APPENDIX B: ENVIRONMENTAL JUSTICE

Environmental Justice & Title VI

Federal law requires the Michiana Area Council of Governments (MACOG) to ensure that citizens are not excluded from participating in, denied the benefits of, or be subjected to discrimination under any of its federally funded programs on the basis of race, color, or native origin. Federal Law also requires that MACOG indentifies and addresses areas of disproportionately high adverse human health or environmental effects on minority and low income populations in all of its programs, policies, and activities.

Indicators of Potential Disadvantage

In order to best accomplish the federal requirements of Environmental Justice (EJ), MACOG has identified several indicators of potential disadvantage defined as groups that may have specific planning related challenges. Potentially disadvantaged population groups include minorities, low income populations, carless households, persons with physical disabilities, seniors, Hispanics, and people with limited English Proficiency (LEP). MACOG has an EJ analysis process that uses the above population groups as "Indicators of Potential Disadvantage (IPD)".

Using the American Community Survey (ACS) five-year estimates data set from the U.S. Census, population groups are identified and located at the census tract level. Data is gathered at the regional level, combining populations from each of the four counties, to determine the regional average for that population group. Any census tract that meets or exceeds the regional average level, or threshold for that population group, is considered an EJ-sensitive tract for that group. Each sensitive groups that exceeds the regional threshold within a census tract.

Proposed Project Impacts

By overlaying the Active Transportation Plan proposed projects over the IPD classified census tracks, impacts to potential concentrated IPD populations can be evaluated. Nearly all census tracks with a concentration of IPD populations have proposed projects in the Active Transportation Plan (Table B-1). All groups, including IPD populations, will benefit from the proposed active transportation projects in the area. The proposed projects will provide 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 experienced by all population 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 disadvantaged populations. Figures B-1, B-2, B-3, and B-4 illustrate the distribution of transportation projects. The projects are located throughout the region, without a disproportionately high impact to the IPD populations.

Table B-1: Summary of Potential Environmental Justice Impacts

Indicators of Potential Disadvantage (IPDs)	Number of Tracts Served by Plan	Percentage of Tracts Served by Plan
3-4	40/40	100%
5-6	24/25	96%
7	2/3	67%
Greater than 3	**66/68**	**97%**

Figure B-1: Elkhart County Environmental Justice

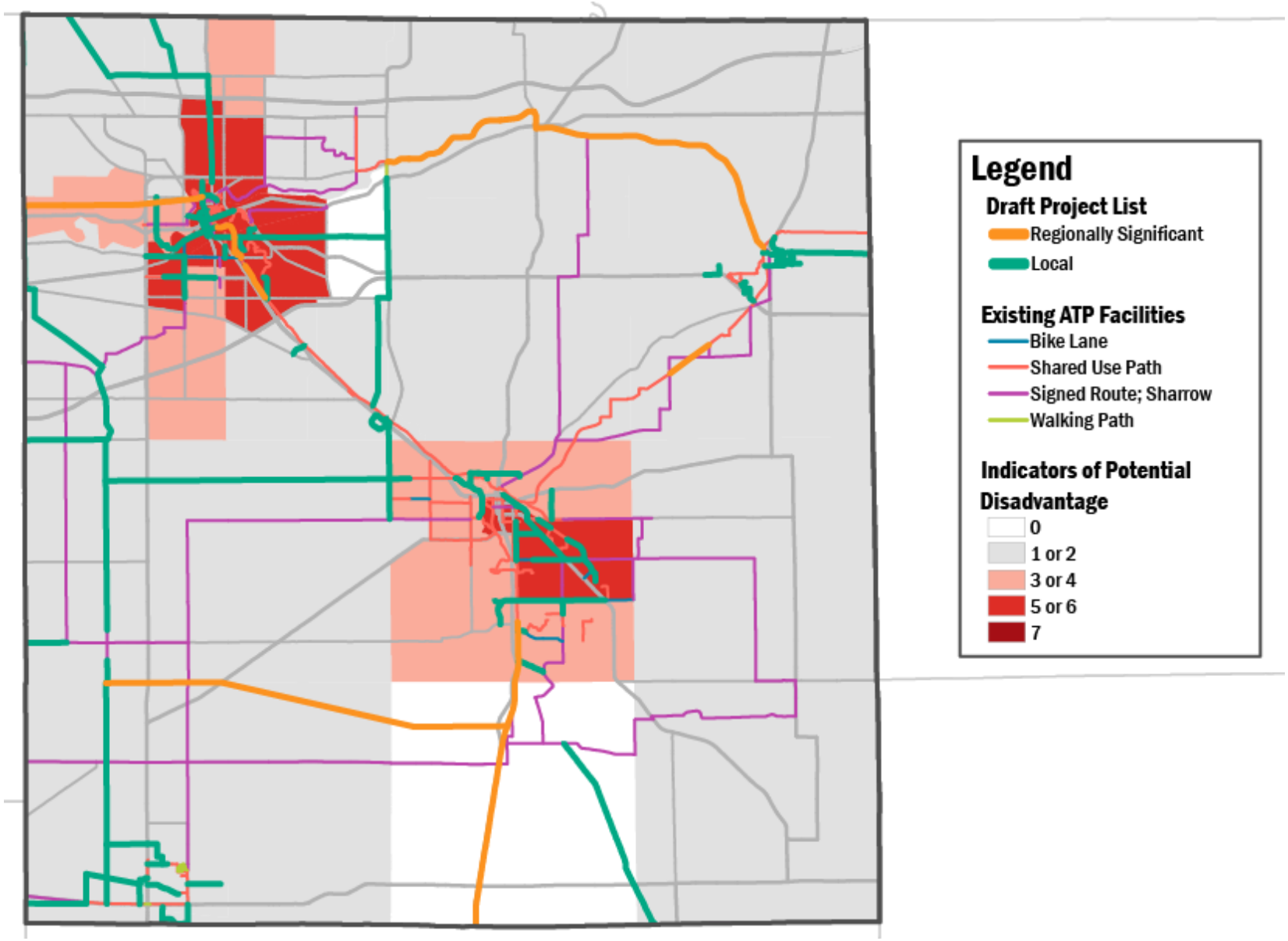


Figure B-2: Kosciusko County Environmental Justice

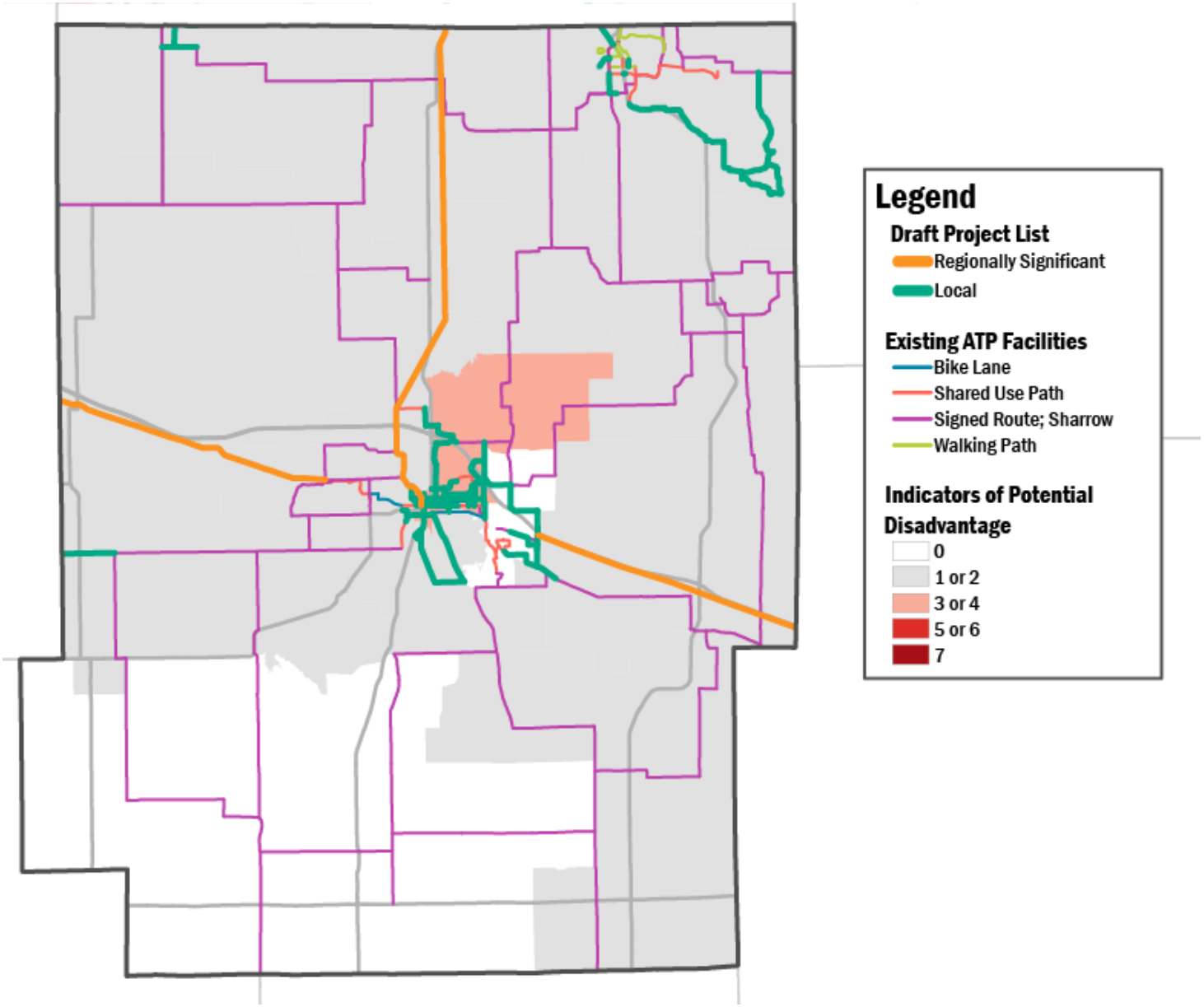


Figure B-3: Marshall County Environmental Justice

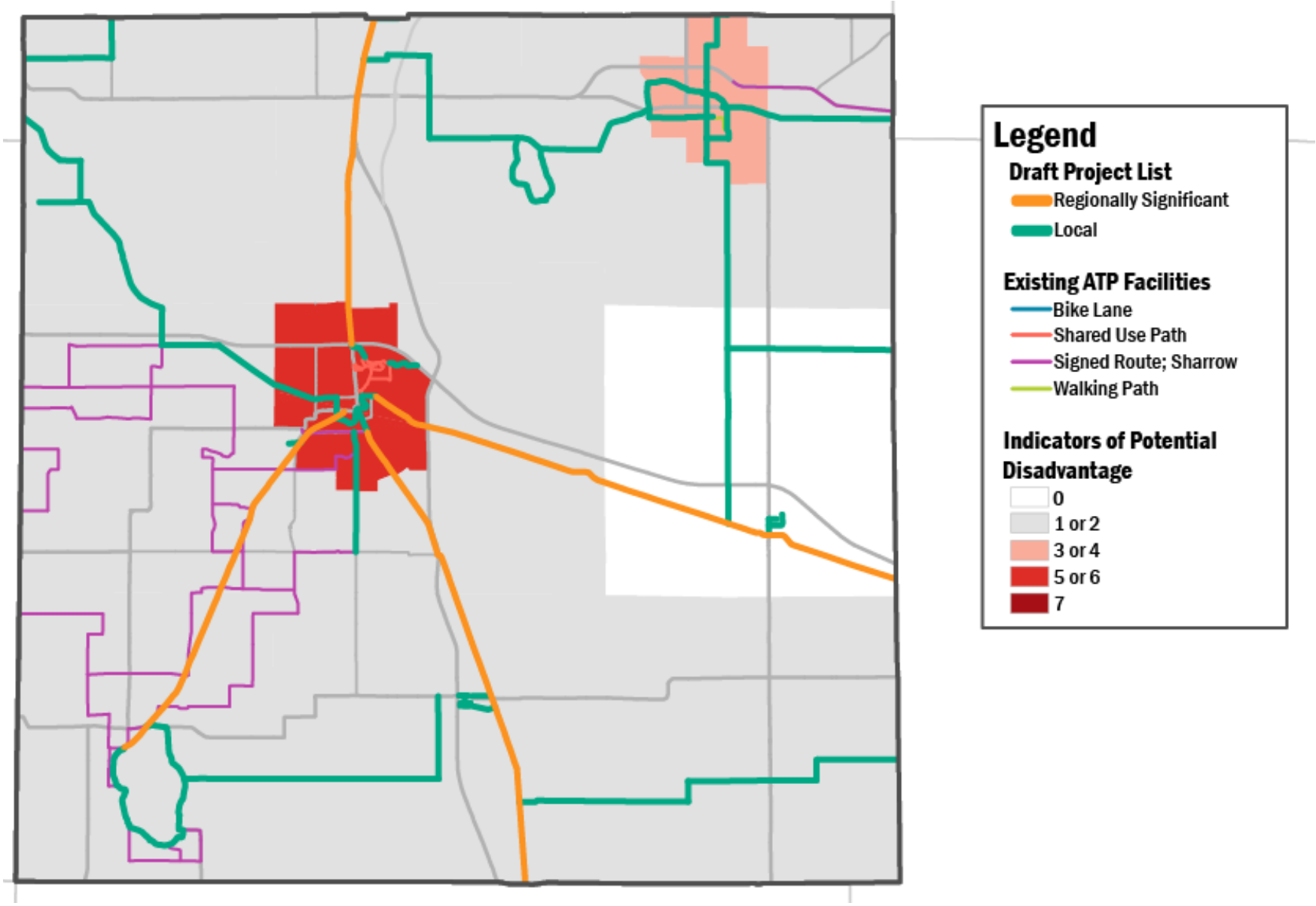
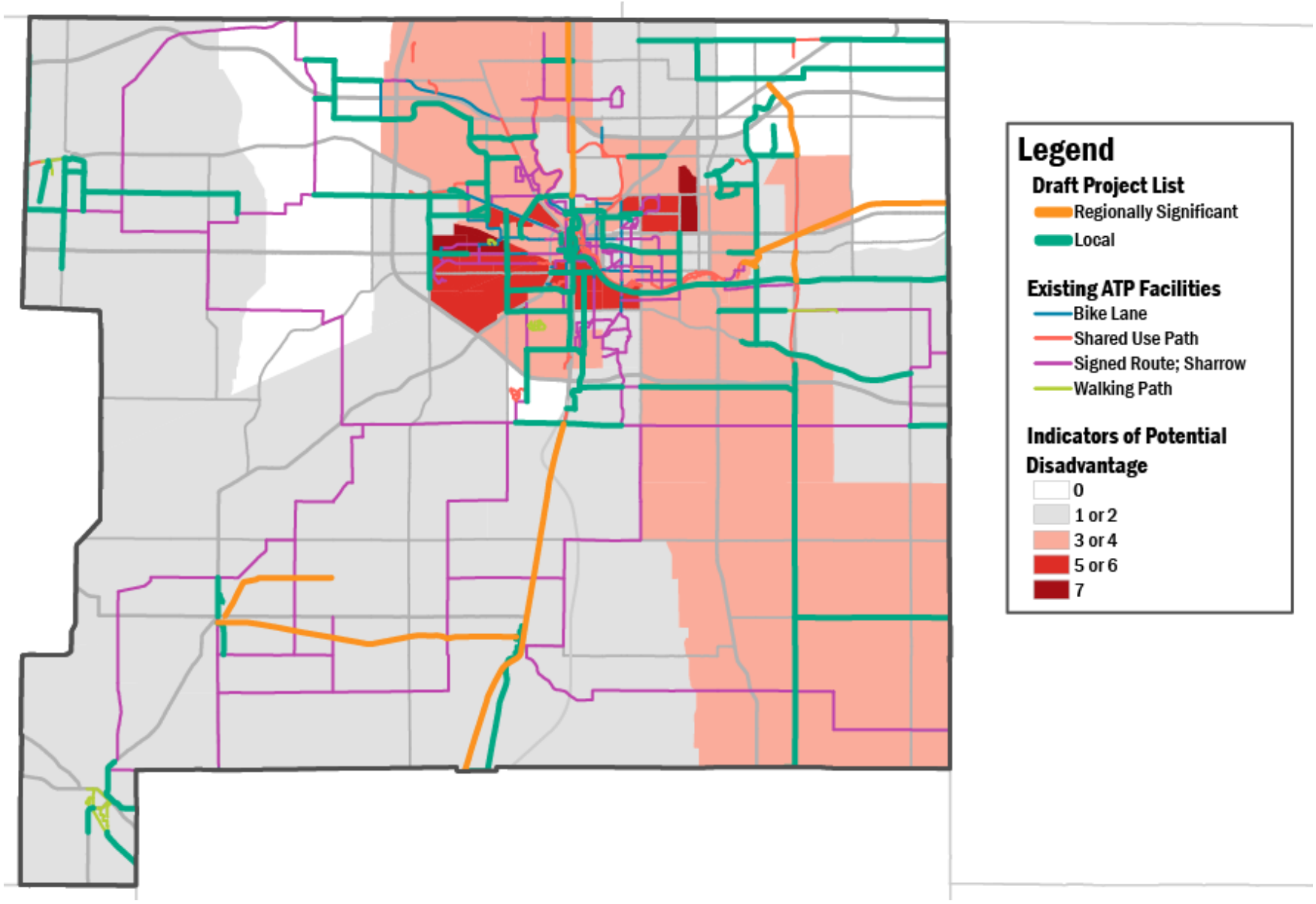


Figure B-4: St. Joseph County Environmental Justice



APPENDIX C: NON-MOTORIZED FACILITY DEMAND ANALYSIS

Introduction

MACOG conducted a bicycle and pedestrian demand analysis that summarizes where people live, work, play and learn. This demand model identifies the areas for expected bicycle and pedestrian travel by overlaying the locations of the land use mix where people live, work, play and learn into a composite map of regional demand, as shown in **Figure C.26** on page 30. This level of analysis can be useful to identify roadways in need of improvement and where there is high demand for bicycle and pedestrian facilities.

Appendix C summarizes the methodology and results of the Live, Work, Play and Learn analysis for the MACOG planning region. Sources for each of the variable inputs includes: population density was determined using 2010 US Census at the census block level; employment density was calculated from 2015 InfoUSA employment data; schools, parks, and tourist based amenities were obtained by MACOG's points of interest layer.

Live, Work, Play & Learn Analysis

Overview

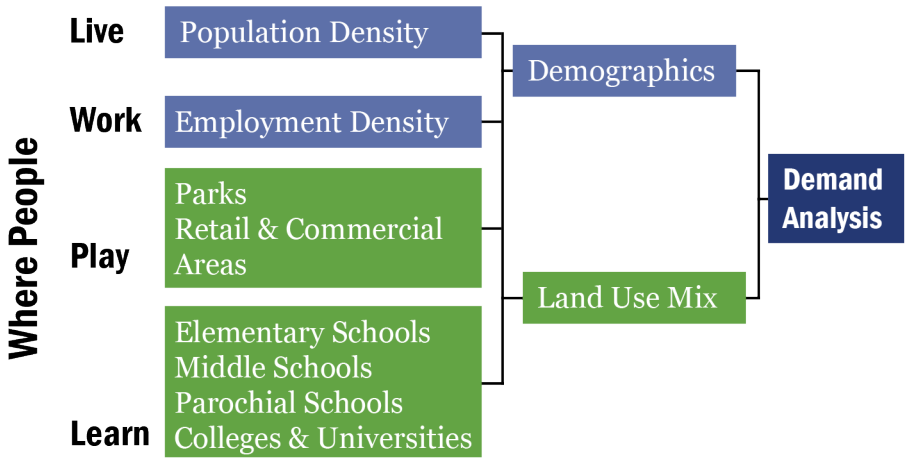
The Live, Work, Play and Learn analysis is a data-driven process to identify the areas in need of improvements that have a high demand for bicycle and pedestrian travel. The demand was measured based on the density per square mile of trip generators, i.e. places of residencies and workplaces, and trip attractors, i.e. parks and retail centers, to establish the demand for bicycle and pedestrian trips. As a result, each model input was represented as heat maps to visually display the hot spots of where people live, work, play and learn.

Demand Model

Methodology

In order to properly map this information, MACOG set up the demand model that summarizes the above approach, shown in **Figure C.1** as a flow chart. This demand model identifies the areas for expected bicycle and pedestrian travel by overlaying the locations of the land use mix and demographics into a composite map, outlining the regional demand, as shown in **Figure C.26** on page 30.

Figure C.1 - Demand Model



Scale of Analysis

In order to generate proper distance and density patterns, each of the model inputs had to be displayed at the smallest geographic setting, where feasible, such as the census block level because census blocks closely represent the street network to help narrow down where bicycle and pedestrian traffic is more prevalent. This approach is based on the *Low-Stress Bicycling and Network Connectivity Report*, published by the Mineta Transportation Institute in May 2012, which suggests using the

smaller geographic setting rather than the more traditional larger regional capture via census block groups or census tracts.

Additionally, due to MACOG providing planning services to a large geographic region that includes multiple local public agencies, each of the model inputs were generated as a series of heat maps for each of the four counties, as well as the five urbanized areas, as shown in the following pages under the Demand Model Results section. In order to accurately display each variable input, the demand model was tailored to a search radius applicable to county and urban scale levels; 3,960 feet (3/4 mile) and 2,640 feet (1/2 mile) for each respective geographic scale. Smaller urban communities, like the City of Nappanee, had a search radius of 1,320 feet (1/4 mile).

Demand Model Results

The results of the demand analysis are described under each of the model input sections and presented in the series of maps for the MACOG planning region, as well the region's urbanized areas. Heat maps were created to help establish the relationship between the proximity of uses and its density. Uses further away from one another and in lower density areas yields lower demand for bicycle and pedestrian facilities than those in higher density areas and close together.

Where People Live

Beginning at the regional level and then focused in to each of the five urban areas, this model input represents the locations of people's trip origins, i.e. their place of residency within the MACOG planning region, as shown in **Figures C.2** through **C.7**. All types of housing density options were included in the analysis; ranging from single-family homes to apartments.

Where People Work

This model input represents the locations of trip ends; people working throughout the MACOG planning region regardless of residency, as shown in **Figures C.8** through **C.13**. Additionally, certain type of jobs can act as a trip attractor or trip generator. Those serving as a trip attractor are ones that residents and tourists are inclined to travel to outside of work, i.e. retail stores, cafes, entertainment/performance centers or restaurants. Likewise, trip generators would be jobs housed in office parks and office buildings. Employment serving as trip attractors are therefore used in the "where people play" category as it can serve as entertainment for residents and tourists.

Where People Play

As mentioned beforehand, this model input is a combination of varied land use types and destinations, as shown in **Figures C.14** through **C.19**. Land use types such as retail centers, cafes, and restaurants, as well as recreational areas were included in this category as these types identify people's source of entertainment and also indicates tourist attractions.

Where People Learn

This model input represents the locations of all school levels, from elementary schools to colleges and universities, as shown in **Figures C.20** through **C.26**. In order to establish the demand for non-motorized trips, MACOG weighed each of the institutions that are conducive for biking and walking trips using the criteria shown in **Table C.1** on the following page. Elementary schools and colleges and universities were weighted higher than middle and high schools as these institutions are more prone to have bicycle and pedestrian trips.

Table C.1 - Weighing of "Where People Learn" Demand Input

Category	Input	Score
Where People Learn	College & University	5
	Elementary Schools	5
	Middle Schools	1
	High Schools	1

Composite Demand

Figure C.26 displays the results of the Live, Work, Play and Learn demand analysis. The analysis shows that there is a strong composite density in the downtown areas of South Bend, Mishawaka, Elkhart, Goshen, Nappanee, Plymouth and Warsaw due to the high concentrations of jobs, entertainment and recreational amenities. There is also strong demand in the Notre Dame area as it is a prominent employer and learning institution with pockets of high-density residential and recreational amenities nearby. The Elkhart urban area has a high linear demand along CR 9/Johnson Street and Prairie Street from Bristol Street through Downtown to Indiana Avenue/Main Street area. Much of this area is served by a continuous north/south connection via the Riverwalk Trail and on-street dedicated bike lanes along Richmond Street, Tipton Street and Sterling Avenue. However, there are limited east/west connections from this continuous route into Downtown and other high-demand areas, which make this corridor a primary candidate receiving improved bicycle and pedestrian facilities to properly connect these areas.

Additionally, this analysis highlights areas of demand that are not being sufficiently served by the current active transportation network. To better represent this, a Bicycle Level of Traffic Stress Analysis was conducted to establish the reach of facilities and where the supply can be improved to match the current demand.

Similar analysis was conducted in detail for all urbanized areas within the MACOG planning region to aid its local public agencies in identifying areas of high-demand to support biking and walking travel.

