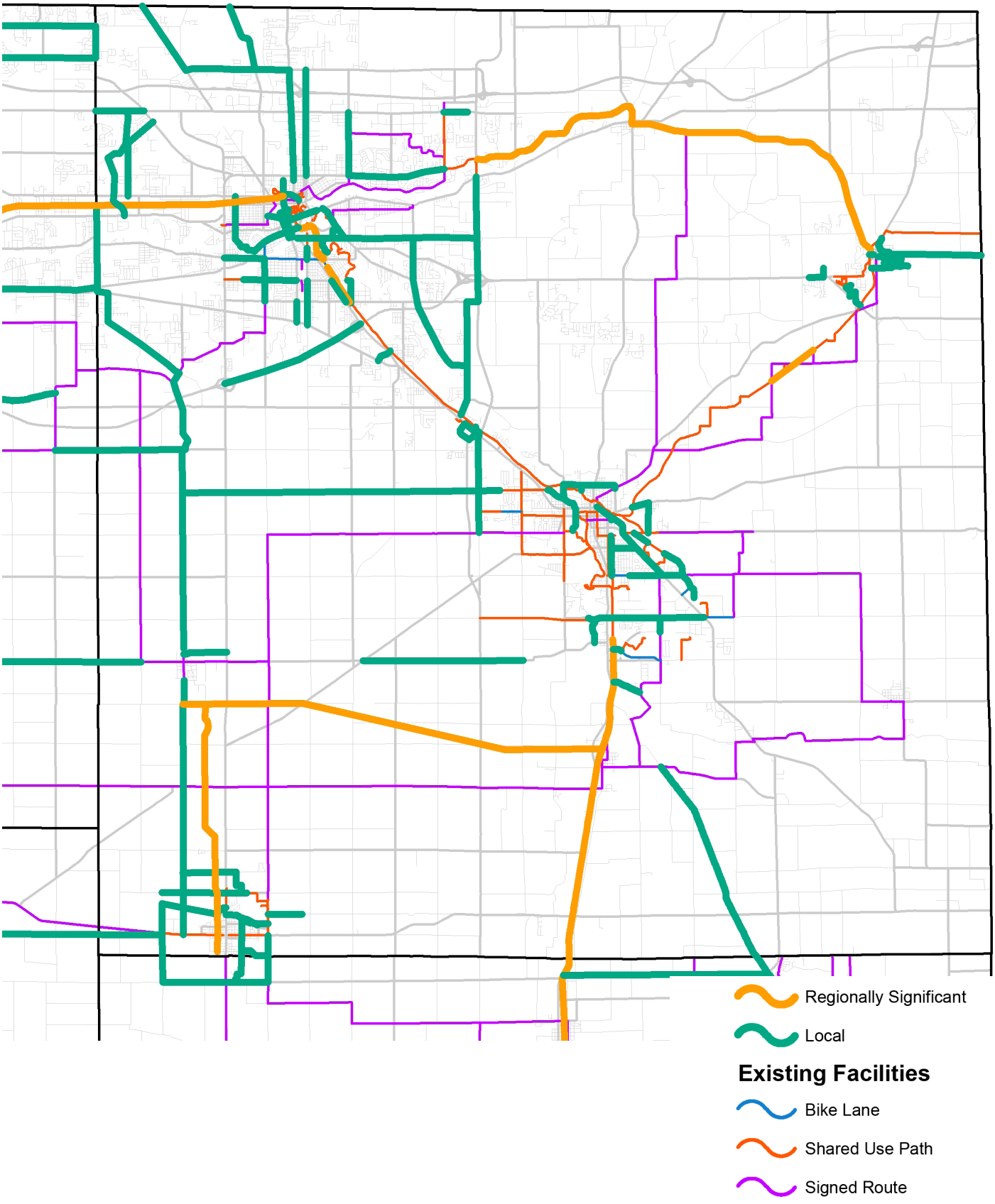


Table B-2: Elkhart County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
1	Bristol	Quaker Trace (Elkhart St)	Bristol Town Limit	Division St	Shared Use Path	High
2	Bristol	Quaker Trace (Divsion St)	Elkhart St	River Rd (CR 8)	Shared Use Path	High
3	Bristol	Quaker Trace (River Rd)	Division St	Arrowhead Dr	Shared Use Path	High
4	Elkhart	Mapleheart Connector (Princeton Blvd)	McDonald St	Indiana Ave	Shared Use Path	High
5	Elkhart	E&W Rail Trail	Main St	CR 1	Shared Use Path	High
6	Elkhart	Sycamore St	Island Park	Langle Park	Walking Path	High
7	Elkhart	Cassopolis St	Bristol St	Windsor St	Walking Path	High
8	Elkhart	Waterfall Dr	Elkhart Ave	Middlebury St	Cycle Track	High
9	Elkhart	Mapleheart Connector (Richmond St)	Middlebury St	McDonald St	Bike Lane	High
10	Elkhart	Main St	Jackson Blvd	Potawattomi Dr	Bike Lane	High
11	Elkhart	Middlebury St	Goshen Ave	Main St	Signed Route	High
12	Elkhart	Sherman St	3rd St	Riverside Dr	Signed Route	High
13	Elkhart	Franklin St	Waterfall Dr	Arcade Ave	Signed Route	High
14	Elkhart	Arcade Ave	Franklin St	West Blvd	Signed Route	High
15	Elkhart	West Blvd	Arcade Ave	Lexington Ave	Signed Route	High
16	Elkhart	West Blvd	Lexington Ave	Mishawaka Rd	Signed Route	High
17	Elkhart	Oakland Ave	Hively Ave	Indiana Ave	Signed Route	High
18	Elkhart	Eddy St	Mapleheart Greenway	Greenway Trail	Shared Use Path	Medium
19	Elkhart	Greenway Trail (Tipton St)	Existing Greenway Trail	Middlebury St	Shared Use Path	Medium
20	Elkhart	Greenway Trail (Cemetery/ Church St)	Middlebury St	Goshen Ave	Shared Use Path	Medium
21	Elkhart	Prarie St	Main St	Indiana Ave	Shared Use Path	Medium

Table B-2: Elkhart County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
22	Elkhart	Lusher Ave	17th St	Benham Ave	Shared Use Path	Medium
23	Elkhart	Middlebury St	Goshen Ave	CR 15	Shared Use Path	Medium
24	Elkhart	Park Connector	High Dive Park	Wellfield Botanic Gardens	Shared Use Path	Medium
25	Elkhart	Cassopolis St	Lawrence St	Bristol St	Walking Path	Medium
26	Elkhart	Cassopolis St	Windsor St	CR 4	Walking Path	Medium
27	Elkhart	Jackson Blvd	Waterfall Dr	Bowers Ct	Bike Lane	Medium
28	Elkhart	3rd St	Sycamore St	Division St	Bike Lane	Medium
29	Elkhart	2nd St	Jeffeson St	Division St	Bike Lane	Medium
30	Elkhart	Indiana Ave	Oakland Ave	Nappanee St	Bike Lane	Medium
31	Elkhart	Mapleheart (Sterling Ave)	Mapleheart Greenway	Ren St	Shared Use Path	Low
32	Elkhart	Middlebury St	CR 15	CR 17	Shared Use Path	Low
33	Elkhart	Main St	Potawattomi Dr	Lawrence St	Complete Street	Low
34	Elkhart County	Quaker Trace (CR 8)	Echo Ln	CR 17	Shared Use Path	In Progress
35	Elkhart County	Pumpkinvine Trail	CR 35	CR 20	Shared Use Path	In Progress
36	Elkhart County	Quaker Trace (CR 8)	Bonneyville Mill	Bristol Town Limit	Shared Use Path	High
37	Elkhart County	Quaker Trace (CR 8)	Cedar Creek Dr	Bonneyville Mill	Shared Use Path	High
38	Elkhart County	Quaker Trace (CR 8)	Arrowhead Dr	Echo Ln	Shared Use Path	High
39	Elkhart County	Pumpkinvine Trail	CR 20	CR 33	Shared Use Path	High
40	Elkhart County	Old CR 17	CR 18	CR 15	Shared Use Path	High
41	Elkhart County	E&W Rail Trail	CR 1	Ash Rd	Shared Use Path	High
42	Elkhart County	Concord Mall Dr	Mishawaka Rd	CR 45	Walking Path	High

Table B-2: Elkhart County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
43	Elkhart County	CR 3	CR 42	US 6	Wide Shoulders/ Signed Route	High
44	Elkhart County	CR 29	CR 46	Elkhart County/ Kosciusko County Line	Signed Route	High
45	Elkhart County	CR 4	Cassopolis St	CR 5	Signed Route	High
46	Elkhart County	CR 5	CR 4	Indiana State Line	Signed Route	High
47	Elkhart County	CR 7	CR 4	Indiana State Line	Signed Route	High
48	Elkhart County	CR 56	CR 101	County Line Rd	Signed Route	High
49	Elkhart County	CR 17 Bike-Ped Bridge	CR 45	Rieth Blvd	Shared Use Path	Medium
50	Elkhart County	CR 3	CR 42	Railroad St	Shared Use Path	Medium
51	Elkhart County	Wabash 4th District Railroad	CR 42	SR 15	Shared Use Path	Medium
52	Elkhart County	SR 15/Winona Railway Corridor	Winona Railway Trail Terminus	Elkhart County/ Kosciusko County Line	Shared Use Path	Medium
53	Elkhart County	CR 28	Ash Rd	CR 3	Signed Route	High
54	Elkhart County	CR 30	CR 3	Reliance Rd	Wide Shoulders/ Signed Route	High
55	Elkhart County	CR 40	Ash Rd	CR 1	Signed Route	High
56	Elkhart County	CR 17	Jackson Blvd	CR 18	Shared Use Path	Low
57	Elkhart County	CR 18	CR 17	Old CR 17	Shared Use Path	Low
58	Elkhart County	CR 16	River Park Dr	Elkhart County/ LaGrange County Line	Shared Use Path	Low
59	Elkhart County	CR 3	Wakarusa Town Limits (Wildcat Dr)	CR 24	Wide Shoulders/ Signed Route	Low
60	Elkhart County	CR 22	CR 3	CR 100	Wide Shoulders/ Signed Route	Low
61	Elkhart County	CR 100	CR 22	CR 20	Wide Shoulders/ Signed Route	Low
62	Elkhart County	CR 20	CR 100	Ash Rd	Wide Shoulders/ Signed Route	Low

Table B-2: Elkhart County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
63	Elkhart County	CR 42	Winona Railway Trail	CR 142	Signed Route	Low
64	Goshen	Northwest Trail (US 33)	Rieth Blvd	Reliance Rd	Shared Use Path	In Progress
65	Goshen	Northwest Trail (Bashor Rd)	Reliance Rd	Tanglewood Dr	Shared Use Path	In Progress
66	Goshen	NorthwestTrail (Reliance Rd)	US 33	Bashor Rd	Shared Use Path	In Progress
67	Goshen	US 33 Northern Connector	Monroe St	Main St	Shared Use Path	High
68	Goshen	Horn Ditch Trail	Fiddlers Pond Trail	Walmart	Shared Use Path	High
69	Goshen	Plymouth Ave	9th St	US 33	Shared Use Path	High
70	Goshen	9th St	Washington St	US 33 Northern Connector	Shared Use Path	High
71	Goshen	Wilden Ave	Rock Run Creek	6th St	Shared Use Path	High
72	Goshen	Waterford Mills Parkway	Regent St	Winona Railway Trail	Bike Lane	High
73	Goshen	Kercher Rd	US 33	Violet Rd	Complete Street	High
74	Goshen	US 33	College Ave	Monroe Ave	Shared Use Path	Medium
75	Goshen	9th St	College Ave	Purl St	Shared Use Path	Medium
76	Goshen	Shanklin-Mullet Trail	Existing Shanklin-Mullet Trail	Lincoln Ave	Shared Use Path	Medium
77	Goshen	Chicago Ave	Lincoln Ave	Bashor Rd	Shared Use Path	Medium
78	Goshen	Indiana Ave	Chicago Ave	Mapleheart Greenway	Shared Use Path	Medium
79	Goshen	Wilden Ave	CR 21	Rock Run Creek	Shared Use Path	Medium
80	Goshen	Fiddlers Pond Trail	Existing Fiddlers Pond Trail	Monroe Ave	Shared Use Path	Medium
81	Goshen	1st St	Wilden Ave	Mapleheart Greenway	Shared Use Path	Medium
82	Goshen	College Ave	15th St	Horn Ditch	Bike Lane	Medium
83	Goshen	Reliance Rd	Bashor Rd	Berkley Ave	Signed Route	Medium

Table B-2: Elkhart County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
84	Goshen	Dierdorff Rd	Kercher Rd	Regent St	Shared Use Path	Low
85	Goshen	Wilden Ave	6th St	Middlebury St	Shared Use Path	Low
86	Goshen	Blackport Dr	Monroe St	SR 4	Signed Route	Low
87	Goshen	Violett Rd	Kercher Rd	CR 40	Signed Route	Low
88	Middlebury	River Bend Park Trails	Warren St	River Park	Walking Path	In Progress
89	Middlebury	Quaker Trace (Bristol Ave)	Railroad St	Cedar Creek Dr	Shared Use Path	High
90	Middlebury	Warren St	River Park Dr	State St	Signed Route	High
91	Middlebury	Church St	Brown St	Pumpkinvine Trail	Signed Route	High
92	Middlebury	Spring St	Pumpkinvine Trail	End of street	Signed Route	High
93	Middlebury	Mill St	Spring St	Warren St	Signed Route	High
94	Middlebury	Lawrence St	Mill St	End of street	Signed Route	High
95	Middlebury	Essenhaus Trail	Essenhaus Trail	Pumpkinvine Trail	Shared Use Path	Medium
96	Middlebury	Old Mill Park Trail	Warren St	Warren St	Walking Path	Medium
97	Middlebury	Northridge SRTS (US 20)	Westlake Dr	Heritage Dr	Walking Path	Medium
98	Middlebury	Old Mill Park Trail	Old Mill Park Trail	York Dr (Pumpkinvine Trail)	Walking Path	Low
99	Middlebury	River Park Dr	Warren St	CR 116	Walking Path	Low
100	Nappanee	Stauffer Park Trail	Main St	Stauffer Park	Shared Use Path	High
101	Nappanee	Northside Trail	Main St	Nappanee St	Shared Use Path	High
102	Nappanee	Woodview Dr	Main St	McCormick Dr	Shared Use Path	High
103	Nappanee	Derksen Dr	Stauffer Park	Miriam Ave	Bike Lane	High
104	Nappanee	NorthWood High School Connector	CR 3	NorthWood High School	Shared Use Path	Medium

Table B-2: Elkhart County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
105	Nappanee	Northside Trail	Nappanee St	Arnott St	Shared Use Path	Medium
106	Nappanee	NorthWood School Connector	SR 19	Woodview Dr	Shared Use Path	Medium
107	Nappanee	Oakland Ave	US 6	Elkhart/Kosciusko County Line	Shared Use Path	Medium
108	Nappanee	Jackson St	US 6	Elkhart/Kosciusko County Line	Shared Use Path	Medium
109	Nappanee	Nappanee Industrial Connector	Oakland Ave	Jackson St	Shared Use Path	Medium
110	Nappanee	Nappanee St	US 6	Northside Trail	Signed Route	Medium
111	Nappanee	Northside Trail	Arnott St	Tomhawk Trail	Shared Use Path	Low
112	Nappanee	Tomahawk Trl	Northside Trail	US 6	Shared Use Path	Low
113	Nappanee	CR 54	Oakland Ave	Blackstone Blvd	Shared Use Path	Low
114	Elkhart/ St. Joseph County	Ash Rd	CR 20	Ferrettie/ Baugo Creek Park Enterence	Shared Use Path	Low
115	Elkhart/ St. Joseph County	Ash Rd	Ferrettie/ Baugo Creek Park Enterence	Elkhart & Western Railroad	Shared Use Path	Low
116	Elkhart/ St. Joseph County	Ash Rd	Adams Rd	Anderson Rd	Shared Use Path	Low

Figure B-3: Kosciusko County Active Transportation

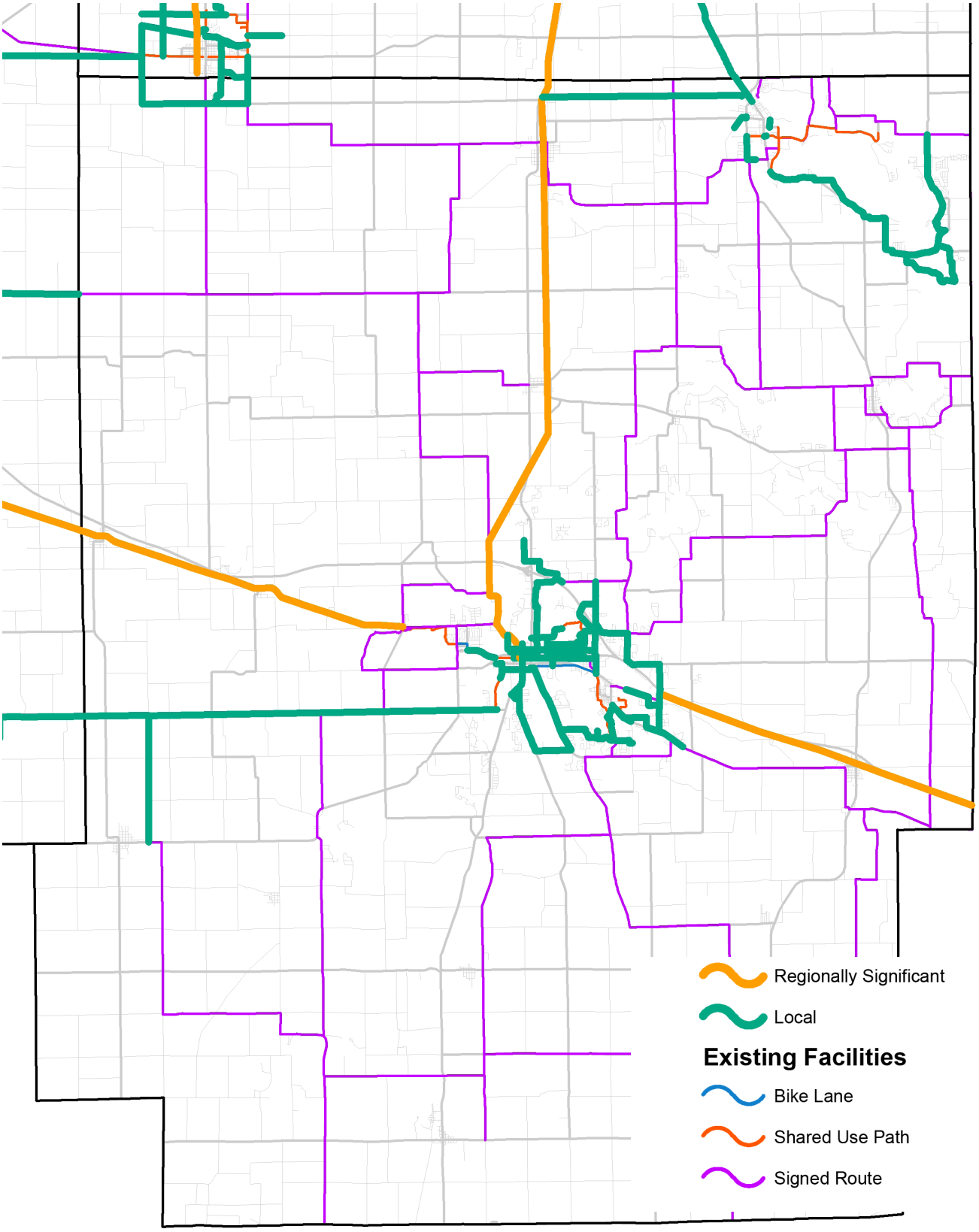


Table B-3: Kosciusko County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
117	Kosciusko County	SR 15/Winona Railway Corridor	Elkhart/Kosciusko County Line	W 300 N	Shared Use Path	High
118	Kosciusko County	W 100 S	Kosciusko/Marshall County Line	S 950 W	Signed Route	High
119	Kosciusko County	S 250 E	Sunset Dr	Old Road 30	Signed Route	High
120	Kosciusko County	Old Road 30	S 250 E	N 175 E	Signed Route	High
121	Kosciusko County	N 175 E	Old Road 30	E 75 N	Signed Route	High
122	Kosciusko County	Lincolnway	N 350 W	Kosciusko/ Marshall County Line	Shared Use Path	Medium
123	Kosciusko County	Fox Farm Rd	Lake St	US 30	Bike Lane	Medium
124	Kosciusko County	US 30/RR Corridor	S 250 E	Kosciusko/Whitley County Line	Shared Use Path	Low
362	Kosciusko County	Path Connection to Syracuse	SR 15/Winona Railway Corridor	Syracuse	Shared Use Path	Low
363	Kosciusko County	Connection from Warsaw to Mentone	Warsaw	Mentone	Complete Street	Low
125	Nappanee	Jackson St	Elkhart/Kosciusko County Line	W 1350 N	Shared Use Path	Medium
126	Nappanee	W 1350 N	SR 19	N 700 W	Shared Use Path	Low
127	Syracuse	Pickwick Dr	SR 13	Pickwick Dr	Shared Use Path	High
128	Syracuse	Syracuse Elementary SRTS	New Syracuse Elementary	Main St	Shared Use Path	High
129	Syracuse	Main St/Railroad Crossing	Railroad Ave	Boston St	Shared Use Path	High
130	Syracuse	Syracsue-Wawasee Trail (SR 13)	Harkless Dr	Grandview Dr	Shared Use Path	High
131	Syracuse	Huntington St	Elkhart/Kosciusko County Line	Main St	Signed Route	High
132	Syracuse	Syracuse Webster Rd	Pickwick Dr	E 1200 N	Shared Use Path	Low
133	Syracuse	Syracuse-Wawasee Trail (Hatchery Rd)	N 850 E	Turkey Creek Rd	Shared Use Path	Low
134	Syracuse	Syracuse-Wawasee Trail (Hatchery Rd)	N 800 E	N 850 E	Shared Use Path	Low

Table B-3: Kosciusko County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
135	Syracuse	Syracuse-Wawasee Trail (Vawter Park Rd)	Southshore Dr	N 800 E	Shared Use Path	Low
136	Syracuse	Syracuse-Wawasee Trail (Southshore Dr)	Grandview Dr	Vawter Park Rd	Shared Use Path	Low
137	Syracuse	Syracuse-Wawasee Trail (N 800 E)	Vawter Park Rd	Hatchery Rd	Shared Use Path	Low
138	Syracuse	Syracuse-Wawasee Trail (N 850 E)	Hatchery Rd	Koher Rd	Shared Use Path	Low
139	Syracuse	Syracuse-Wawasee Trail (Koher Rd)	N 850 E	E 1000 N	Shared Use Path	Low
140	Syracuse	Syracuse-Wawasee Trail (E 1000 N)	Koher Rd	Turkey Creek Rd	Shared Use Path	Low
141	Syracuse	Syracuse-Wawasee Trail (Turkey Creek Rd)	Hatchery Rd	Buttermilk Dr	Shared Use Path	Low
142	Syracuse	Syracuse-Wawasee Trail (Eastern Trail)	Turkey Creek Rd	E 1250 N	Shared Use Path	Low
143	Syracuse	E 1200 N	Syracuse Webster Rd	Brook Pointe Inn	Shared Use Path	Low
144	Syracuse	Front St	Railroad	Chicago St	Walking Path	Low
145	Warsaw	County Farm Rd	W 200 S	SR 15	Shared Use Path	High
146	Warsaw	SR 15	Kincaid St	Herscher Dr	Shared Use Path	High
147	Warsaw	Silveus Crossing	US 30	W 300 N	Shared Use Path	High
148	Warsaw	Shelden St	W 300 N	W 250 N	Shared Use Path	High
149	Warsaw	Herscher Dr	Ranch Rd	SR 15	Walking Path	High
150	Warsaw	Center St	Columbia St	Detroit Street	Cycle Track	High
151	Warsaw	E 200 N	Sunset Dr	US 30	Signed Route	High
152	Warsaw	Husky Trl	Mariner Dr	E 200 N	Complete Street	High
153	Warsaw	SR 15	Kincade St	Winona Ave	Shared Use Path	Medium
154	Warsaw	Logan St	Current Trail	Winona Ave	Shared Use Path	Medium