Figure C.2 - Where People Live in the Region

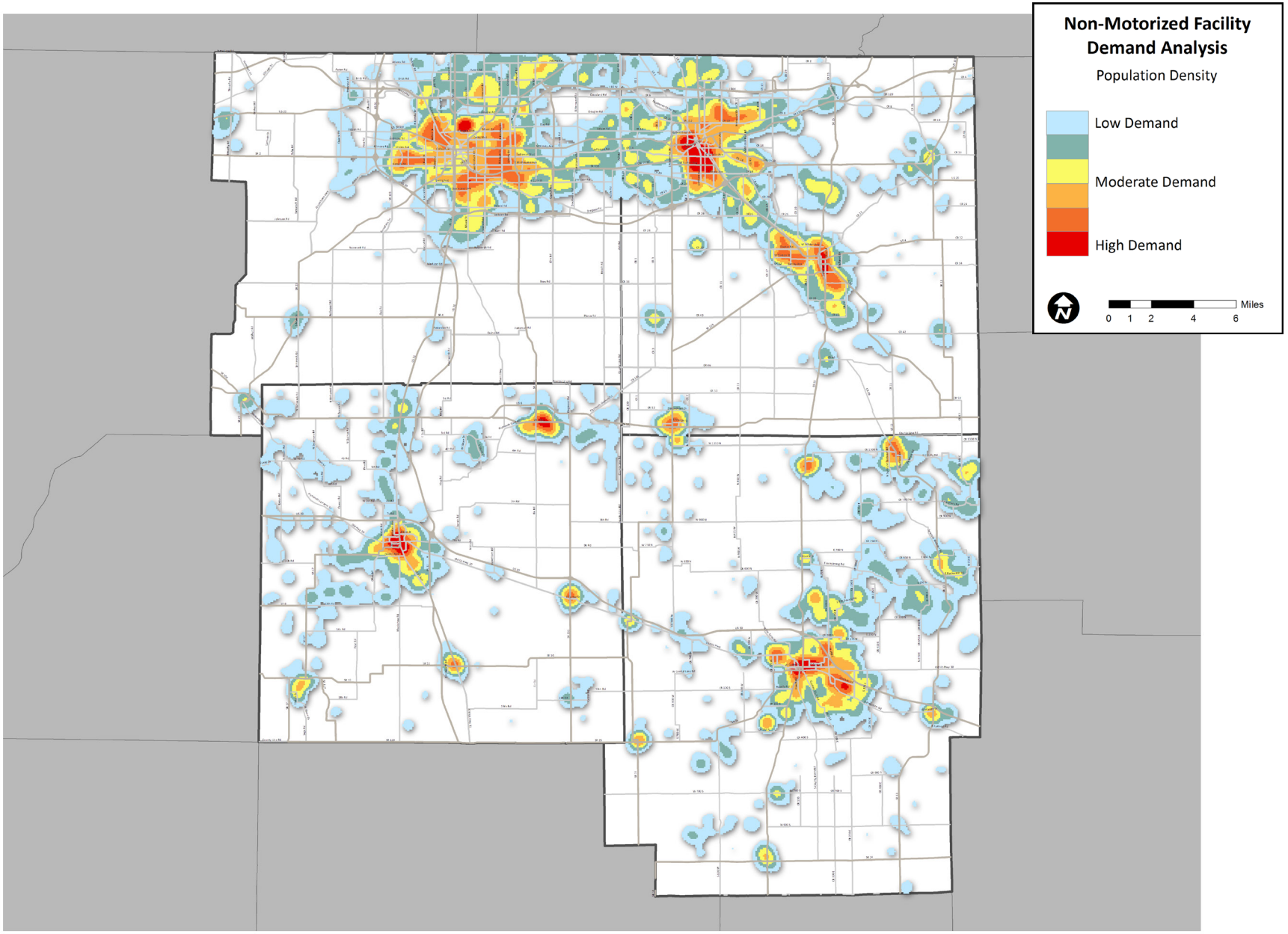


Figure C.3 - Where People Live in Elkhart and Goshen of Elkhart County

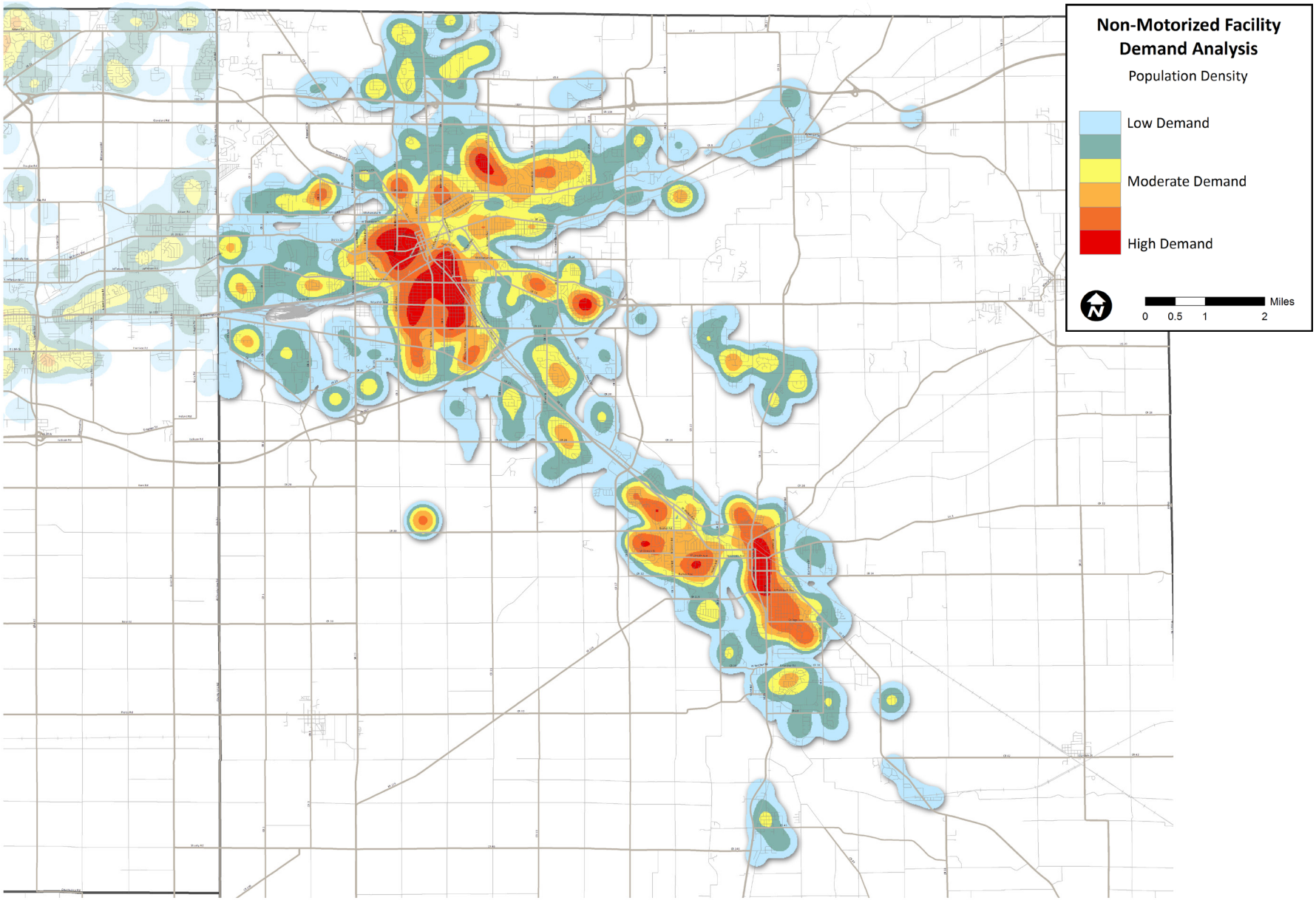


Figure C.4 - Where People Live in Nappanee of Elkhart County

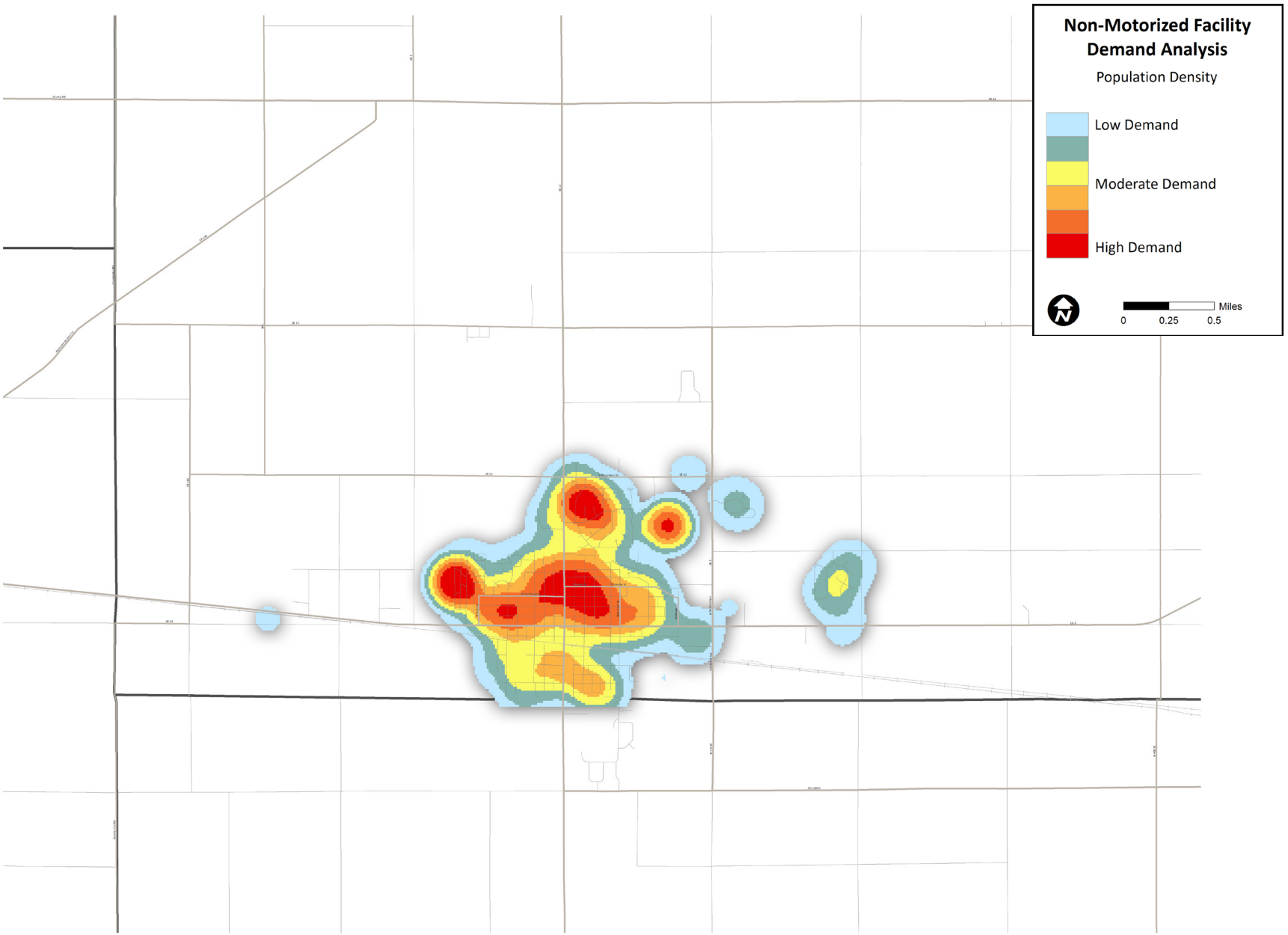


Figure C.5 - Where People Live in Warsaw of Kosciusko County

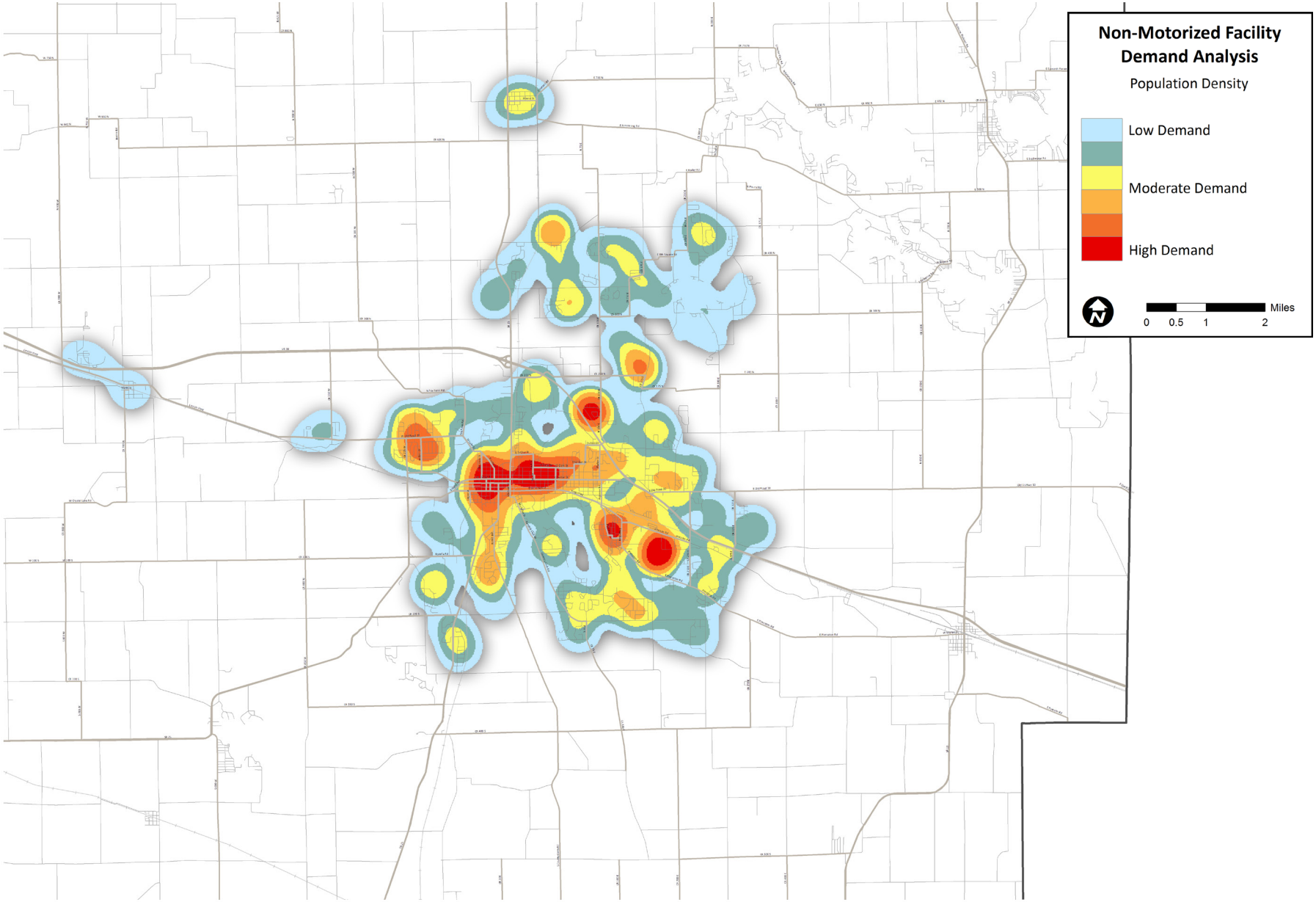


Figure C.6 - Where People Live in Plymouth of Marshall County

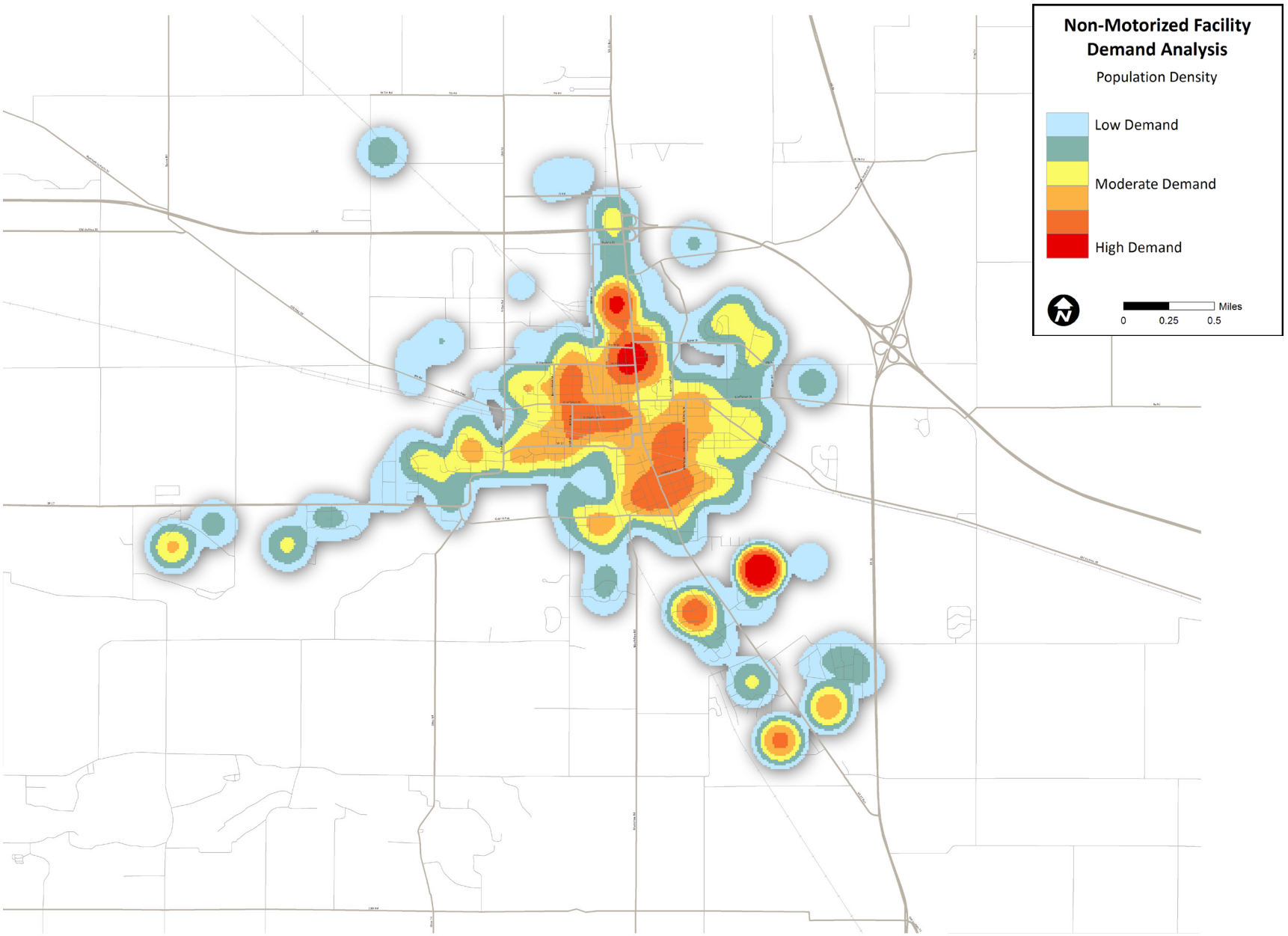


Figure C.7 - Where People Live in South Bend and Mishawaka of St. Joseph County

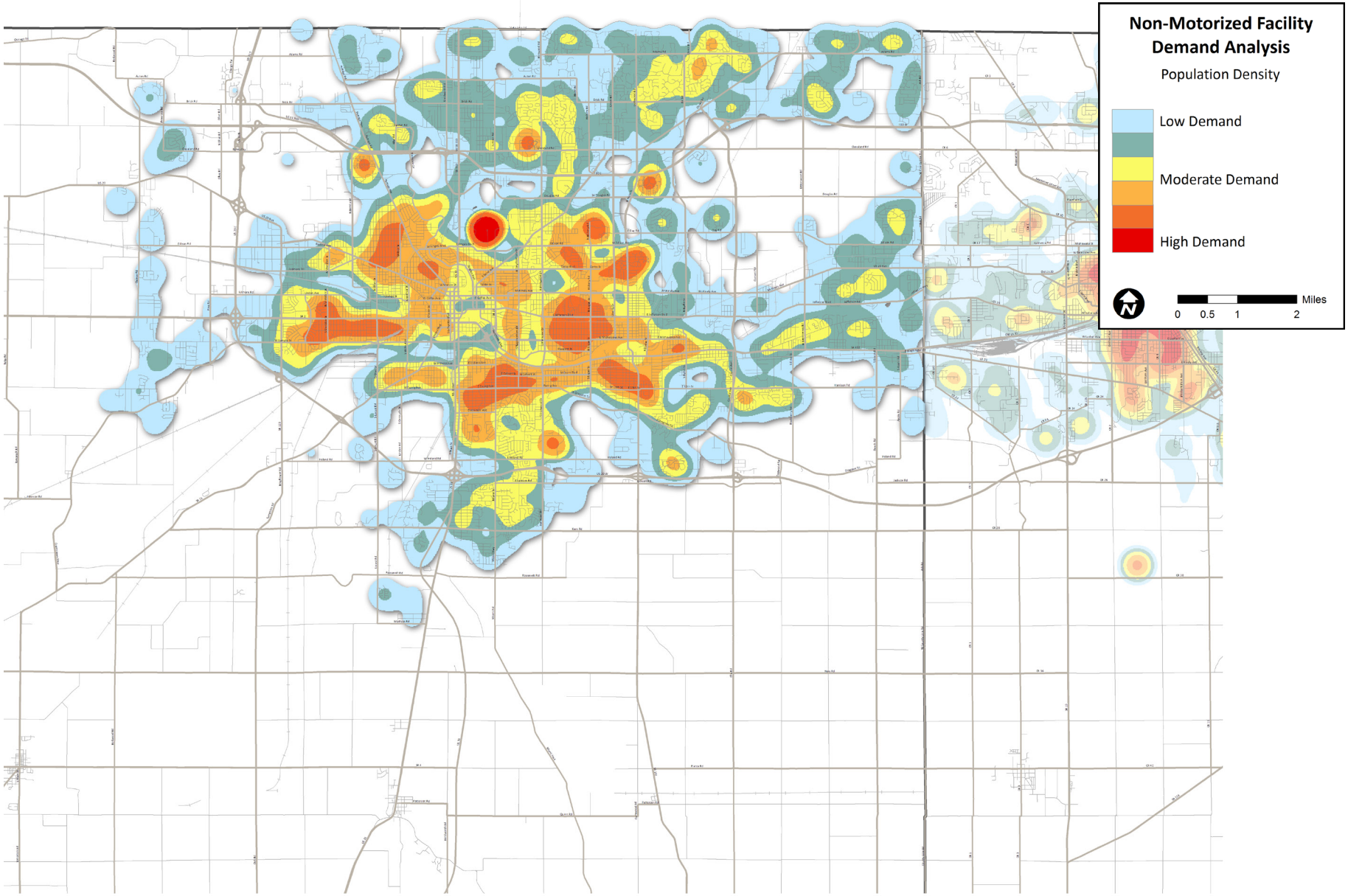


Figure C.8 - Where People Work in the Region

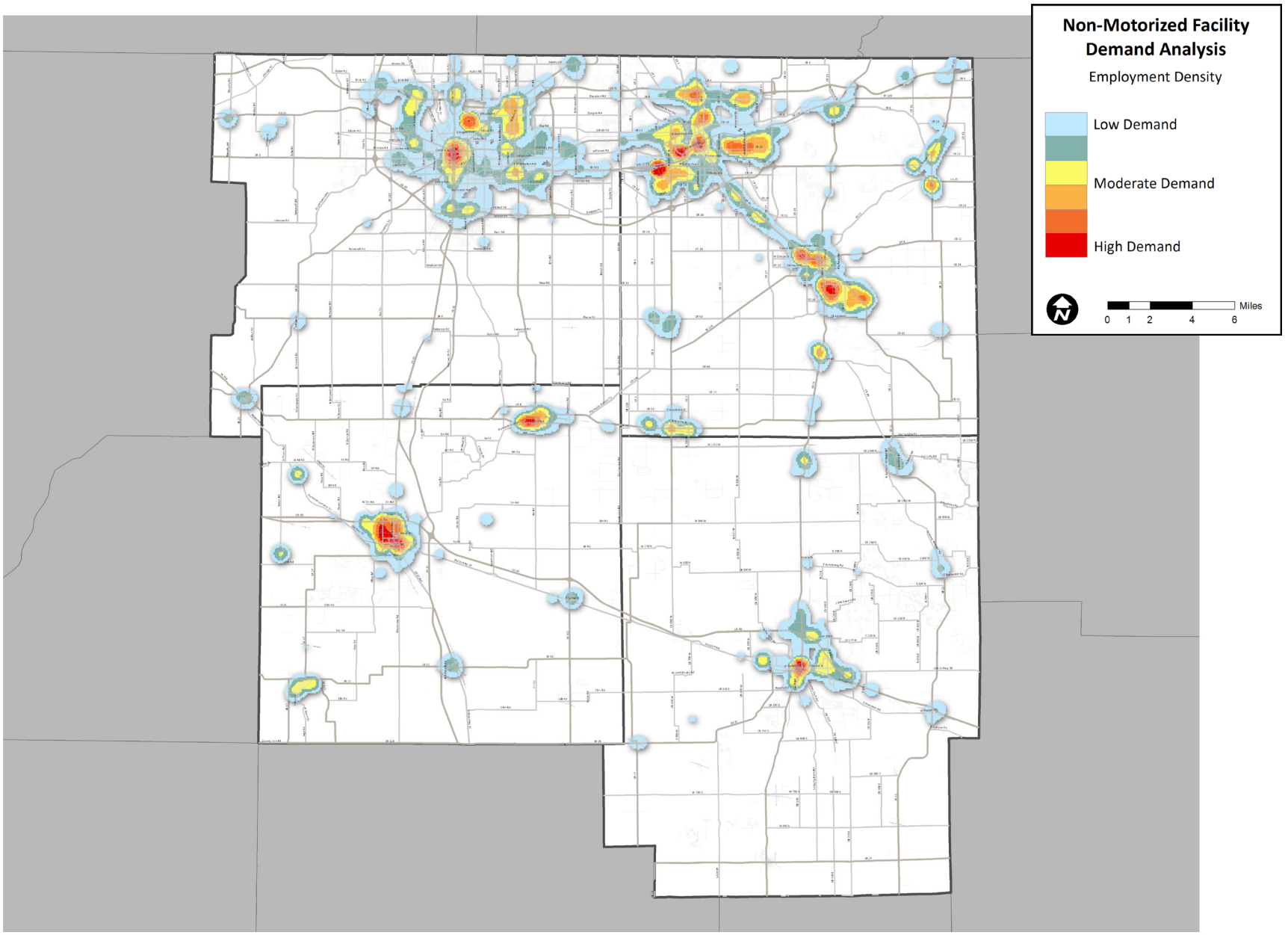


Figure C.9 - Where People Work in Elkhart and Goshen of Elkhart County

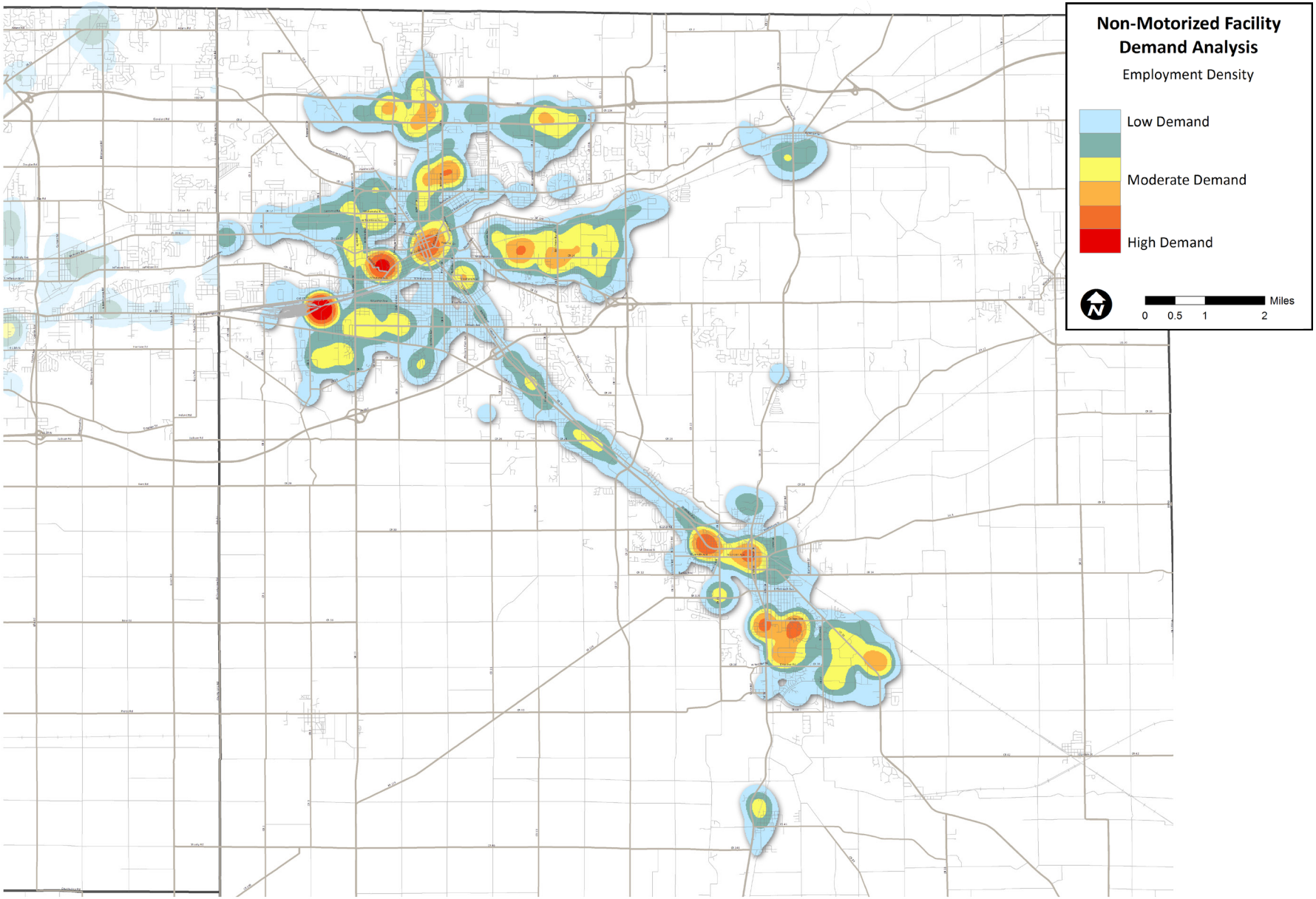


Figure C.10 - Where People Work in Nappanee of Elkhart County

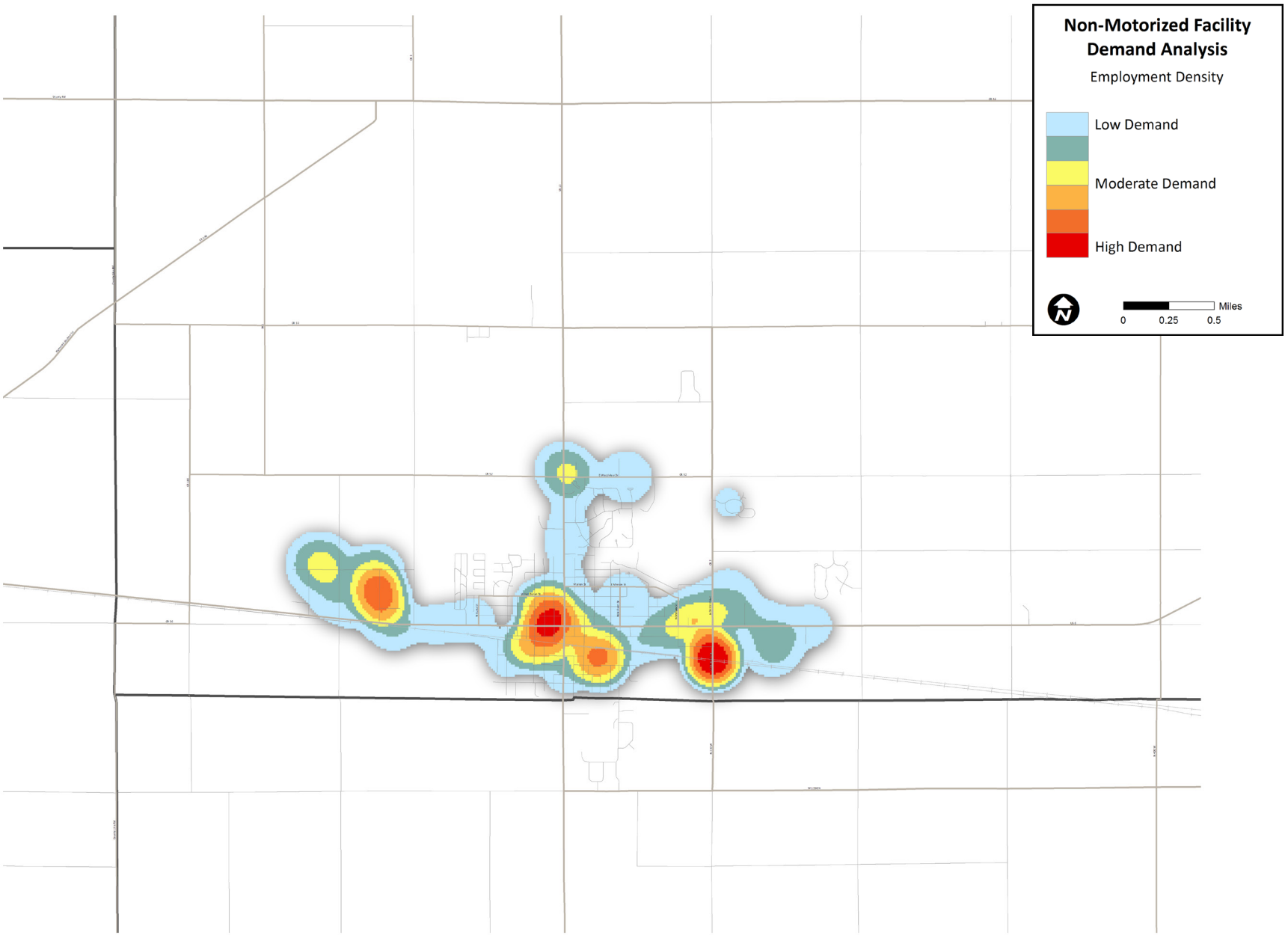


Figure C.11 - Where People Work in Warsaw of Kosciusko County

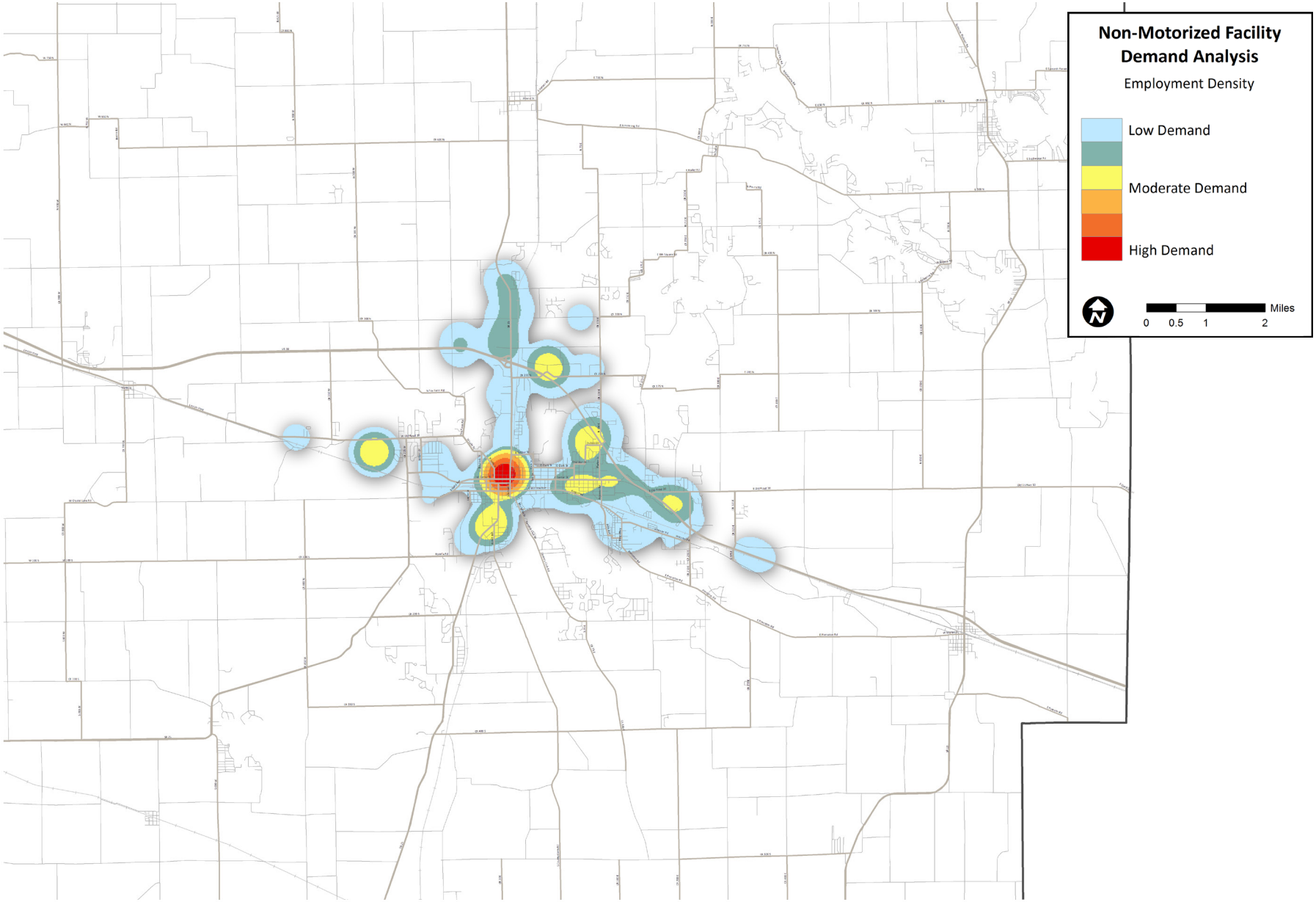


Figure C.12 - Where People Work in Plymouth of Marshall County

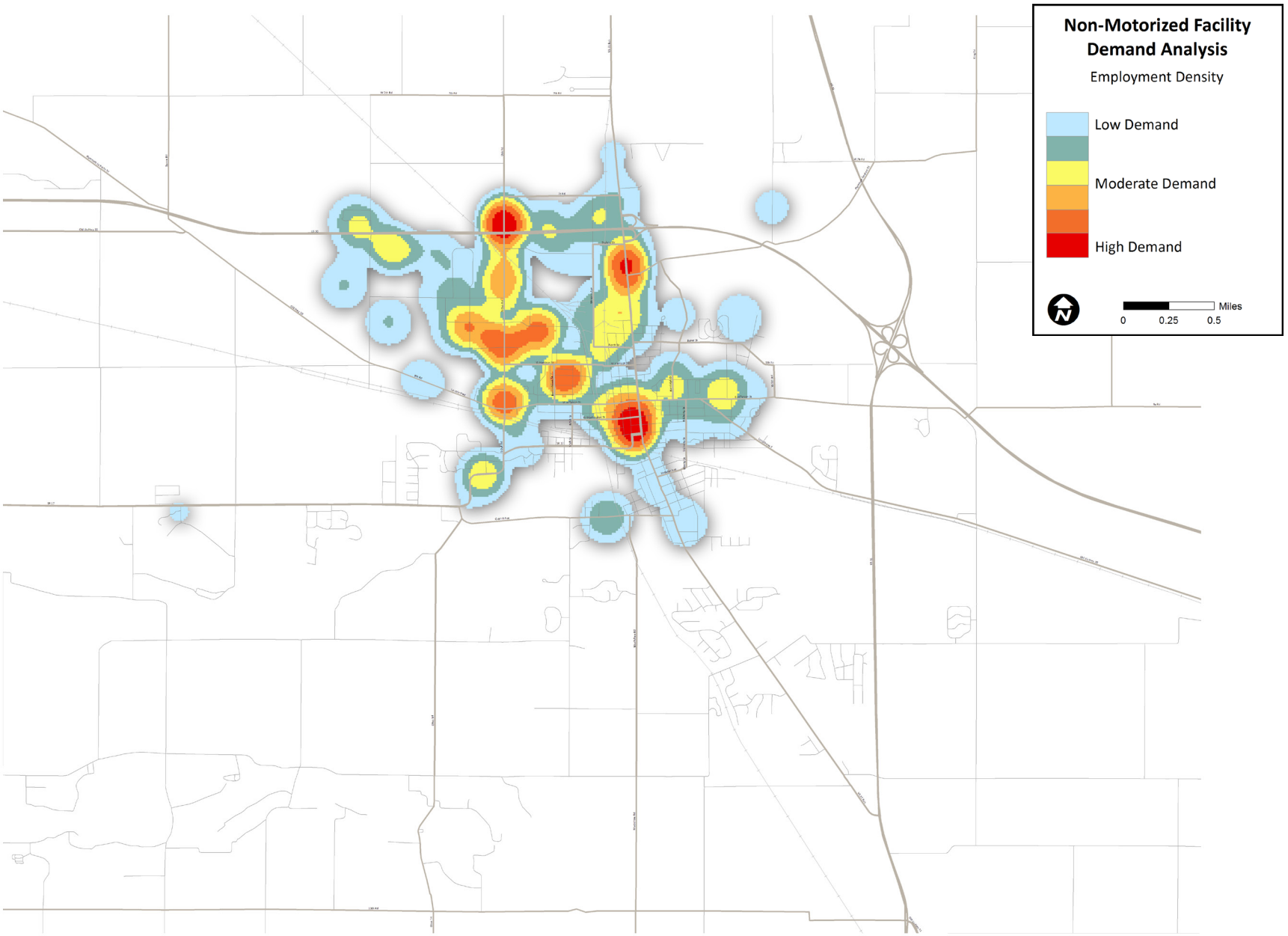


Figure C.13 - Where People Work in South Bend and Mishawaka of St. Joseph County

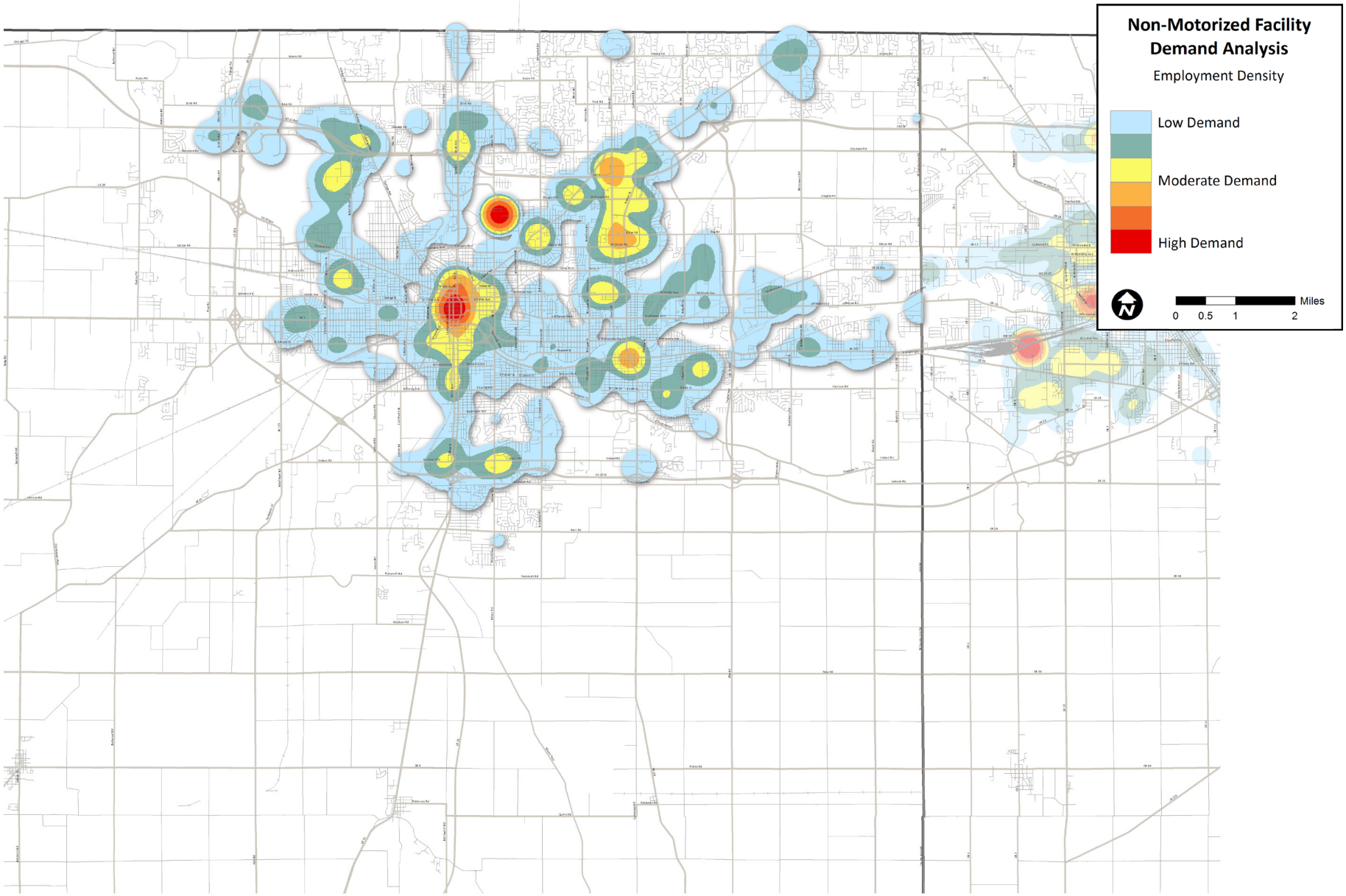


Figure C.14 - Where People Play in the Region

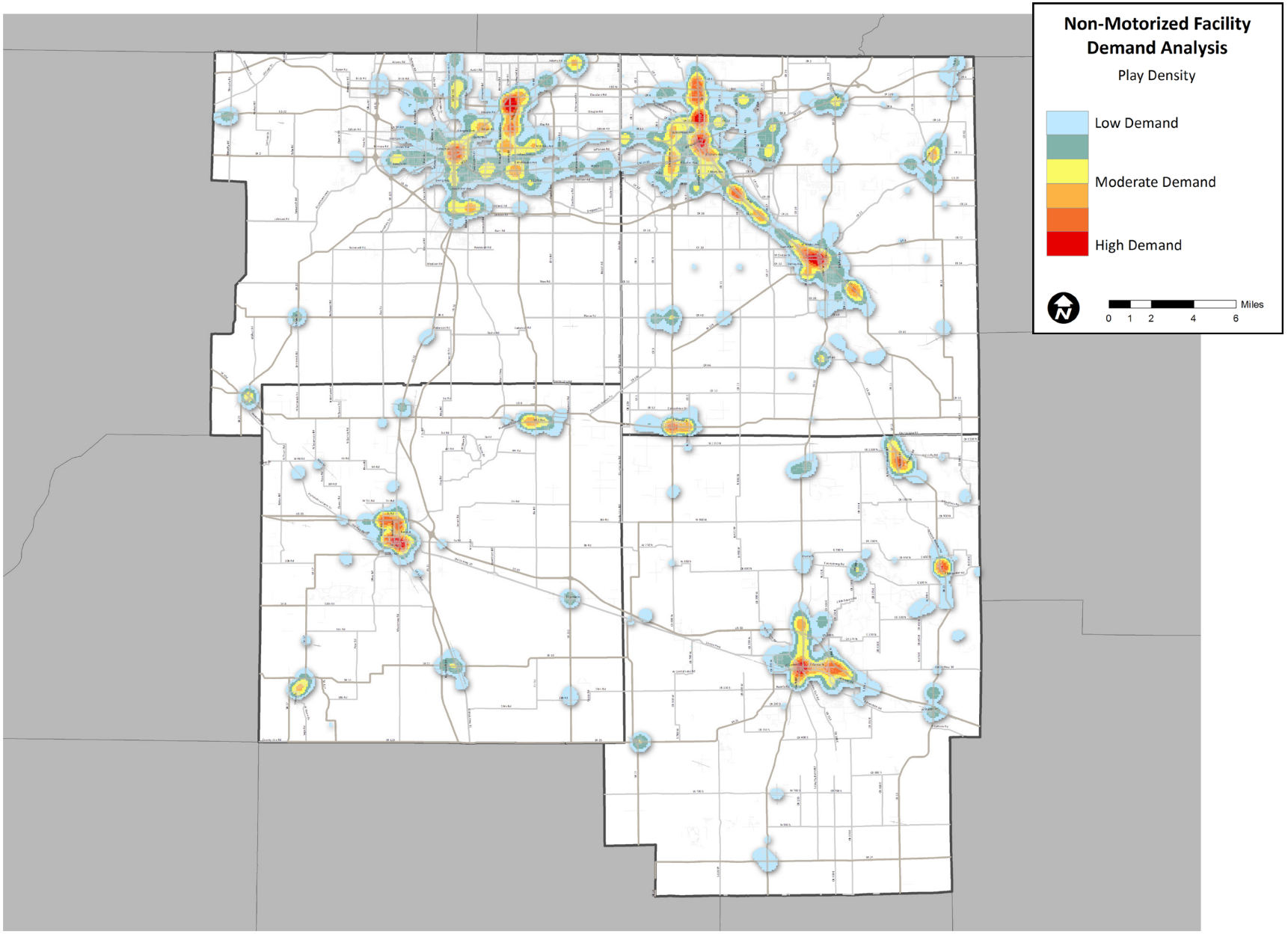


Figure C.15 - Where People Play in Elkhart and Goshen of Elkhart County

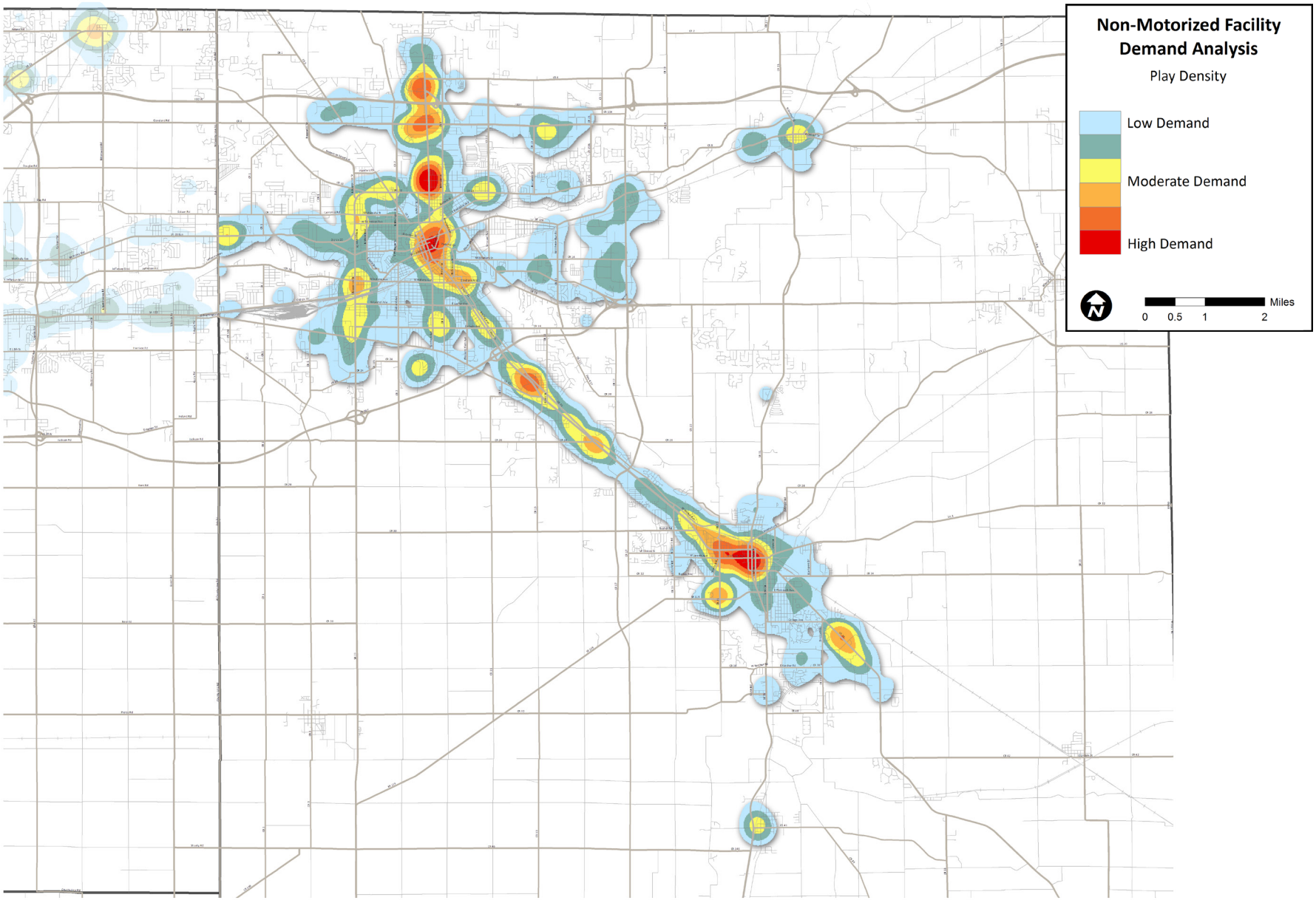


Figure C.16 - Where People Play in Nappanee of Elkhart County

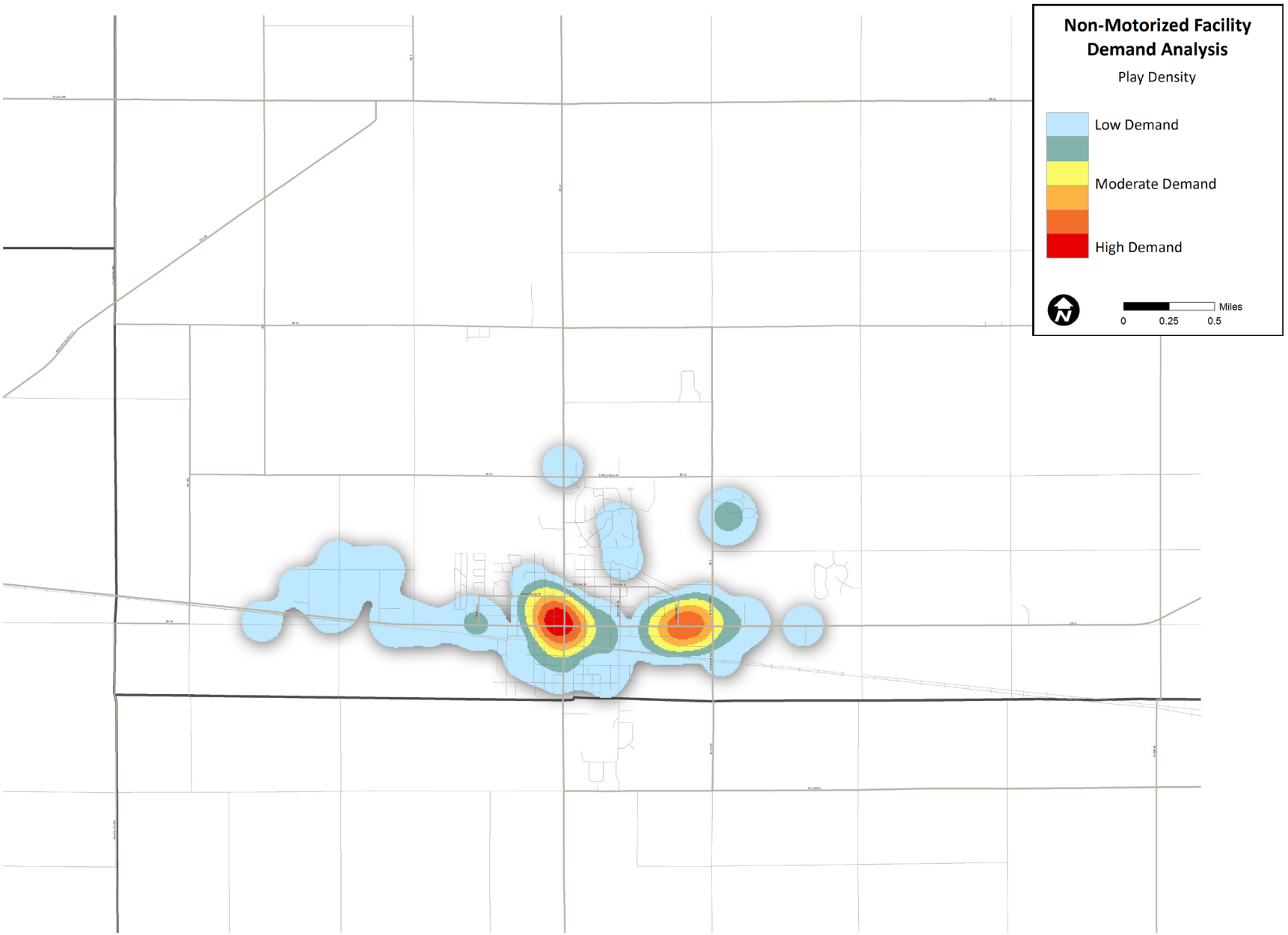


Figure C.17 - Where People Play in Warsaw of Kosciusko County

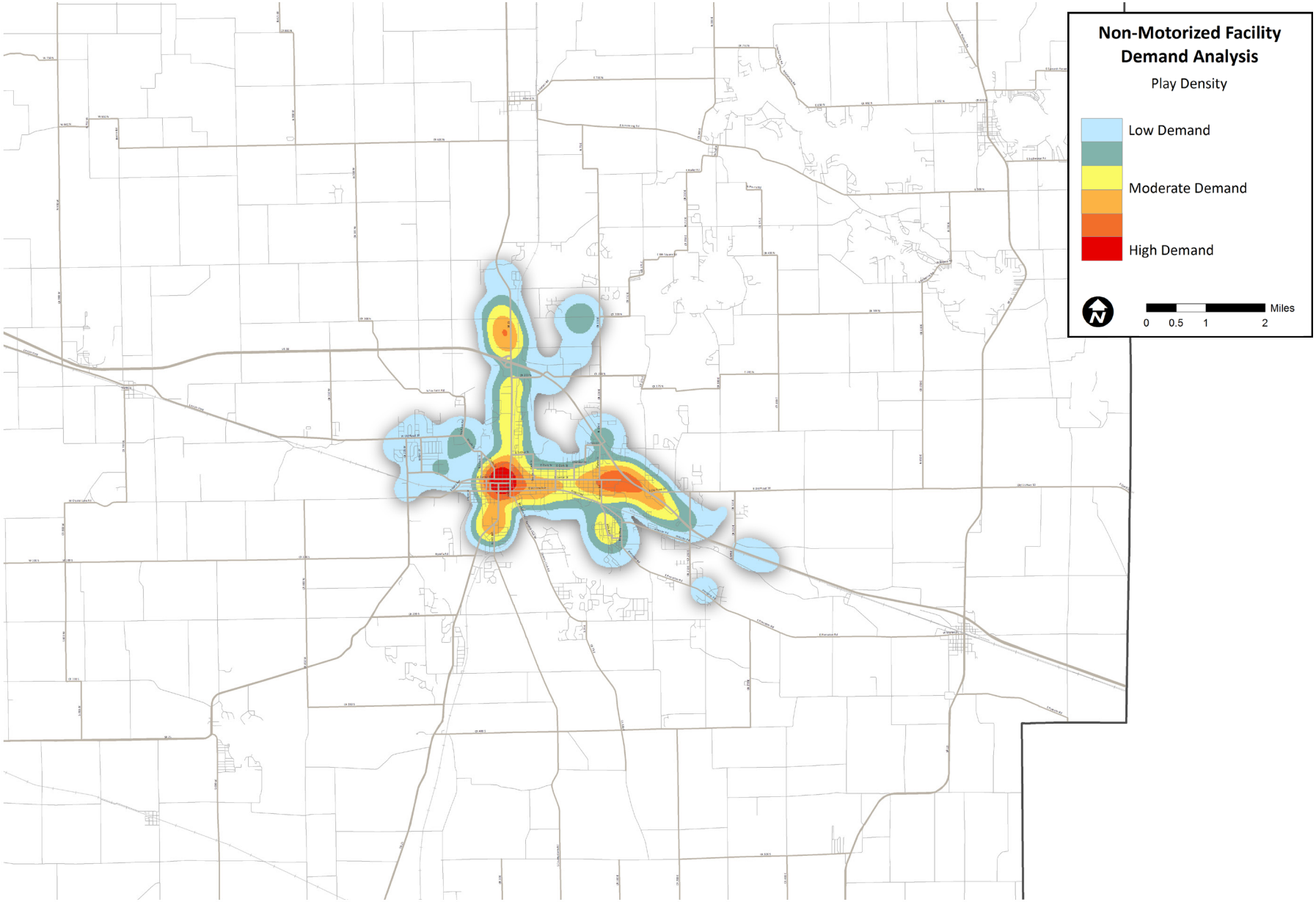


Figure C.18 - Where People Play in Plymouth of Marshall County

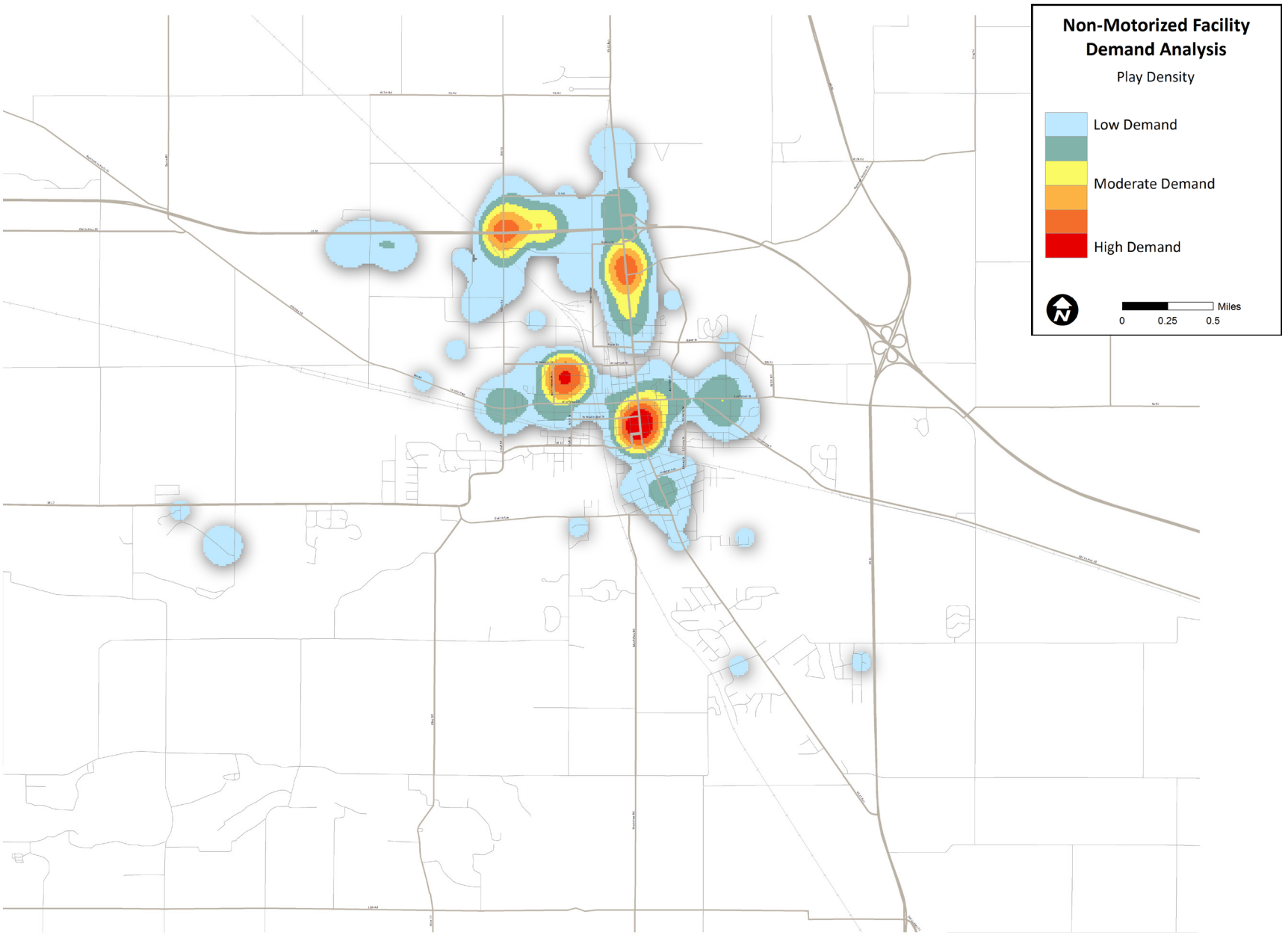


Figure C.19 - Where People Play in South Bend and Mishawaka of St. Joseph County

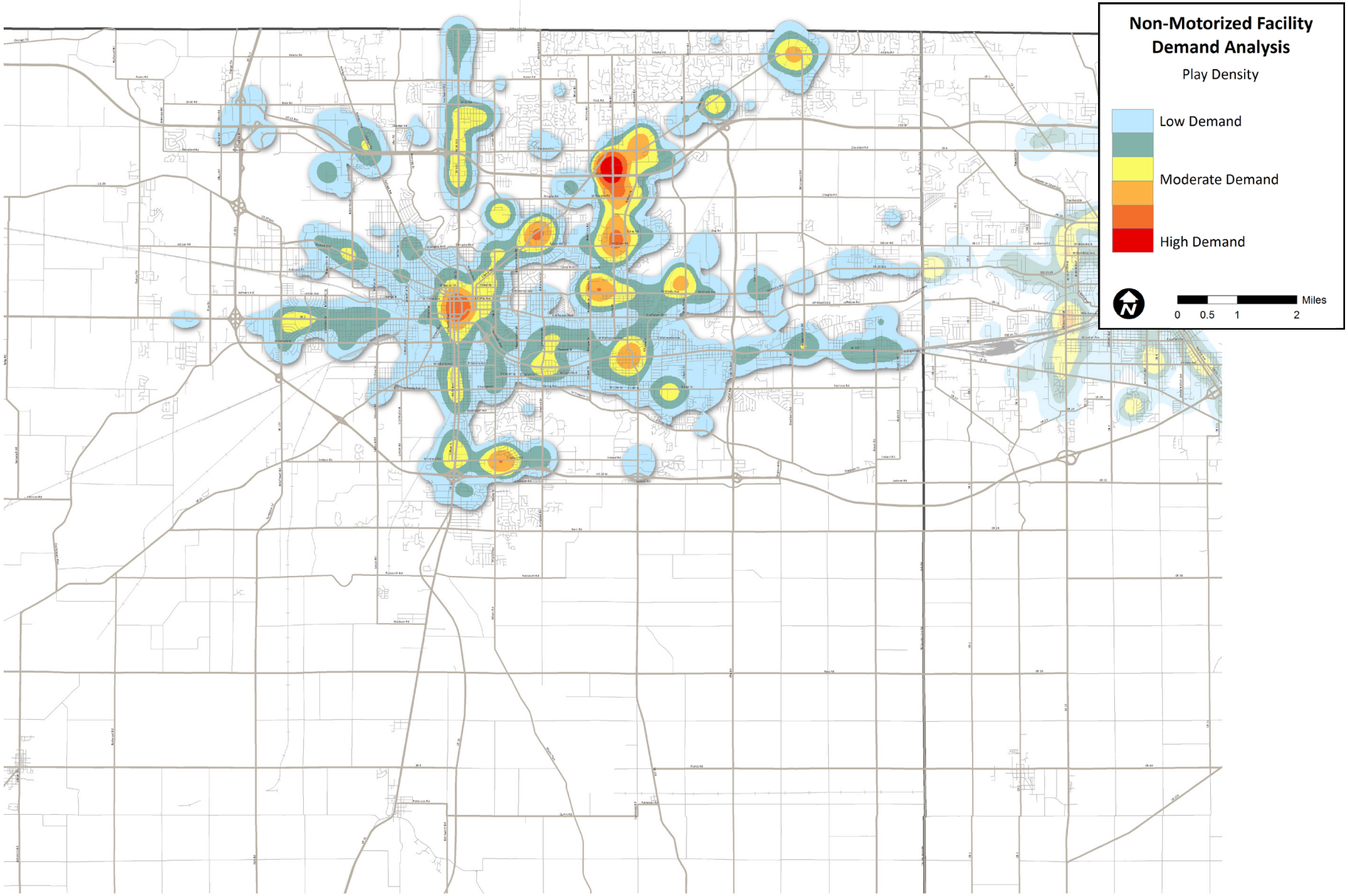


Figure C.20 - Where People Learn in the Region

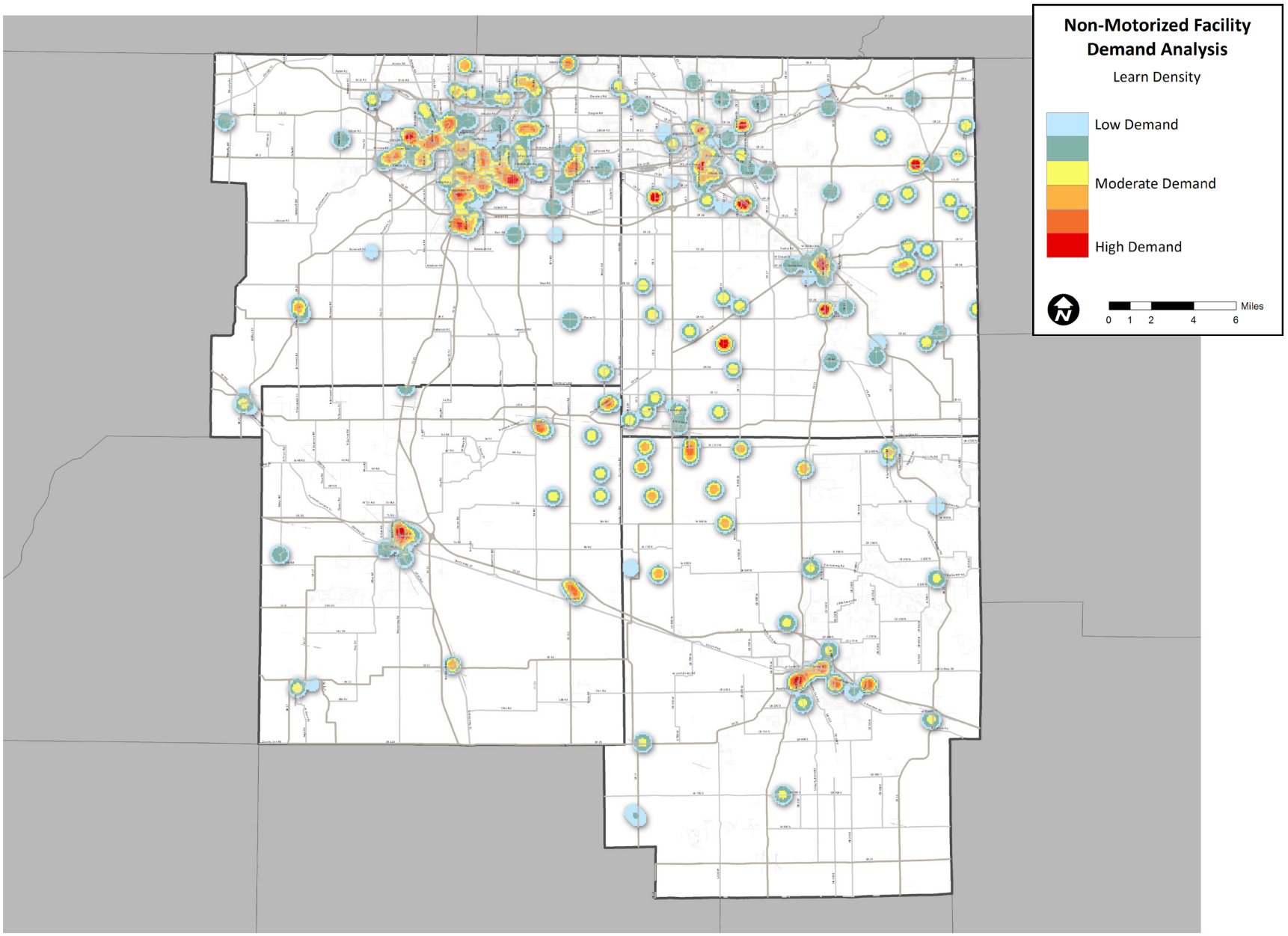


Figure C.21 - Where People Learn in Elkhart and Goshen of Elkhart County

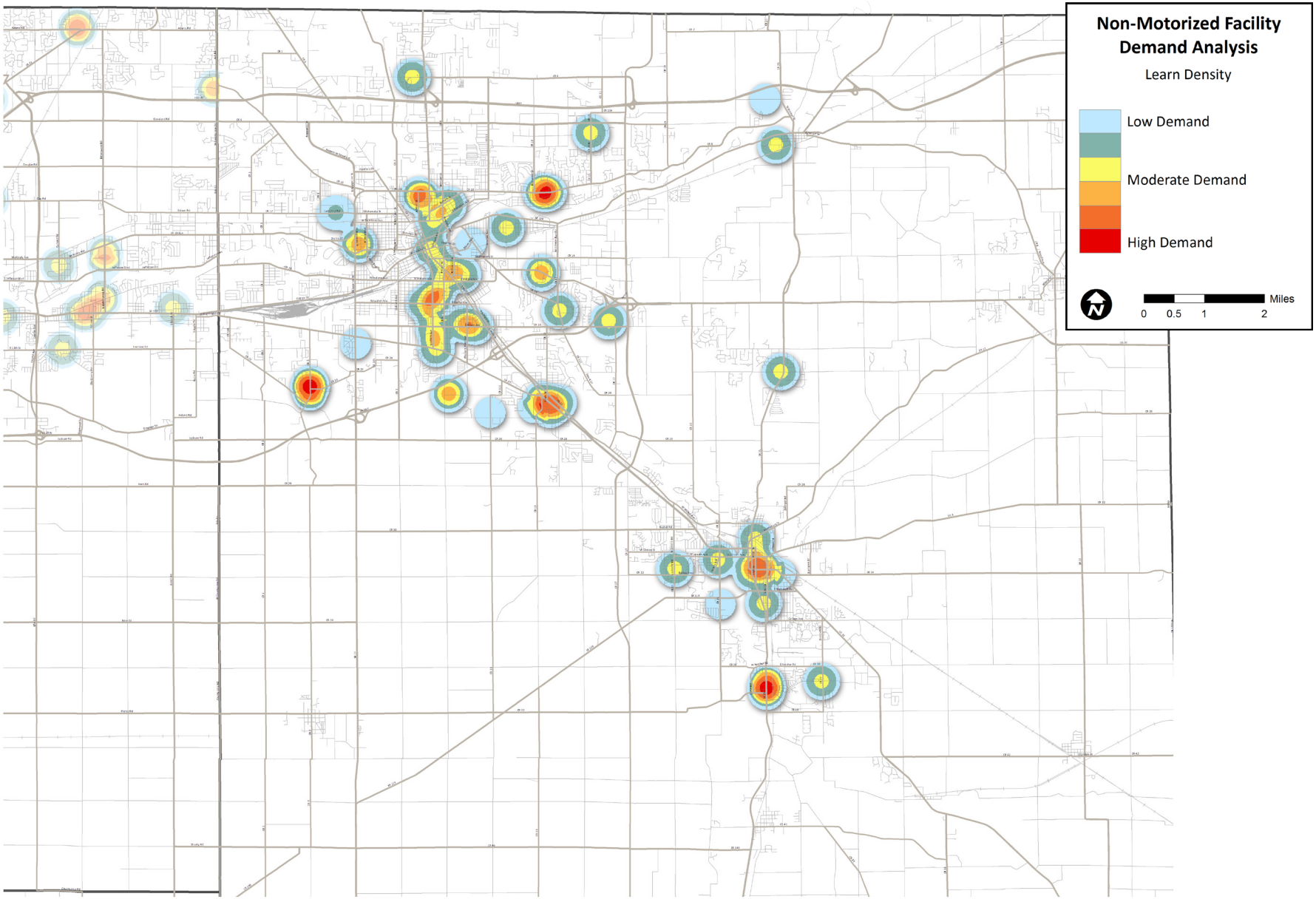


Figure C.22 - Where People Learn in Nappanee of Elkhart County

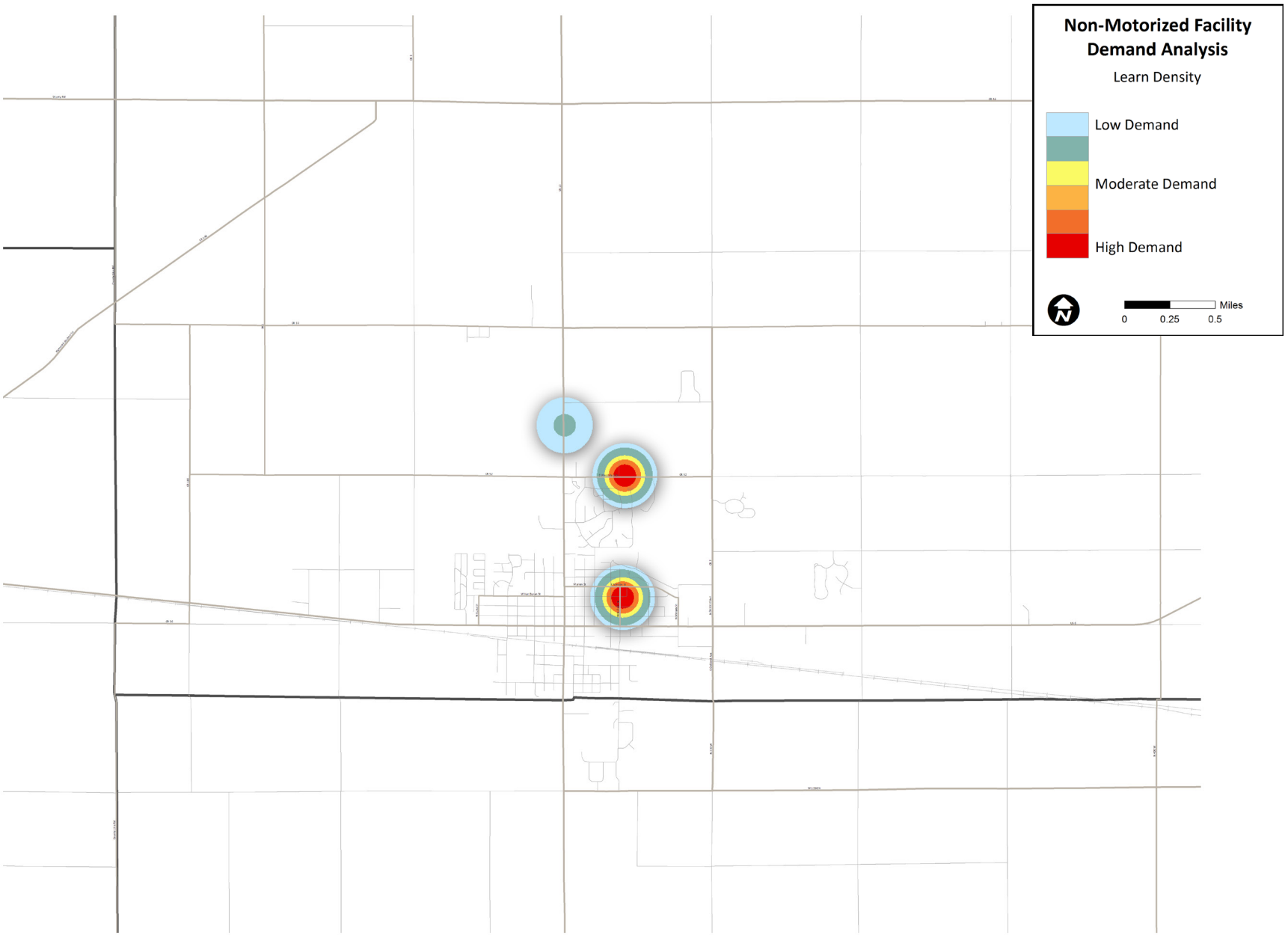


Figure C.23 - Where People Learn in Warsaw of Kosciusko County

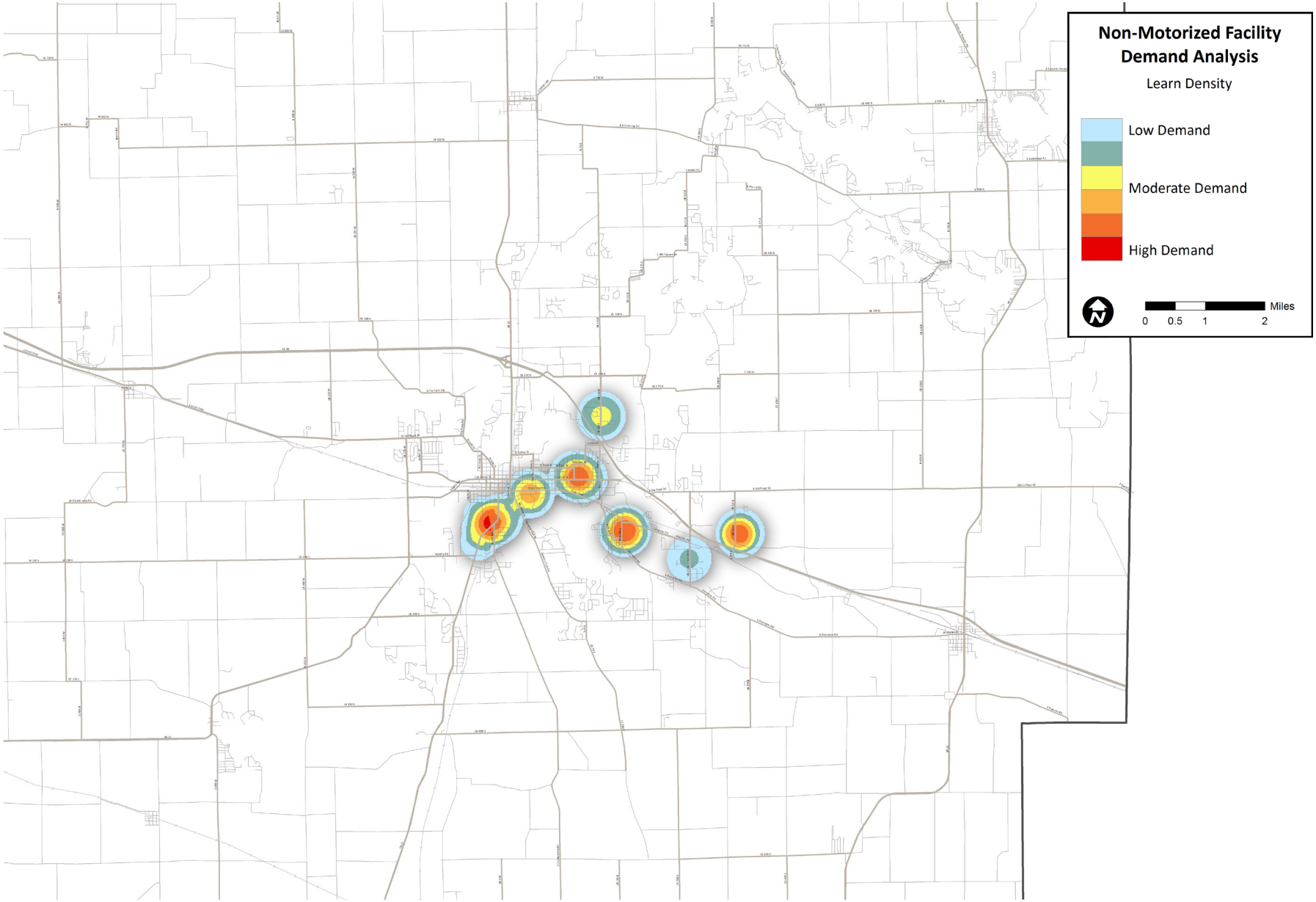


Figure C.24 - Where People Learn in Plymouth of Marshall County

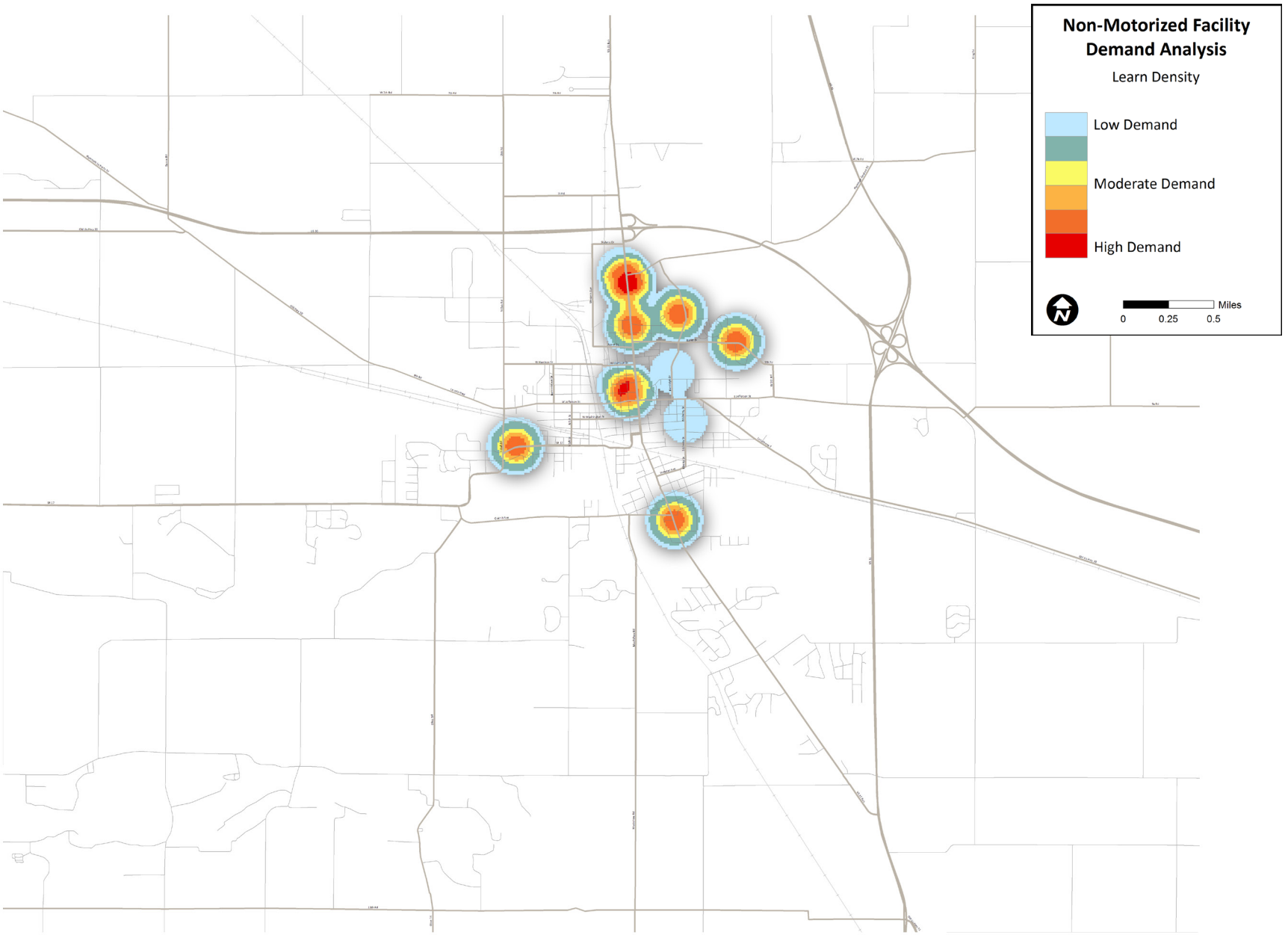


Figure C.25 - Where People Learn in South Bend and Mishawaka of St. Joseph County

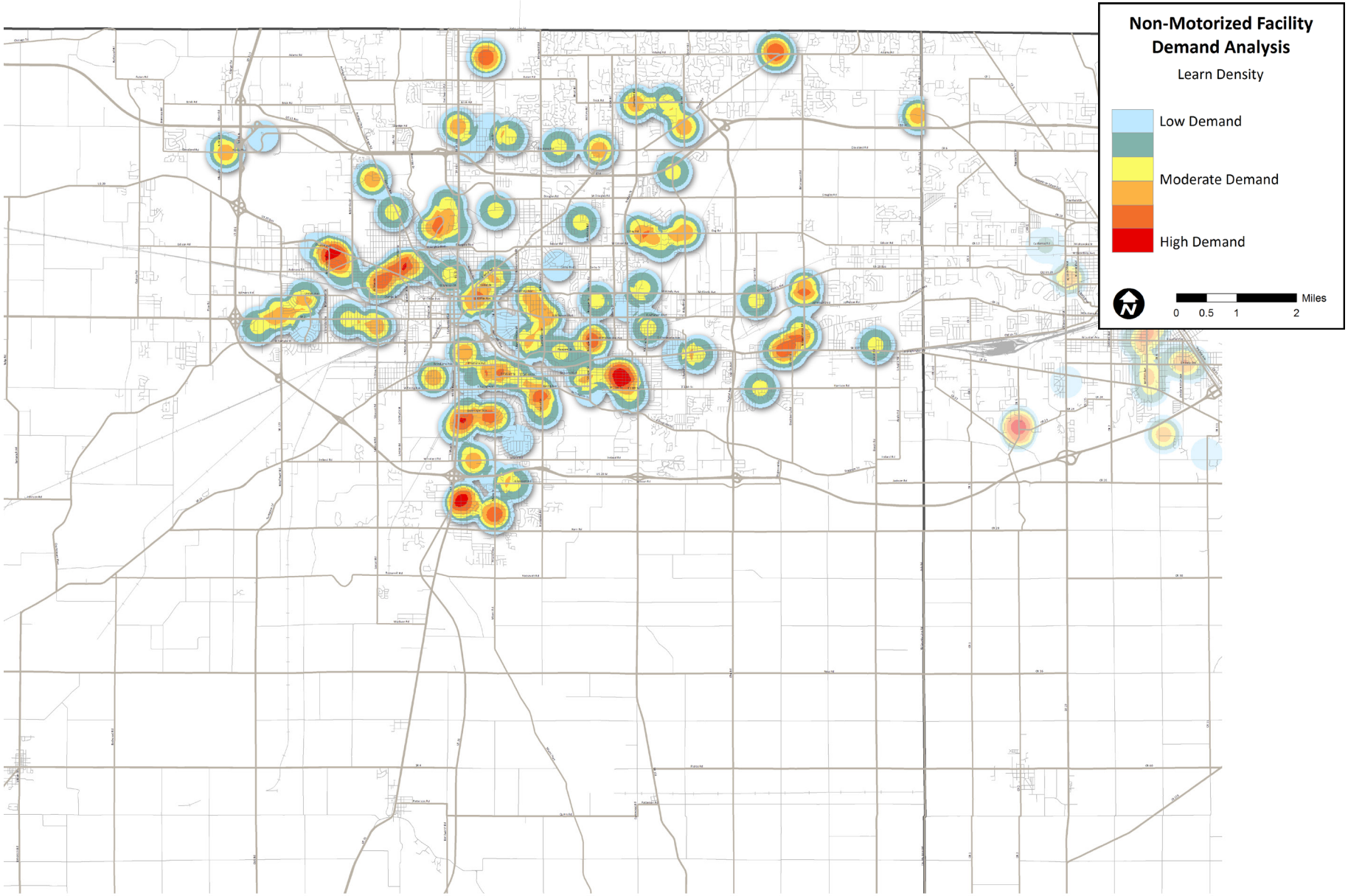
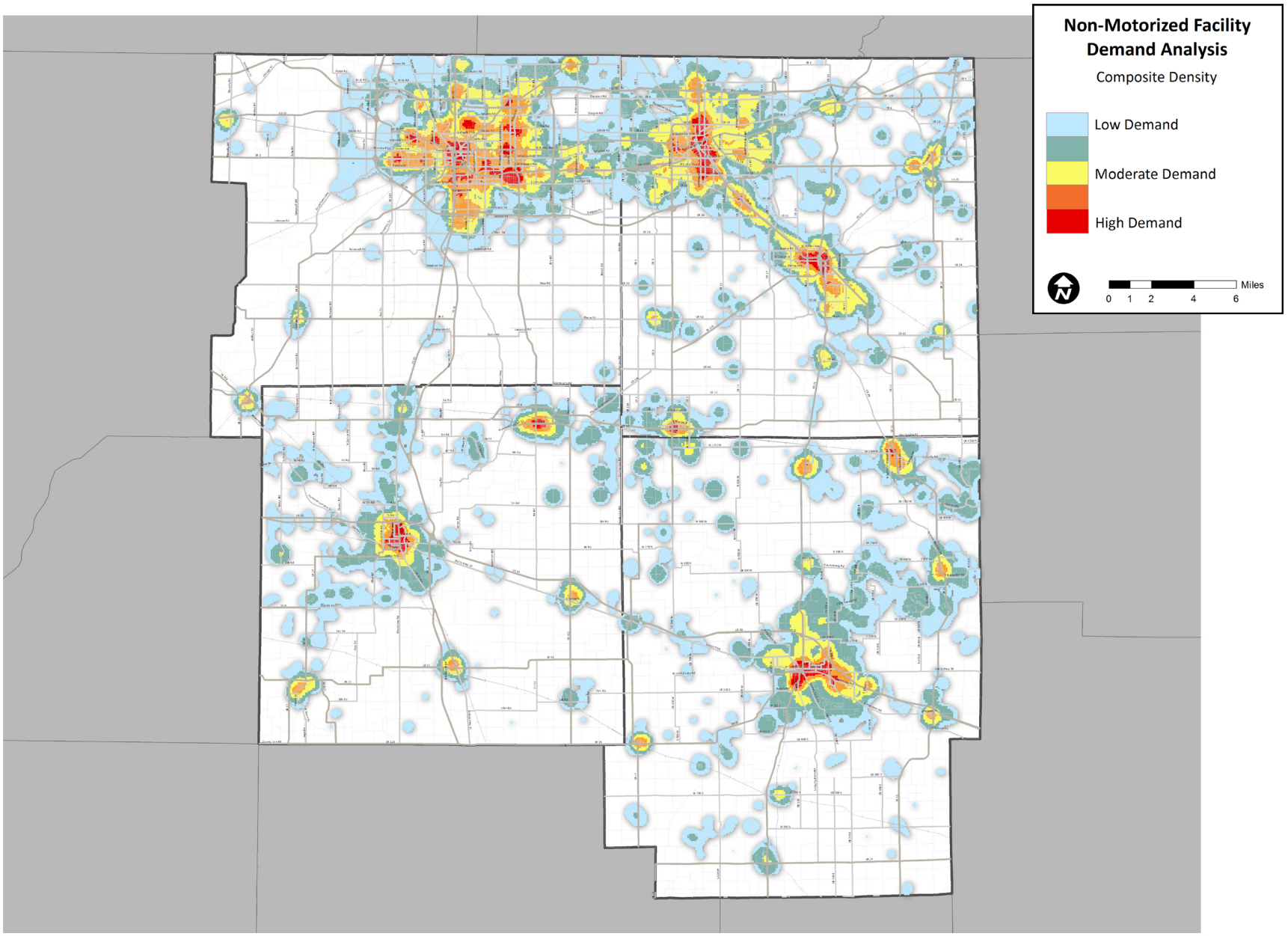


Figure C.26 - Composite Demand



APPENDIX D: BICYCLE SUITABILITY ANALYSIS

Introduction

Appendix D describes in further details the methods and results of the Bicycle Level of Traffic Stress (BLTS) for the MACOG planning region. The BLTS suitability analysis took into consideration the factors that impact bicyclists' level of comfort and safety, and analyzed the entire road network within the planning region, excluding limited access highways, alleys, and service roads, to give a general picture of connectivity throughout the planning region. Data for the analysis was provided via MACOG's road and traffic count databases.

Bicycle Level of Traffic Stress

MACOG based the suitability analysis from the *2012 Mineta Transportation Institute (MTI) Report 11-19: Low-Stress Bicycling and Network Connectivity*. The method outlined in the MTI report uses factors from road data, including posted speed limit, number of travel lanes, impact of traffic volumes, and presence of bicycle facilities. Each road segment was classified into one of four levels of traffic stress, as identified in the MTI report, see **Table D.1** for complete definitions of each level of traffic stress.

The lowest bicycle level of traffic stress, BLTS 1, is assigned to roads that would be tolerable for most children to ride, as well as multi-use trails that are separated from automobile traffic. The next rating, BLTS 2, is roads that can easily be ridden by most adults. BLTS 3 is the next level; assigned to road segments that would be comfortable for cyclists who are "confident" riding with