Table B-3: Kosciusko County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
155	Warsaw	Market St	Detriot St	Bronson St	Shared Use Path	Medium
156	Warsaw	Country Club Rd	Smith St	E 200 S	Shared Use Path	Medium
157	Warsaw	Buffalo St	Center Lake	Winona Ave	Bike Lane	Medium
158	Warsaw	Lake St	Market St	Fox Farm Rd	Bike Lane	Medium
159	Warsaw	W 250 N	Shelden St	Rainbow Dr	Signed Route	Medium
160	Warsaw	Rainbow Dr/Bell Dr	E 250 N	Biomet Dr	Signed Route	Medium
161	Warsaw	Biomet Dr	E 200 N	Bell Dr	Signed Route	Medium
162	Warsaw	Harrison St	Market St	Dubois Dr	Shared Use Path	Low
163	Warsaw	Dubois Dr	Harrison St	Parker St	Shared Use Path	Low
164	Warsaw	Arthur St	Detriot St	Beyer Farm Trail	Shared Use Path	Low
165	Warsaw	Springhill Rd	Provident Dr	Northpoint Dr	Shared Use Path	Low
166	Warsaw	Provident Dr	Dubois Dr	Springhill Rd	Shared Use Path	Low
167	Warsaw	Parker St	Dubois St	Husky Trl	Shared Use Path	Low
168	Warsaw	North Point Dr	Mariner Dr	Husky Trl	Shared Use Path	Low
169	Warsaw	E 200 S	Country Farm Rd	Country Club Rd	Shared Use Path	Low
170	Warsaw	West St	Lake St	Ft Wayne St	Bike Lane	Low
171	Warsaw	Ft Wayne St	West St	Lincoln St	Bike Lane	Low
172	Warsaw	Main St	Union St	Huron St	Bike Lane	Low
173	Warsaw	Prarie St	Logan St	Smith St	Bike Lane	Low
174	Warsaw	Park St	Market St	Anchorage Rd	Bike Lane	Low
175	Warsaw	Cook St	Main St	Arthur St	Bike Lane	Low

Table B-3: Kosciusko County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
176	Warsaw	Sheridan St	Cook St	Harrison St	Bike Lane	Low
177	Warsaw	Ft Wayne St	Lincoln St	Parker St	Bike Lane	Low
178	Warsaw	Parker St	Center St	Dubois Dr	Bike Lane	Low
179	Warsaw	Lincoln St	Market St	Beyer Farm Trail	Bike Lane	Low
180	Warsaw	Argonne Rd	Center St	Winona Ave	Bike Lane	Low
181	Warsaw	Scott St	Smith St	Sheridan St	Bike Lane	Low
182	Warsaw	Husky Trl/Patterson Rd	N 175 E	Mariner Dr	Complete Street	Low
183	Winona Lake	Heritage Trail (Pierceton Rd)	Miller Field Park	Stonehenge Golf Club	Shared Use Path	High
184	Winona Lake	Jefferson SRTS (Wooster Rd)	Jefferson Elementary School	S 250 E	Shared Use Path	Medium
185	Winona Lake	Heritage Trail (S 250 E)	Lakeland Christian Academy	Pierceton Rd	Shared Use Path	Medium

Figure B-4: Marshall County Active Transportation

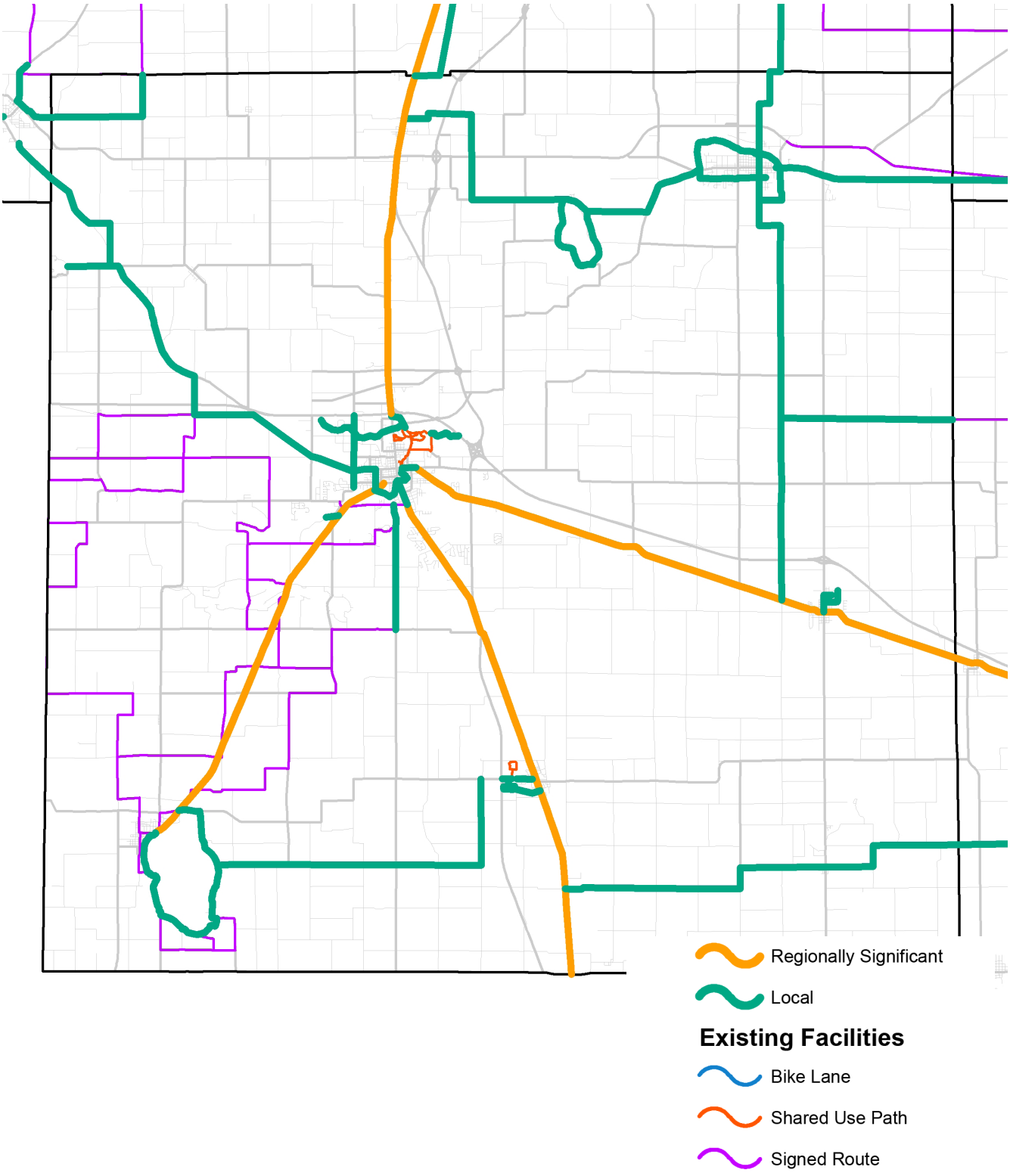


Table B-4: Marshall County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
186	Argos	Indiana Ave	US 31	Argos Community Park	Shared Use Path	High
187	Argos	Pond Trail	Indiana Ave	Indiana Ave	Shared Use Path	Medium
188	Argos	Indiana Ave	Argos Community Park	1st St	Shared Use Path	Medium
189	Argos	Railroad Trail	Kenilworth Rd	Michigan St	Shared Use Path	Low
190	Bourbon	Florence St	Thompson St	Triton Elementary School	Shared Use Path	High
191	Bourbon	Thompson St	Florence St	Center St	Complete Street	Medium
192	Bourbon	Liberty Ave/Triton Ave	Thompson St	Shaffer Rd	Shared Use Path	Low
193	Bremen	Grant St	Sunnyside Park	Yellow River	Shared Use Path	High
194	Bremen	Bremen Greenway	Yellow River Greenway	Plymouth St	Shared Use Path	Medium
195	Bremen	Woodies Ln	Plymouth St	3rd Rd	Bike Lane	Medium
196	Bremen	Center St	4th St	3rd Rd	Signed Route	High
197	Bremen	3rd Rd	Elm Rd	Woodies Ln	Signed Route	Medium
198	Bremen	Yellow River Greenway	Grant St	Bremen Greeway	Shared Use Path	Low
199	Culver	Lake Maxinkuckee Trail	Culver	Culver	Shared Use Path	High
200	Marshall County	Abandoned Rail	Culver	Plymouth	Shared Use Path	High
201	Marshall County	Michigan Rd/Old 31	Marshall/St. Joseph County Line	US 30	Shared Use Path	High
202	Marshall County	Muckshaw Rd	Oakhill Ave	13th Rd	Wide Shoulders/ Signed Route	High
203	Marshall County	Lincolnway	Kosciusko/ Marshall County Line	Plymouth City Limits	Signed Route	High
204	Marshall County	Michigan Road	US 31	Marshall County/ Fulton County Line	Signed Route	High
205	Marshall County	Michigan Rd	US 31	Eastwood Dr	Signed Route	High

Table B-4: Marshall County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
206	Marshall County	19th Rd	Michigan Rd	Fir Rd	Signed Route	High
207	Marshall County	Fir Rd	19th Rd	18b Rd	Signed Route	High
208	Marshall County	18b Rd	Fir Rd	Cedar Rd	Signed Route	High
209	Marshall County	Cedar Rd	18b Rd	18th	Signed Route	High
210	Marshall County	18th Rd	Cedar Rd	Kosciusko/ Marshall County Line	Signed Route	High
211	Marshall County	Elm Rd	Lincolnway	3rd Rd	Signed Route	High
212	Marshall County	8th Rd	Elm Rd	County Line Rd	Signed Route	High
213	Marshall County	2b Rd	County Line Rd	Bremen Town Limits	Signed Route	High
214	Marshall County	3rd Rd/N Shore Dr	Plymouth Goshen Trl	Linden Rd	Signed Route	High
215	Marshall County	Plymouth Goshen Trl	Plymouth St	3a Rd	Signed Route	High
216	Marshall County	Linden Rd	3rd Rd	1st Rd	Signed Route	High
217	Marshall County	1st Rd	Linden Rd	Michigan Rd	Signed Route	High
218	Marshall County	Lake of the Woods	3rd Rd	3rd Rd	Signed Route	High
219	Marshall County	Lincolnway	Rose Rd	Lincolnway	Signed Route	High
220	Marshall County	Rose Rd	Lincolnway	Plymouth LaPorte Trl	Signed Route	High
221	Marshall County	Plymouth LaPorte Trl	Rose Rd	4b Rd	Signed Route	High
222	Marshall County	4b Rd	Plymouth LaPorte Trl	Koontz Lake	Signed Route	High
223	Marshall County	Thorn Rd	4b Rd	3b Rd	Signed Route	High
224	Marshall County	3b Rd	Thorn Rd	Plymouth LaPorte Trl	Signed Route	High
225	Marshall County	Plymouth LaPorte Trl	3b Rd	County Line Rd	Signed Route	High

Table B-4: Marshall County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
226	Marshall County	Linden Rd	SR 10	18b Rd	Signed Route	High
227	Marshall County	18b Rd	Linden Rd	Shore Dr	Signed Route	High
228	Marshall County	1st Rd	Tamarack Rd	County Line Rd	Signed Route	High
229	Marshall County	Tamarack Rd	County Line Rd	1st Rd	Signed Route	High
230	Marshall County	Lincolnway	Lincolnway	Plymouth City Limits	Signed Route	High
231	Marshall County	Elm Rd	Tyler Rd	4th St	Signed Route	High
232	Marshall County	US 31/Michigan Rd	13th Rd	Michigan Rd	Shared Use Path	Medium
233	Plymouth	Plymouth Greenway	Jefferson St	5th St	Shared Use Path	High
234	Plymouth	Lincolnway	Plymouth City Limits	Jefferson St	Signed Route	High
235	Plymouth	Michigan Rd	Eastwood Dr	Oakhill Ave	Signed Route	High
236	Plymouth	Lincolnway/ Jefferson St	Plymouth City Limits	5th St	Signed Route	High
237	Plymouth	5th St	Jefferson St	Cromer St	Signed Route	High
238	Plymouth	Plymouth Greenway	Existing Greenway	US 30	Shared Use Path	Medium
239	Plymouth	Jefferson St	Plymouth Greenway Crossing	Lincolnway	Bike Lane	Medium
240	Plymouth	Michigan St	Pennsylvania Ave	Oakhill Ave	Signed Route	Medium
241	Plymouth	Plymouth Greenway	Dixon Lake	Railroad Trail	Shared Use Path	Low
242	Plymouth	Greenway-Michigan Rd Connector	Existing Greenway	Michigan Rd	Shared Use Path	Low

Figure B-5: St. Joseph County Active Transportation

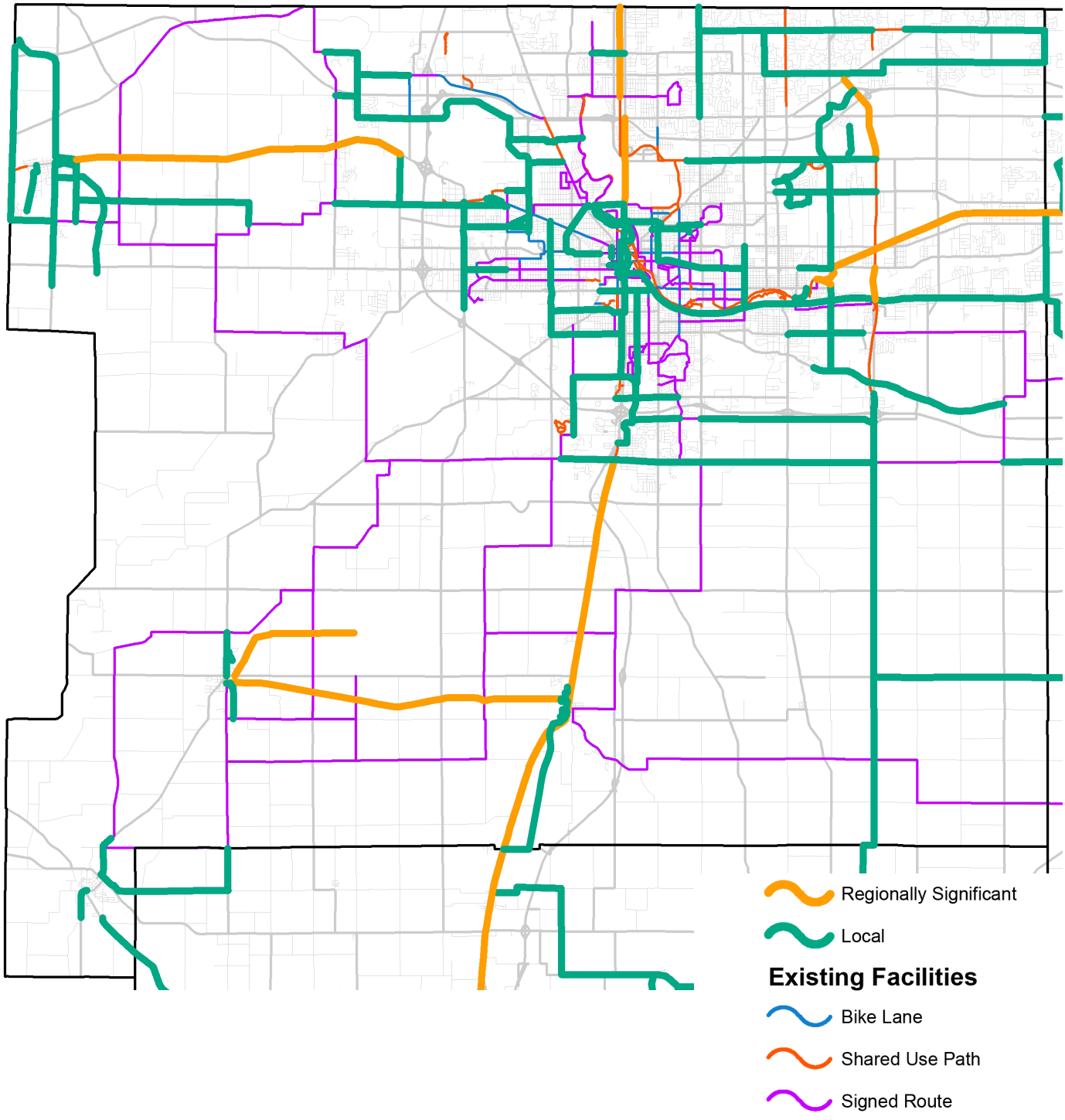


Table B-5: St. Joseph County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
243	Lakeville	Motts Alley	Michigan Rd	Wilson Dr	Shared Use Path	High
244	Lakeville	Wetland Walkway			Walking Path	High
245	Lakeville	Abandoned Railroad Corridor	Michigan Rd	LaVille Schools	Shared Use Path	Medium
246	Lakeville	Wilson Dr	Motts Alley	Mangus St	Shared Use Path	Medium
247	Lakeville	Newton Park Trail	Wilson Dr	Newton Park	Shared Use Path	Low
248	Mishawaka	Beacon Parkway	Capital Ave	Fir Rd	Shared Use Path	In progress
249	Mishawaka	Douglas Rd	Fir Rd	Capital Ave	Shared Use Path	High
250	Mishawaka	Juday Creek Golf Course Trail	Douglas Rd	Lindy Dr	Shared Use Path	High
251	Mishawaka	12th St	Union St	Downey Ave	Shared Use Path	High
252	Mishawaka	Capital Ave	Lincolnway	Jefferson Blvd	Shared Use Path	High
253	Mishawaka	Jefferson Blvd	Byrkit St	Cedar St	Walking Path	High
254	Mishawaka	Fir Rd/Byrkit Ave	Beacon Pkwy	Jefferson Blvd	Shared Use Path	Medium
255	Mishawaka	Byrkit Ave	Prospect Dr	Dragoon Trl	Shared Use Path	Medium
256	Mishawaka	Byrkit Ave Pedestrian Bridge	Jefferson Blvd	Prospect Dr	Shared Use Path	Medium
257	Mishawaka	Prospect Dr	Merrifield Park	Byrkit Ave	Shared Use Path	Medium
258	Mishawaka	Holy Cross Pkwy	Trinity Place	Edison Lakes Pkwy	Shared Use Path	Medium
259	Mishawaka	Juday Creek Trail	Edison Lakes Pkwy	Main St	Shared Use Path	Medium
260	Mishawaka	Edison Lake Pkwy	Holy Cross Pkwy	Park Place	Shared Use Path	Medium
261	Mishawaka	Park Place	Edison Lakes Pkwy	Filbert Rd	Shared Use Path	Medium
262	Mishawaka	Filbert Rd	Park Place	Day Rd	Shared Use Path	Medium
263	Mishawaka	Day Rd	Edison Lakes Pkwy	Fir Rd	Shared Use Path	Medium

Table B-5: St. Joseph County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
264	Mishawaka	Dragoon Trl	Blair Hills Ave	Clover Rd	Shared Use Path	Medium
265	Mishawaka	Lincolnway	Ironwood Dr	Capital Ave	Complete Street	Low
266	Mishawaka	Lincolnway	Capital Ave	Mishawaka City Limits	Complete Street	Low
267	New Carlisle	College St	Lincolnway	Bourissa Hills Park	Walking Path	High
268	New Carlisle	County Line Rd	Early Rd	Spicer Lake	Wide Shoulders/ Signed Route	High
269	New Carlisle	Dunn Rd	Race St	Wintergreen Rd	Signed Route	High
270	New Carlisle	Bourissa Hills Park Trail Connector	Bourissa Hills Park	Woodmont Ridge Dr	Shared Use Path	Medium
271	New Carlisle	Timothy Rd	Lincolnway	Bendix Woods	Wide Shoulders/ Signed Route	Medium
272	New Carlisle	Trail	Race St	Wintergreen Rd	Shared Use Path	Low
273	North Liberty	Potato Creek State Park Trail	North Liberty	Potato Creek State Park	Shared Use Path	In progress
274	North Liberty	Tamarack Trail	Quinn Rd	Main St	Shared Use Path	In progress
275	North Liberty	Safe Routes to School	School Dr	Wrenwood Dr	Shared Use Path	In progress
276	North Liberty	SR 23	Osborne Rd	SR 4	Signed Route	High
277	South Bend	Coal Line Phase I	Lincolnway	Riverside Dr	Shared Use Path	In progress
278	South Bend	Michigan St	Marion St	Bartlet St	Shared Use Path	In progress
279	South Bend	Coal Line Trail Ph II	Riverside Dr	Michigan Rd	Shared Use Path	In progress
280	South Bend	Boland Dr	Portage Ave	Riverside Dr	Shared Use Path	In progress
281	South Bend	St. Joseph St/ Michigan St	Jefferson Blvd	Marion St	Cycle Track	In progress
282	South Bend	Michigan St	Jefferson Blvd	Broadway St	Bike Lane	In progress
283	South Bend	Main St	Marion St	South St	Bike Lane	In progress

Table B-5: St. Joseph County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
284	South Bend	Lafayette Blvd	Riverside Dr	North Shore Dr	Shared Use Path	High
285	South Bend	Jefferson Blvd	Eddy St	Logan St	Bike Lane	High
286	South Bend	Ardmore Trl	Sheriden St	Bendix Dr	Complete Street	High
287	South Bend	Chippewa Ave	Gertude St	Fellows St	Complete Street	High
288	South Bend	Jackson Rd	York Rd	Fellows St	Complete Street	High
289	South Bend	Olive St	Ewing Ave	Ford St	Complete Street	High
290	South Bend	Ewing St	Olive St	Main St	Complete Street	High
291	South Bend	Eddy St	Chalfant St	Jefferson Blvd	Complete Street	High
292	South Bend	Corby Blvd	Twykenham Dr	Ironwood Dr	Complete Street	High
293	South Bend	Riverside Dr	Michigan St	Michigan St	Shared Use Path	Medium
294	South Bend	Riverside Dr	Michigan St	Lafayette Blvd	Shared Use Path	Medium
295	South Bend	Michigan Rd	Angela Blvd	Cleveland Rd	Shared Use Path	Medium
296	South Bend	Indiana Ave/Railroad	Olive	Main St	Shared Use Path	Medium
297	South Bend	Main St	Chippewa Ave	Indiana Ave	Shared Use Path	Medium
298	South Bend	Indiana Ave/ Michigan St	Main St	Broadway St	Shared Use Path	Medium
299	South Bend	Wayne St	Michigan St	Taylor St	Complete Street	Medium
300	South Bend	Western Ave	St. Joseph St	Lafayette Blvd	Complete Street	Medium
301	South Bend	Monroe St/ Lincolnway	Lafayette Blvd	Bronson St	Complete Street	Medium
302	South Bend	Lincolnway West	Maplewood Ave	Lexington Ave/ Airport Blvd	Complete Street	Medium
303	South Bend	William St	Lincolnway	Washington St	Complete Street	Medium
304	South Bend	Michigan St	North Shore Dr	Angela Blvd	Complete Street	Medium

Table B-5: St. Joseph County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
305	South Bend	Olive St	Ford St	Western Ave	Complete Street	Medium
306	South Bend	Sample St	SR 23	Lafayette Blvd	Complete Street	Medium
307	South Bend	Railroad (Bendix Dr)	Westmore St	Nimtz Pkwy	Shared Use Path	Low
308	South Bend	Lathrop St	Bendix Dr	Portage Ave	Shared Use Path	Low
309	South Bend	Boland Dr	Portage Ave	Railroad (Bendix Dr) Trail	Shared Use Path	Low
310	South Bend	Fellows St	Sample St	Ireland Rd	Complete Street	Low
311	South Bend	Fellows St	Ireland Rd	Jackson Rd	Complete Street	Low
312	South Bend	Mayflower Rd	Dogwood Dr	Lincolnway	Complete Street	Low
313	South Bend	Olive St	Western Ave	Lincolnway	Complete Street	Low
314	South Bend	Howard St	North Shore Dr	SR 23	Complete Street	Low
315	South Bend	Campeau St	South Bend Ave	Rockne Dr	Complete Street	Low
316	South Bend	Sample St	Lafayette Blvd	High St	Complete Street	Low
317	South Bend	Western Ave	Sheriden St	Mayflower Rd	Complete Street	Low
318	South Bend	Voorde Dr	Sheriden St	Bendix Dr	Complete Street	Low
319	South Bend	Prast Blvd	Ardmore Trl	Bendix Dr	Complete Street	Low
320	South Bend	Nimtz Pkwy	Railroad (Bendix Dr) Trail	Olive Rd	Complete Street	Low
321	South Bend	Lincolnway	Bronson St	Ironwood Dr	Complete Street	Low
322	South Bend/ Mishawaka	Logan St	Bethel College	Northside Blvd/ Wilson Blvd	Complete Street	Low
323	St. Joseph County	Auten Rd	SR 933	Laurel Rd	Shared Use Path	In progress
324	St. Joseph County	La Salle Trail	Darden	State Line Rd	Shared Use Path	In progress
325	St. Joseph County	Old US 31/Michigan Rd	Marshall/St. Joseph County Line	Kern Rd	Shared Use Path	High