or alongside traffic whether a bicycle facility is provided or not. Lastly, BLTS 4 is assigned to road segments that would only be acceptable to "strong and fearless" cyclists who tolerate riding on roadways with higher traffic volumes, speeds and limited pavement width. A fifth category was created to highlight roads that showed up with a rating of a four, but ultimately are not suitable for on-road cyclists.

Table D.1 - Level of Traffic Stress Definitions

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a rightturn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.
LTS 5	A level of stress of LTS4, but not suitable for on-road cyclists.

Bicycle Level of Traff Stress Methodology

The Bicycle Level of Traffic Stress (BLTS) analysis completed for the MACOG planning region is based on the 2012 MTI approach. The resulting categorization of each road segment in the MACOG planning region is termed as one of the four LTS categories; LTS 1 is the highest comfort level. Scoring was based off of the four basic categories: number of travel lanes, traffic volumes (AADT), type of bicycle facility, and posted speed limit, see **Table D.2** for the summarized scoring matrix.

As you can see in the scoring matrix table, LTS scoring decreases comfort as the number of travel lanes, traffic volumes, and posted speed limit increase. Traffic volumes and number of lanes reduce level of comfort more frequently where bicyclists have to share the road with motorists. On the other hand, comfort decreases for bicyclists riding in a bike lane where traffic volumes parallel to them increase.

Table D.2 - Scoring Matrix for Bicycle Level of Traffic Stress

Number of Travel Lanes	Traffic Volumes (AADT)	Type of Bicycle Facility											
		No Facility			Separated Facility (Buffered Bike Lane or Trail)			Bike Lane			Signed Route		
		Speed Limit											
		<= 25 mph	35 mph	> 35 mph	<= 25 mph	35 mph	> 35 mph	<= 25 mph	35 mph	> 35 mph	<= 25 mph	35 mph	> 35 mph
2 Lanes	<= 3k AADT	LTS 1	LTS 2	LTS 2	LTS 1	LTS 1	LTS 1	LTS 1	LTS 1	LTS 2	LTS 1	LTS 2	LTS 2
	3k - 10k AADT	LTS 2	LTS 2	LTS 3	LTS 1	LTS 1	LTS 1	LTS 1	LTS 2	LTS 3	LTS 2	LTS 2	LTS 3
	10k - 20k AADT	LTS 3	LTS 3	LTS 3	LTS 1	LTS 1	LTS 1	LTS 2	LTS 3	LTS 4	LTS 2	LTS 3	LTS 4
	>20k AADT	LTS 3	LTS 3	LTS 4	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 3	LTS 4	LTS 4
3 Lanes	<= 3k AADT	LTS 2	LTS 2	LTS 2	LTS 1	LTS 1	LTS 1	LTS 2	LTS 2	LTS 3	LTS 2	LTS 2	LTS 3
	3k - 10k AADT	LTS 2	LTS 3	LTS 4	LTS 1	LTS 1	LTS 1	LTS 2	LTS 3	LTS 3	LTS 2	LTS 3	LTS 3
	10k - 20k AADT	LTS 3	LTS 3	LTS 4	LTS 1	LTS 1	LTS 1	LTS 3	LTS 3	LTS 4	LTS 3	LTS 4	LTS 4
	>20k AADT	LTS 3	LTS 4	LTS 4	LTS 2	LTS 2	LTS 2	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
4 - 5 Lanes	<= 3k AADT	LTS 2	LTS 3	LTS 3	LTS 2	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 3	LTS 3	LTS 4
	3k - 10k AADT	LTS 3	LTS 3	LTS 4	LTS 2	LTS 2	LTS 2	LTS 3	LTS 3	LTS 4	LTS 3	LTS 3	LTS 4
	10k - 20k AADT	LTS 3	LTS 3	LTS 4	LTS 2	LTS 2	LTS 2	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
	>20k AADT	LTS 4	LTS 4	LTS 4	LTS 3	LTS 3	LTS 3	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4
6+ Lanes	All Volumes	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4	LTS 4

Bicycle Level of Traffic Stress Results

The BLTS model analyzed the roadway network within the MACOG planning region excluding limited access highways, alleys, and service roads, to provide a full picture of connectivity around the four counties. The results of this analysis are shown in the series of maps on the following pages, beginning with the overall look of the region as well as each of the five urban areas designated as a city; **Figures D.1** through **D.6**. Much of the roads in the MACOG planning region are deemed accessible for most adult riders. Disconnected clusters of low-stress streets characterize most of the urbanized street network; however, heavily traveled and high-speed roads like McKinley Avenue, SR-2/Western Avenue, SR-23, Cleveland Road, US 33 and US 30 function as barriers to bicycle mobility. The results of this analysis will be used later in the planning process to inform the recommendations for new bicycle and pedestrian infrastructure to improve connectivity, safety, and comfort.