Table B-5: St. Joseph County Proposed Project List

ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
326	St. Joseph County	E&W Rail Trail	Elkhart/St. Joseph County Line	Fir Rd	Shared Use Path	High
327	St. Joseph County	Capital Ave	SR 23	Douglas Rd	Shared Use Path	High
328	St. Joseph County	Kern Rd	Lilac Rd	York Rd	Signed Route	High
329	St. Joseph County	Walkerton Trl	Marshall/St. Joseph County Line	Walkerton Town Limits	Signed Route	High
330	St. Joseph County	Dragoon Trl	Clover Rd	Beech Rd	Signed Route	High
331	St. Joseph County	Elm Rd	Ireland Rd	Tyler Rd	Signed Route	High
332	St. Joseph County	Jackson Rd	Ironwood Rd	Elm Rd	Signed Route	High
333	St. Joseph County	Edison Rd	Quince Rd	Sheridan St	Signed Route	High
334	St. Joseph County	Ardmore Trl	Mayflower Rd	Sheridan St	Signed Route	High
335	St. Joseph County	Old Cleveland Rd	Olive Rd	Primrose Rd	Signed Route	High
336	St. Joseph County	Primrose Rd	Old Cleveland Rd	Auten Rd	Signed Route	High
337	St. Joseph County	Auten Rd	Primrose Rd	Quince Rd	Signed Route	High
338	St. Joseph County	Darden Rd	Primrose Rd	Quince Rd	Signed Route	High
339	St. Joseph County	Brick Rd	Olive Rd	Primrose Rd	Signed Route	High
340	St. Joseph County	Linden Rd	Chippewa Ave	Johnson Rd	Signed Route	High
341	St. Joseph County	Dice St	Michigan Rd	St. Joseph St	Signed Route	High
342	St. Joseph County	St. Joseph St	Dice St	Ruth Ave	Signed Route	High
343	St. Joseph County	Ruth Ave	St. Joseph St	Carroll St	Signed Route	High
344	St. Joseph County	Carroll St	Ruth Ave	Jackson Rd	Signed Route	High
345	St. Joseph County	Wintergreen Rd	Dunn Rd	Early Rd	Signed Route	High

Table B-5: St. Joseph County Proposed Project List

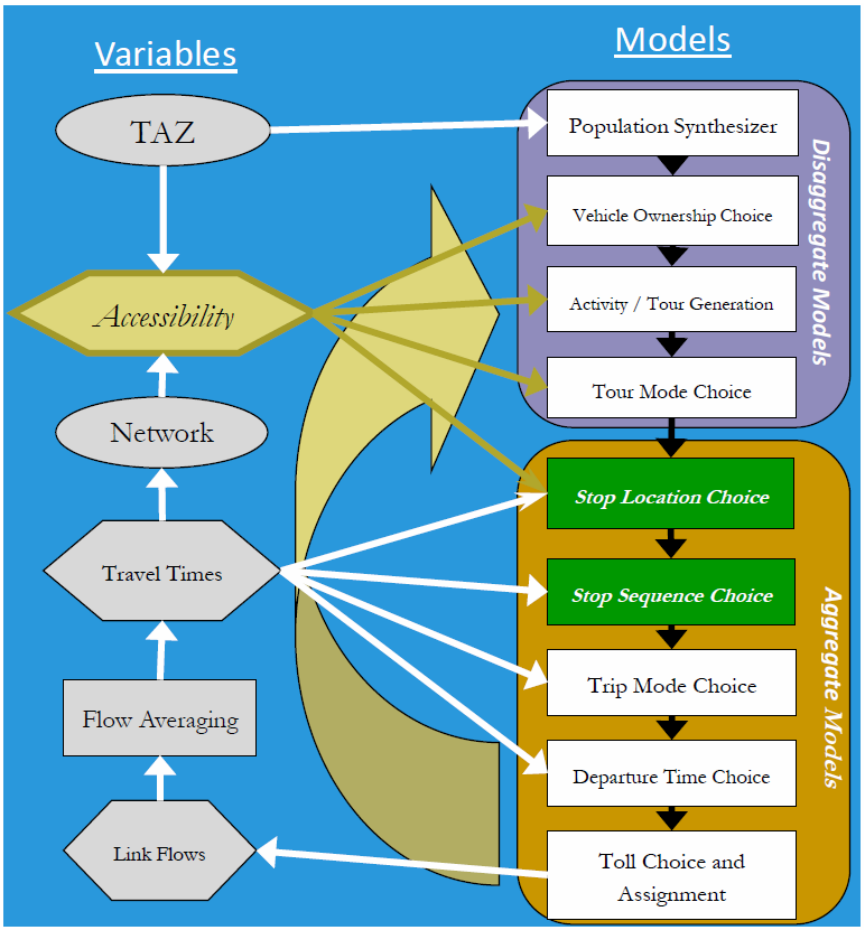
ID	Sponsor	Project Name	Beginning Termini	Ending Termini	Type	Priority
346	St. Joseph County	Sage Rd	Early Rd	Edison Rd	Signed Route	High
347	St. Joseph County	Edison Rd	Sage Rd	Wintergreen Rd	Signed Route	High
348	St. Joseph County	Early Rd	Timothy Rd	County Line Rd	Signed Route	High
349	St. Joseph County	Kern Rd	Beech Rd	Ash Rd	Signed Route	High
350	St. Joseph County	Pierce Rd	Elm Rd	Ash Rd	Signed Route	High
351	St. Joseph County	4th District of the Wabash RR Trail	North Liberty	Lakeville	Shared Use Path	Medium
352	St. Joseph County	Douglas Rd	Twykenham Dr	SR 23	Shared Use Path	Medium
353	St. Joseph County	Adams Rd	Ironwood Rd	Elm Rd	Shared Use Path	Low
354	St. Joseph County	Brick Rd/Anderson Rd	Grape Rd	Ash Rd	Shared Use Path	Low
355	St. Joseph County	Adams Rd	Bittersweet Rd	Ash Rd	Shared Use Path	Low
356	St. Joseph County	Grape Rd	Brick Rd	Adams Rd	Shared Use Path	Low
357	St. Joseph County	Lincolnway	Mishawaka City Limits	Ash Rd	Complete Street	Low
361	St. Joseph County	Ironwood Rd	Cleveland Rd	State Line Rd	Shared Use Path	Low
358	Walkerton	SR 23	Harrison St	Walnut Crossing Dr	Walking Path	High
359	Walkerton	Harrison St/ Underwood Rd	County Line Rd	SR 23	Signed Route	High
360	Walkerton	SR 23	Walkerton Trl	Walkerton Town Limits	Walking Path	Medium

Appendix C:
Modeling Process

C

Travel demand forecasting models (TDMs) are a major analysis tool for the development of long-range transportation plans. These mathematical models are designed to calculate the number of trips, connect their origins and destinations, forecast the mode of travel, and identify the roadways or transit routes most likely to be used in completing a trip. Models are used to determine where future transportation problems are likely to occur, as indicated by modeled roadway congestion. Once identified, the model can test the ability of roadway and transit system improvements to address those problems.

Figure C-1: The MACOG Hybrid Model Design



Source: MACOG Travel Model: Model Development and Validation Report

For the 2045 Transportation Plan, in coordination with the Michigan Department of Transportation (MDOT) and the Southwest Michigan Planning Commission (SWMPC), MACOG contracted with Resource Systems Group (RSG) to expand the travel demand forecasting model into Niles, Michigan to the north of the urbanized area as well as the rural counties of Kosciusko and Marshall County to the south. A hybrid model, blending aspects of traditional four-step models and activity-based models, the model can be described as trip-based, as it produces aggregate trip table matrices of trips between origins and destinations rather than disaggregate records detailing individual travelers' activities. However, it can also be described as tour-based since the travel patterns predicted can be mathematically proven to be consistent with tours and all travel is segmented within the model by types of tours, eliminating the non-home-based trips problematic in traditional four-step models.

Unlike traditional four-step models which are entirely aggregate and activity-based models which are entirely disaggregated, the hybrid model includes both aggregate and disaggregate component models. Despite the inclusion of disaggregate choice models, there are no random number draws or Monte Carlo simulations included in the TDM. As a result, the model results are reproducible, unlike the results of activity-based or other simulation models. Any difference between two model runs is directly attributable to differences in their inputs as with traditional trip-based models. Whereas, in simulation models, multiple model runs are necessary when comparing alternatives to ensure that the difference between model runs results from differences in the alternative inputs rather than from differences in the random numbers drawn for each run.

Significant elements of the TDM are as follows:

Socioeconomic Inputs

HELPViz Land Use Model

HELPViz was developed by RSG as part of the Sustainable Evansville Area Coalition's Regional Plan for Sustainable Development. Using the Land-Based Classification System's activity-based codes, local 2002 aerial photography and 2013 oblique photography was used to describe land use changes in Elkhart and St. Joseph County over a 10-year period which was then used to adapt HELPViz to the area.

This land use model offers sensitivity to land use zoning, building codes and infrastructure facilities such as the transportation network, water and sewer utilities. HELPViz allocates the future population and employment regional totals to the TAZs based on build out capacities, the transportation network and infrastructure facilities. HELPViz uses a Nested Logit model framework and uses information at both TAZ and parcel levels.

Michigan Population Forecasts

Travel demand models are driven, in part, by the relationship of land use activities and characteristics of the transportation network. Inputs to the modeling process include the number of households, population in the households, vehicles, and employment located in a given TAZ.

The collection and verification of the socioeconomic data for the Michigan portion of the model was a collaborative effort between SWMPC, their committee members, and MDOT. Household, population, and employment data from the 2010 U.S. Census, the 2015 American Community Survey, Claritas and Hoovers employment databases was presented to SWMPC's Technical Advisory and Policy Committees. They were asked to provide detailed information about new development and where employers or population had been lost. The revised data was included in the travel demand model.

Kosciusko and Marshall County Demographics

Future population and employment growth in Kosciusko and Marshall County was based on a methodology used by the Hillsborough County Metropolitan Planning Organization in Florida. Local control totals based on Census counts were used to distribute growth to urban cores and areas of influence surrounding the various cities and towns while limiting overall growth to independent county control totals established using Woods and Poole data. This includes the average household income, average students per household, and average workers per household by horizon year.

The allocation methodology for population and employment to vacant developable lands was accomplished using a multi-step process that culminated in the allocation of growth based on the results of a gravity model. The gravity model distributes growth based on the attractiveness of a census block multiplied by the attractiveness of an activity centroid divided by the square of the distance between the two.

Using feedback from stakeholders that was digitized using a 500' grid, a residential density value was assigned to each square. Based on the density value of each grid, a priority would be assigned to the square from 1-3. This value, aggregated to the Census Block level, is the basis for the attractiveness score of the Census Block.

Population Synthesis

The TDM generates a disaggregate synthetic population of households based on the supplied demographic information associated with the traffic analysis zones. For each zone, individual households are created. Each household has a total number of persons, workers, students, and a binary variable indicating whether any of the household members is over the age of 65. Each household also has an income variable that indicates whether the household belongs to the lower (under $35,000/year), middle ($35,000 - $75,000/year) or upper (over $75,000/year) income category, each of which comprises approximately a third of the households in the region. The number of vehicles available to each household is modeled separately, after the

population synthesis, based on these variables and other variables describing the zone in which the household is located.

Tour and Stop Generation

The TDM generates tours and stops rather than trips. The number of tours and stops of each type is estimated using multiple regression models applied to the disaggregated synthetic population of households. First, the number of tours, of each type, is estimated for each household. Then, for each stop type, the ratio of stops per tour is modeled and the total number of stops produced by multiplying this ratio by the number of tours. (See Table C-1)

In this framework, the modeled behavior is dominated by the tour generation equations, with the stop generation playing a secondary role (in some ways similar to, albeit simpler than, activity-based approaches which allow more tradeoffs). This is reflected in their goodness-of-fit which is quite good for the tour generation equations, but rather modest for stop generation since stop rates per tour are relatively constant.

Although cross-classification models were once viewed as an advance over regression models for generating trips, this was due to their ability to reduce aggregation bias compared to regression models which were applied to zones as a whole. By applying regression models instead to a disaggregate population, aggregation bias is eliminated altogether in the approach adopted here. While cross-classification models are limited to two or three variables at most, regression models can include more variables, introducing sensitivity in resulting trip rates to factors like gas prices and accessibility variables, in addition to the basic demographic characteristics. Although interaction effects were widely tested, the only interaction effect that proved significant was the interaction of gas prices and household income; increasing gas prices decreased certain stop rates, but only for low income households.

The number of work tours was mostly a simple function of the number of workers. Vehicle ownership, the presence of seniors and household income offered some additional explanatory power. The presence of seniors

Table C-1: Factors Affecting Household Tour and Stop Generation

	Workers	Non-Workers	Students	Seniors	Vehicles	Income	Gas Price	Accessi-bility
Work Tours	+			-	+	+		
Work Stops	+			-	+	+		-
Other Stops	+	-	+	-	+	+		
School Tours			+			+		-
School Stops			+			+		-
Other Stops			+			+		-
Other Tours	+	+		+	+		-	
Short Maintenance Stops	+	+		+	+	+	-	
Long Maintenance Stops	+	+	-	+	+		-	
Discretionary Stops	+	+	+	+	+	+	-	
Key	+	**Variable (column) increases tour/stop rate (row)**			-	**Variable (column) decreases tour/stop rate (row)**		

Source: MACOG Travel Model: Model Development and Validation Report

in a household made work tours slightly less frequent, perhaps because senior workers are less likely to work full time.

The number of work stops is calculated for each household and allocated to income groups based on the household's income. The number of work stops per work tour is relatively constant. However, the number of work stops per work tour is slightly higher for high income workers, probably reflecting greater frequency of eating out for lunch which results in two work stops (before and after lunch). Accessibility also makes work stops marginally more frequent because it implies that commute times are shorter, so it is easier to get back and forth between home and work, such as going home for lunch, returning to work after dinner, work activities on weekends, etc.

The number of other stops per work tour is significantly increased by the number of household students from workers stopping to drop off students on the way to work and decreases with the number of non-workers in the household who can drop off the students instead. Here also, we see income and vehicle ownership increasing other stops on work tours, again perhaps increased lunch stops out.

The number of other (non-work) tours made by a household is most influenced by the number of non-workers in the household: more non-workers generate more non-work tours. However, the non-work tours are also increased albeit less by workers and are more frequent for households with seniors and more vehicles. Non-work tours also decrease slightly as gas prices rise. The number of short (under 30 minutes) maintenance stops per other tour was largely constant, but somewhat higher for households with more people and income. The number of long (over 30 minutes) maintenance stops was also fairly constant and increased with the number of vehicles available; however, it also decreased with the number of students, who may curtail long shopping activities. The number of discretionary stops decreased slightly with the presence of seniors and increased with income and students with cars.

Tour-Based Modal Choice

In the model, as in activity-based models, the mode of travel is developed in two stages: tour mode choice and trip mode choice. After tours are generated, they are assigned a primary mode by tour mode choice models. Then, after the spatial distribution of stops creates trips, individual trips are assigned a mode based on the primary mode of the tour in trip mode choice models. (See Table C-2 on the following page)

The model makes use of four primary tour modes:

- Private Automobile
- Public Transit
- Walk / Bike
- School Bus

The primary mode for a tour is determined by a simple set of definitions or rules.

- Any tour containing a school bus trip is a school bus tour.
- Any other (non-school bus) tour containing a public transit trip is a public transit tour.
- Any other (non-transit) tour containing a private automobile trip is an automobile tour.
- Any other tour, which contains only walk or bike trips, is a non-motorized tour.

In this framework, the primary choice determining transit mode share is the tour mode choice. Trip mode choice ultimately reduces mostly to the determination of vehicle occupancy for automobile tours or the allocation of access modes for transit tours. Even in advanced activity-based models, fixed shares or other simple heuristics have been used for trip mode choice; whereas, tour mode choice models are more comparable to mode choice in traditional models.

The incorporation of behaviorally sensitive tour mode choice models in the TDM represents significant added value as compared to the previous model in which mode shares were fixed and totally insensitive to demographics, levels-of-service, or any other policy variables. The model produces, in addition to automobile trips by occupancy class, the system-level transit

ridership, the number of transit trips generated by each residence zone, and the total regional number of daily walk/bike trips. Moreover, the model architecture allows for the straightforward addition of future component models to produce transit and non-motorized trips at the route/street level. These component models and level of spatial fidelity could be developed in a future model upgrade.

The key difference between the tour mode choice models and those common in activity-based models is the way in which they measure the level-of-service provided by each competing mode and the related assumption of the hierarchy of travelers' choices (i.e., whether travelers' destination choices depend more on their mode choices or vice versa).

In activity-based models, as in traditional four-step models, tour mode choice is modeled after destination choice (or distribution) and can therefore use actual travel times between origins and destinations as level-of-service variables. This traditional model structure was first developed for very large metropolitan areas with significant choice rider markets and is more sensitive to changes in level-of-service provided by transit improvements and for testing their impacts on transit route ridership. However, it may be oversensitive to level-of-service variables and a source of optimism bias in transit forecasts, as this model structure is built on the assumption that travelers are more likely to change mode than destination. This may well be the case for affluent choice riders for their work commute in large cities. However, there are

Table C-2: Factors Affecting Tour Mode Choice

	LOS	Cost		Demographics					Built Environement		
	Accessibility by Mode	Gas Price	Bus Fare	Workers	Students	Senior HH	Income	Vehicle per Person	Percent Sidewalks	Activity Diversity	Intersection Density
Work Tours											
Auto	+	-	+		+	+	+	+	-	-	
Transit	+	+	-		-	-	+	-	-	-	
Non-Motorized	+	+	+		+	-	-	-	+	+	
School Tours											
Auto	+	-					+	+			
Transit	+	+					-	+			
Non-Motorized	+	+					-	-			
School Bus	+	+					-	-			
Other Tours											
Auto	+	-		+	+	+		+		-	-
Transit	+	+		+	-	-		-		-	-
Non-Motorized	+	+		-	+	-		-		+	+
Key	+ Direct Increase										
	+ Indirect Increase										
	- Indirect Decrease										
	- Direct Decrease										

Source: MACOG Travel Model: Model Development and Validation Report

many situations where it is more reasonable to assume that travelers are more likely to change destinations than mode.

Local household survey data offer some support of this general assumption for the region that travelers are more likely to change destination than mode of travel. In general, this assumption seems more appropriate in markets similar to MACOG with few choice riders, where mode choice is generally a foregone conclusion on which destination choice is conditioned. For example, either the traveler has access to a car and does not even think of riding transit or they do not have access to a car and rely on transit, choosing their destinations, possibly even workplace, based on where the transit system can get them. "Reverse hierarchy" models such as those developed for the TDM, which represent destination (or stop location) choice conditional on mode choice, still take the level-of-service provided by competing modes into account and allow for changes in ridership based on improvements to transit or highway modes. However, they measure the level-of-service provided by each mode not directly by the travel times between origins and destinations but indirectly by the accessibility to various types of destination provided by each mode to a residence zone.

Departure Time Choice

The regional travel model includes departure time choice models which distribute trips throughout the day. The models are capable not only of producing the traditional AM, PM and off peak trip tables for standard assignments, but also can produce trip tables for any or all 15-minute periods from 6 am to 9 pm. These 15-minute trip tables should be of significant value for traffic micro-simulations and could be used in the future in conjunction with a dynamic network assignment.

In addition to adding temporal resolution, the departure time choice models add sensitivity to new variables, most notably travel times and accessibility. The new models will reflect shifts in travelers' departure times in order to avoid longer travel times. This effect, commonly referred to as peak-spreading as travelers leave earlier or later to avoid peak traffic, was modest, but already statistically significant in the household survey data. The effect was evident for all tour types but was most significant for Other Tours, which, in general, presumably have more flexibility in the timing of their activities than the other tour types.

The models also incorporate accessibility variables which allow departure times to vary geographically in the model, e.g., lower accessibility, rural travelers might generally leave for work earlier (since they have further to go to get to work).

Home-based and non-home-based trips for each tour type are represented by different models, since the first and last trips of a tour have different temporal distributions compared with mid-tour non-home-based trips. This segmentation is particularly important for midday/lunch traffic which is associated primarily with shorter, mid-tour non-home-based trips, as opposed to the am and pm peaks which are more associated with longer home-based trips.

University Student Travel Models

The university student travel models are supported by the Michiana Area College Travel Study. The College Travel Study closely paralleled the Michiana Area Household Travel Study in questionnaire structure and content. Six colleges agreed to participate in the study: Bethel College, Goshen College, Holy Cross College, Ivy Tech Community College, the University of Notre Dame, and Indiana University – South Bend.

Before administering the College Travel Study, the survey was soft-launched to 25 students from Goshen College. Goshen College was gracious to agree to soft-launch the survey as a way to test the data and ensure that the survey questions were clear and relevant to students taking the survey. After the soft-launch was completed, the data was reviewed. The College Travel Study was then administered with each participating college sending out an invitation email. Survey administration began on Wednesday September 18, and closed on October 14. This survey administration timing was specifically selected to ensure that the survey started after classes were in session (and the add/drop period had

passed) and the survey was completed prior to the October break period. A total of 672 students completed the survey.

Truck Model

Based on the method recommended in the Quick Response Freight Manual II, a commercial vehicle model was developed for predicting trips for four-tire commercial vehicles, single unit (SU) trucks, and multiple unit (MU) trucks. The model uses a four-step process. These steps are trip generation, distribution, choice of time of day and trip assignment. In addition, the special trip generators of inter-region and inter-modal trucks were added in the model to better replicate the current inter-region and inter-modal truck movements.

The inputs to trip generation are the number of employees and the number of households by Traffic Analysis Zone (TAZ). These rates were obtained by adjusting the original generation rates in the Quick Response Freight Manual. To replicate the current truck traffic condition in the study area, the rates for four-tire commercial vehicles were further adjusted by a factor of 0.10.

The external-internal (EI) and internal-external (IE) truck trips were classified as a distinct type of trip in order to better replicate the in-balance direction truck flows at different time periods. Before the trip distribution, the trip origins and destinations were balanced for all TAZs and external stations for the following types of trips:

- EI-IE SU truck trips of all TAZs and external stations
- EI-IE MU truck trips of all TAZs and external stations
- Internal-to-Internal (II) SU truck trips of all TAZs
- Internal-to-Internal (II) MU truck trips of all TAZs
- Internal-to-Internal (II) 4-tire commercial vehicle trips of all TAZs

For four-tire commercial vehicles, it is assumed that the normal EI-IE trip attractions are proportional to the trip destinations. At the beginning, destinations are used as the normal EI-IE trip attractions and the balancing process scales to the total adjusted attractions.

For single-unit and multi-unit trucks, a destination choice model was applied separately to internal & external trips. The destinations chosen in these models (the sum over all origins) are scaled to the total number of trips produced in generation. This vector is then used as both the productions and attractions for a doubly-constrained gravity model to distribute the truck trips.

The time-of-day assignments were implemented in order to obtain better model results. To facilitate this, the trip tables from trip distribution must be factored to reflect morning peak, midday, and off-peak periods prior to trip assignment. The hourly time-of-day factors were derived from classification traffic counts provided by MACOG and applied to the MACOG Regional Travel Model.

Appendix D:
Air Quality Conformity Analysis

D

There are many aspects of air quality that are important to the environment, health and quality of life of the region and its residents. Clean air is vital to the productivity of people, land and businesses in North Central Indiana. Poor air quality can cause a wide variety of health problems, contributing to premature death from cardiovascular and respiratory diseases such as asthma. These problems are often worse in poor urban communities. Air pollution comes from many different sources such as factories, power plants, dry cleaners, cars, buses, trucks, windblown dust, and even fires. It can harm plant life, causing negative impacts on natural areas, forests, and farms.