Figure D.1 - Regional Bicycle Level of Traffic Stress

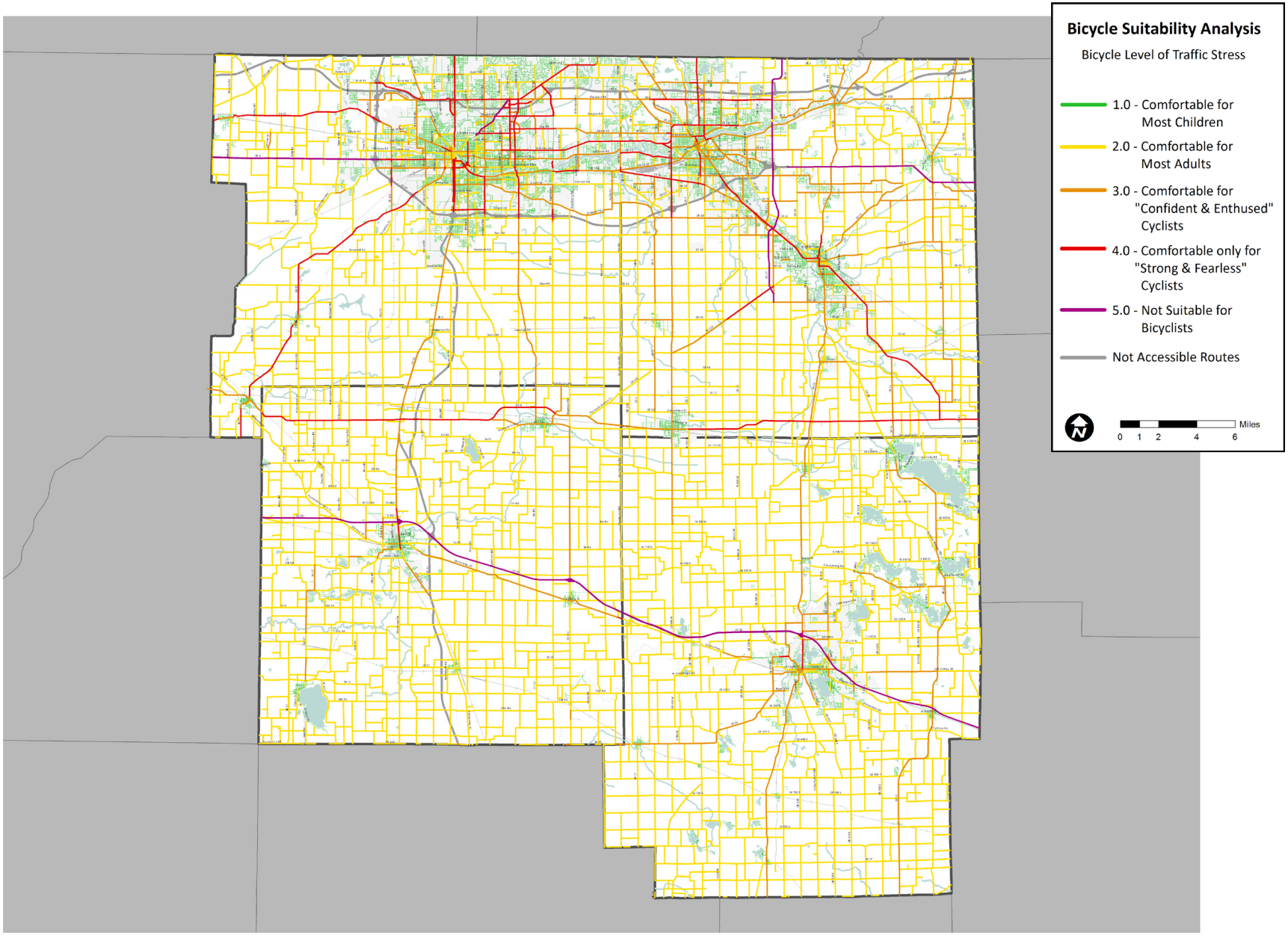


Figure D.2 - Bicycle Level of Traffic Stress in Elkhart and Goshen

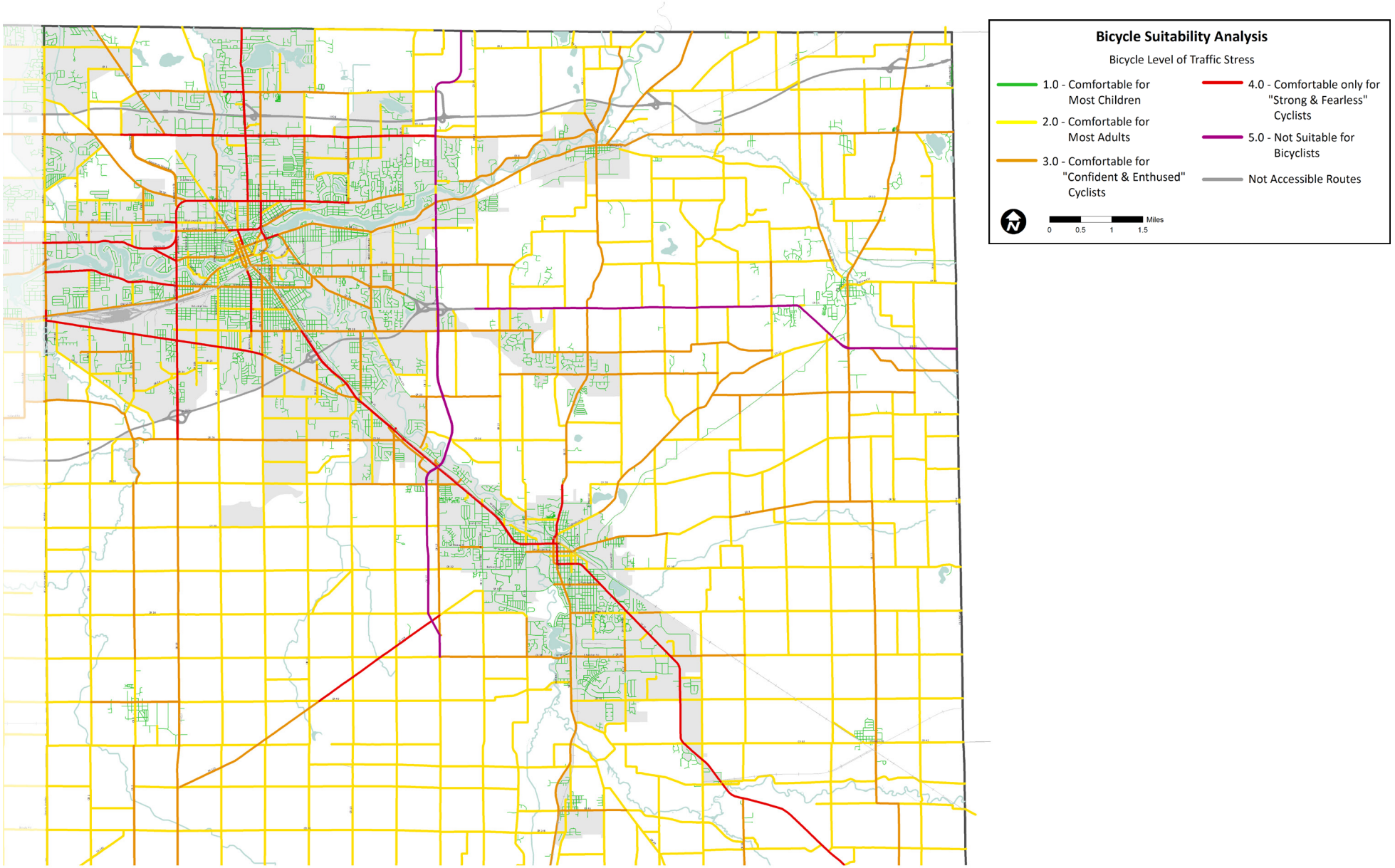


Figure D.3 - Bicycle Level of Traffic Stress in Nappanee

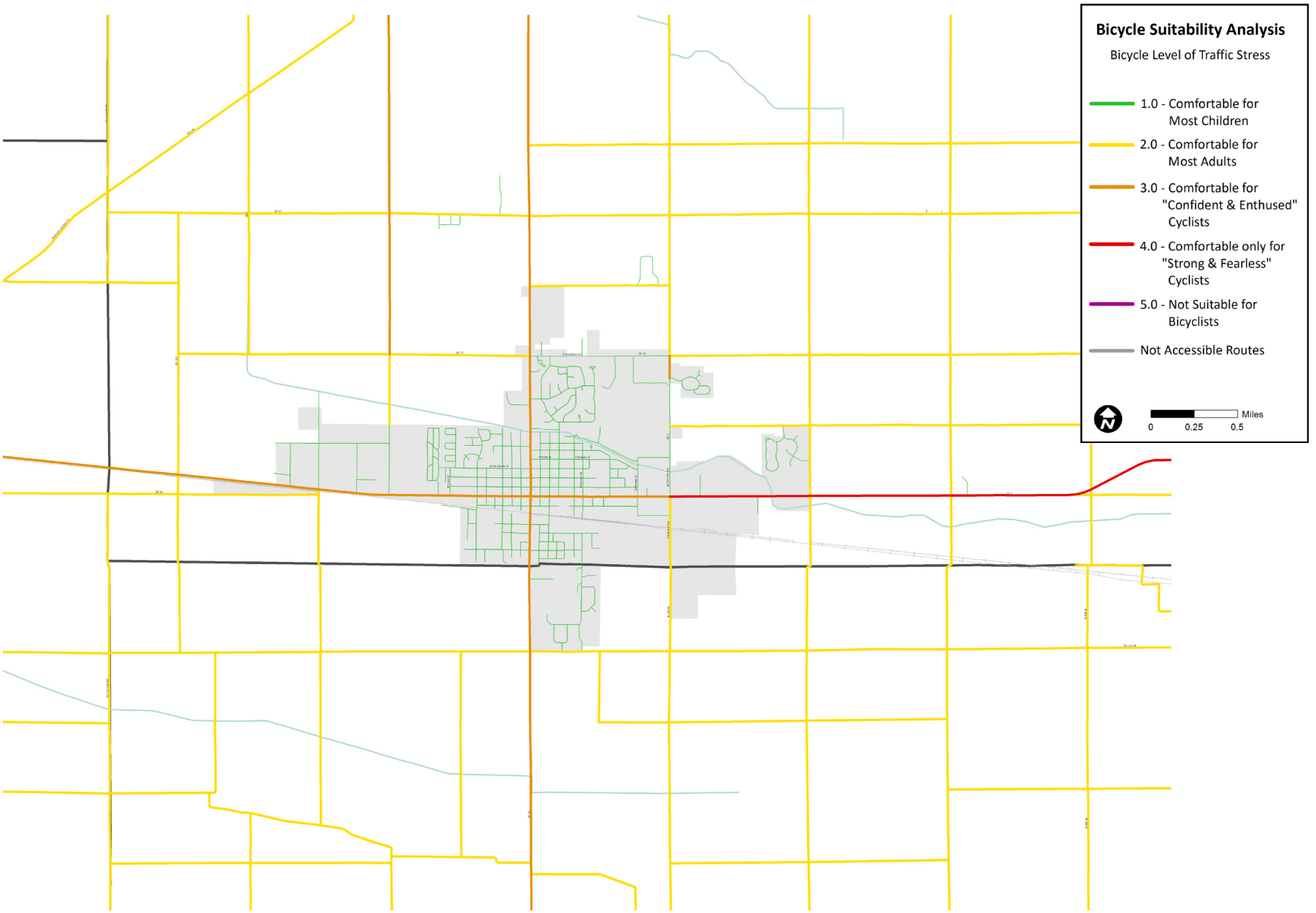


Figure D.4 - Bicycle Level of Traffic Stress in Warsaw

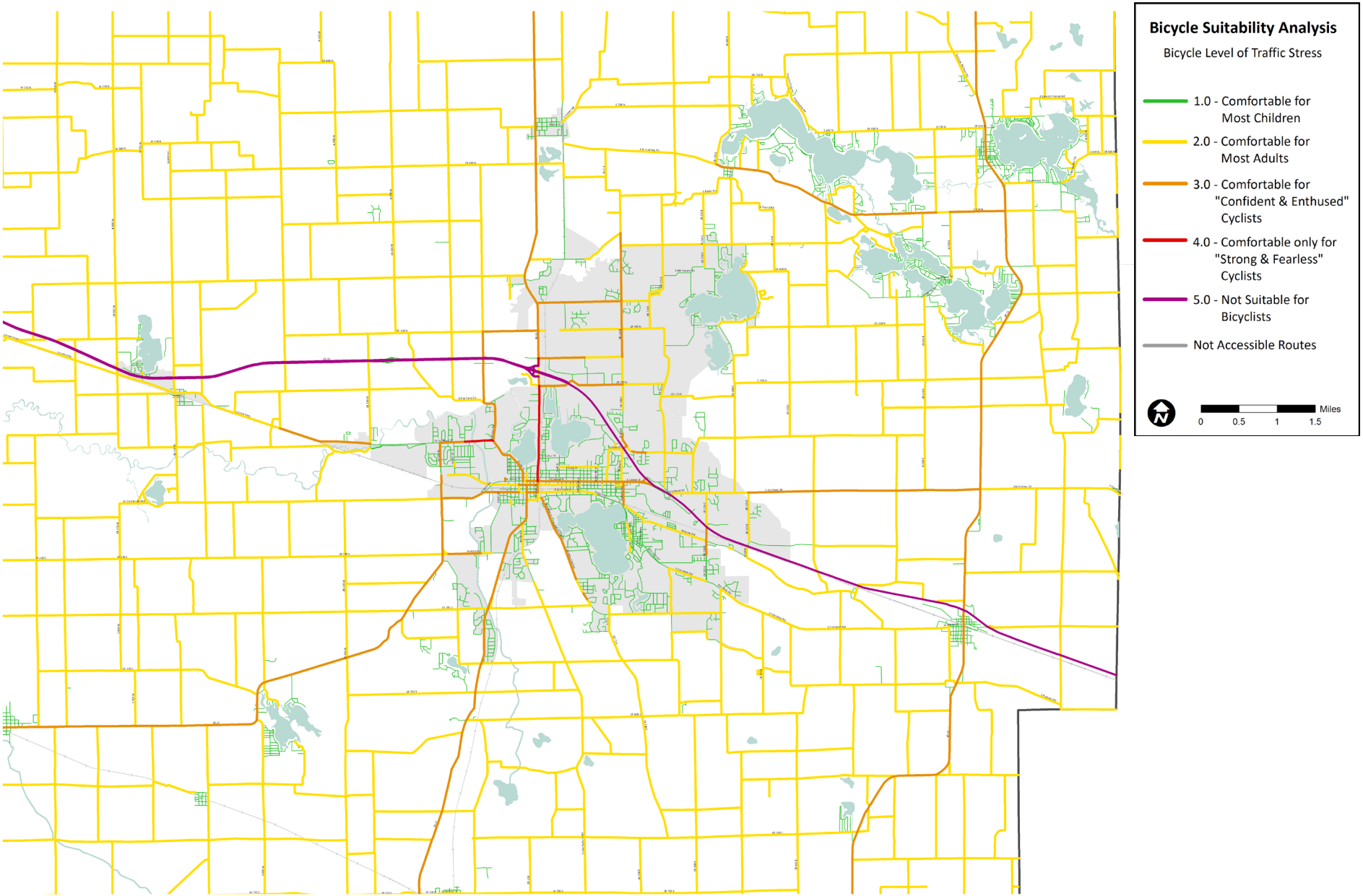
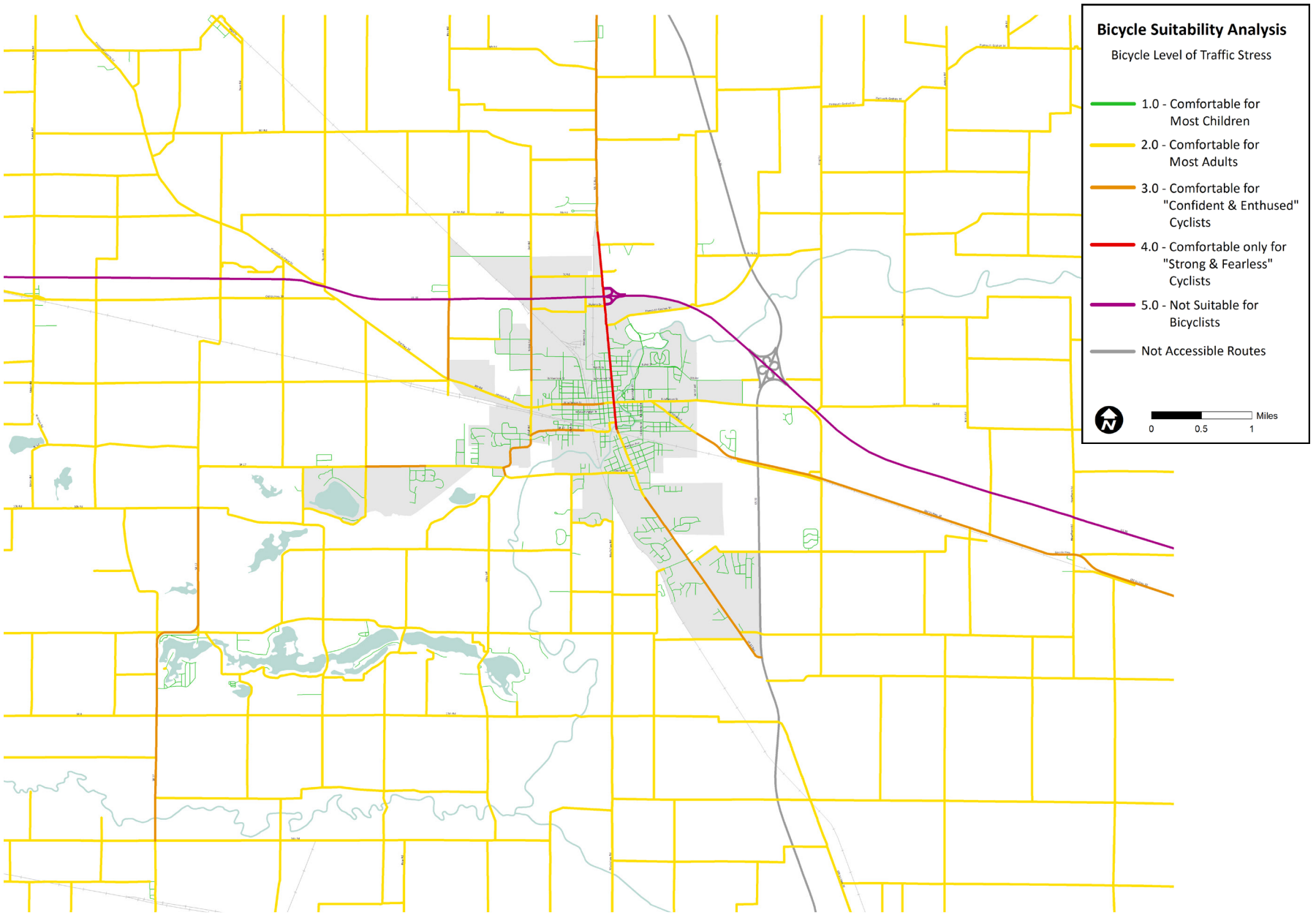
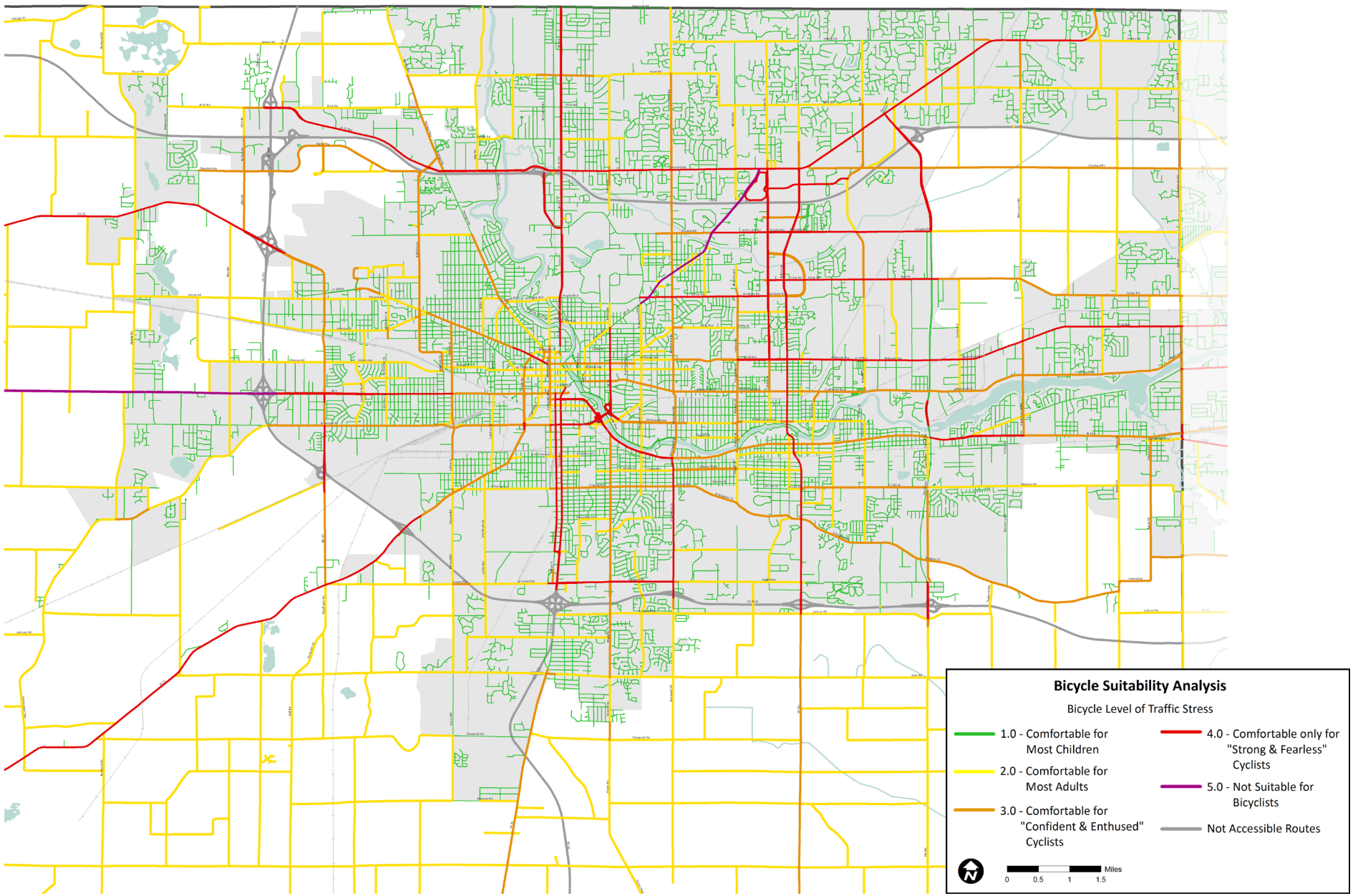


Figure D.5 - Bicycle Level of Traffic Stress in Plymouth




Bicycle Suitability Analysis
Bicycle Level of Traffic Stress
1.0 - Comfortable for Most Children
2.0 - Comfortable for Most Adults
3.0 - Comfortable for "Confident & Enthused" Cyclists
4.0 - Comfortable only for "Strong & Fearless" Cyclists
5.0 - Not Suitable for Bicyclists
Not Accessible Routes
Miles
0
0.5
1
1.5

APPENDIX E: CRASH ANALYSIS

Introduction

A person's level of perception on safety concerns will determine if an individual will choose to bike or walk over drive their automobile. Safety, convenience and weather are the most common reasons for people opting not to bicycle more often on the road. Even if the trip is over a short distance, if an individual does not feel safe biking on the road or there is a gap in the network, more often than not, the individual has made up his or her mind not to bike or walk and will use a different mode of travel. Likewise, crashes involving motor vehicles represent a significant threat, both real and perceived, to the safety of bicyclists and pedestrians and the decision to choose to bike or walk. A survey was polled during the planning process of this Plan throughout the planning region. Respondents stated they feel motorists' attitudes towards non-motorized users to that of being impatient having to wait at intersection crossings or passing bicyclists on the open road, and don't believe that bicyclists are entitled to be on the road. An examination of the impacts of crashes on bicyclists and pedestrians emphasizes the liability of these road users. According to the *2014 Indiana Crash Facts Report*, bicyclists and pedestrians represented less than 1% of all individuals in traffic collisions in Indiana, but made up 11% of all traffic fatalities. Only 0.2% of motor vehicle occupants involved in traffic collisions were killed, compared to 5.7% of all bicyclists and pedestrians.

MACOG is fortunate to have access to valuable collision data to help identify trends in crashes, understand crash characteristics, and develop safety promotions and other countermeasures to create a safer environment for bicyclists and pedestrians. This section of the Plan summarizes reported crashes in the MACOG planning region that involved bicyclists and pedestrians between 2012 and present (2016).

There are certain limitations to consider when interpreting bicycle and pedestrian related crash data. Firstly, a street or intersection that did not experience a crash during the analysis period is not an indication that people are not bicycling or walking there, nor is it evidence that the area does not have any challenges to bicycling or walking. Secondly, crash data does not take into consideration "near misses", attributed to conditions at many high-risk locations, such as bike lanes along roads with high volumes of traffic. Thirdly, in the absence of user count data, there is no way to measure "exposure" to crashes, defined as crashes per mile traveled or crashes per bicyclist. For example, consider two streets that experienced the same number of crashes but different cyclist volumes. Streets that experience high presence of bicyclists typically are safer than streets with a low presence of bicyclists.

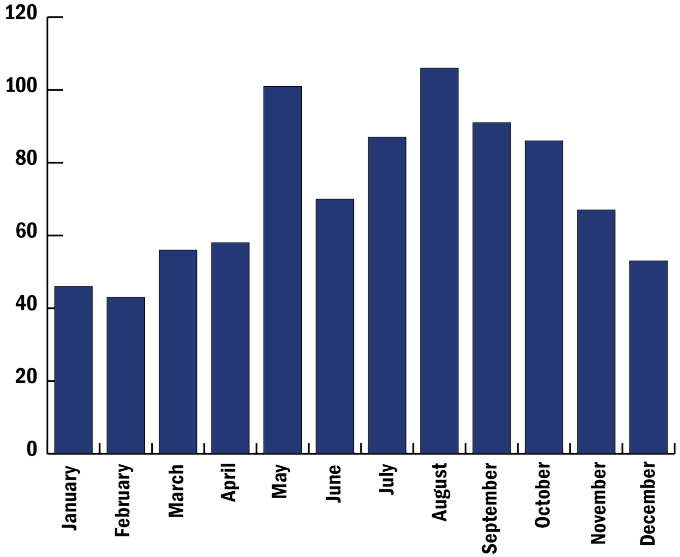
Non-Motorized Crashes

Over 864 non-motorized related collisions were reported in the MACOG planning region from 2012 to 2016. Of these 864 collisions, roughly 29 percent occurred in the City of South Bend, followed by the City of Elkhart with 23 percent. Approximately 769 incidents resulted in injuries with over 50 percent of those injuries were pedestrians. Additional, 35 occurrences resulted in a fatality with 66 percent being pedestrians. The nature of these crashes are further analyzed below to identify the correlations to help develop recommendations for bicycle and pedestrian infrastructure improvements and programs to make biking and walking safer, and easier mode of choice for transportation and recreation.

Crashes by Month, Day of Week, & Time

Figure E.1 through **E.3** show reported bicycle crashes by month, day of week, and time of day, respectively. As shown in **Figure E.1**, the greatest number of crashes occurs between the summer and fall months; peaking in May and August. This could correlate with May designated as National Bike Month and people may be more incline to bike as a means of transportation; weather may consistently be fair following what seems to be a daunting winter season; people going on summer vacations; or, increased civic activities.

Figure E.1 - Crashes by Month



As shown in **Figure E.2**, crashes occurred more frequently during the weekdays (Monday through Friday) than the weekends (Saturday and Sunday). This may attribute to people in the MACOG planning region choosing to commute by bike for their work and non-work trips rather than by car. **Figure E.3** shows crash occurrences by the time of day. The reported collisions occurred most frequently during mid-day hours between 9

Figure E.2 - Crashes by Day of Week

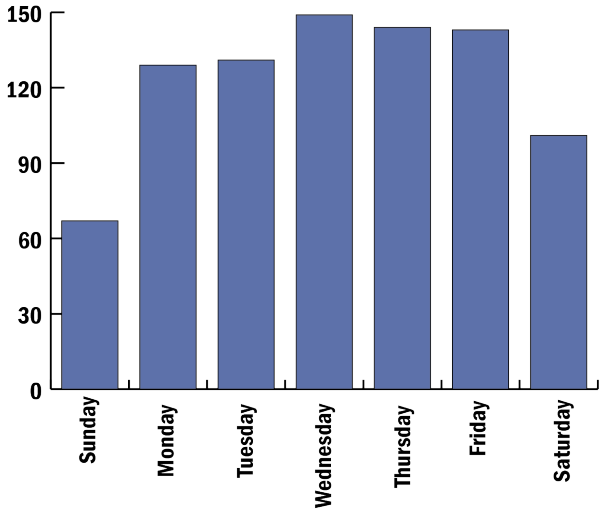
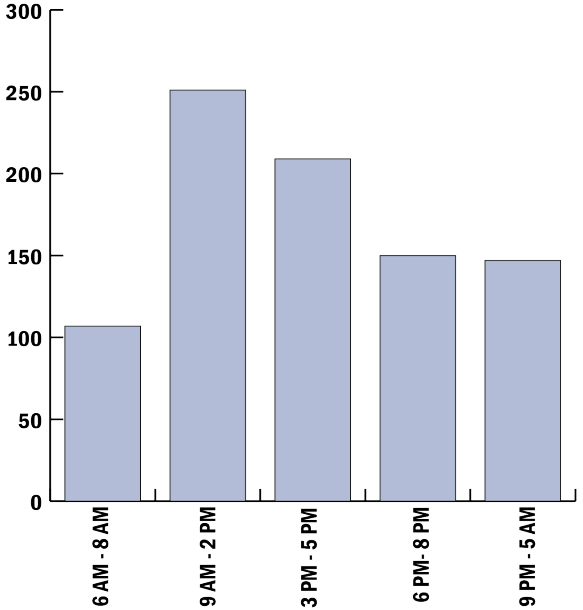


Figure E.3 - Crashes by Time of Day



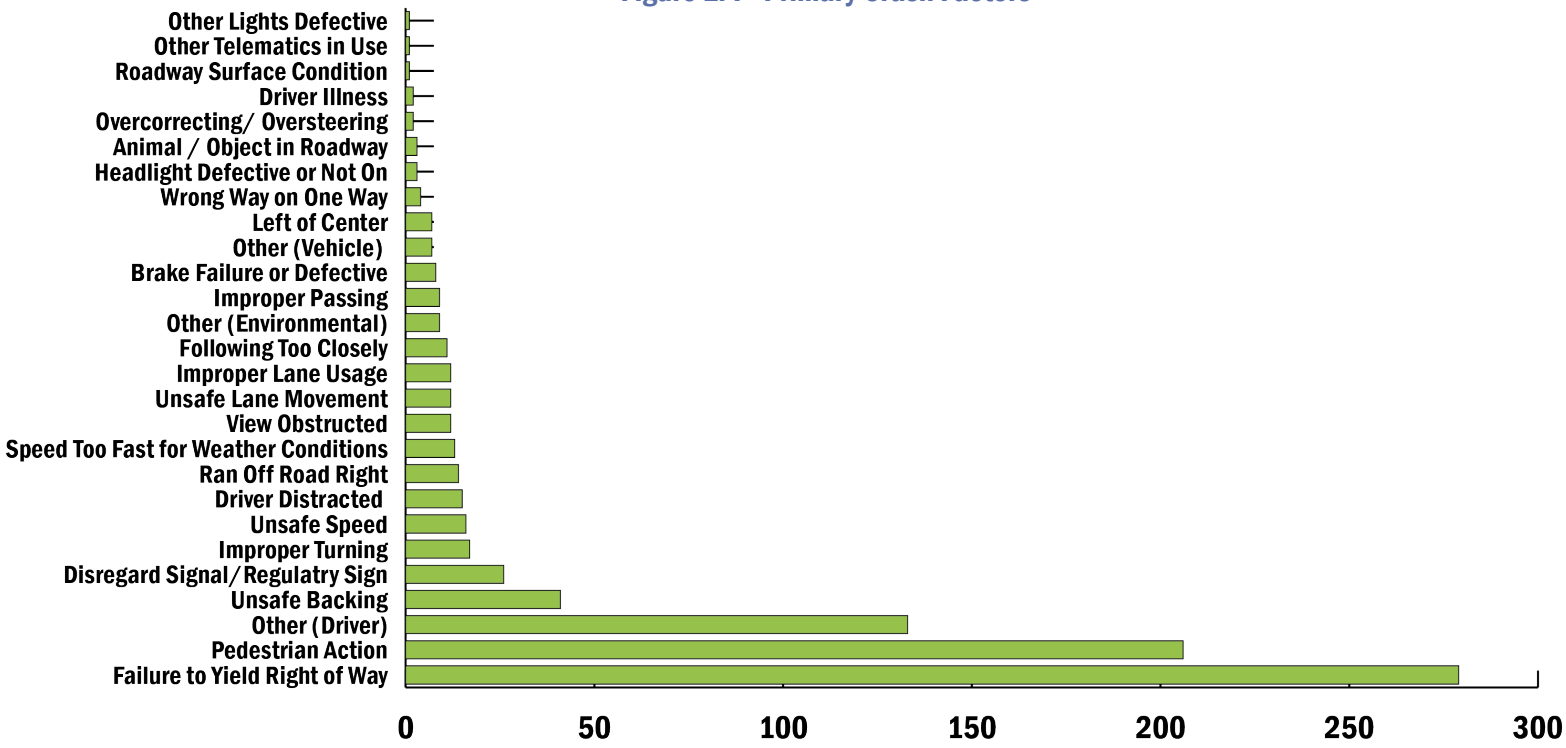
AM and 2 PM, which made up nearly 30 percent of total crash occurrences. Crash occurrences between the afternoon hours of 3 PM and 5 PM accounted for 25 percent of the total crashes. A great amount of the crash occurrences during the mid-day times occurred around the time people are leaving for lunch between 11 AM and 2 PM. Additionally, the spike at 3 PM may be associated with school dismissals.

Crash Characteristics

Knowing the crash characteristics can be helpful in assisting local communities to be proactive in developing countermeasures and solutions ahead of time for reducing the risk of collisions between bicyclists and motor vehicles. By analyzing the primary factors and manner of crashes, local communities and MACOG can identify common trends from the data and develop safety programs or recommend infrastructure improvements to counteract bicyclists' fear of riding on the street and driver behaviors.

There were 27 different primary factors reported in the details of the 864 non-motorized crashes. Of the 27 primary factors, failure to yield the right-of-way was the most frequently cited cause of crashes, accounting for 32 percent. Other frequently cited primary causes included pedestrian action (non-motorized user was the primary cause for accident) with 24 percent, other (driver) with 15 percent, and unsafe backing (motorist backing out of parking space) with 5 percent, see **Figure E.4**.

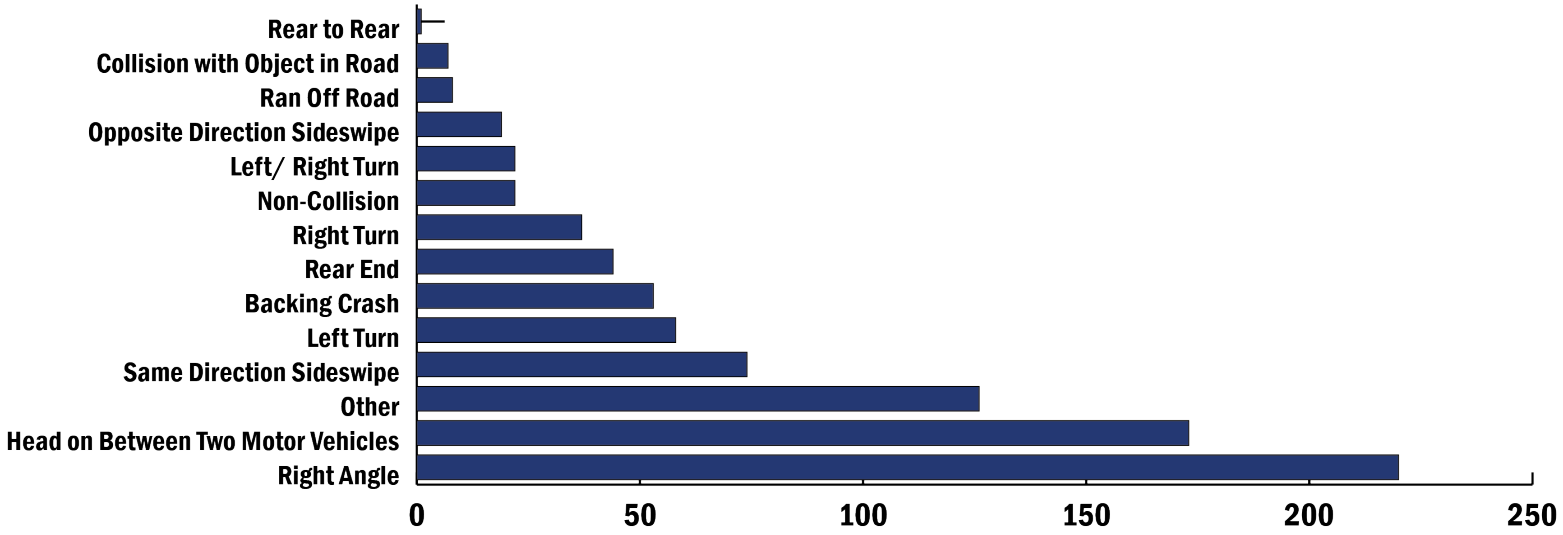
Figure E.4 - Primary Crash Factors



While most crashes are attributed to motorists being at fault by not being aware of non-motorized users, other crash factors are associated with a bicyclist's behavior, such as operating a bike with faulty brakes, minimal lights, or riding on the wrong side of the road. While MACOG does offer safety materials on rules of the road for bicyclists, more targeted educational classes and safety campaigns need to be installed to help empower the local communities to effectively spread the word.

Additional crash type data includes the manner in which the non-motorized user(s) and vehicle(s) collided. As shown in **Figure E.5**, right angle crashes was the main manner of collision between non-motorized users and motorists that made up for 25 percent of crashes. Over 75 percent of these right angle collisions occurred at an intersection. Other frequent manners included other (random manners) made up 20 percent, head on collisions constituted for 15 percent, and same directional sideswipes had 9 percent.

Figure E.5 - Manner of Collision



Top Crash Locations

In the absence of count data, crash location data can help decision makers visualize what roadways non-motorized users are likely traveling on and can ultimately help guide their efforts to improve those streets to have greater access to the uses these users are attracted to and improve safety conditions on the roadways non-motorized are likely using based on the frequency of crash location data.

Due to MACOG providing planning services to a large geographic region that includes multiple local public agencies, the crash location data was generated as a series of heat maps for each of the four counties, as well as the five urbanized areas, as shown in **Figures E.6** through **E.11** on the following pages. In order to accurately display each variable input, the demand model was tailored to a search radius applicable to county and urban scale levels; 3,960 feet (3/4 mile) and 2,640 feet (1/2 mile) for each respective geographic scale. Smaller urban communities, like the City of Nappanee, had a search radius of 1,320 feet (1/4 mile).