Within the context of air quality, it is most relevant to discuss the status of the Elkhart and St. Joseph Counties region with regard to attainment of the National Ambient Air Quality Standards. Air quality has improved in the region substantially over the past decade. Significant investment by industries in pollution reduction to comply with federal and state regulation of air emissions has contributed to this improvement. Other significant contributors to this progress include implementation of vapor recovery requirements on area gas stations and congestion mitigation awareness in transportation planning.

National Ambient Air Quality Standards

The federal government established the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants, all of which, in concentrations above certain levels, have adverse effects on human health. These criteria pollutants include: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), ozone (O_3), particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).

NAAQS attainment status achievements are one of the strongest demonstrations of air quality improvement over time. Based on air quality monitoring data collected in Elkhart and St. Joseph Counties by the Indiana Department of Environmental Management (IDEM), the MACOG region is in attainment of the existing NAAQS for Ozone and Fine Particulate Matter. The MACOG area's air quality continues to improve with each passing year.

While celebrating the region's achievements, it is important that we continue to strive for continuing improvement in air quality. The United States Environmental Protection Agency (EPA) is mandated to periodically review and update the NAAQS as scientific evidence warrants. As new data and studies reveal new information about health risks from these pollutants, the standards are reviewed and if necessary modified to be more protective of public health. EPA currently has several air quality standards and monitoring requirements in various states of study, proposal, and promulgation. Some of these could result in the region falling back into nonattainment, based on new data or tighter standards.

Ozone has only recently been designated in attainment and Fine Particulate Matter is the second most hazardous pollutant in the region, this section focuses on them for purposes of understanding the current status of the region's ambient air quality.

Ozone

Ozone (O_3) is an odorless, colorless, highly reactive gas. Ground level ozone forms when its precursors (i.e., nitrogen oxides and volatile organic compounds) mix with high temperatures, bright sunlight and calm winds. This reaction forms smog and can lead to ozone action days, a period when certain pollutant-generating activities should be minimized. Cars, power plants, refineries, chemical plants, gasoline storage, and household paints and solvents emit nitrogen oxides and volatile organic compounds as a byproduct of their use. O_3 can irritate the eyes, nose, throat and respiratory system. It can be especially harmful to individuals with chronic heart or lung disease, as well as the very young and very old. Children, in particular, can be at risk during the summer months due to increased

outdoor activity. In addition to public health risks from O_3, long-term exposure during the growing season also damages sensitive vegetation. Cumulative O_3 exposure can lead to reduced tree growth; visibly injured leaves; and increased susceptibility to disease, damage from insects and harsh weather.

As of October 2015, an area does not meet the 8-hour O_3 NAAQS if the 3-year average of each year's fourth highest 8-hour average O_3 concentration is greater than 0.070 ppm. The design values for Elkhart and St. Joseph County's air emissions indicate that both of the counties are in attainment of the 2015 Ozone NAAQS.

Fine Particulate Matter

Fine particulate matter ($PM_{2.5}$) is produced by all forms of combustion from engines, wood-burning, open-burning and industrial processes. The annual $PM_{2.5}$ NAAQS is met when the annual arithmetic mean concentration is less than or equal to 15.0 μg/m3 (parts per billion). The 24-hour $PM_{2.5}$ NAAQS is met when the three-year average of the 98th percentile of 24-hour concentration is less than 35 $\mu g/m^3$. The trend of compliance with the annual $PM_{2.5}$ is a greater indicator of the impact of fine particulate matter on human health.

In January 2013, the EPA set the Annual $PM_{2.5}$ standard to 12 $\mu g/ m^3$ (parts per billion). The design values for Elkhart and St. Joseph County's air emissions indicate that the MACOG region continues to remain in conformance with the revised health standards.

> ***What is a design value?***
>
> A design value is a statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS).

South Coast Air Quality Mgmt. District v. EPA

On February 16, 2018, the United States Court of Appeals for the District of Columbia Circuit in South Coast Air Quality Mgmt. District v. EPA ("South Coast II," 882 F.3d 1138) held that transportation conformity determinations must be made in areas that were either nonattainment or maintenance for the 1997 ozone national ambient air quality standard (NAAQS) and attainment for the 2008 Ozone NAAQS when the 1997 Ozone NAAQS was revoked. These conformity determinations are required in these areas after February 16, 2019. The South Bend-Elkhart area was a maintenance area at the time of the 1997 Ozone NAAQS revocation on April 6, 2015 and was also designated unclassifiable/attainment for the 2008 Ozone NAAQS on May 21, 2012. Therefore, per the South Coast II decision, a conformity determination is required for the 1997 Ozone NAAQS on the Transportation Plan.

Transportation Conformity Requirements

On November 29, 2018, the EPA issued Transportation Conformity Guidance for the South Coast II Court Decision (EPA-420-B-18-050, November 2018) that addresses how transportation conformity determinations can be made in areas that were nonattainment or maintenance for the 1997 Ozone NAAQS when the ruling for the 1997 Ozone NAAQS was revoked, and an areas was designated attainment for the 2008 Ozone NAAQS in EPA's original designations for this NAAQS (May 21, 2012).

The transportation conformity regulation at 40 CFR 93.109 sets the criteria and procedures for determining conformity. The conformity criteria for Transportation Plans and Transportation Improvement Programs (TIPs) includes: the latest planning assumptions (93.110), the latest emissions model (93.111), consultation (93.112), transportation control measures (93.113(b) and (c)), and an emissions budget and/or interim emissions (93.118 and/or 93.119).

For the 1997 Ozone NAAQS areas, transportation conformity for Transportation Plans and TIPs for

the 1997 Ozone NAAQS can be demonstrated without a regional emissions analysis, per 40 CFR 93.109(c). This provision states that the regional emissions analysis requirement applies one year after the effective date of EPA's nonattainment designation for a NAAQS and until the effective date of revocation of such NAAQS for an area. The 1997 Ozone NAAQS revocation was effective on April 6, 2015, and the South Coast II court upheld the revocation. As no regional emission analysis is required for this conformity determination, there is no requirement to use the latest emissions model, or budget and interim emissions tests.

Therefore, transportation conformity for the 1997 Ozone NAAQS for MACOG's 2045 Transportation Plan, Michiana on the Move, can be demonstrated by showing the remaining requirements in Table 1 in 40 CFR 93.109 have been met. These requirements, which are laid out in Section 2.4 of EPA's guidance and addressed below, include:

- Latest planning assumptions (93.110)
- Consultation (93.112)
- Transportation Control Measures (93.113)
- Fiscal constraint (93.108)

The complete air quality conformity determination can be found in the *Transportation Conformity Determination Report for the 1997 Ozone NAAQS* on MACOG's website.

Appendix E:
Red Flag Investigation

E

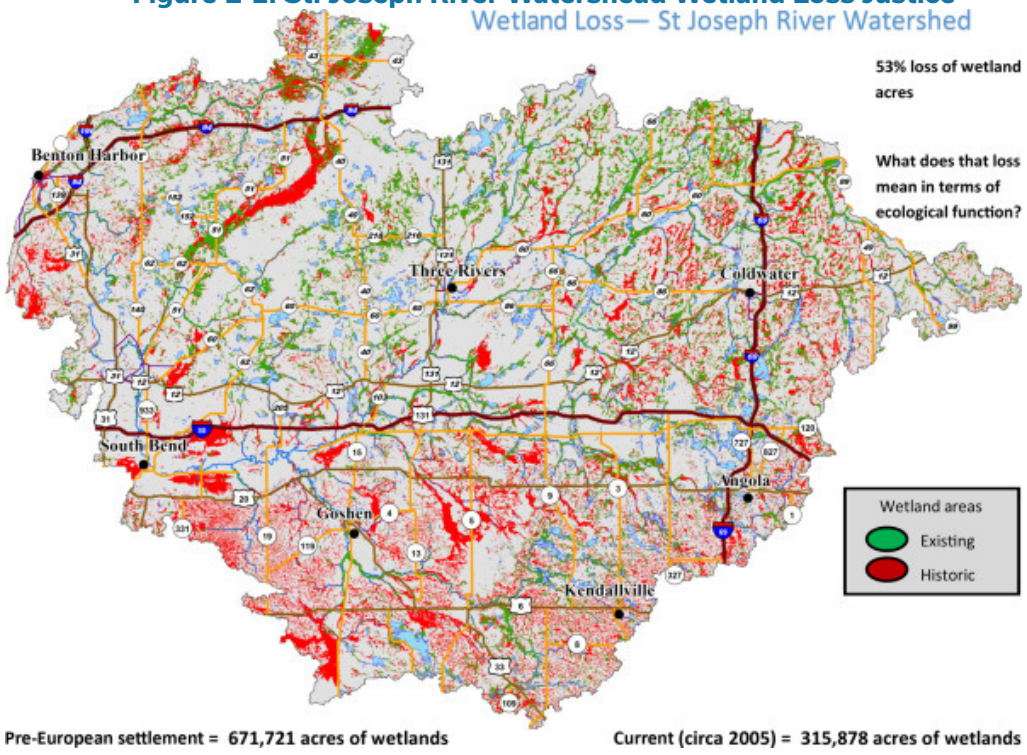
The National Environmental Policy Act of 1969 (NEPA) established a national policy to promote the protection of the environment in the actions and programs of federal agencies. The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)act as lead federal agencies, and are responsible for implementing the NEPA process and working with state and local project sponsors during transportation project development. All transportation projects have the potential to impact our environment; therefore, it is essential that environmental considerations are identified during the planning and design phases.

The FHWA and FTA NEPA process is designed to assist transportation officials in making project decisions that balance engineering and transportation needs with the consideration of social, economic, and environmental factors. This process allows for involvement and input from the public, interest groups, resource agencies, and local governments. The process is used as an "umbrella" for compliance with over 40 environmental laws, regulations, and executive orders, and provides an integrated approach to addressing impacts to the human and natural environment from transportation projects.

While an in depth environmental review is not appropriate at this stage for projects included in the Transportation Plan, an initial consultation with environmental and cultural resources agencies is important to provide an opportunity to share plans and discuss future activities during project development. The following list includes partners who were contacted for feedback related to the plan.

Environmental and Cultural Resource Partners
Indiana Department of Environmental Management, Office of Air Quality
Indiana Department of Natural Resources, Division of Historic Preservation & Archaeology
Indiana State Department of Agriculture, Soil and Water Conservation Districts
USDA National Resources Conservation Services
US Fish and Wildlife Services (USFWS)
US EPA Region 5
US EPA, Ground Water & Drinking Water Brand (Sole Source Aquifer)
US Army Corps of Engineers
Saint Joseph River Basin Commission
Shirley Heinz Land Trust
Izaak Walton League
Pokagon Band of Potawatomi
Local Historic Preservation Offices

Figure E-1: St. Joseph River Watershead Wetland Loss Justice



In the St. Joseph River Watershed, 53% of pre-settlement wetlands have been lost (see Figure E-1). In an effort to mitigate any further impacts to wetlands, MACOG will work with our environmental partners, such as the Shirley Heinz Land Trust, to ensure that wetland mitigation occurs with the development of transportation projects.

Red Flag Investigations are another key component to MACOG's compliance with NEPA, hazardous material requirements, as well as MACOG's commitment to a healthy environment. A red flag investigation is a preliminary environmental analysis that identifies potential impacts to Infrastructure, Mining/Mineral Exploration, Hazardous Material Concerns, Water Resources, and Historical Resources within a ½ mile radius of a proposed project area. The results from this analysis will be incorporated into project planning, design, and construction with the goal of minimizing impacts to local resources.

Projects advancing to construction will require additional studies and detailed design to more clearly describe project features. This process enables environmental impacts and appropriate mitigation measures to be established. Projects using state or federal funds will require detailed environmental study and permitting in conformance with the National Environmental Policy Act (NEPA) and other federal, state and local regulations.

Preliminary Red Flag Investigation Data

The following is a listing of potential impacts to Infrastructure, Mining/Mineral Exploration, Hazardous Materials and Water Resources based on results from red flag investigations performed by MACOG. The categories included in the review were chosen because they were generally available throughout the region in a GIS format.

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
Elkhart County												
CR 118	Old CR 17 to CR 19	New Road Construction	✓		✓							✓
CR 13	Sunnyside Ave to US 20	Added Travel Lanes	✓	✓	✓	✓				✓	✓	✓
CR 15	CR 6 to CR 104	New Road Construction			✓	✓	✓			✓	✓	
CR 17	CR 142 to CR 38	New Road Construction	✓	✓	✓							
CR 17	CR 46 to CR 142	New Road Construction		✓								
CR 17	CR 50 to CR 46	New Road Construction										
CR 17	US 6 to CR 50	New Road Construction						✓				✓
CR 18	CR 13	Intersection Improvement										
CR 20	CR 111	Intersection Improvement		✓	✓							✓
CR 20	SR 15	Intersection Improvement						✓		✓	✓	✓
CR 20	SR 19 to US 33	Added Travel Lanes	✓	✓	✓	✓	✓			✓	✓	✓
CR 22	CR 3	Intersection Improvement								✓	✓	
CR 24	CR 3	Intersection Improvement			✓					✓		
CR 26	SR 15 to CR 31	New Road Construction	✓	✓		✓	✓	✓	✓	✓		✓
CR 31	CR 36 to CR 26	New Road Construction	✓	✓		✓						✓
CR 38	SR 119 to CR 17	Center Turn Lanes	✓		✓							

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
CR 40	SR 19 to SR 119	Added Travel Lanes	✓	✓	✓							
CR 43	CR 1400 N to US 6	Added Capacity										✓
CR 52	CR 101 to SR 19	Road Reconstruction	✓			✓				✓		✓
CR 6	Ash Rd to CR 10	Added Travel Lanes					✓	✓		✓	✓	
CR 6	CR 10 to John Weaver Parkway	Added Travel Lanes					✓			✓	✓	
Johnson St	Bristol St to SR 4	Added Travel Lanes			✓		✓	✓		✓	✓	
Kerryhaven Dr	Current Termini to CR 10	New Road Construction			✓		✓	✓		✓	✓	
Old SR 17	SR 18 to Love's Dr	New Road Construction		✓	✓	✓						
Sunnyside Dr	US 33 to CR 13	Added Travel Lanes								✓	✓	
2nd St	Harrison St to Jefferson St	One-Way to Two-Way		✓		✓	✓	✓		✓	✓	✓
3rd St	Harrison St to Jefferson St	One-Way to Two-Way		✓		✓	✓	✓		✓	✓	✓
Benham Ave	Lusher Ave to Indiana Ave	Road Reconstruction		✓		✓	✓			✓	✓	✓
Bristol St	Johnson St to Jeanwood Dr	Road Diet			✓	✓	✓			✓		
Bristol St	Jeanwood Dr to CR 15	Added Travel Lanes			✓	✓	✓			✓		
CR 6	CR 6 to Cassopolis St	Intersection Improvement										
Goshen Ave	Jackson Blvd to Middlebury St	Road Reconstruction	✓	✓	✓	✓	✓			✓	✓	
Hively Ave	Norfolk Southern Railroad (#510012C)	Grade Separation		✓		✓	✓			✓		✓
Indiana Ave	Oakland Ave	Intersection Improvement		✓			✓		✓	✓		✓
Jackson Blvd	Goshen Ave	Intersection Improvement		✓	✓	✓	✓			✓	✓	
Jackson Blvd	Goshen Ave to Riverview Ave	Road Diet		✓	✓	✓	✓			✓	✓	
Jackson Blvd	Main St to Joshnson St	Road Reconstruciton	✓	✓	✓	✓	✓			✓	✓	

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
Main St	Beardsley Ave	Intersection Improvement		✓	✓	✓	✓			✓	✓	
Main St	Hively Ave to Lusher Ave	Road Diet		✓	✓	✓	✓			✓	✓	✓
Middlebury St	Prairie St to Goshen Ave	Added Travel Lanes	✓	✓	✓	✓				✓	✓	
Northside Connector	Adamsville Rd to Johnson St	New Road Construction			✓							
Prairie St	Mishawaka Rd to Lusher Ave	Added Travel Lanes	✓			✓	✓			✓	✓	✓
Sunny Dr	Northpointe Blvd to CR 4	New Road Construction								✓	✓	
Toledo Rd	Goshen Ave to Indiana Ave	Intersection Improvement	✓			✓	✓			✓		✓
College Ave	US 33 to Century Dr	Center Turn Lanes		✓	✓	✓	✓					
CR 142	CR 17 to CR 15	Added Travel Lanes		✓								✓
US 33	Fairfield Ave to Plymouth Ave	Auxiliary Lanes										
CR 40	Dierdorff Rd to US 33	Center Turn Lanes										✓
Waterford Mills Pkwy	CR 40 to SR 15	New Road Construction	✓	✓		✓	✓			✓	✓	✓
Wilden Ave	Current Termini to Middlebury St	New Road Construction				✓	✓		✓	✓	✓	✓
CR 16	SR 13 to County Line Rd	Horse and Buggie Lanes										
CR 101	Market St to CR 52	Road Reconstruction		✓	✓							✓
CR 150	SR 19 to CR 3	New Road Construction	✓	✓	✓					✓		✓
Maple Ln	CR 42 to Wabash Ave	Center Turn Lanes	✓	✓	✓					✓		✓
Orchard Park Dr	Current Termini to SR 19	New Road Construction								✓	✓	
Kosciusko County												
Armstrong Rd	CR 200 E	Intersection Improvement										
County Farm Rd	SR 14 to CR 700 S	Added Capacity	✓	✓		✓	✓					
CR 1200 N	Syracuse Webster Rd/N 500 E	Intersection Improvement	✓			✓				✓		✓

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
CR 1300 N	Norfolk Southern Railroad (New Crossing)	Grade Separation		✓				✓		✓		
CR 1300 N	SR 15 to Old SR 15	New Road Construction		✓				✓		✓		
CR 200 E / N 100 E	E 200 N to Armstrong Rd	Added Capacity	✓			✓	✓	✓		✓		✓
CR 225 S	CR 200 S to Packerton Rd	Added Capacity				✓		✓		✓		✓
CR 350 W	Old US 30 to US 30	Added Capacity		✓		✓				✓		✓
CR E 450 N	CR N 100 E	Intersection Improvement	✓		✓							✓
CR 800 W	US 30 to SR 19 / W 900 N	Added Travel Lanes	✓		✓							✓
CR 700 S	SR 19 to County Farm Rd	Added Travel Lanes	✓	✓						✓	✓	✓
CR 900 N	CR 500 S to SR 25	Added Travel Lanes		✓	✓					✓		
N Fox Farm Rd	CR 150 W to US 30	Added Capacity	✓		✓	✓	✓	✓		✓		✓
New Road (CR 350 E)	Pierceton Rd to Wooster Rd	New Road Construction		✓								✓
New Road (CR 850 W)	W 1350 N to Indiana Ave	New Road Construction	✓	✓	✓	✓				✓		✓
Old US 30	CR 350 W	Intersection Improvement		✓		✓				✓		
Old US 30	N Zimmer Rd to CR 350 W	Added Capacity		✓		✓				✓		✓
Pierceton Rd	Parckerton Rd to Market St	Added Capacity		✓		✓	✓	✓		✓	✓	✓
CR 1350 N	CR 700 W to CR 950 N	Road Reconstruction										✓
Wawasee Dr (CR 900 E)	Morris Rd to County Line Rd	Added Capacity	✓	✓		✓		✓		✓		✓
Jackson Street	W 1350 N to Current Termini	New Road Construction										
CR 100 E	CR 250 N to CR 300 N	Road Realignment										
CR 100 S	SR 15 to Country Club Rd	New Road Construction	✓	✓		✓	✓		✓	✓	✓	✓

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
CR 150 W	Lake St to US 30	Added Travel Lanes		✓	✓	✓				✓	✓	✓
CR 300 N	Shelden Dr	Intersection Improvement		✓		✓	✓	✓				✓
Market St	Norfolk Southern	Grade Separation		✓		✓	✓			✓		✓
Parker St	Center St	Intersection Improvement		✓		✓	✓			✓	✓	
Sheridan St	Parker St to Harrison	New Road Construction		✓		✓	✓	✓				✓
Zimmer Rd	SR 25 to Old US 30	Added Capacity		✓		✓				✓		✓
Zimmer Rd	Winona Ave	Intersection Improvement		✓		✓						✓
Columbus Dr	Pierceton Rd to Chestnut St	New Road Construction		✓		✓	✓			✓		✓
Kings Hwy/ Winona Ave	Parke Ave/ Argonne Rd to	Intersection Improvement		✓	✓	✓	✓					✓
Packerton Rd	CR 225 S to Pierceton Rd	Added Travel Lanes				✓		✓		✓		✓
Pierceton Rd	CR 250 E	Safety Improvement				✓						✓
Pierceton Rd	Packerton Rd	Intersection Improvement				✓				✓		✓
Wooster Rd	Kings Hwy	Intersection Improvement		✓	✓	✓				✓	✓	✓
Wooster Rd	CR 250 E	Intersection Improvement		✓	✓	✓				✓	✓	✓
Marshall County												
Lincoln Hwy	Pioneer Dr	Intersection Improvement		✓								
Michigan Rd	12 B Rd to US 31	Intersection Improvement	✓	✓			✓					✓
Veterans Pkwy	Michigan Rd to Pioneer Dr	New Road Construction		✓						✓		✓
Main St	Davis St	Intersection Improvement	✓	✓			✓					✓
Hoham Dr	Oak Dr to Michigan Rd	Center Turn Lanes		✓						✓		✓
Jim Neu Dr	Western Ave to Oak Dr	New Road Construction	✓	✓			✓			✓	✓	✓

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
Richter Rd	Jefferson St to Baker St	Road Reconstruction		✓		✓	✓			✓		✓
Plymouth Municipal Airport		Runway Extension		✓						✓		✓
Oak Rd	US 30 to Hoham Dr	Added Travel Lanes		✓						✓		✓
Suter Rd	Lincoln Hwy to 9A Rd	New Road Construction		✓	✓							✓
St. Joseph County												
Cleveland Rd	Beech Rd	Intersection Improvement						✓				
Douglas Rd/ Cleveland Rd Connector	Bittersweet Rd to Beech Rd	New Road Construction						✓				✓
Douglas Rd	Canadian National	Grade Separation		✓		✓						✓
Douglas Rd	Bittersweet Rd	Intersection Improvement										✓
Douglas Rd	Ironwood Rd	Intersection Improvement	✓	✓		✓		✓				✓
Douglas Rd	Ivy Rd to SR 23	Added Travel Lanes	✓	✓		✓		✓				✓
Edison Rd	Similax Rd	Intersection Improvement		✓								✓
Edison Rd	Timothy Rd to Walnut Rd	New Road Construction										✓
Edison Rd	Walnut Rd	Intersection Improvement										✓
Filmore Rd	Larrison Rd	Intersection Improvement				✓						
Harrison Rd	Strawberry Rd to Lemon Rd	New Road Construction		✓		✓						✓
Larrison Rd	Filmore Rd	New Road Construction		✓		✓						✓
Pierce Rd	Miami Rd to SR 331	New Road Construction		✓		✓						✓
Snowberry Rd	Hamilton Trl to Hamilton Trl	New Road Construction	✓	✓		✓		✓				✓
Twelfth St	SR 331 to Union St	Added Capacity		✓		✓	✓		✓	✓	✓	✓
Beacon Pkwy Connector	Clevelan Rd to Beacon Pkwy	New Road Construction		✓		✓	✓	✓		✓	✓	✓

Table E-1: Infrastructure

Road	Limits	Type	Cemeteries	Railroads	Religious Facilities	Trails	Managed Lands	Airports	Hospitals	Recreational Facilities	Schools	Pipelines
Catalpa Ave	Filbert Rd to Catalpa Ave	New Road Construction		✓	✓	✓	✓			✓		✓
Division St	Catalpa Ave to Current Terminus	New Road Construction		✓	✓	✓	✓	✓		✓	✓	✓
Elwood Ave	SR 331	Intersection Improvement		✓		✓	✓		✓	✓	✓	✓
Fir Rd	McKinley Ave to 1-80/90	Center Turn Lanes		✓			✓	✓		✓	✓	✓
Fulmer Rd	Current Terminus to Clover Rd	New Road Construction	✓	✓		✓	✓	✓		✓	✓	✓
Grape Rd	Douglas Rd	Intersection Improvement										
Hickory Rd	Helper St to SR 23	New Road			✓	✓	✓			✓		✓
Jefferson Blvd	Byrkit St to Cedar St	Safety Improvement		✓		✓	✓			✓	✓	✓
McKinley Ave	Fir Rd to Division St	Added Capacity		✓		✓	✓	✓		✓	✓	✓
Twelfth St	Campbell St to Dodge St	Added Travel Lanes		✓		✓	✓		✓	✓	✓	✓
Union St	Irelto Dr to Sixth St	Added Capacity			✓	✓	✓		✓	✓	✓	✓
Veterans Pkwy	Cul-de-Sac to Cleveland Rd	New Road Construction										
Veterans Pkwy	Cul-de-Sac to Douglas Rd	New Road Construction										✓
Bendix Dr	Betrand Rd to Lathrop Rd	Road Diet	✓	✓		✓	✓	✓		✓	✓	✓
Bertrand Rd	Meade St to Bendix Dr	Safety Improvement		✓		✓	✓			✓	✓	✓
Colfax St	SR 23 to Colfax Bridge	Center Turn Lanes	✓		✓	✓	✓		✓	✓	✓	✓
Lincolnway West	Olive St	Intersection Improvement		✓		✓	✓	✓		✓	✓	
Meade St	Orange Rd to Bertrto Rd	Safety Improvement		✓		✓	✓			✓	✓	✓
Sample St	Maryflower Rd	Intersection Improvement				✓	✓			✓	✓	✓
Sample St	SR 23 to Mayflower Rd	Safety Imrpovement				✓	✓			✓	✓	✓
Sheridan St	Lincolnway to Progress Dr	Road Reconstruction		✓		✓	✓	✓		✓	✓	✓

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
Elkhart County																				
CR 118	Old CR 17 to CR 19	New Road Construction		✓	✓	✓	✓				✓		✓							
CR 13	Sunnyside Ave to US 20	Added Travel Lanes		✓	✓	✓					✓		✓							
CR 15	CR 6 to CR 104	New Road Construction			✓	✓					✓		✓							
CR 17	CR 142 to CR 38	New Road Construction			✓	✓						✓	✓							
CR 17	CR 46 to CR 142	New Road Construction			✓	✓						✓								
CR 17	CR 50 to CR 46	New Road Construction		✓	✓	✓	✓						✓							
CR 17	US 6 to CR 50	New Road Construction		✓	✓	✓	✓						✓							
CR 18	CR 13	Intersection Improvement																		
CR 20	CR 111	Intersection Improvement		✓	✓	✓					✓		✓							
CR 20	SR 15	Intersection Improvement		✓	✓	✓	✓				✓		✓							
CR 20	SR 19 to US 33	Added Travel Lanes		✓	✓	✓					✓		✓							
CR 22	CR 3	Intersection Improvement		✓	✓	✓	✓				✓		✓							
CR 24	CR 3	Intersection Improvement		✓	✓	✓	✓				✓									
CR 26	SR 15 to CR 31	New Road Construction		✓	✓	✓	✓				✓		✓	✓			✓			
CR 31	CR 36 to CR 26	New Road Construction		✓	✓	✓	✓				✓						✓			
CR 38	SR 119 to CR 17	Center Turn Lanes			✓	✓							✓							
CR 40	SR 19 to SR 119	Added Travel Lanes		✓	✓	✓					✓	✓	✓							

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
CR 43	CR 1400 N to US 6	Added Capacity		✓	✓	✓					✓		✓							
CR 52	CR 101 to SR 19	Road Reconstruction			✓		✓				✓		✓							
CR 6	Ash Rd to CR 10	Added Travel Lanes		✓	✓	✓	✓				✓		✓							
CR 6	CR 10 to John Weaver Parkway	Added Travel Lanes			✓	✓	✓				✓		✓							
Johnson St	Bristol St to SR 4	Added Travel Lanes		✓	✓	✓	✓				✓		✓				✓			
Kerryhaven Dr	Current Termini to CR 10	New Road Construction			✓								✓							
Old SR 17	SR 18 to Love's Dr	New Road Construction		✓	✓	✓							✓							
Sunnyside Dr	US 33 to CR 13	Added Travel Lanes		✓	✓	✓					✓		✓							
2nd St	Harrison St to Jefferson St	One-Way to Two-Way				✓														
3rd St	Harrison St to Jefferson St	One-Way to Two-Way				✓														
Benham Ave	Lusher Ave to Indiana Ave	Road Reconstruction																	✓	
Bristol St	Johnson St to Jeanwood Dr	Road Diet		✓	✓	✓	✓				✓		✓				✓			
Bristol St	Jeanwood Dr to CR 15	Added Travel Lanes		✓	✓	✓	✓				✓		✓				✓			
CR 6	CR 6 to Cassopolis St	Intersection Improvement		✓	✓															
Goshen Ave	Jackson Blvd to Middlebury St	Road Reconstruction			✓	✓	✓				✓	✓								
Hively Ave	Norfolk Southern Railroad (#510012C)	Grade Separation			✓	✓	✓				✓		✓						✓	

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
Indiana Ave	Oakland Ave	Intersection Improvement			✓	✓	✓				✓									
Jackson Blvd	Goshen Ave	Intersection Improvement				✓					✓									
Jackson Blvd	Goshen Ave to Riverview Ave	Road Diet				✓					✓									
Jackson Blvd	Johnson St	Intersection Improvement		✓	✓	✓	✓				✓		✓				✓			
Main St	Beardsley Ave	Intersection Improvement				✓					✓								✓	
Main St	Hively Ave to Lusher Ave	Road Diet			✓	✓	✓				✓		✓							
Middlebury St	Prairie St to Goshen Ave	Added Travel Lanes			✓	✓	✓				✓		✓				✓			
Northside Connector	Adamsville Rd to Johnson St	New Road Construction		✓	✓	✓	✓				✓		✓						✓	
Prairie St	Mishawaka Rd to Lusher Ave	Added Travel Lanes			✓								✓						✓	
Sunny Dr	Northpointe Blvd to CR 4	New Road Construction			✓	✓	✓				✓									
Toledo Rd	Goshen Ave to Indiana Ave	Intersection Improvement		✓	✓	✓	✓				✓		✓							
College Ave	US 33 to Century Dr	Center Turn Lanes		✓	✓	✓	✓				✓		✓							
CR 142	CR 17 to CR 15	Added Travel Lanes				✓							✓							
US 33	Fairfield Ave to Plymouth Ave	Auxiliary Lanes		✓	✓	✓	✓				✓									
CR 40	Dierdorff Rd to US 33	Center Turn Lanes			✓		✓				✓									
Waterford Mills Pkwy	CR 40 to SR 15	New Road Construction	✓	✓	✓															
Wilden Ave	Current Termini to Middlebury St	New Road Construction				✓	✓		✓	✓	✓	✓								

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
CR 16	SR 13 to County Line Rd	Horse and Buggie Lanes			✓	✓	✓				✓									
CR 101	Market St to CR 52	Road Reconstruction			✓		✓				✓									
CR 150	SR 19 to CR 3	New Road Construction			✓								✓							
Maple Ln	CR 42 to Wabash Ave	Center Turn Lanes			✓								✓							
Orchard Park Dr	Current Termini to SR 19	New Road Construction			✓	✓					✓		✓							
Kosciusko County																				
Armstrong Rd	CR 200 E	Intersection Improvement			✓															
County Farm Rd	SR 14 to CR 700 S	Added Capacity		✓	✓	✓	✓				✓	✓	✓						✓	
CR 1200 N	Syracuse Webster Rd/N 500 E	Intersection Improvement			✓	✓	✓				✓		✓							
CR 1300 N	Norfolk Southern Railroad (New Crossing)	Grade Separation				✓							✓							
CR 1300 N	SR 15 to Old SR 15	New Road Construction				✓							✓							
CR 200 E / N 100 E	E 200 N to Armstrong Rd	Added Capacity		✓	✓	✓	✓				✓		✓							
CR 225 S	CR 200 S to Packerton Rd	Added Capacity		✓	✓	✓					✓	✓	✓						✓	
CR 350 W	Old US 30 to US 30	Added Capacity		✓	✓	✓	✓				✓		✓							
CR E 450 N	CR N 100 E	Intersection Improvement				✓							✓						✓	
CR 800 W	US 30 to SR 19 / W 900 N	Added Travel Lanes				✓							✓						✓	

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
CR 700 S	SR 19 to County Farm Rd	Added Travel Lanes		✓	✓	✓	✓				✓	✓	✓							
CR 900 N	CR 500 S to SR 25	Added Travel Lanes				✓					✓		✓							
N Fox Farm Rd	CR 150 W to US 30	Added Capacity		✓	✓	✓	✓				✓	✓	✓					✓	✓	
New Road (CR 350 E)	Pierceton Rd to Wooster Rd	New Road Construction		✓	✓						✓	✓	✓							
New Road (CR 850 W)	W 1350 N to Indiana Ave	New Road Construction		✓	✓															
Old US 30	CR 350 W	Intersection Improvement		✓	✓	✓	✓				✓		✓							
Old US 30	N Zimmer Rd to CR 350 W	Added Capacity		✓	✓	✓	✓				✓		✓							
Pierceton Rd	Parckerton Rd to Market St	Added Capacity		✓	✓	✓					✓	✓	✓							
CR 1350 N	CR 700 W to CR 950 N	Road Reconstruction				✓					✓									
Wawasee Dr (CR 900 E)	Morris Rd to County Line Rd	Added Capacity		✓	✓	✓					✓		✓							
Jackson Street	W 1350 N to Current Termini	New Road Construction			✓								✓							
CR 100 E	CR 250 N to CR 300 N	Road Realignment				✓							✓						✓	
CR 100 S	SR 15 to Country Club Rd	New Road Construction		✓	✓	✓	✓				✓		✓							
CR 150 W	Lake St to US 30	Added Travel Lanes				✓							✓							
CR 300 N	Shelden Dr	Intersection Improvement		✓	✓	✓	✓				✓		✓							

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
Market St	Norfolk Southern	Grade Separation		✓	✓	✓					✓		✓						✓	
Parker St	Center St	Intersection Improvement		✓	✓	✓					✓		✓							
Sheridan St	Parker St to Harrison	New Road Construction		✓	✓	✓	✓				✓		✓							
Zimmer Rd	SR 25 to Old US 30	Added Capacity		✓	✓	✓	✓				✓		✓						✓	
Zimmer Rd	Winona Ave	Intersection Improvement		✓	✓	✓					✓		✓						✓	
Columbus Dr	Pierceton Rd to Chestnut St	New Road Construction		✓	✓	✓	✓				✓		✓							
Kings Hwy/ Winona Ave	Parke Ave/ Argonne Rd to	Intersection Improvement		✓	✓	✓					✓		✓							
Packerton Rd	CR 225 S to Pierceton Rd	Added Travel Lanes				✓					✓		✓							
Pierceton Rd	CR 250 E	Safety Improvement		✓	✓	✓					✓	✓	✓							
Pierceton Rd	Packerton Rd	Intersection Improvement		✓	✓	✓					✓		✓							
Wooster Rd	Kings Hwy	Intersection Improvement				✓							✓							
Wooster Rd	CR 250 E	Intersection Improvement				✓							✓							
Marshall County																				
Lincoln Hwy	Pioneer Dr	Intersection Improvement			✓	✓					✓		✓							
Michigan Rd	12 B Rd to US 31	Intersection Improvement			✓	✓	✓				✓		✓							
Veterans Pkwy	Michigan Rd to Pioneer Dr	New Road Construction			✓	✓	✓				✓		✓							
Main St	Davis St	Intersection Improvement			✓	✓	✓				✓		✓							

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
Hoham Dr	Oak Dr to Michigan Rd	Center Turn Lanes				✓					✓		✓							
Jim Neu Dr	Western Ave to Oak Dr	New Road Construction			✓	✓	✓				✓		✓							
Richter Rd	Jefferson St to Baker St	Road Reconstruction		✓	✓	✓	✓				✓		✓							
Plymouth Municipal Airport		Runway Extension				✓					✓		✓							
Oak Rd	US 30 to Hoham Dr	Added Travel Lanes				✓					✓		✓							
Suter Rd	Lincoln Hwy to 9A Rd	New Road Construction		✓	✓	✓					✓		✓							
St. Joseph County																				
Cleveland Rd	Beech Rd	Intersection Improvement			✓	✓	✓													
Douglas Rd/ Cleveland Rd Connector	Bittersweet Rd to Beech Rd	New Road Construction			✓	✓	✓				✓						✓			
Douglas Rd	Canadian National	Grade Separation			✓	✓	✓				✓		✓							
Douglas Rd	Bittersweet Rd	Intersection Improvement				✓	✓				✓									
Douglas Rd	Ironwood Rd	Intersection Improvement			✓	✓	✓				✓	✓	✓							
Douglas Rd	Ivy Rd to SR 23	Added Travel Lanes			✓	✓	✓				✓	✓	✓							
Edison Rd	Similax Rd	Intersection Improvement			✓															
Edison Rd	Timothy Rd to Walnut Rd	New Road Construction			✓	✓	✓						✓				✓			
Edison Rd	Walnut Rd	Intersection Improvement			✓	✓	✓										✓			
Filmore Rd	Larrison Rd	Intersection Improvement			✓	✓	✓						✓							

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
Harrison Rd	Strawberry Rd to Lemon Rd	New Road Construction			✓	✓	✓				✓		✓							
Larrison Rd	Filmore Rd	New Road Construction			✓	✓	✓				✓		✓							
Pierce Rd	Miami Rd to SR 331	New Road Construction			✓	✓					✓		✓							
Snowberry Rd	Hamilton Trl to Hamilton Trl	New Road Construction			✓	✓	✓				✓	✓	✓							
Twelfth St	SR 331 to Union St	Added Capacity		✓	✓	✓	✓					✓	✓							
Beacon Pkwy Connector	Clevelan Rd to Beacon Pkwy	New Road Construction		✓	✓	✓							✓							
Catalpa Ave	Filbert Rd to Catalpa Ave	New Road Construction			✓	✓							✓							
Division St	Catalpa Ave to Current Terminus	New Road Construction			✓	✓							✓							
Elwood Ave	SR 331	Intersection Improvement		✓	✓	✓	✓					✓	✓							
Fir Rd	McKinley Ave to 1-80/90	Center Turn Lanes			✓	✓	✓				✓		✓							
Fulmer Rd	Current Terminus to Clover Rd	New Road Construction		✓	✓							✓	✓							
Grape Rd	Douglas Rd	Intersection Improvement																		
Hickory Rd	Helper St to SR 23	New Road		✓	✓	✓	✓				✓		✓							
Jefferson Blvd	Byrkit St to Cedar St	Safety Improvement		✓	✓	✓	✓				✓		✓							
McKinley Ave	Fir Rd to Division St	Added Capacity		✓	✓	✓							✓							
Twelfth St	Campbell St to Dodge St	Added Travel Lanes		✓	✓	✓	✓					✓	✓							

Table E-2: Water Resources & Mining and Mineral Resources

Road	Limits	Type	Canal Routes - Historic	NWI Wetland Lines	NWI Wetland Polygons	Rivers & Streams	IDEM 303d Rivers and Streams	Cave Entrance Density	Karst Springs	Canal Structures - Historic	Floodplain-DFIRM	NWI Wetland Points	Lakes	IDEM 303d Listed Lakes	Sinkhole Areas	Sinking-Stream Basins	Petroleum Well	Mines-Surface	Petroleum Field	Mines-Underground
Union St	Irelto Dr to Sixth St	Added Capacity		✓	✓	✓	✓				✓	✓	✓				✓			
Veterans Pkwy	Cul-de-Sac to Cleveland Rd	New Road Construction			✓	✓	✓				✓						✓			
Veterans Pkwy	Cul-de-Sac to Douglas Rd	New Road Construction			✓	✓	✓				✓		✓							
Bendix Dr	Betrand Rd to Lathrop Rd	Road Diet		✓	✓							✓	✓							
Bertrand Rd	Meade St to Bendix Dr	Safety Improvement			✓							✓	✓							
Colfax Rd	SR 23 to Colfax Bridge	Center Turn Lanes			✓	✓	✓				✓		✓				✓			
Lincolnway West	Olive St	Intersection Improvement																		
Meade St	Orange Rd to Bertrto Rd	Safety Improvement			✓								✓							
Sample St	Maryflower Rd	Intersection Improvement			✓	✓														
Sample St	SR 23 to Mayflower Rd	Safety Imrpovement			✓	✓														
Sheridan St	Lincolnway to Progress Dr	Road Reconstruction																		

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Elkhart County																				
CR 118	Old CR 17 to CR 19	New Road Construction																		✓
CR 13	Sunnyside Ave to US 20	Added Travel Lanes					✓								✓			✓		✓
CR 15	CR 6 to CR 104	New Road Construction	✓																	✓
CR 17	CR 142 to CR 38	New Road Construction						✓												✓
CR 17	CR 46 to CR 142	New Road Construction																		
CR 17	CR 50 to CR 46	New Road Construction																		✓
CR 17	US 6 to CR 50	New Road Construction																		
CR 18	CR 13	Intersection Improvement																		
CR 20	CR 111	Intersection Improvement	✓				✓				✓									✓
CR 20	SR 15	Intersection Improvement					✓				✓									✓
CR 20	SR 19 to US 33	Added Travel Lanes	✓	✓	✓		✓							✓	✓					✓
CR 22	CR 3	Intersection Improvement					✓													
CR 24	CR 3	Intersection Improvement					✓													
CR 26	SR 15 to CR 31	New Road Construction																		✓
CR 31	CR 36 to CR 26	New Road Construction						✓												
CR 38	SR 119 to CR 17	Center Turn Lanes																		✓

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
CR 40	SR 19 to SR 119	Added Travel Lanes			✓		✓								✓					✓
CR 43	CR 1400 N to US 6	Added Capacity																		
CR 52	CR 101 to SR 19	Road Reconstruction					✓	✓							✓					✓
CR 6	Ash Rd to CR 10	Added Travel Lanes									✓				✓					✓
CR 6	CR 10 to John Weaver Parkway	Added Travel Lanes									✓									✓
Johnson St	Bristol St to SR 4	Added Travel Lanes	✓				✓				✓			✓	✓					✓
Kerryhaven Dr	Current Termini to CR 10	New Road Construction																		✓
Old SR 17	SR 18 to Love's Dr	New Road Construction																		✓
Sunnyside Dr	US 33 to CR 13	Added Travel Lanes	✓				✓								✓			✓		✓
2nd St	Harrison St to Jefferson St	One-Way to Two-Way	✓	✓	✓		✓				✓		✓	✓	✓					
3rd St	Harrison St to Jefferson St	One-Way to Two-Way	✓	✓	✓		✓				✓		✓	✓	✓					
Benham Ave	Lusher Ave to Indiana Ave	Road Reconstruction	✓				✓								✓					
Bristol St	Johnson St to Jeanwood Dr	Road Diet					✓								✓					
Bristol St	Jeanwood Dr to CR 15	Added Travel Lanes					✓								✓					
CR 6	CR 6 to Cassopolis St	Intersection Improvement					✓				✓			✓	✓					✓
Goshen Ave	Jackson Blvd to Middlebury St	Road Reconstruction	✓	✓	✓		✓			✓	✓		✓	✓	✓		✓			✓

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Hively Ave	Norfolk Southern Railroad (#510012C)	Grade Separation	✓	✓	✓		✓		✓	✓	✓			✓	✓			✓		✓
Indiana Ave	Oakland Ave	Intersection Improvement	✓		✓		✓			✓	✓			✓	✓					
Jackson Blvd	Goshen Ave	Intersection Improvement	✓	✓	✓		✓				✓			✓	✓					✓
Jackson Blvd	Goshen Ave to Riverview Ave	Road Diet	✓	✓	✓		✓				✓			✓	✓					✓
Jackson Blvd	Johnson St	Intersection Improvement	✓	✓	✓		✓			✓	✓		✓		✓					✓
Main St	Beardsley Ave	Intersection Improvement	✓	✓	✓		✓				✓	✓	✓	✓	✓					✓
Main St	Hively Ave to Lusher Ave	Road Diet	✓		✓		✓				✓			✓	✓			✓		✓
Middlebury St	Prairie St to Goshen Ave	Added Travel Lanes	✓	✓	✓		✓			✓	✓		✓	✓	✓		✓			✓
Northside Connector	Adamsville Rd to Johnson St	New Road Construction	✓				✓				✓			✓	✓					✓
Prairie St	Mishawaka Rd to Lusher Ave	Added Travel Lanes					✓							✓	✓					
Sunny Dr	Northpointe Blvd to CR 4	New Road Construction					✓			✓				✓	✓					✓
Toledo Rd	Goshen Ave to Indiana Ave	Intersection Improvement		✓			✓			✓		✓		✓						
College Ave	US 33 to Century Dr	Center Turn Lanes					✓							✓	✓					✓
CR 142	CR 17 to CR 15	Added Travel Lanes					✓	✓							✓					
US 33	Fairfield Ave to Plymouth Ave	Auxiliary Lanes																		
CR 40	Dierdorff Rd to US 33	Center Turn Lanes					✓													

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Waterford Mills Pkwy	CR 40 to SR 15	New Road Construction					✓							✓	✓					
Wilden Ave	Current Termini to Middlebury St	New Road Construction	✓		✓		✓						✓		✓					✓
CR 16	SR 13 to County Line Rd	Horse and Buggie Lanes																		
CR 101	Market St to CR 52	Road Reconstruction						✓		✓				✓	✓					✓
CR 150	SR 19 to CR 3	New Road Construction		✓			✓			✓				✓	✓					✓
Maple Ln	CR 42 to Wabash Ave	Center Turn Lanes		✓			✓			✓				✓	✓					✓
Orchard Park Dr	Current Termini to SR 19	New Road Construction	✓	✓	✓		✓			✓	✓		✓	✓	✓					✓
Kosciusko County																				
Armstrong Rd	CR 200 E	Intersection Improvement					✓													
County Farm Rd	SR 14 to CR 700 S	Added Capacity						✓												
CR 1200 N	Syracuse Webster Rd/N 500 E	Intersection Improvement					✓							✓	✓					✓
CR 1300 N	Norfolk Southern Railroad (New Crossing)	Grade Separation					✓	✓												✓
CR 1300 N	SR 15 to Old SR 15	New Road Construction					✓	✓												✓
CR 200 E / N 100 E	E 200 N to Armstrong Rd	Added Capacity			✓		✓				✓									✓
CR 225 S	CR 200 S to Packerton Rd	Added Capacity																		

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
CR 350 W	Old US 30 to US 30	Added Capacity			✓									✓						
CR E 450 N	CR N 100 E	Intersection Improvement						✓			✓					✓				
CR 800 W	US 30 to SR 19 / W 900 N	Added Travel Lanes						✓			✓					✓				
CR 700 S	SR 19 to County Farm Rd	Added Travel Lanes					✓	✓							✓					
CR 900 N	CR 500 S to SR 25	Added Travel Lanes					✓	✓			✓									✓
N Fox Farm Rd	CR 150 W to US 30	Added Capacity					✓							✓	✓					✓
New Road (CR 350 E)	Pierceton Rd to Wooster Rd	New Road Construction																		
New Road (CR 850 W)	W 1350 N to Indiana Ave	New Road Construction		✓			✓				✓			✓	✓					✓
Old US 30	CR 350 W	Intersection Improvement			✓						✓			✓						
Old US 30	N Zimmer Rd to CR 350 W	Added Capacity			✓		✓				✓		✓	✓	✓					✓
Pierceton Rd	Parckerton Rd to Market St	Added Capacity	✓				✓				✓			✓	✓					✓
CR 1350 N	CR 700 W to CR 950 N	Road Reconstruction									✓									
Wawasee Dr (CR 900 E)	Morris Rd to County Line Rd	Added Capacity					✓													✓
Jackson Street	W 1350 N to Current Termini	New Road Construction					✓				✓									✓
CR 100 E	CR 250 N to CR 300 N	Road Realignment									✓									✓

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
CR 100 S	SR 15 to Country Club Rd	New Road Construction	✓				✓							✓	✓					✓
CR 150 W	Lake St to US 30	Added Travel Lanes	✓		✓		✓								✓			✓		
CR 300 N	Shelden Dr	Intersection Improvement					✓							✓	✓					✓
Market St	Norfolk South-ern	Grade Separa-tion	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓					✓
Parker St	Center St	Intersection Improvement	✓	✓			✓				✓		✓	✓	✓					✓
Sheridan St	Parker St to Harrison	New Road Construction	✓				✓							✓	✓					✓
Zimmer Rd	SR 25 to Old US 30	Added Capac-ity					✓				✓			✓	✓					✓
Zimmer Rd	Winona Ave	Intersection Improvement									✓			✓	✓					✓
Columbus Dr	Pierceton Rd to Chestnut St	New Road Construction			✓		✓				✓			✓	✓					✓
Kings Hwy/ Winona Ave	Parke Ave/ Argonne Rd to	Intersection Improvement	✓	✓			✓				✓		✓	✓	✓					✓
Packerton Rd	CR 225 S to Pierceton Rd	Added Travel Lanes																		
Pierceton Rd	CR 250 E	Safety Im-provement					✓													
Pierceton Rd	Packerton Rd	Intersection Improvement																		✓
Wooster Rd	Kings Hwy	Intersection Improvement	✓		✓		✓								✓			✓		
Wooster Rd	CR 250 E	Intersection Improvement	✓		✓		✓								✓			✓		

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Marshall County																				
Lincoln Hwy	Pioneer Dr	Intersection Improvement					✓													
Michigan Rd	12 B Rd to US 31	Intersection Improvement	✓		✓		✓			✓	✓			✓	✓					✓
Veterans Pkwy	Michigan Rd to Pioneer Dr	New Road Construction					✓			✓				✓	✓					✓
Main St	Davis St	Intersection Improvement	✓		✓		✓			✓	✓			✓	✓					✓
Hoham Dr	Oak Dr to Michigan Rd	Center Turn Lanes					✓							✓	✓					
Jim Neu Dr	Western Ave to Oak Dr	New Road Construction		✓			✓			✓			✓	✓	✓					✓
Richter Rd	Jefferson St to Baker St	Road Reconstruction			✓		✓				✓			✓	✓					✓
Plymouth Municipal Airport		Runway Extension					✓							✓	✓					
Oak Rd	US 30 to Hoham Dr	Added Travel Lanes					✓								✓					
Suter Rd	Lincoln Hwy to 9A Rd	New Road Construction	✓	✓	✓		✓			✓			✓	✓	✓					✓
St. Joseph County																				
Cleveland Rd	Beech Rd	Intersection Improvement																		
Douglas Rd/ Cleveland Rd Connector	Bittersweet Rd to Beech Rd	New Road Construction																		
Douglas Rd	Canadian National	Grade Separation																		✓
Douglas Rd	Bittersweet Rd	Intersection Improvement																		

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Douglas Rd	Ironwood Rd	Intersection Improvement		✓			✓			✓			✓	✓	✓			✓		✓
Douglas Rd	Ivy Rd to SR 23	Added Travel Lanes		✓			✓			✓			✓	✓	✓			✓		✓
Edison Rd	Similax Rd	Intersection Improvement		✓			✓			✓				✓	✓					✓
Edison Rd	Timothy Rd to Walnut Rd	New Road Construction									✓									✓
Edison Rd	Walnut Rd	Intersection Improvement									✓									✓
Filmore Rd	Larrison Rd	Intersection Improvement											✓		✓			✓		
Harrison Rd	Strawberry Rd to Lemon Rd	New Road Construction																		✓
Larrison Rd	Filmore Rd	New Road Construction																		✓
Pierce Rd	Miami Rd to SR 331	New Road Construction						✓							✓					
Snowberry Rd	Hamilton Trl to Hamilton Trl	New Road Construction		✓			✓			✓			✓	✓	✓			✓		✓
Twelfth St	SR 331 to Union St	Added Capac-ity	✓	✓	✓		✓			✓			✓	✓	✓					✓
Beacon Pkwy Connector	Clevelan Rd to Beacon Pkwy	New Road Construction		✓	✓		✓			✓	✓		✓	✓	✓			✓		✓
Catalpa Ave	Filbert Rd to Catalpa Ave	New Road Construction					✓				✓			✓	✓					✓
Division St	Catalpa Ave to Current Terminus	New Road Construction		✓			✓						✓	✓	✓					✓
Elwood Ave	SR 331	Intersection Improvement	✓	✓	✓		✓			✓			✓	✓	✓					✓
Fir Rd	McKinley Ave to 1-80/90	Center Turn Lanes		✓			✓							✓	✓			✓		✓

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Fulmer Rd	Current Terminus to Clover Rd	New Road Construction	✓	✓	✓		✓			✓			✓	✓	✓					✓
Grape Rd	Douglas Rd	Intersection Improvement																		
Hickory Rd	Helper St to SR 23	New Road	✓				✓					✓	✓							✓
Jefferson Blvd	Byrkit St to Cedar St	Safety Improvement			✓		✓				✓		✓	✓	✓			✓		✓
McKinley Ave	Fir Rd to Division St	Added Capacity		✓	✓		✓			✓	✓		✓	✓	✓			✓		✓
Twelfth St	Campbell St to Dodge St	Added Travel Lanes	✓	✓	✓		✓			✓			✓	✓	✓					✓
Union St	Irelto Dr to Sixth St	Added Capacity	✓		✓		✓			✓	✓		✓	✓	✓					✓
Veterans Pkwy	Cul-de-Sac to Cleveland Rd	New Road Construction																		
Veterans Pkwy	Cul-de-Sac to Douglas Rd	New Road Construction																		
Bendix Dr	Betrand Rd to Lathrop Rd	Road Diet	✓	✓	✓		✓			✓			✓	✓	✓					✓
Bertrand Rd	Meade St to Bendix Dr	Safety Improvement	✓		✓		✓			✓			✓	✓	✓					✓
Colfax Rd	SR 23 to Colfax Bridge	Center Turn Lanes	✓	✓		✓	✓			✓			✓	✓	✓					✓
Jefferson	Logan to Ironwood	Center Turn Lanes		✓			✓			✓				✓	✓					
Lincolnway West	Olive St	Intersection Improvement	✓	✓			✓			✓				✓	✓					
Meade St	Orange Rd to Bertrto Rd	Safety Improvement	✓		✓		✓			✓			✓	✓	✓					✓

Table E-3: Hazardous Materials

Road	Limits	Type	Brownfield Sites	State Cleanup Sites	Voluntary Remediation Program	Manufactured Gas Plant Sites	Underground Storage Tanks	Confined Feeding Operations	Tire Waste Sites	Waste Treament, Storage, and Disposal	NPDES Pipe Locations	Superfund Sites	Institutional Control Sites	Industrial Waste Sites	Leaking Underground Storage Tanks	Septage Waste Sites	Infectious/Medical Waste Sites	Solid Waste Landfills	Waste Transfer Stations	NPDES Facilities
Sample St	Maryflower Rd	Intersection Improvement											✓		✓					✓
Sample St	SR 23 to Mayflower Rd	Safety Imrpovement											✓		✓					✓
Sheridan St	Lincolnway to Progress Dr	Road Reconstruction					✓			✓			✓	✓	✓					✓

Appendix F:
Environmental Justice

F

Environmental Justice and Title VI

The Michiana Area Council of Governments uses the Indicators of Potential Disadvantage to help staff, member governments, planning partners, and the general public consider Civil Rights (Title VI) and Environmental Justice (EJ) concerns when carrying out planning activities, project development, and programming. The IPD analysis identifies populations of interest under Title VI and EJ using U.S. Census American Community Survey (ACS) data.

Indicators of Potential Disadvantage

MACOG supports and models their Environmental Justice (EJ) process based upon guidelines from the Delaware Valley Regional Planning Commission (DVRPC) in Pennsylvania. DVRPC developed the Indicators of Potential Disadvantage (IPD) method, which locates selected population groups in the region to better inform how the regional transportation system and MPO programs, policies, and investments might impact these groups. These population groups include minorities, low-income, carless households, persons with physical disabilities, elderly over age 65, Hispanic, and Limited English Profiency (LEP).

Neither Title VI or the Civil Rights Act nor Executive Order #12898 provides specific guidance to evaluate EJ within a region's transportation planning process. Therefore, MPOs must devise their own methods for ensuring that EJ population groups and issues are represented in transportation decision-making. This is a challenging assignment, and serious consideration must be given to the available types of quantifiable data, as well as how the data is to be used and interpreted. It should be noted that while the IPD method helps ascertain population data, it is only one tool in a larger strategy involving public participation, stakeholder outreach, data sources, and other research.

IPD information is derived from the American Community Survey (ACS) five-year estimates data set from the U.S. Census. The ACS is conducted every year to provide up-to-date information about the social and economic needs of the country. ACS data is in one-year, three-year, and five-year estimates. The five-year estimates set was chosen as it provides the largest sample size, includes data for all areas, and information can be found at the census tract and block group level.

A full report of the Environmental Justice population analysis with maps and figures is available on MACOG's website.

Proposed Project Impacts

By mapping the 2045 Transportation Plan proposed projects, potential impacts to IPD tracts can be evaluated. Most of tracts with an above average populations of potential disadvantage have proposed projects in the 2045 Transportation Plan. Many of the projects identified to be open by 2025 are located in these areas. All groups, including IPD populations, will benefit from the proposed transportation improvements in the area. The proposed projects include improved accessibility and connectivity to the area, which provides increased access to community services.

Each project will bring short-term impacts to residents in the area, such as delays, increased detour traffic, noise, or right-of-way purchases. These impacts will be experiences by all populations groups, not just the IPD populations. During project development, considerations will need to be made at the project level if there are any adverse impacts to the potentially disadvantage population groups. Figures F-1, F-2, F-3, and F-4 illustrate the distribution of transportation projects. The projects are located throughout the region, without a disproportionately high impact to the IPD populations.

Figure F-1: Elkhart County Environmental Justice

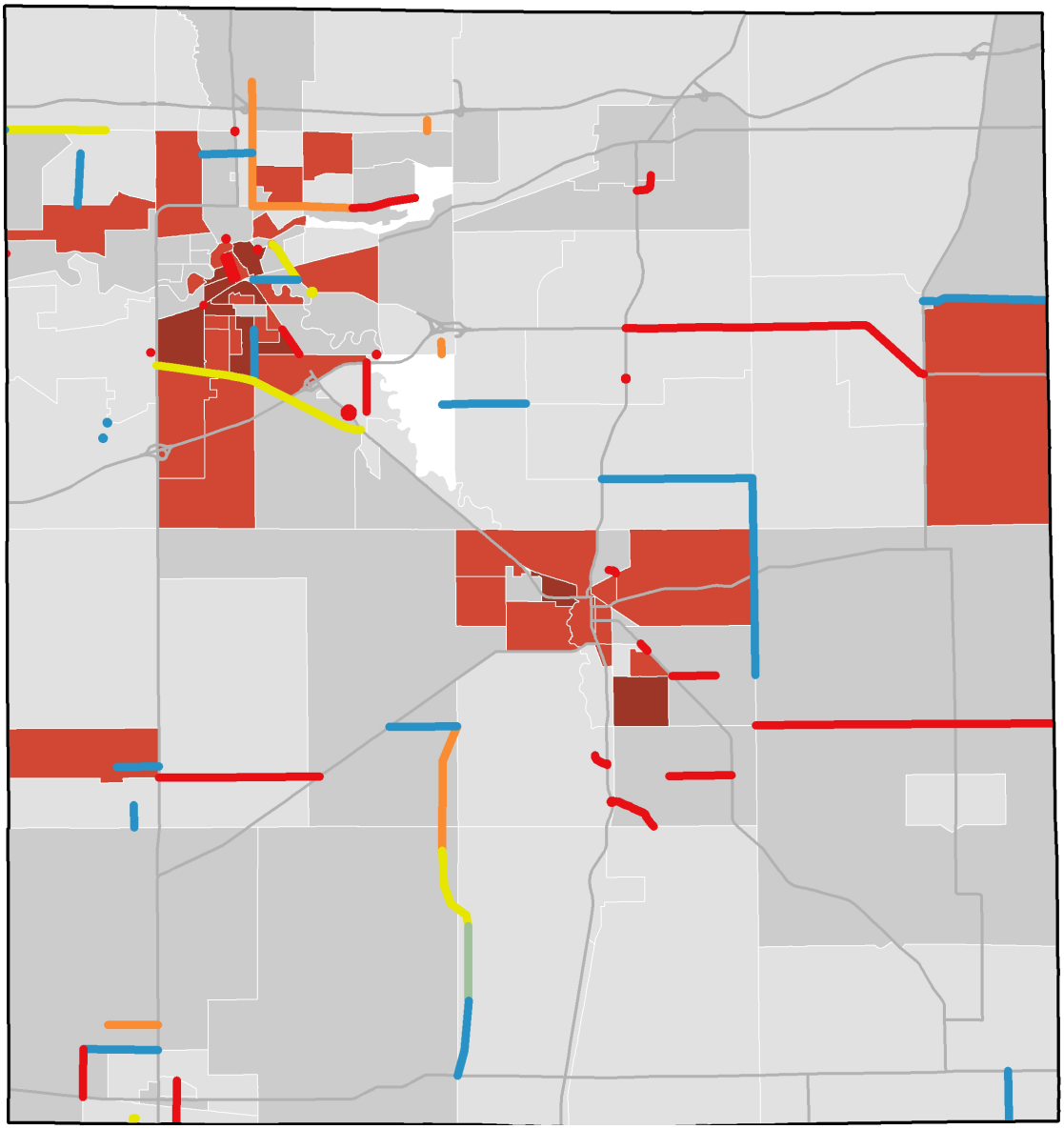


Figure F-2: Kosciusko County Environmental Justice

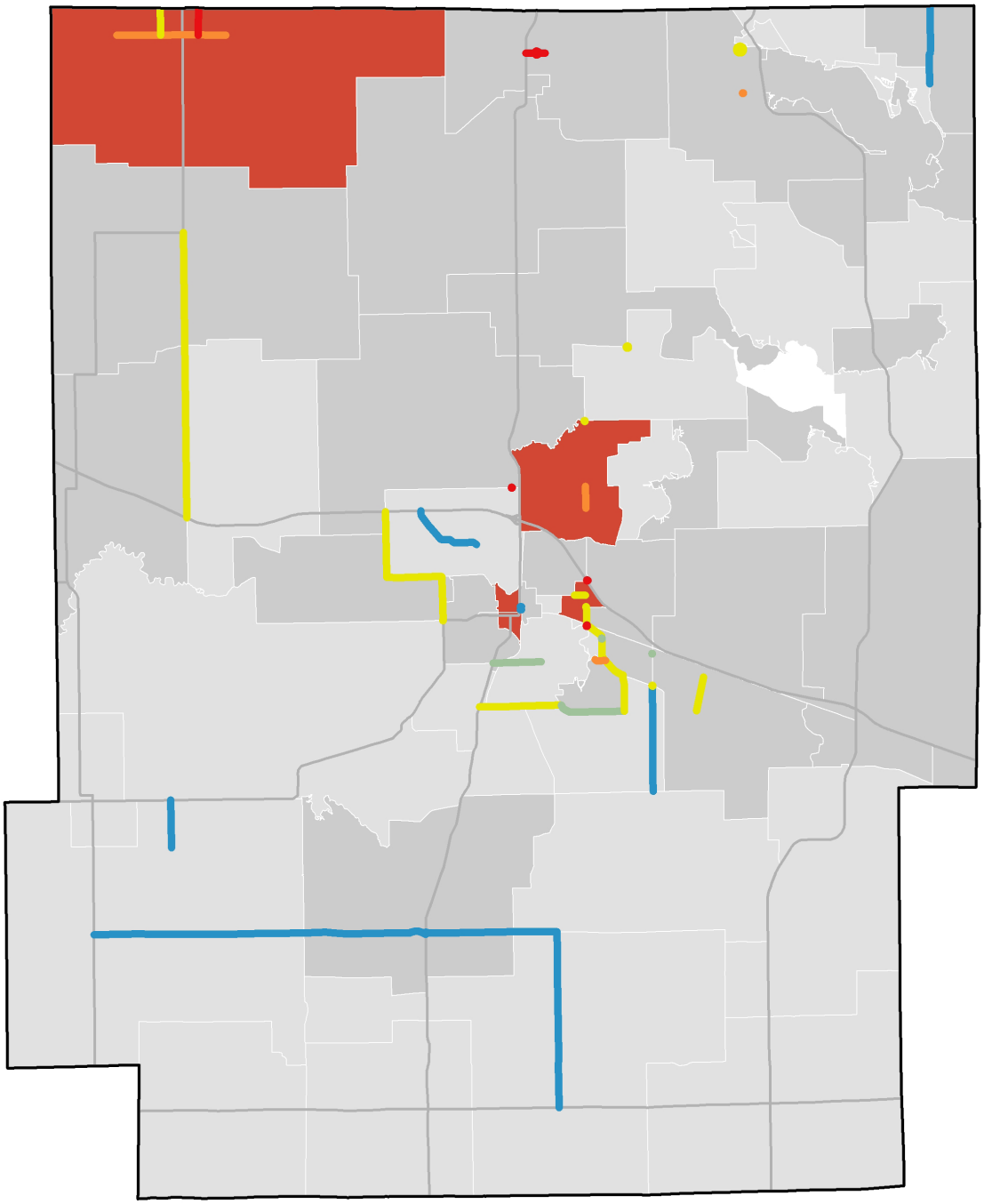


Figure F-3: Marshall County Environmental Justice

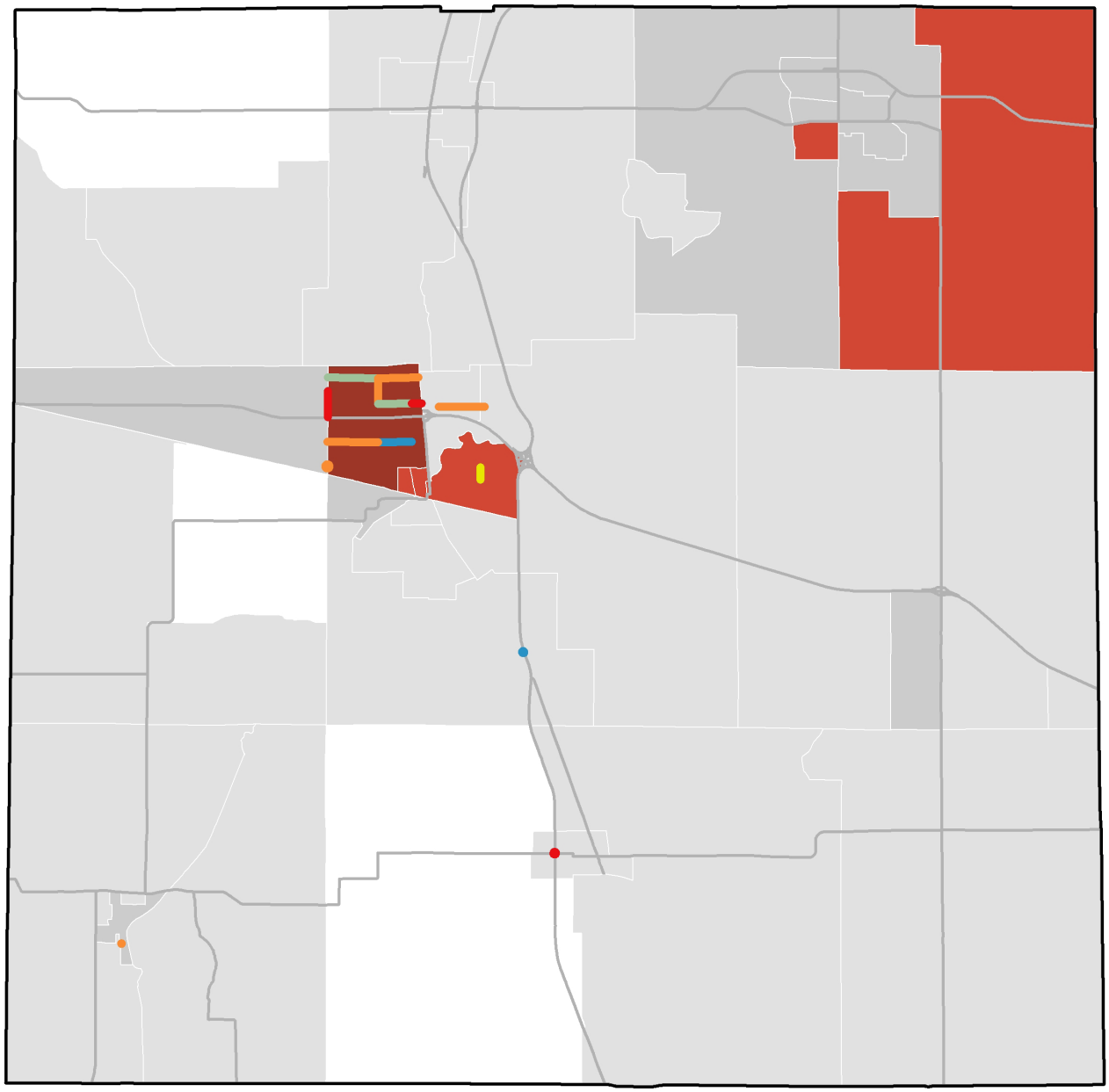


Figure F-4: St. Joseph County Environmental Justice

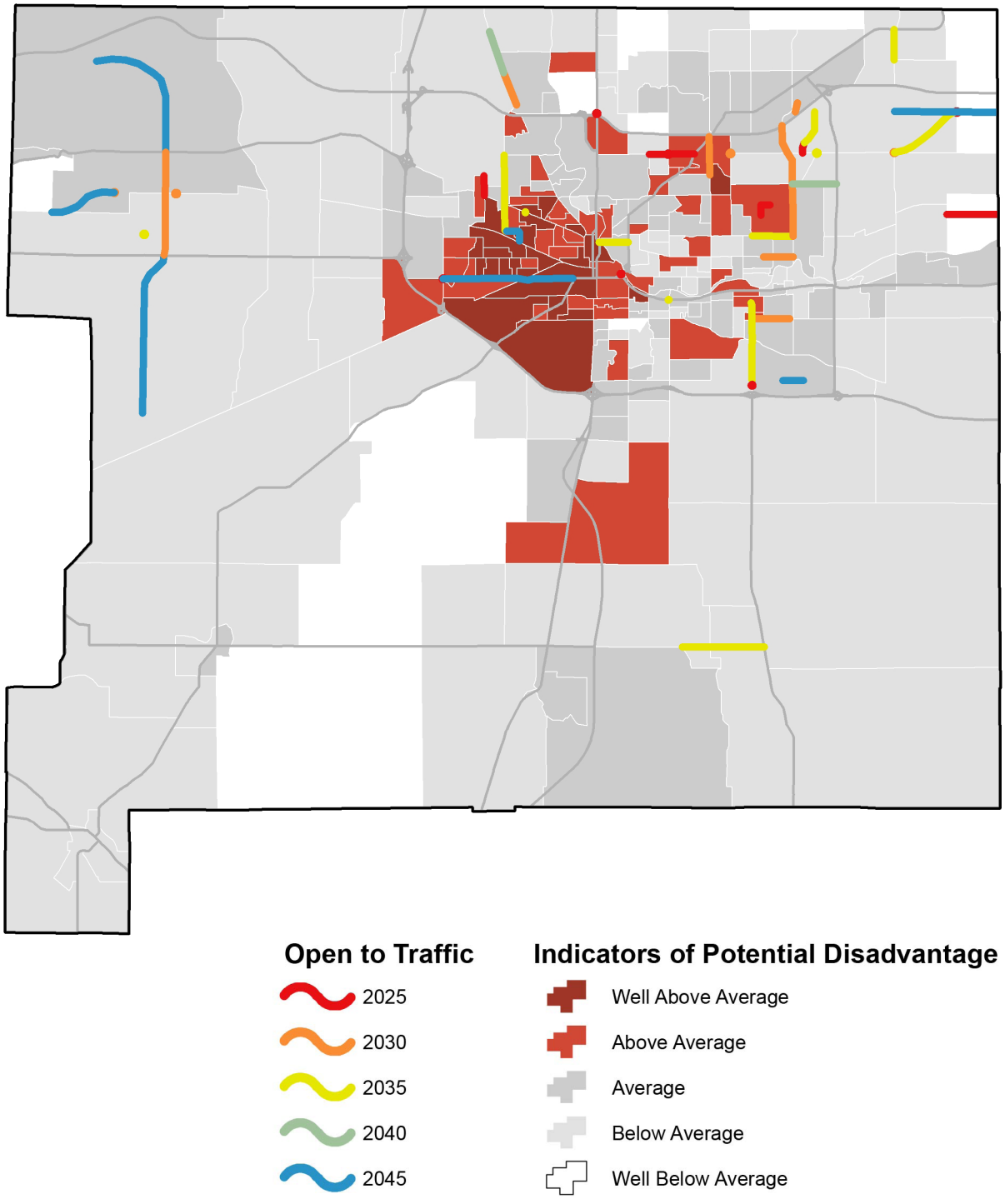
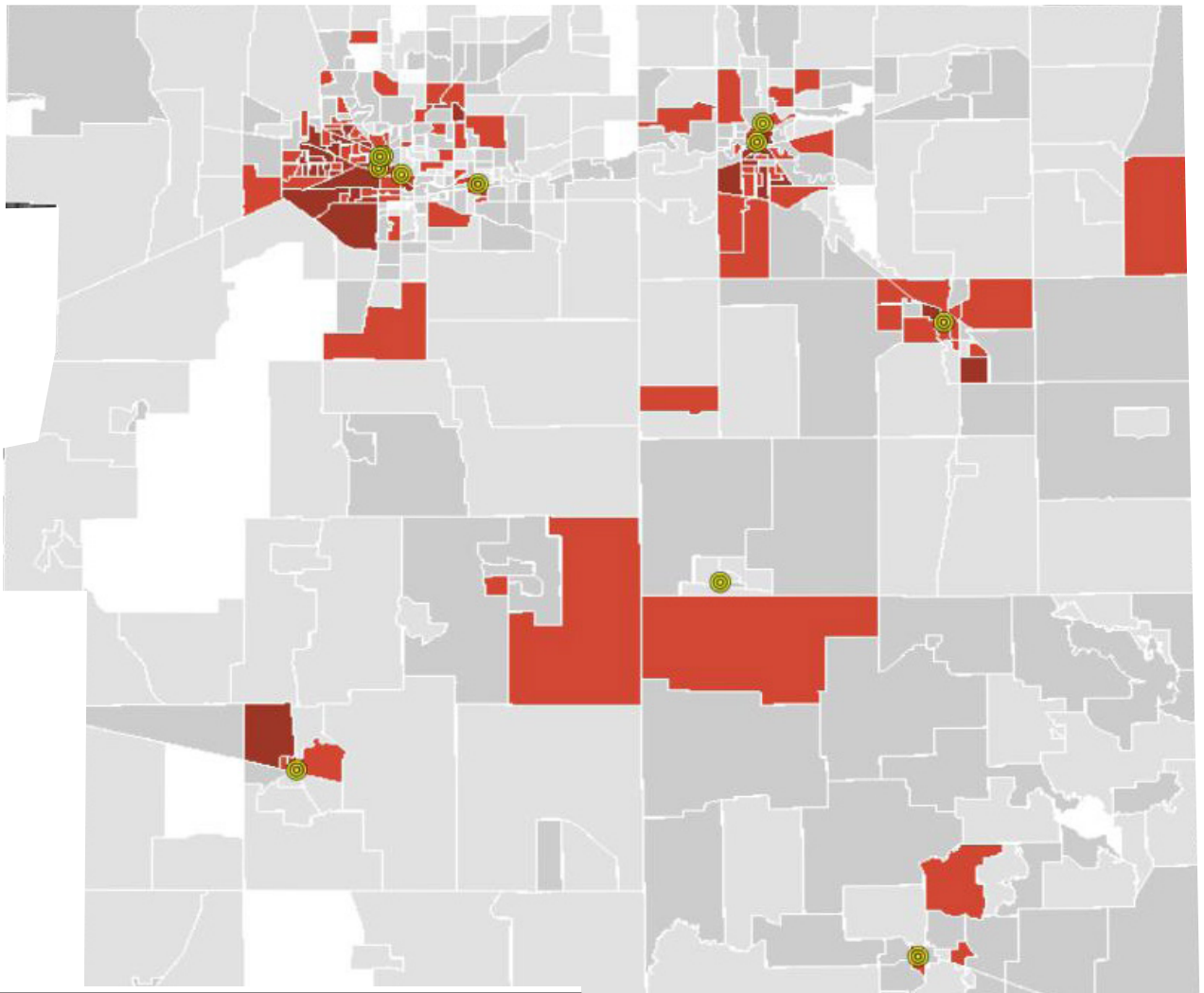


Figure F-5: Pop-Up Outreach Events



Public Outreach Events
Kosciusko County Farmers Market
Goshen Farmers Market
South Bend Farmers Market
Elkhart Pop-up Market
Transpo South Street Station
Interurban Trolley Station
French Press Coffee Co., City of Plymouth
Main St Roasters, City of Nappanee
South Bend First Fridays
Mishawaka Public Library
Sustainable Operations Workshop

MACOG held a series of pop-up events throughout the region at various events and places. Pop-up events were held in each of the cities in order to engage the public on various items related to the Plan. These were held at places and events that people would already be at or be attending in an effort to better engage with those who would be unable to attend or participate in other engagement activities.

Appendix G:
Congestion Management Process

G

Introduction

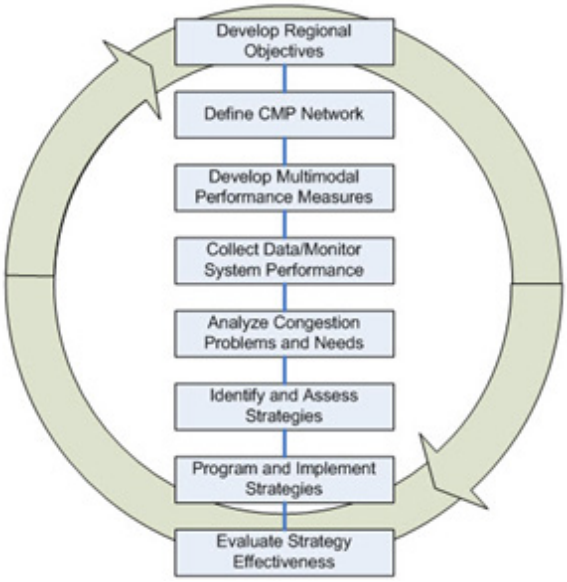
A Congestion Management Process (CMP) is a systematic and regionally-accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet State and local needs. It identifies strategies and recommendations throughout the region to minimize congestion and enhance the ability of people and goods to reach their destinations.

A CMP is required in metropolitan areas with a population exceeding 200,000, known as Transportation Management Areas (TMAs). In TMAs designated as ozone or carbon monoxide non-attainment areas, the CMP takes on a greater significance because Federal law prohibits projects that result in a significant increase in carrying capacity for single occupant vehicles (SOVs) from being programmed in these areas unless the project is addressed in the region's CMP.

The Michiana Area Council of Government's 2019 Congestion Management Process (CMP) was created to replace the previous CMP. The CMP was developed as an integral part of 2045 Transportation Plan. The CMP is tailored to the unique characteristics of the MACOG region. It provides a structured framework for evaluating travel demand reduction and operational management strategies, lends itself to identifying, prioritizing, and programming transportation improvement projects, and has been integrated into the Transportation Improvement Plan (TIP) and the Transportation Plan (TP) by providing reliable tools for project evaluation, selection and prioritization.

MACOG's CMP includes the eight elements of the CMP as discussed in the Federal Highway Administration (FHWA) Congestion Management Process guidebook. The figure below shows the elements of the MACOG CMP.

Figure G-1: MACOG CMP Elements



Source: https://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/fig2.cfm

Defining Congestion

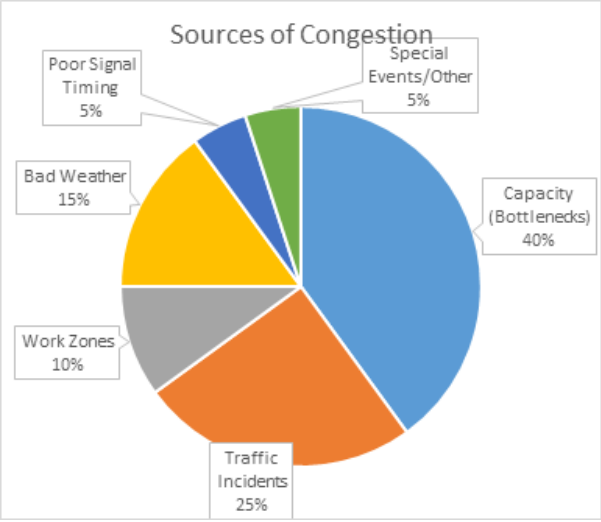
Traffic congestion is the level at which transportation system performance is no longer acceptable due to traffic interference. The level of acceptable system performance will vary by type of transportation facility, location within the region and time of day. The level of acceptable system performance depends upon transportation and development goals for the region and reflects public perception of traffic congestion. Essentially, congestion is a condition on road networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queuing.

Traffic congestion is generally categorized into recurring or non-recurring congestion. Recurring congestion is caused by inadequate road capacity. In other words, there are more vehicles trying to utilize a roadway than can be physically accommodated at a single time. Sometimes, poor signal timings, poor access management, and

roadway geometric deficiencies contribute to reduced capacity. This type of congestion begins at regular times of the day and often occurs at the same locations. Recurring congestion is often defined as routine disruption in traffic flow.

Non-recurring congestion is an unexpected disruption in traffic flow often caused by random events such as crashes, spillages, vehicle breakdowns, inclement weather, special events, road construction, etc. According to the Federal Highway Administration (FHWA), sixty percent (60%) of congestion is caused by non-recurring factors.

Figure G-2: Sources of Congestion



Congestion Management Process

The Congestion Management Process was initially spelled out in the Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU). The CMP is a regional approach to manage and monitor the transportation system. The CMP is intended to serve as an organized and transparent way for our planning area to identify and manage congestion, connect performance measures to support funding for projects, and evaluate recommended strategies to ensure we are effectively addressing congestion.

MACOG created the CMP by following the U.S. Department of Transportation Federal Highway Administration's "Congestion Management Process: A Guidebook". The following describes the contents of a CMP:

> *"A congestion management process is a systematic and regionally-accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. The CMP is intended to move these congestion management strategies into the funding and implementation stages."*

The CMP, as defined in federal regulation, is intended to serve as a systematic process that provides for safe and effective integrated management and operation of the multimodal transportation system. The process includes:

- Development of congestion management objectives
- Establishment of measures of multimodal transportation system performance
- Collection of data and system performance monitoring to define the extent and duration of congestion and determine the causes of congestion
- Identification of congestion management strategies
- Implementation activities, including identification of an implementation schedule and possible funding sources for

each strategy
- Evaluation of the effectiveness of implemented strategies

The elements of a successful CMP defined in the process model that follows serve as a guide for the actions to be taken in developing a CMP. These eight actions include:

1. Develop Regional Objectives for Congestion Management
2. Define CMP Network
3. Develop Multimodal Performance Measures
4. Collect Data / Monitor System Performance
5. Analyze Congestion Problems and Needs
6. Identify and Assess Strategies
7. Program and Implement Strategies
8. Evaluate Strategy Effectiveness

Action 1 - Develop Regional Objectives

The Regional CMP reflect the goals and objectives developed as part of the Michiana on the Move: 2045 Transportation Plan. While MACOG will be developing more extensive regional objectives throughout the next fiscal year, the overall focus of the CMP is to reduce congestion through the use of better management and operations of the existing transportation system. Therefore the primary objectives are to:

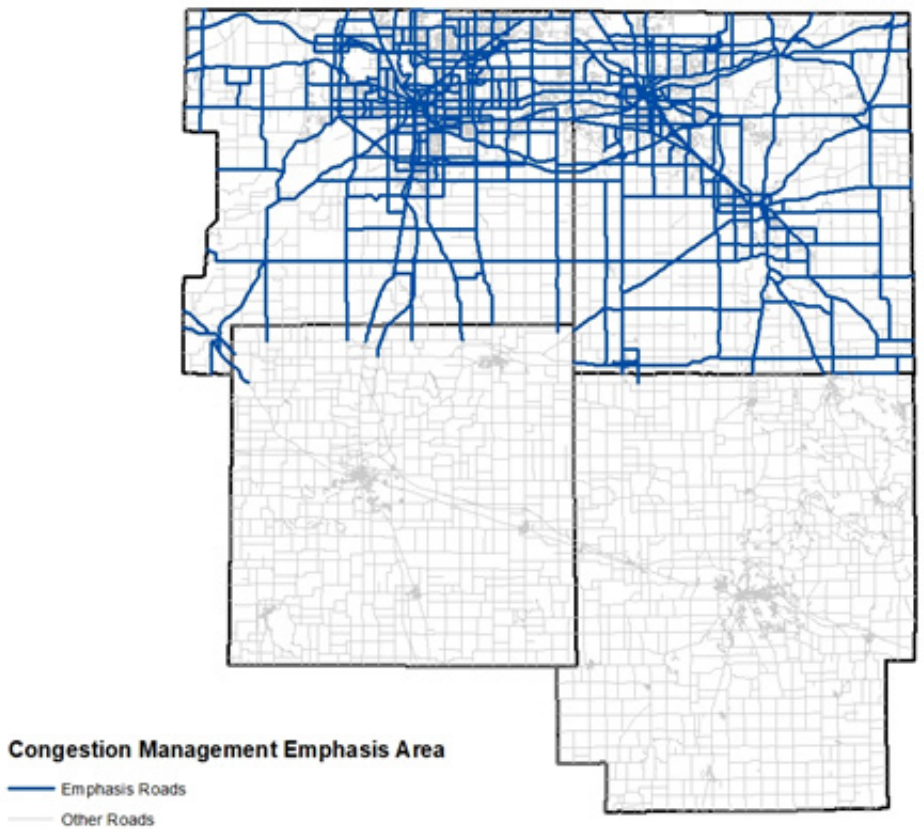
- Maximize effectiveness and efficiency of the existing transportation system
- Reduce Intersection Delay
- Reduce Corridor Delay
- Reduce Traffic Crashes
- Develop multimodal alternatives for people and goods

Action 2 - Define CMP Network

The MACOG planning area consists of the federally designated urbanized areas of Elkhart and St. Joseph Counties. MACOG also serves as a rural planning organization to Kosciusko and Marshall Counties. The 4-county region contains an estimated 601,923 people (2018 Census Population Estimates), covers 1,921 square miles, and includes 35 cities and towns. The MACOG region is comprised of over 6,548 miles of roadway, providing connectivity and access, both locally and regionally.

MACOG is unique in the sense that it is an MPO that represents rural areas as well as two urbanized areas (the South Bend Urbanized Area and the Elkhart/Goshen Urbanized Area). While MACOG monitors and studies congestion throughout the entire region, the CMP is intended to be focused on metropolitan areas with a population exceeding 200,000.

Figure G-3: Congestion Management Emphasis Area



For MACOG's Congestion Management Process network an emphasis is placed on all federally functionally classified roads (major collector and above) in St. Joseph and Elkhart Counties which consists of 1,147 centerline miles of roadway.

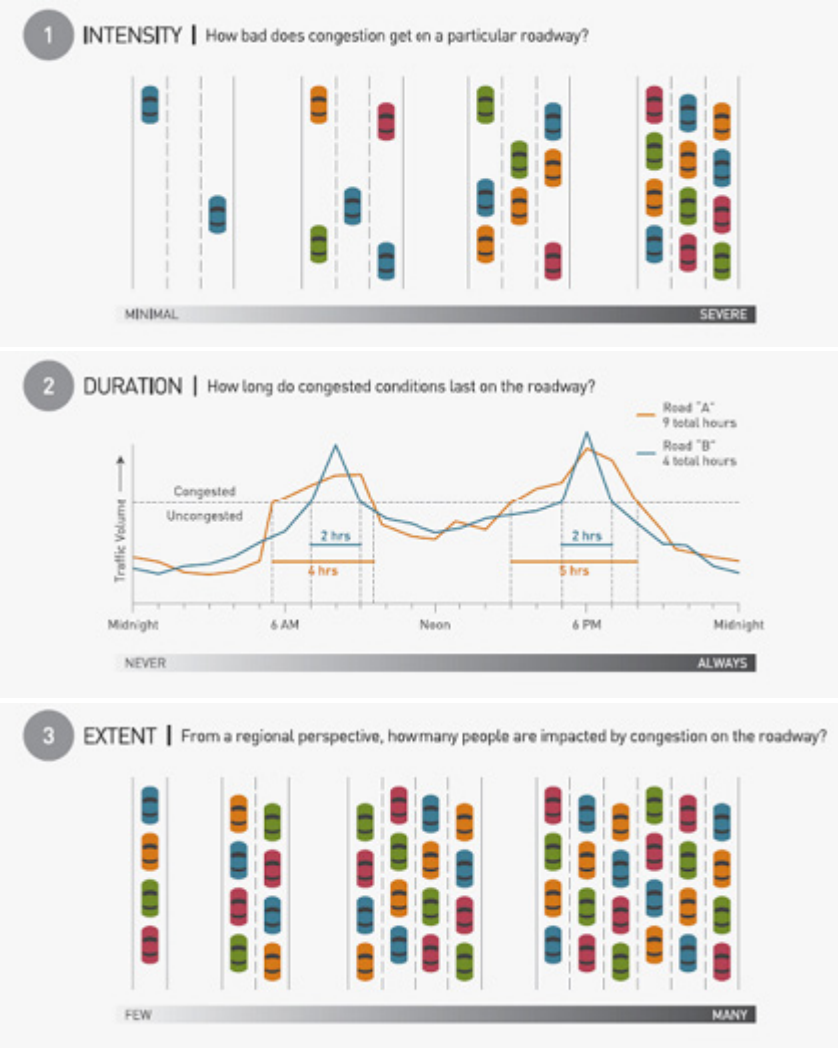
Action 3 - Develop Multi-Modal Performance Measures

Performance measures are defined as specific indicators used to evaluate how well a person, organization, or a system is operating. Performance measures for the CMP specifically characterize current and future conditions on the transportation system in the region, track progress toward meeting regional objectives, identify specific locations with issues to address, assess the effectiveness of strategies, and communicate system performance.

Since congestion is a complex topic there are multiple facets of congestion that can be measured. Congestion deals with both spatial (the where such as an intersection, roadway segment, or transit route) and temporal dimensions (the when such as time of day or year). Additionally, the transportation network is a system that does not operate in isolation. This means that actions that take place in one part of the transportation system can affect (positively or negatively) congestion on other nearby facilities. There is also a relative aspect to congestion where transportation users may qualitatively perceive congestion as being more or less severe based on observations at the same location at a different time, or at a different location. This is why it is important understand the following four major dimensions of congestion:

- Intensity – The relative severity of congestion that affects travel. Intensity has traditionally been measured through indicators such as V/C ratios or LOS measures that consistently relate the different levels of congestion experienced on roadways.
- Duration – The amount of time the congested conditions persist before returning to an uncongested state.
- Extent – The number of system users or components (e.g. vehicles, pedestrians, transit routes, and lane miles) affected by congestion, for example the proportion of system network components (roads, bus lines, etc.) that exceed a defined performance measure target.
- Variability – The changes in congestion that occur on different days or at different times of day. When congestion is highly variable due to non-recurring conditions, such as a roadway with a high number of traffic crashes causing delays, this has an impact on the reliability of the system.

Figure G-4: Dimensions of Congestions



These four dimensions of congestion discussed are not, however, all inclusive of the range of issues that could be considered in selecting performance measures for the CMP. Therefore, the following performance measures can be utilized when assessing the transportation system:

Level of Service and Volume to Capacity Ratio

The most common measure currently used to define congestion involves Level-of-Service (LOS) values as defined in the Highway Capacity Manual (HCM). LOS is a qualitative measure describing operational conditions of a segment or traffic stream. Six different levels are defined (LOS A, B, C, D, E, and F).

LOS A = Free flow

LOS B = Reasonable free flow

LOS C = Stable flow

LOS D = Approaching unstable flow

LOS E = Unstable flow

LOS F = Forced or breakdown flow

Level of Service (LOS) and Volume-to-Capacity Ratios (V/C) gauge the intensity of roadway congestion at a particular location. They are primarily used as general indicators of roadway sufficiency or for detailed corridor studies. LOS is expressed as values A through F, representing the volume over capacity, while V/C represents it as a ratio.

Travel Time Measures

Average Travel Time

The average travel time is defined as the total time to traverse a length of a roadway under prevailing traffic conditions. All stopped delays are included in the average travel time. This measure can be used to compare the quality of service of various alternate routes from a point of origin to a point of the destination.

Average Travel Speed

The average travel speed is calculated by dividing the distance traveled by the average total time to travel along a given length of roadway. The total time includes stopped delays in addition to the actual time the vehicle is in motion. The number of travel time runs depends on the variance in travel time, the acceptable degree of precision, and the level of confidence desired.

Delay

Total delay or stopped delay is the time that a vehicle is stopped in traffic or at an intersection. Expressed in seconds per vehicle, stopped delay can be measured as the actual "locked wheel" time, or in terms of time less than a very slow speed, such as 5 mph. The Highway Capacity Manual's (HCM) delay equation uses turning movement volumes to capacity ratios to determine stopped delays at intersections.

Travel Time Index

Travel Time Index (TTI) is the ratio of travel time in the peak period to the travel time at free-flow conditions. TTI measures the travel time for a given roadway segment. Travel time can include waiting time at signals, as well as delay caused by traffic.

Traffic Counts and Turn Movements

When monitored correctly, the amount of traffic on the road network can be useful in identifying potential congested areas. Roads and intersections are designed to handle certain volumes at any given time. The volumes and type of vehicles are often good indicators of existing or future problems. MACOG has an extensive traffic count program with nearly 5,000 locations counted every three years. These counts are on State and local roads throughout the region and extending into surrounding counties. This helps MACOG to establish at baseline roadway network that is used in the Travel Demand Model (TDM), which allows us to model congestion issues on a comprehensive roadway network including all National Highway Network roads and other roads that are functionally classified as major collector and above.

MACOG has an extensive traffic count database that, in some locations, extends to the early 1980s. Most of the locations counted use traditional road tube collection methods, however, MACOG is expanding with the use of video capture systems (i.e. MioVision). This new method uses artificial intelligence (AI) machine learning techniques to analyze turning movements at intersections. This significantly reduces the required staff time to gather and process turning movements in the region.

This is an ongoing process designed to provide decision-makers with valuable information about the transportation system performance and to evaluate the effectiveness of strategies to address congestion. By monitoring the effectiveness of congestion mitigation strategies, MACOG can improve our ability to select the most cost-effective strategies at each location specific to its condition and needs.

Crash Rates

Traffic crashes can cause non-recurring congestion by temporarily blocking one or more lanes of traffic. Time is needed for emergency response professionals (i.e. police, firefighters, emergency medical services, emergency management agencies, etc.) to perform their jobs. This also includes "clear time" to remove the vehicles and debris from the roadway and crash site. Crashes at an intersection can affect the entire function of the intersection. During a fatal crash, the roadway is often completely closed for hours.

MACOG reviews and improves the accuracy of reported crash locations from the Automated Reporting Information Exchange System (ARIES), the database portal that all police departments report traffic crashes into for Indiana, since 2006. This information is used to identify locations where safety may be an issue, which could be an indicator of non-recurring traffic incidents causing delays. When MACOG studies crash data we use the three most recent years of crash data to identify high crash intersections and corridors. High crash corridors are based on the total number of crashes occurring along each corridor in a community and their severity.

Action 4 - Collect Data/Monitor System Performance

Performance measures rely on the collection of data. MACOG collects and obtains a wide variety of data related to system performance. Much of this data is also used in conjunction with the Congestion Management Process. MACOG understands the limitations such as availability and cost for gathering data. The following data is useful in determining existing and future congestion, as well as, determining the cause of congestion.

Traffic Count and Turn Movement Data

The MACOG traffic counting program allows us to monitor any increases or decreases in traffic over time. MACOG collects count data at over 5,000 locations on state and local facilities every three years that in some locations, go back to the early 1980s. The counters used by MACOG are capable of collecting information such as volume, speed, time of day, and vehicle classification.

In addition to an extensive traffic count database, MACOG has expanded with the use of video capture systems to gather turning movement data at intersections.

Crash Data

MACOG reviews and improves the accuracy of reported crash locations from ARIES, the database portal that all police departments report traffic crashes into for Indiana, since 2006. This information is used to identify locations where safety may be an issue, which could be an indicator of non-recurring traffic incidents causing delays.

Land Use Data

Congestion is often the result of developments in land use. MACOG tracks changes to land use developments with the aid of aerial photography. Information on land use changes, trends and future development are used in MACOG's Travel Demand Modeling. Additionally, the HELPViz Land Use Model was developed by RSG for MACOG. Using the Land-Based Classification System's activity-based codes, 2002 aerial

photography and 2013 oblique photography was used to describe land use changes in the urbanized areas of the region over a 10-year period which was then used to adapt HELPViz to the area.

This land use model offers sensitivity to land use zoning, building codes and infrastructure facilities such as the transportation network, water and sewer utilities. HELPviz allocates the future population and employment regional totals to the TAZs based on build out capacities, the transportation network and infrastructure facilities. HELPviz uses a Nested Logit model framework and uses information at both TAZ and parcel levels.

Transit Data

MACOG oversees the operation of the Interurban Trolley, the public transit system in Elkhart and Goshen. This means that MACOG has a robust dataset of transit data including boarding and alighting statistics, total ridership, on-time performance, and archived Automatic Vehicle Location. Additionally, MACOG has strong partnership with Transpo and are typically provided similar datasets because MACOG frequently assists them with various planning projects.

Bicycle / Pedestrian Data

Although MACOG has an extensive traffic data collection program it has largely been focused on vehicular traffic. MACOG has begun expanding the traffic data collection to be more inclusive of all modes by launching an active transportation (i.e. walking and cycling) data collection program. In 2019, automated counters were procured and will be installed to continuously collect data on bicycles and pedestrians on key active transportation facilities. The data will allow MACOG to understand pedestrian and cyclist behavior such as factors that affect usage including seasonal variations, weather effects, and time of day. The data will also help plan facilities to meet the needs of the users.

Other Data Sources

Additionally, MACOG is continuing to evaluate the effectiveness and benefits of other data sources, including the National Performance Management Research Data Set (NPMRDS), mobile data sets (i.e. StreetLight), and other transportation data sources and analysis programs. New and innovated data collection techniques and sources are constantly being promoted, which requires MACOG to reevaluate the effectiveness of each dataset.

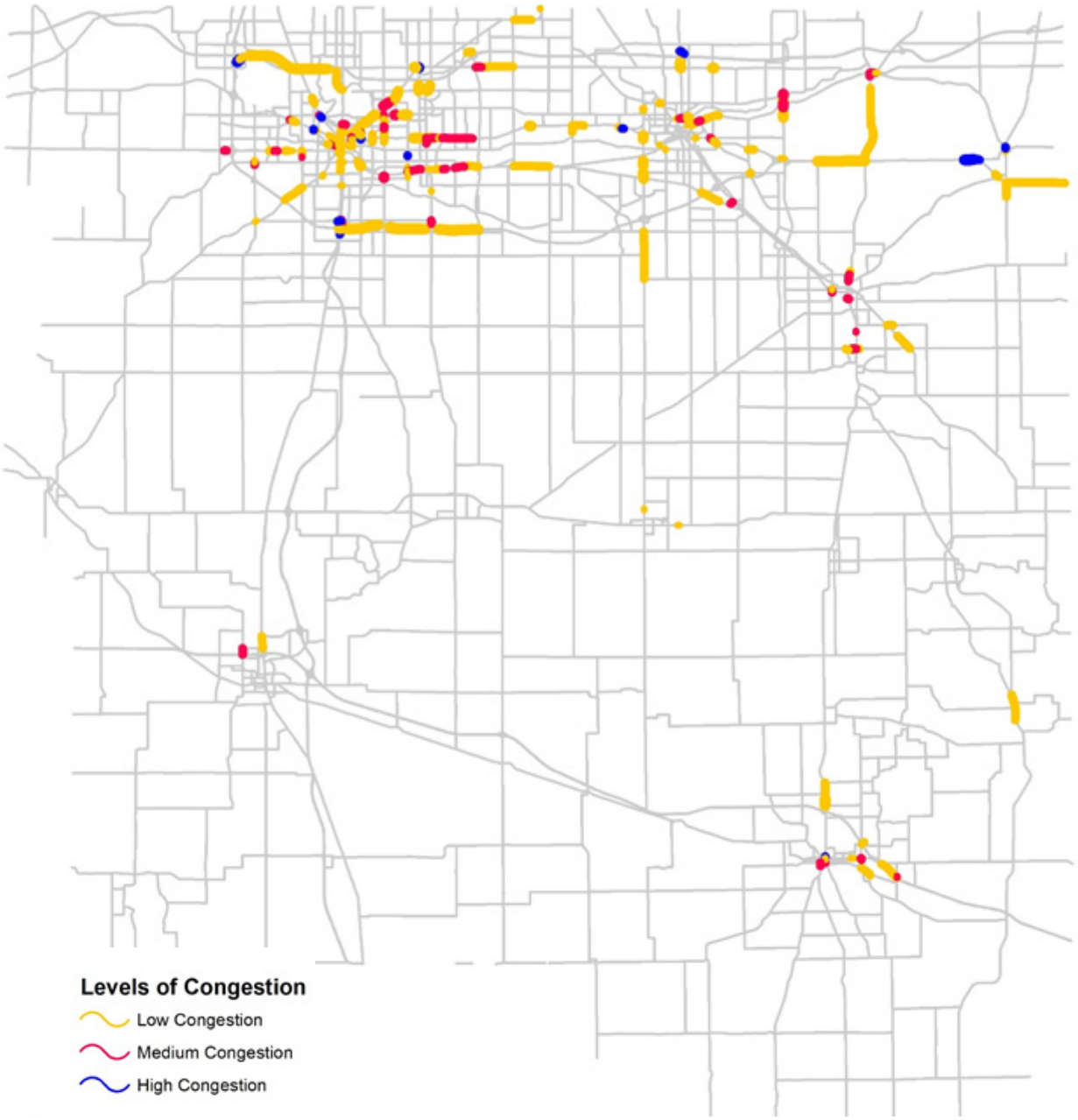
Action 5 - Analyze Congestion Problems and Needs

In order to identify congestion, MACOG utilizes performance measures, data collected for performance monitoring, and analytical tools. Input from local communities was also included as to the location of congested areas.

The traffic count data collected by MACOG is analyzed to measure the V/C ratios for the AM and PM peak hours. This V/C ratio can be used to calculate the LOS during the most congested times of the day. With improvements to the traffic count database, the peak hour average speed data can be used to identify existing and future areas of potential congestion issues through comparison to the daily 85th percentile speed values throughout the transportation network, rather than just at a few selected locations.

Travel time survey data is traditionally collected using the floating car method to gather data for the AM and PM peak hours. Utilizing this travel time data with available free flow times, the TTI for the collected corridors can be calculated. The TTI can then be used to designate the congestion level as low, moderate, high, or severe. However, the floating car method is subject to drawbacks with peak hour data collection often occurring outside normal business hours and different driving habits among drivers resulting in different congested speeds. Instead, MACOG is looking to the data provided through FHWA's National Performance Management Research Data Set (NPMRDS) to provide consistent results for future

Figure G-5: Level of Congestion



analysis.

Lastly, a transportation model is utilized to simulate the traffic flow for the region in order to discover where there are areas of congestion, and also to determine the effects of vehicular traffic on regional air quality. The transportation model is a network of links and nodes designed to represent the overall system of roads in a given area. This model is then combined with data previously described to create a simulation of the traffic flows of the region. The travel forecasting models offer a means by which decision makers can look at different transportation options and see the potential effects they might have at the regional or corridor level.

MACOG continues to improve the collection, interpretation, and dissemination of data required to enhance the Congestion Management

Process.

Congested Segments

The map shows the existing congestion on roadways throughout the region as identified by the travel demand model. The model generated a worst-case Level of Service based on multiple durations (peak hour, peak period, intersection, etc). A Level-of-Service D, E, and F were then identified as congested with Level of Service D representing low congestion and Level of Service F representing high congestion. Due to the regional nature of the model, MACOG continues to make refinements and as such will produce updated congestion maps as needed.

Action 6 - Identify And Assess Strategies

The identification and assessment of appropriate congestion mitigation strategies is a key component of the CMP. The strategies for managing congestion can be divided into four categories:

1. Travel Demand Management (TDM)
2. Traffic System Management (TSM)
3. Active & Public Transportation Improvements
4. Road Capacity Strategies

Travel Demand Management

The primary purpose of TDM strategies is to create a more efficient transportation system by reducing the number of vehicles during peak periods while providing mobility options to those who want to travel. To accomplish this type of change, TDM will incentivize changes in behaviors and are effective in dense, mixed-use environments. These strategies include:

- Parking management: Providing traveler information on parking spaces availability can reduce the amount of time vehicles spend searching for a parking space. Reduced parking fees for high-occupant vehicles or by the time of day will incentivize individuals to either carpool or change the travel time to non-peak hours.
- Carpools and vanpools: Ridesharing reduces single-occupant vehicle (SOV) trips and vehicle miles traveled (VMT). Carpools are generally two to five people sharing a ride in their personal vehicles. Vanpools are typically leased through a vanpool provider (public or private) and can accommodate up to twelve people.
- Employer programs: These include allowing employees to work from home (telecommute) which helps reduce SOV trips, especially during peak travel times. Additionally, employers may allow workers to arrive and leave work outside the traditional commute period, either a Compressed Week (four 10-hour workdays) or Flexible Schedules (start and end times vary).

Transportation System Management

While TDM address the supply (number of vehicles) of congestion, TSM seeks to identify operational strategies to enhance the capacity of the transportation system. Through better management and operation of existing transportation facilities, improved capacity and traffic flow will also benefit air quality, movement of goods, and system accessibility and safety. These strategies include:

- Access Management: Controlling the design and operation of driveway and street connections will allow more free-flowing traffic conditions with fewer access points for delays.
- Intersection Improvements: Congestion and travel-time can be improved with enhanced traffic control devices, additional turning lanes, pedestrian safety medians, and other appropriate geometric designs to help reduce congestion and improve safety.
- Signal Interconnect & Optimization: Delays may be caused by excessive wait-times at signalized intersections. Traffic flow could be improved through updated equipment upgrades, timing plan improvements, interconnected signals, or traffic signal removal.
- Traffic Calming: Changing the physical

design of the roadway can result in traffic to slow down or even a reduction of the amount of traffic. This could include narrowing roads, speed humps, road diets, traffic circles, etc. This can also have the benefit of increasing biking and walking by creating a safer space for pedestrians and cyclists.

- Traffic Incident Management: Coordinating multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective traffic incident management reduces the duration and impacts of traffic incidents and improves the safety of motorist, crash victims, and emergency responders.
- Remove At-Grade Rail Crossings: In a few key locations of the region, at-grade rail crossings reduce traffic flow on major corridors. Congestion segments could be improved by separating the roadway from the railway.

Active & Public Transportation Improvements

Shifting the view of congestion from a motorized traffic focus to a people centric focus can result in a multi-modal implementation. Improving other modes of transportation can encourage more individuals to switch their preference from SOV to walking, biking, or public transit. These strategies include:

- Land Use or Livable Community Policies: Development policies that support increased accessibility to bicycle, pedestrian and transit can reduce demand for travel by automobile. Examples would include policies that encourage new transit-oriented designs or reinvestment in existing urban centers.
- Complete Street Design: Optimize the use of existing streets by incorporating bicycle facilities in the form of bike lanes, buffered bike lanes, shared-use paths, or side paths to facilitate road sharing and encourage bicycle use.
- Improved Transit Service: Congestion on a particular corridor or destination may be alleviated with the addition of new fixed-route service, more frequent service, or extended service. More reliable & frequent service has been shown to increase ridership and decrease vehicular traffic.

Road Capacity Strategies

This category of strategies addresses adding more base capacity to the road network. Given the expense and possible adverse environmental impacts of new single-occupant vehicle capacity, management and operations strategies should be given due consideration before additional capacity is considered. Additionally, these improvement may only be a short-term solution, because increasing the capacity might induce more demand. These strategies include:

- Additional Travel Lanes: Deficient roadway capacity is a major contributor to congestion. Additional roadway capacity is needed in many areas to keep-up with increased travel demand.
- Geometric Design Improvements: Bottlenecks can occur where short sections of the roadway are of an insufficient width or number of lanes to accommodate the travel demand. Intersections may need additional turn lanes, channelized turn lanes, or grade-separated interchanges.
- Center Turn Lanes: Providing an area where vehicles can move out of the thru lanes and pause while making a left turn can improve the flow of traffic. This can also reduce the risk of rear-end crashes and make turning vehicles more visible to on-coming traffic.

Action 7 - Program And Implement Strategies

The CMP has been integrated into the transportation planning process. In the Transportation Plan, MACOG used LOS and V/C to assist in evaluating and prioritizing the final recommended projects. Similarly, when considering projects for in the Transportation

Improvement Program (TIP), congestion is an important criterion in the project scoring.

A scoring system was developed as part of the FY 2020-2024 TIP, which identifies ten categories to evaluate projects. Two categories that relate to the CMP. One of those specifically focuses on congestion, where 10 points (out of 100) are awarded to projects that aim to reduce vehicle miles traveled (VMT) or vehicle hours traveled (VHT). The other is on connectivity, where another 10 points are given for projects that improve mobility options or provide intermodal connections.

Action 8 - Evaluate Strategies

Understanding and evaluating the effectiveness of the CMP is dependent upon the proper monitoring of the implemented strategies. The monitoring will help decision makers determine whether strategies were successful in alleviating congestion and if so, to what degree they were successful. The evaluation of implemented strategies will be accomplished through the feedback of data collection efforts and performance measures. The following measures and data can be collected after a project has been completed to monitor effectiveness:

- Level of Service
- Delay Studies
- Crash Rates
- Traffic volumes

Reduction in congestion leads to less stress, safer roads, shorter travel times, and improved air quality. MACOG's Congestion Management Process is meant to identify areas where congestion may be a problem and recommend a range of potentially useful strategies to alleviate congestion. Identification of congested areas can lead to more detailed studies and may ultimately lead to projects in the Transportation Plan and Transportation Improvement Program. Through continuous monitoring and updated process, the CMP will evolve and change with the transportation system, in the hopes of making a better and safer transportation network.

Appendix H:
Scenario Methodology & Outcomes

Figure H-1: Level of Service by Scenario

Projects Open to Traffic By 2025						
Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
INDOT	SR 15	Kercher Road		E	E	E
INDOT	SR 15	SR 120		E	F	F
INDOT	SR 19	CR 38		D	D	D
INDOT	SR 19	CR 52		C	C	C
INDOT	US 20	CR 19	SR 15	D	E	D
INDOT	US 33	College Avenue		D	E	D
INDOT	US 33	Elkhart River	2nd Street	B	B	B
INDOT	US 33	Pike Street	Monroe Street	D	D	D
INDOT	US 6	CR 29		A	A	A
INDOT	US 6	US 33		C	C	C
Elkhart	Jackson Boulevard	Main Street	Johnson Street	D	D	D
Goshen	Main Street	Madison Street	Pike Street	B	B	B
Goshen	Waterford Parkway	SR 15	Regent Street	B	B	B
St. Joseph County	Edison Road	Ash Road		C	C	C
St. Joseph County	McKinley Highway	Ash Road		E	F	E
Mishawaka	12th Street	Byrkit Road	Downy Street	C	C	C
Elkhart County	CR 13	Sunnyside Avenue	CR 18	C	D	D
Elkhart County	CR 18	CR 13		D	E	D
Elkhart County	CR 38	CR 31	County Line	A	B	A
Elkhart County	Sunnyside Avenue	CR 20	CR 13	E	F	E
INDOT	SR 15	CR 142		C	D	C
INDOT	SR 15	CR 18		D	D	D
INDOT	SR 15	CR 42		C	C	C
INDOT	US 20	CR 35	SR 13	F	F	F
INDOT	US 20	SR 15	CR 35	C	C	C

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
INDOT	US 33	College Avenue	Monroe Street	D	D	D
Elkhart	2nd Street	Harrison Street	Jefferson Street	D	D	D
Elkhart	3rd Street	Harrison Street	Jefferson Street	C	D	D
Elkhart	Bristol Street (CR 10)	Jeanwood Drive (CR 13)	CR 15	B	C	C
Elkhart	CR 6	Cassopolis Street		D	D	D
Elkhart	Hively Avenue	Railroad Crossing		B	B	B
Elkhart	Indiana Avenue	Oakland Avenue		D	D	D
Elkhart	Jackson Boulevard	Johnson Street		E	E	E
Elkhart	Main Street	Beardsley Avenue		D	D	D
Elkhart	Main Street	Hively Avenue	Lusher Avenue	A	B	A
Goshen	College Avenue (CR 36)	US 33	Railroad Crossing	C	D	D
Kosciusko County	1300 N	Railroad Crossing		A	B	A
Kosciusko County	1300 N	SR 15	Old SR 15	A	B	A
INDOT	US 30	Parker Street		D	D	D
Warsaw	Anchorage Road	SR 15	Biomet Road	C	C	C
Warsaw	W 300 N	Sheldon Road		B	C	B
Winona Lake	Kings Avenue	Park Avenue		D	E	D
INDOT	US 31	SR 10		B	B	B
Plymouth	Hoham Drive	Western Avenue	Michigan Road	B	B	B
St. Joseph County	Cleveland Road	Beech Road		C	D	D
St. Joseph County	Douglas Road	Ironwood Road		C	D	C
St. Joseph County	Douglas Road	Ironwood Road	SR 23	D	D	D
St. Joseph County	Douglas Road	Ivy Road	Ironwood Road	C	C	C
St. Joseph County	McKinley Highway	Birch Road	Ash Road	C	C	C
INDOT	SR 23	Lafayette Street		C	D	C

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
INDOT	SR 23	Main Street		D	E	D
INDOT	SR 933	Cleveland Road		C	D	D
Mishawaka	Elmwood Road	Bremen Highway		C	C	C
South Bend	Corby Road	Ironwood Drive		E	F	F
South Bend	Sample Street	Mayflower Road		E	E	E

Projects Open to Traffic By 2035

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth	Urban Growth
Elkhart County	CR 15	CR 6	CR 104	A	A	A
Elkhart County	CR 17	CR 142	CR 38	C	C	C
Elkhart County	Johnson Street	Bristol Street	CR 4	C	D	C
Elkhart	Bristol Street (CR 10)	Johnson Street	Jeanwood Drive (CR 13)	C	C	C
Elkhart	Jackson Boulevard	Goshen Avenue		E	E	E
Goshen	CR 40	CR 27	US 33	A	A	A
Kosciusko County	1200 N	N 500 E		A	C	A
Marshall County	Lincoln Way	Pioneer Drive		B	B	B
Marshall County	Veteran's Parkway	Michigan Road	Oak Drive	A	A	A
Plymouth	Oak Drive	Hoham Drive	Veteran's Parkway	E	F	E
Mishawaka	12th Street	Union Street	Byrkit Road	D	D	D
Elkhart County	CR 17	CR 46	CR 142	B	B	B
Elkhart County	CR 20	CR 111		D	D	D
Elkhart County	CR 20	SR 19	Concord Mall Drive	D	D	D
Elkhart County	CR 6	Ash Road	CR 10	D	D	D
Elkhart County	CR 6	CR 10	John Weaver Parkway	C	D	D
Elkhart	Toledo Road	Goshen Avenue		D	D	D

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
Kosciusko County	1300 N	Kern Road		A	B	A
Kosciusko County	Armstrong Road	N 200 E		A	A	A
Kosciusko County	E 200 S	SR 15	Country Club Road	B	B	B
Kosciusko County	E 450 N	N 100 E		B	B	B
Kosciusko County	N 350 W	Old US 30	US 30	A	A	A
Kosciusko County	N 800 W	US 30	W 900 N	A	A	A
Kosciusko County	Old US 30	CR 350		B	C	B
Kosciusko County	Old US 30	CR 350	Zimmer Road	C	D	C
Kosciusko County	Pierce Road	Packerton Road	Market Street	B	B	B
Warsaw	Center Street	Parker Street		E	E	E
Warsaw	Sheridan Road	Harrison Street	Parker Street	A	A	A
Warsaw	Winona Avenue (SR 25	Zimmer Road		B	D	B
Warsaw	Zimmer Road	SR 25	Old US 30	B	C	B
Plymouth	Pioneer Drive	US 30	7B Road	B	B	A
Mishawaka	Union Street	Ireland Road	13th Street	D	E	D
South Bend	Bendix Drive	Bertrand Drive	Lathrop Avenue	B	C	B
South Bend	Colfax Avenue	Hill Street	SR 23	D	D	D
South Bend	Lincoln Way	Olive Street		D	D	D

Projects Open to Traffic By 2045

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth	Urban Growth
Elkhart County	CR 17	CR 50	CR 46	B	B	B
Kosciusko County	E 225 S	E 200 S	Packerton Road	B	C	B
Warsaw	Rozella Road	SR 15	Country Club Road	A	A	A
Marshall County	Veteran's Parkway	Oak Drive	Pioneer Drive	A	A	A

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
Plymouth	Hoham Drive	Oak Drive	Western Avenue	C	C	B
Elkhart County	CR 118	Old CR 17	CR 19	A	A	A
Elkhart County	CR 17	US 6	CR 50	B	B	B
Elkhart County	CR 22	CR 3		A	B	B
Elkhart County	CR 24	CR 3		A	B	A
Elkhart County	CR 26	SR 15	CR 31	A	A	A
Elkhart County	CR 31	CR 36	CR 26	A	A	A
Elkhart County	CR 38	SR 119	CR 17	A	A	A
Elkhart County	CR 43	E 1400 N	US 6	A	A	A
Elkhart County	SR 13	Warren Street		F	F	F
INDOT	SR 15	CR 20		D	E	D
Elkhart	Middlebury Street	Prairie Street	Goshen Avenue	D	E	D
Elkhart	Prairie Street	Mishawaka Avenue	Lusher Avenue	C	C	C
Goshen	Waterford Parkway	CR 40	SR 15	A	A	A
Goshen	Wilden Avenue	Current Termini	Middleton Road	A	A	A
Kosciusko County	Country Farm Road	SR 14	E 700 S	A	A	A
Kosciusko County	Fox Farm Road	N 150 W	US 30	A	A	A
Kosciusko County	N 100 E / N 200 E	E 200 N	Armstrong Road	B	C	C
Kosciusko County	Pierce Road	S 250 E		B	B	B
Kosciusko County	S 250 E	E 400 S	Pierce Road	A	A	A
Kosciusko County	W 100 S	Zimmer Road		B	C	B
Kosciusko County	W 700 S	SR 15	County Farm Road	A	A	A
Kosciusko County	W 700 S	SR 19	SR 15	A	A	A
Kosciusko County	Wawasee Road	Morrison Road	1400 N	A	A	A
Warsaw	100 E	250 N	300 N	B	B	B

Sponsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
Warsaw	Center Street	Railroad Crossing		C	C	D
Warsaw	Market Street	Railroad Crossing		C	C	C
Warsaw	N 150 W	Lake Street	US 30	C	D	C
Winona Lake	Packerton Road	225 S	Pierce Road	B	C	B
Winona Lake	Pierce Road	Packerton Road		B	C	B
Winona Lake	Wooster Street	Kings Avenue		D	E	D
Winona Lake	Wooster Street	S 250 E		D	D	D
Plymouth	Hoham Drive	Oak Drive		E	F	E
Plymouth	Jim Nu Drive	Oak Drive	Western Avenue	A	A	A
Plymouth	Suter Drive	Lincoln Way	9A Road	A	A	A
St. Joseph County	Connector Road	Bittersweet Road	Beech Road	A	A	A
St. Joseph County	Douglas Road	Bittersweet Road		C	C	C
St. Joseph County	Edison Road	Smilax Road		A	A	A
St. Joseph County	Edison Road	Timothy Road	Walnut Road	A	A	A
St. Joseph County	Edison Road	Walnut Road		A	A	A
St. Joseph County	Fillmore Road	Larrison Road		A	A	A
St. Joseph County	Pierce Road	Miami Highway	SR 331	A	A	A
St. Joseph County	Snowberry Road	Inwood Road	Chicago Trail	A	A	A
Mishawaka	Fir Road	McKinley Avenue	I-80/90	C	C	C
Mishawaka	Grape Road	Douglas Road		D	E	D
Mishawaka	Jefferson Boulevard	Cedar Road	Byrkit Road	B	B	B
Mishawaka	McKinley Avenue	Division Street	Fir Road	F	F	F
South Bend	Bertrand Drive	Bendix Drive	Meade Street	A	A	A
South Bend	Hickory Road	Helper Street	SR 23	A	A	A
South Bend	Jefferson Boulevard	Ironwood Drive	Logan Street	C	C	C

ɔnsor	Project Route	Starting Termini	Ending Termini	Baseline Scenario	High-Growth Scenario	Urban Growth Scenario
h Bend	Lincoln Way	Ironwood Drive		D	D	D
h Bend	Meade Street	Orange Street	Bertrand Drive	A	A	A
h Bend	Sample Street	Mayflower Road	SR 23	C	D	C

MICHIANA ON THE MOVE transportation plan 2045

Michiana on the Move
2045 Transportation Plan

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Michiana Area Council of Governments

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