Figure E.6 - Regional Crash Density

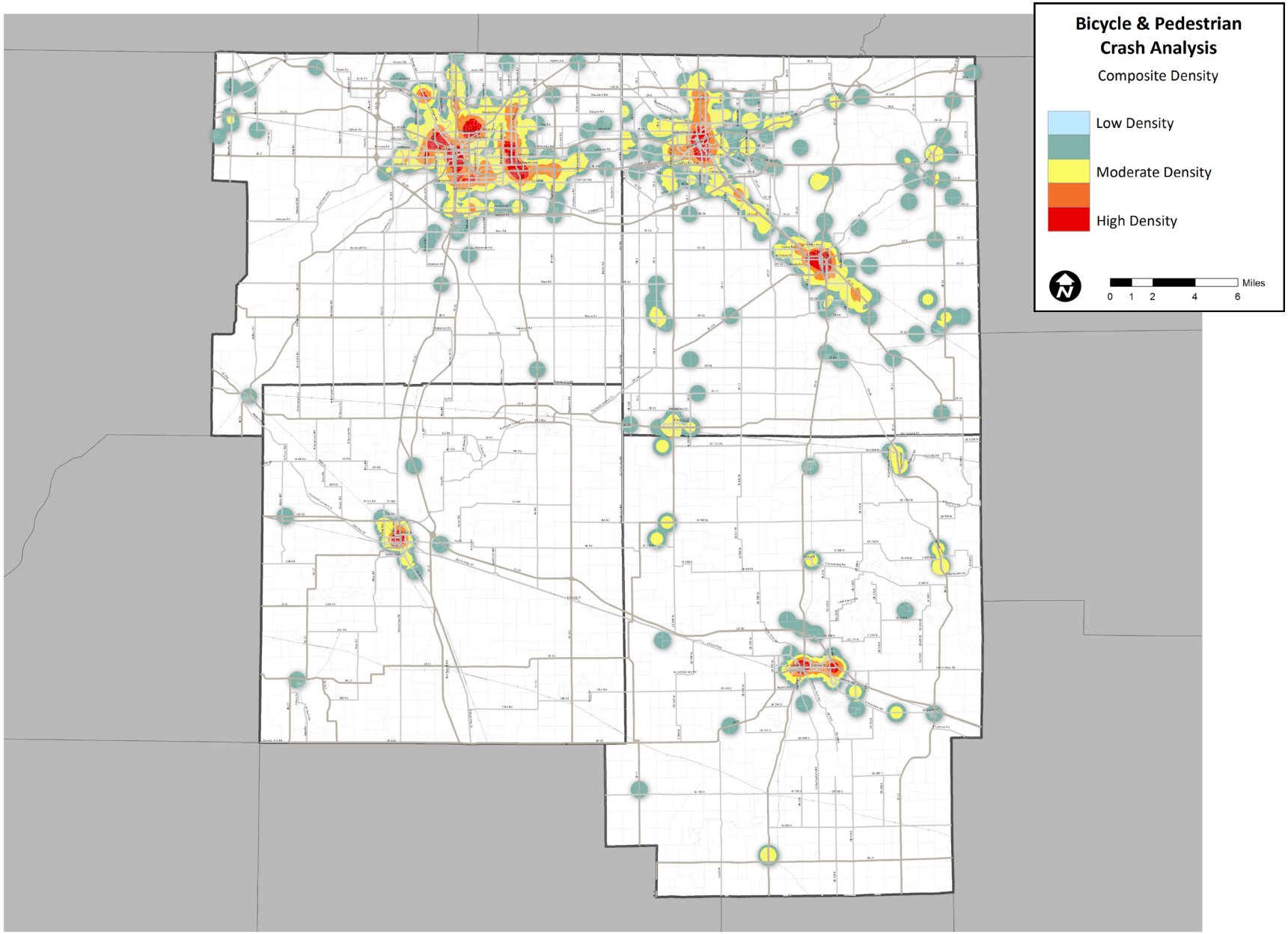


Figure E.7 - Crash Density in Elkhart and Goshen of Elkhart County

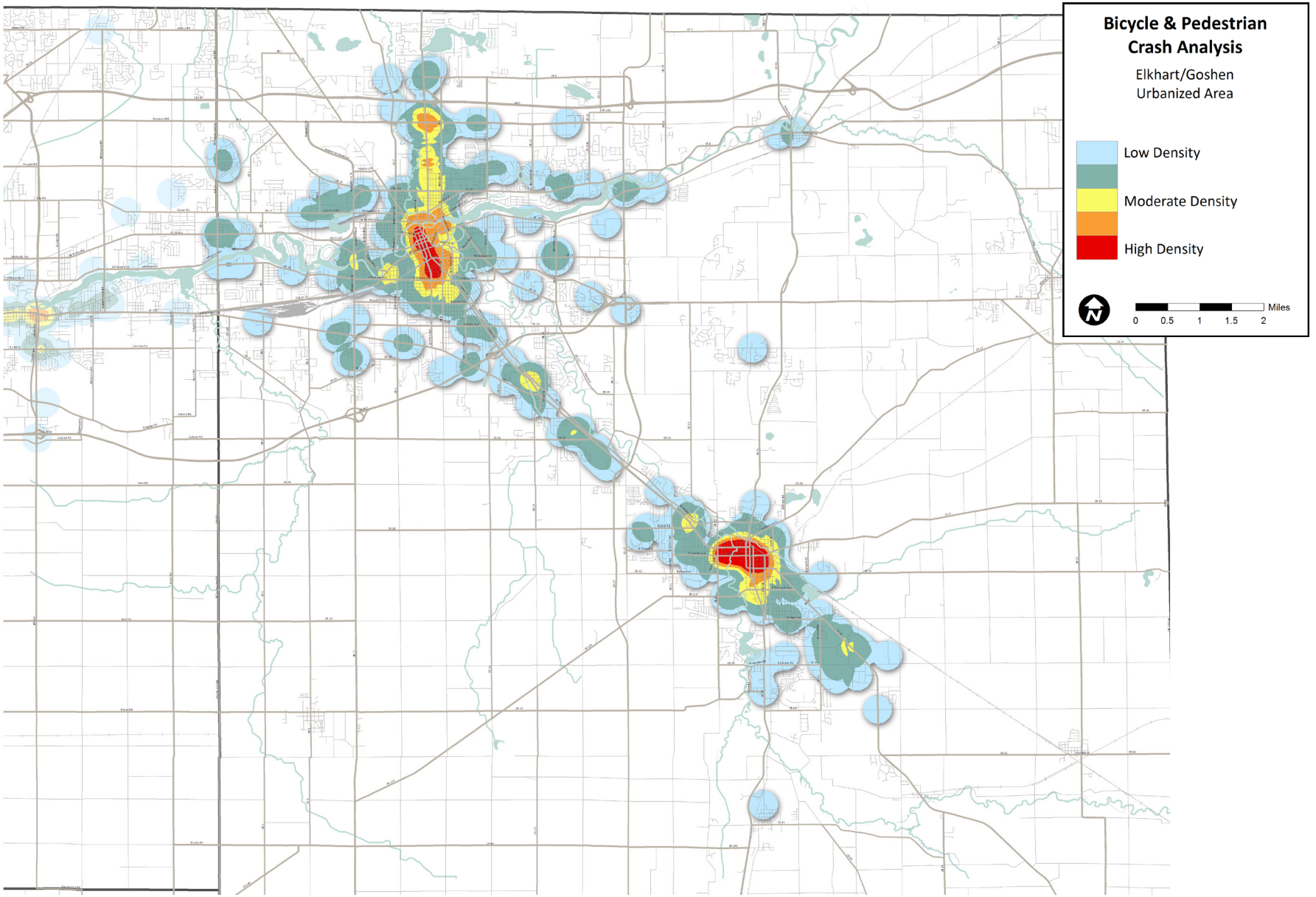


Figure E.8 - Crash Density in Nappanee of Elkhart County

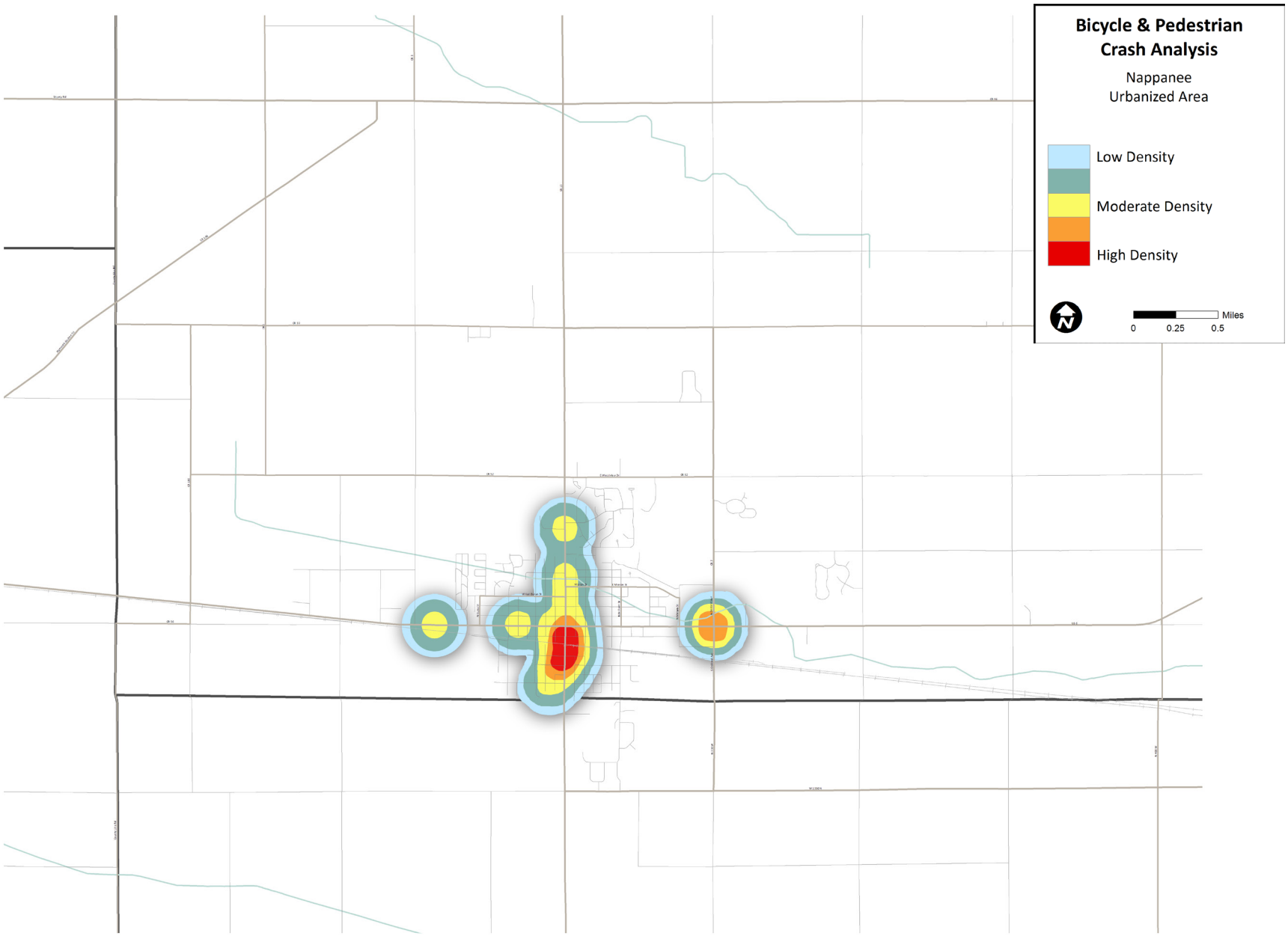


Figure E.9 - Crash Density in Warsaw of Kosciusko County

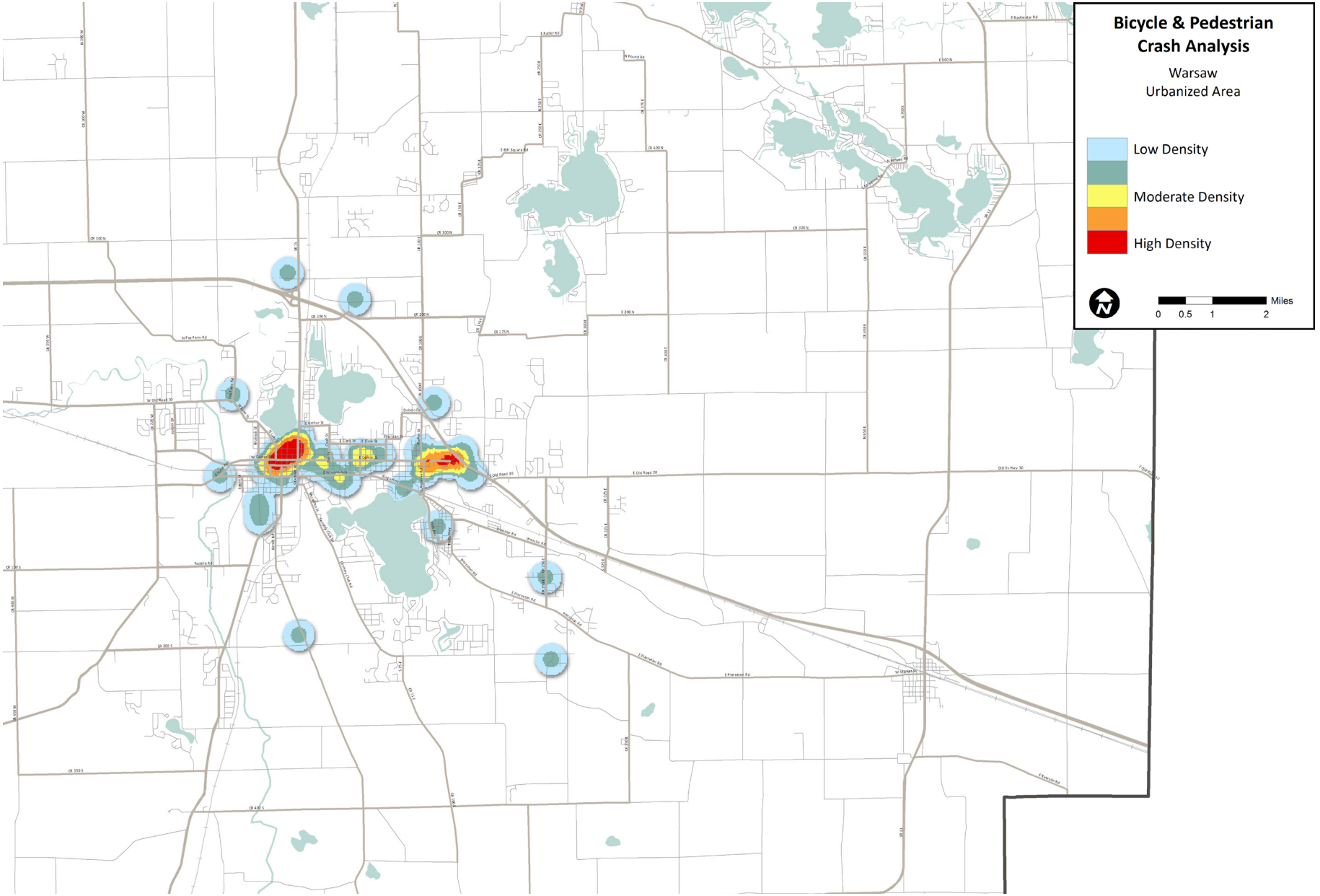


Figure E.10 - Crash Density in Plymouth of Marshall County

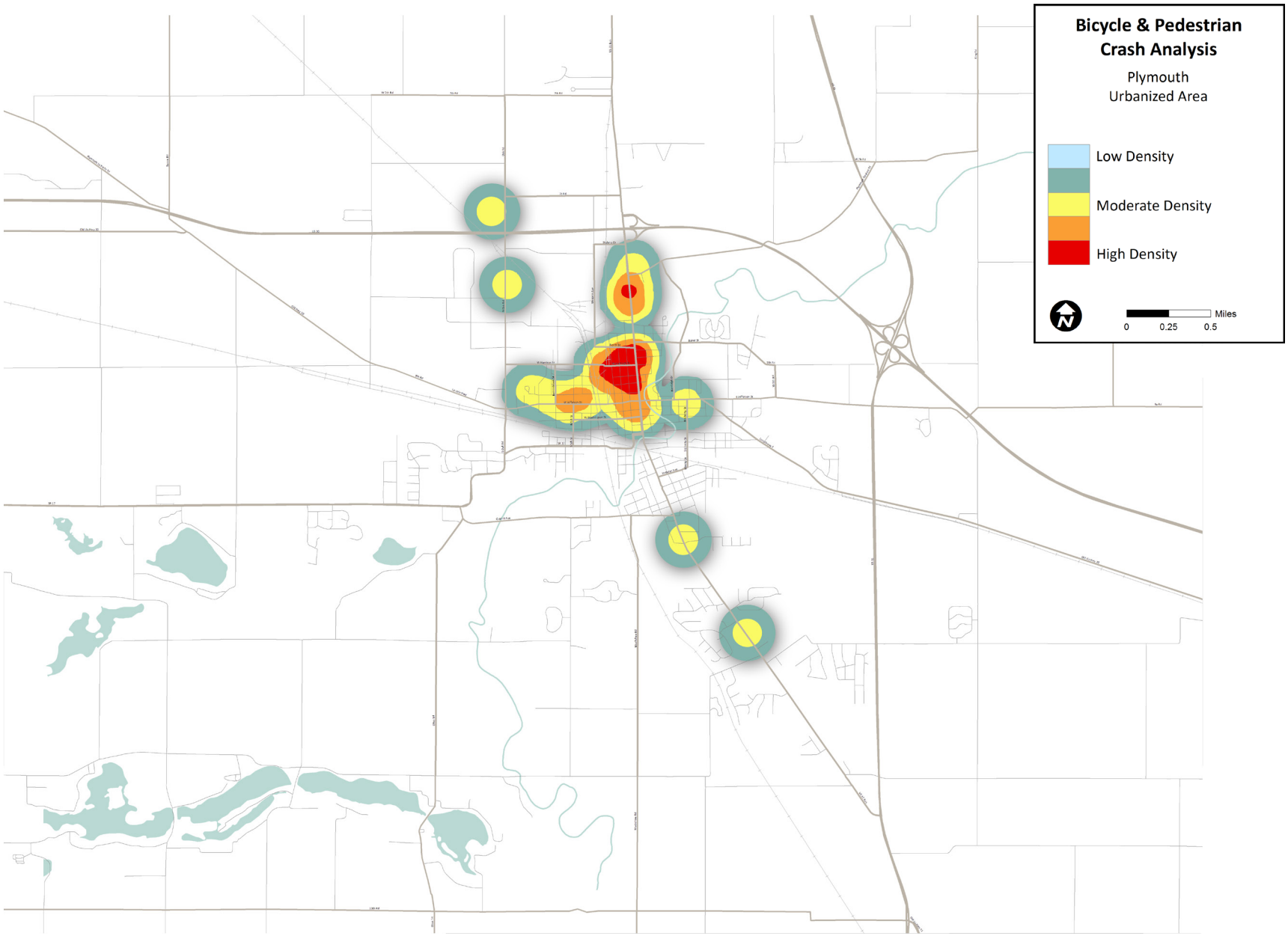
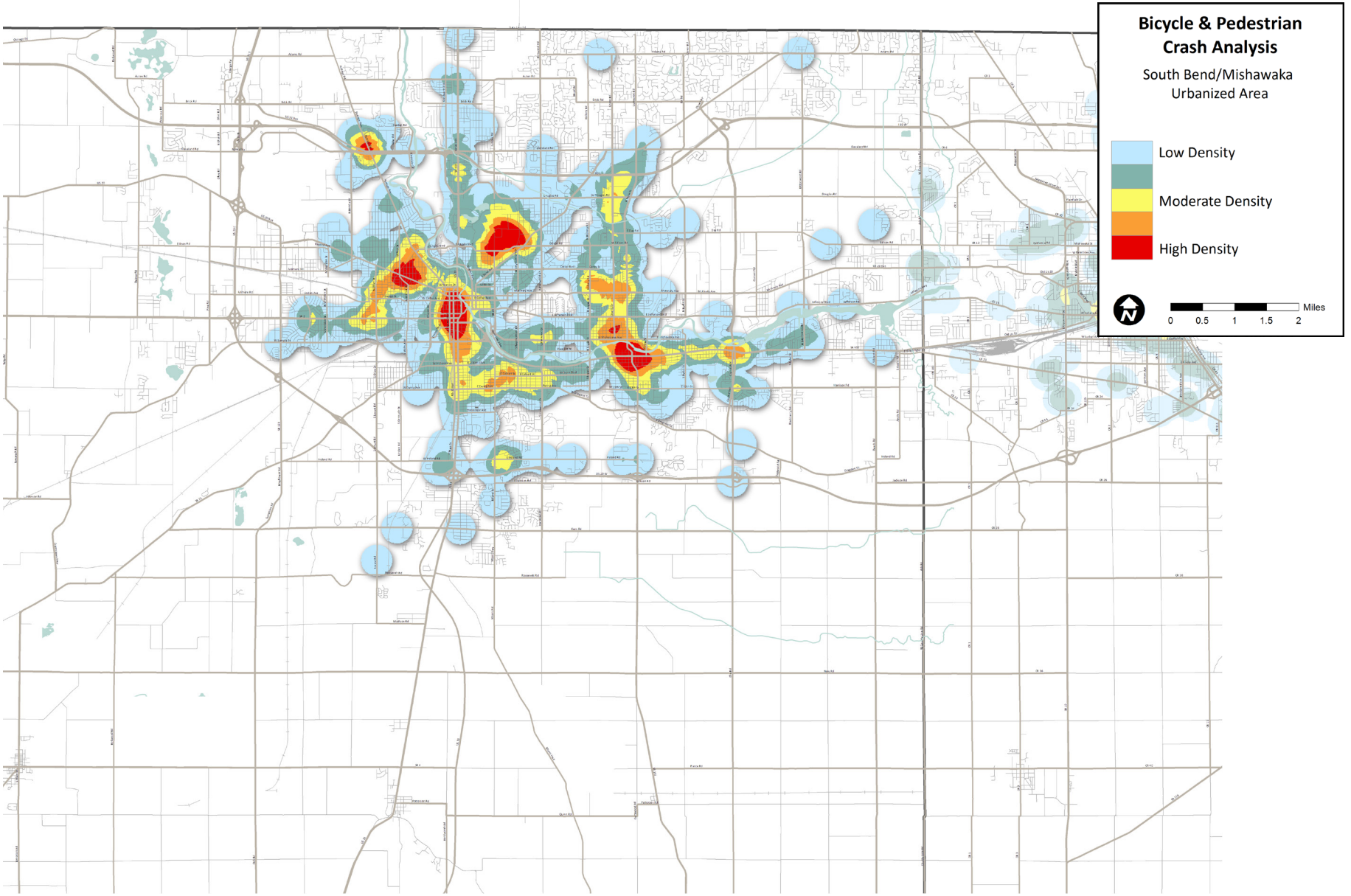


Figure E.11 - Crash Density in South Bend and Mishawaka of St. Joseph County



In addition to mapping where the reported crashes occurred, which are mapped at or near intersections as these are the more frequent locations for crashes to occur, MACOG wanted to further analyze the top crash locations at or near intersections in relation to where non-motorized users are going or areas in the planning region that are high demand. The areas of attraction in high demand were determined by using the hot spots from the Non-Motorized Facility Demand Analysis. This level of analysis will help justify that increased access and safety improvements should be focused on the streets that connects to uses in these hot spot areas as these are the areas where non-motorized users are attracted to and roadways they are commonly using. **Figure E.12** shows the top ten crash locations from 2012 to present by the non-motorized facility areas of high demand. **Table E.1** shows the total crashes of those top ten crash locations in the areas of high demand**.** Downtown Goshen had the highest frequency of reported crashes over the five year study period with 36 occurrences; making up 13.5 percent of the total crashes occurring in an area of high demand for non-motorized users. Downtown South Bend was the second highest frequent area with 27 reported crashes, and Elkhart was the third highest frequent area with 26 reported crashes. Each area made up nearly 10 percent of the total crashes in an area of high demand.

MACOG also recorded the frequency of crashes on roadway corridors of which had five or more crashes within the top ten non-motorized facility areas of high demand, as represented in **Table E.2**. The number of crashes for each corridor listed includes crashes at or near intersections on the roadway on which the crash occurred. The Cassopolis St/SR 19 corridor in Elkhart had the highest frequency of crashes with 15 total crashes. US 33 through downtown Goshen rated the second highest with 12 total crashes. Main Street in downtown South Bend was the third highest frequent roadway corridor with 11 total crashes.

Table E.1 - Top Ten Crash Locations by Non-Motorized Facility Demand Areas

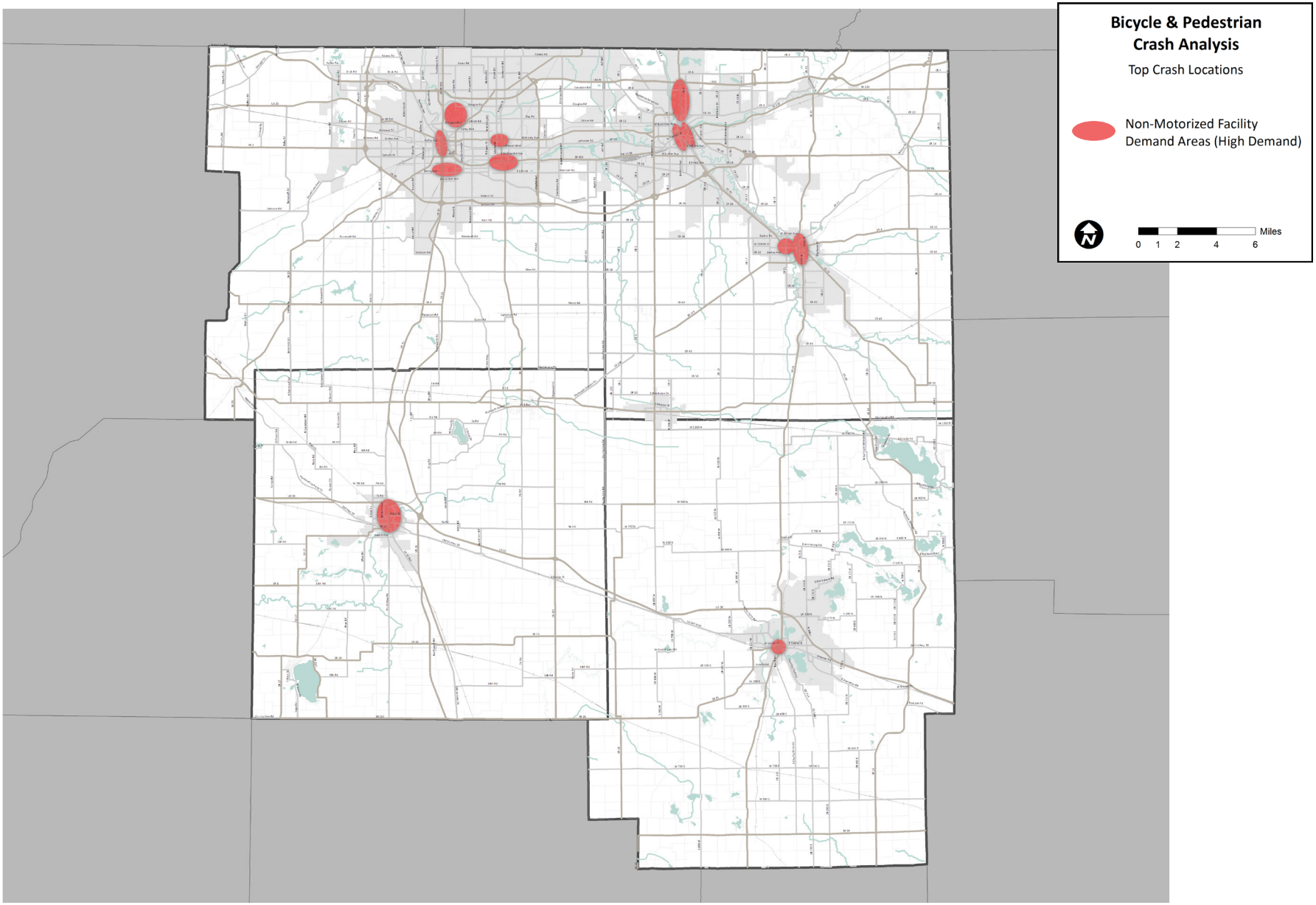
City	Non-Motorized Facility Demand Area	Total Crashes
Goshen	Downtown	36
South Bend	Downtown	27
Elkhart	Downtown	20
Mishawaka	Downtown	20
South Bend	Notre Dame	18
Elkhart	Cassopolis St/SR 19 Area	18
Goshen	Indiana Ave & Lincoln Ave Area	14
Elkhart	Riverwalk Area	13
South Bend	Ewing Ave Area	12
Mishawaka	Town & Country	10
Plymouth	Downtown	10
Warsaw	Downtown	10

*Although the Western Ave/SR 2 area was not amongst the top ten crash locations; overall, it was the third highest rated corridor in South Bend with 6 total crashes, see **Table E.2**.

Table E.1 - High Frequency Crash Roadway Corridors in the Top Ten Non-Motorized Facility Demand Areas

City	Non-Motorized Facility Demand Area	Top Corridor	From Street	To Street	Total Crashes
Elkhart	Cassopolis St/SR 19 Area	Cassopolis St	Windsor Ave	Bristol St	15
Elkhart	Downtown	Main St	Beardsley Ave	Dr. Martin Luther King Jr Dr	9
Elkhart	Riverwalk Area	Johnson St	Beardsley Ave	Waterfall Dr	7
Elkhart	Downtown	2nd St	Sycamore St	Harrison St	6
Elkhart	Downtown	Benham Ave	2nd St	Indiana Ave	5
Elkhart	Downtown	Beardsley Ave	Edwardsburg Ave	Johnson St	5
Goshen	Downtown	US 33	3rd St	Monroe St	12
Goshen	Indiana Ave & Lincoln Ave Area	Lincoln Ave	Riverside Blvd	Chicago Ave	9
Goshen	Downtown	SR 4/Lincoln Ave	3rd St	9th St	8
Goshen	Downtown	3rd St	US 33	Douglas St	8
Mishawaka	Downtown	Lincoln Way East/SR 933	Hill St	Merrifield Ave	8
Mishawaka	Town & Country	McKinley Ave	Hickory Rd	Main St	6
Mishawaka	Downtown	Main St	Grove St	Lincoln Way East/SR 933	5
Mishawaka	Town & Country	Main St	Leyte Ave	Omer Ave	5
South Bend	Downtown	Main St	Marion St	Monroe St	11
South Bend	Downtown	Michigan St/St Joseph St	LaSalle Ave	SR 23/Sample St	7
South Bend	Western Ave*	Western Ave/SR 2	Lake St	Olive St	6
South Bend	Notre Dame	Twyckenham Dr	Douglas Rd	Edison Rd	5
South Bend	Ewing Ave	Michigan St	Indiana Ave	Ewing Ave	5

Figure C.12 - Top Crash Locations Map



APPENDIX F : SURVEY RESULTS

Introduction

In order to gain more understanding of residents' attitudes and habits toward active transportation, the Michiana Area Council of Governments (MACOG) developed an online survey and interactive map for the region. The survey was conducted between March 3, 2016 through May 7, 2016 and available on our website as well as in paper form. MACOG encouraged residents in our region to take the survey through a variety of marketing and promotion, such as display boards, flyers, and postcards. The Active Transportation Steering Committee as well as other stakeholders also shared the survey through social media and newsletters.

The survey was divided into four section: bicycling, walking, values, and demographics. In total, MACOG received 350 responses from all four counties, all seven cities, and eight of the towns. MACOG also received several responses from communities in our surrounding region. The following section provides a summary of the survey results and information gathered from the interactive map.

Active Transportation Survey Summary

Bicycling

Most survey respondents were people who bike either casually or as experienced cyclists (157 and 127 people respectively) though a significant portion (57 people) described themselves as less confident cyclists. Only a small number of survey respondents (9 people) are not people who bike. (Figure F.1)

Figure F.1 - Level of Comfort Bicycling

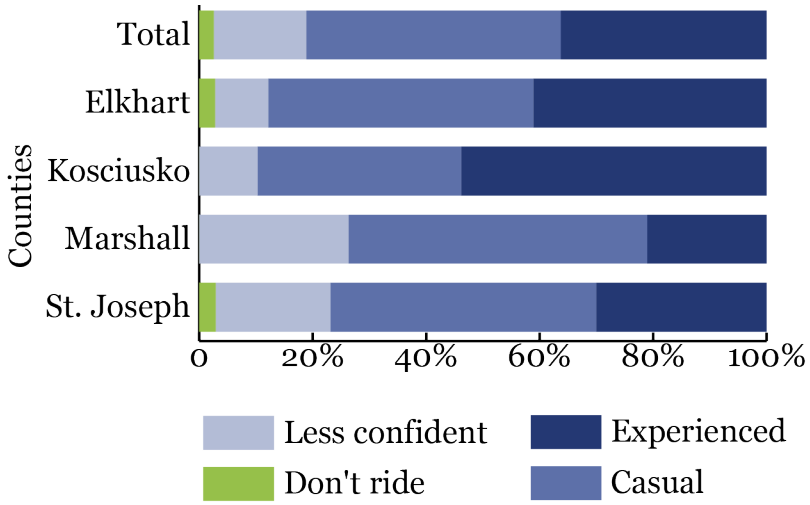


Figure F.2- Types of Places Traveled to by Bicycle

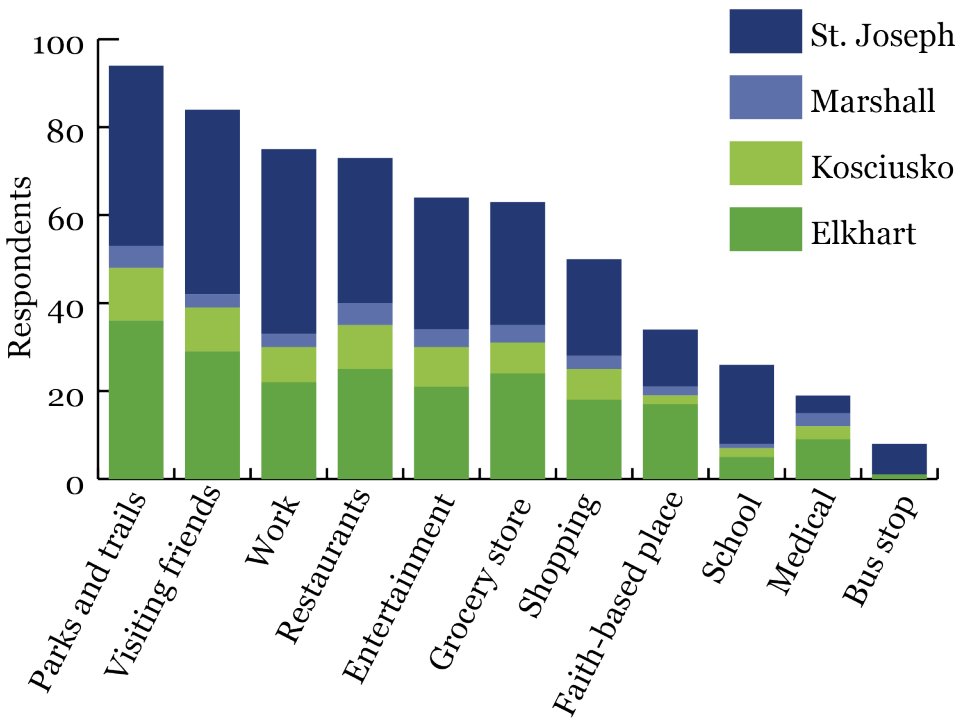
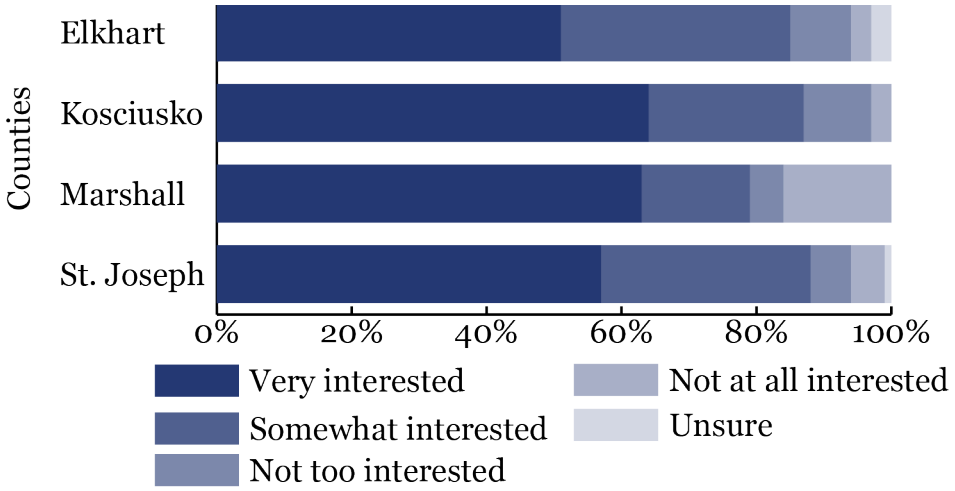


Figure F.3- Interest in Riding a Bike more often for Transportation



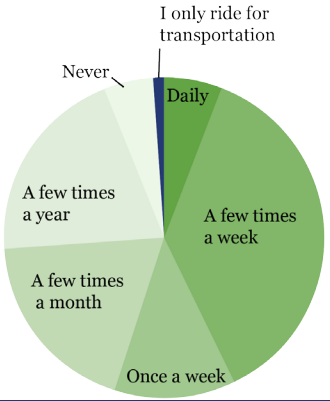
For Transportation

Despite an active group of respondents only 24% of respondents are people who bike for transportation purposes daily or a few times a week. Respondents indicated that they use their bike to travel to several places including parks, trails and nature (27% of respondents), visiting friends (25%), work (22%), and restaurants and eating out (21%) among other places (Figure F.2). Most respondents are interested in biking as a form of transportation with 56% very interested in biking as transportation and 29% somewhat interested in biking as transportation. Over half of respondents (54%) are willing to travel 5 miles or less on bike, with 25% willing to travel 15 - 10 miles and 21% willing to travel greater than ten miles (Figure F.3)

For Recreation

Almost a third of respondents (31%) only bike for recreation or exercise. There was a notable difference between genders with only 16% of male respondents but nearly half of female respondents only biking for recreation or exercise. Many respondents indicated that they ride for recreational purposes often with 37% of respondents riding for recreation a few times a week and an additionally 6% riding for recreation daily. A significant percentage (19%) of respondents bike a few times a month (Figure F.4).

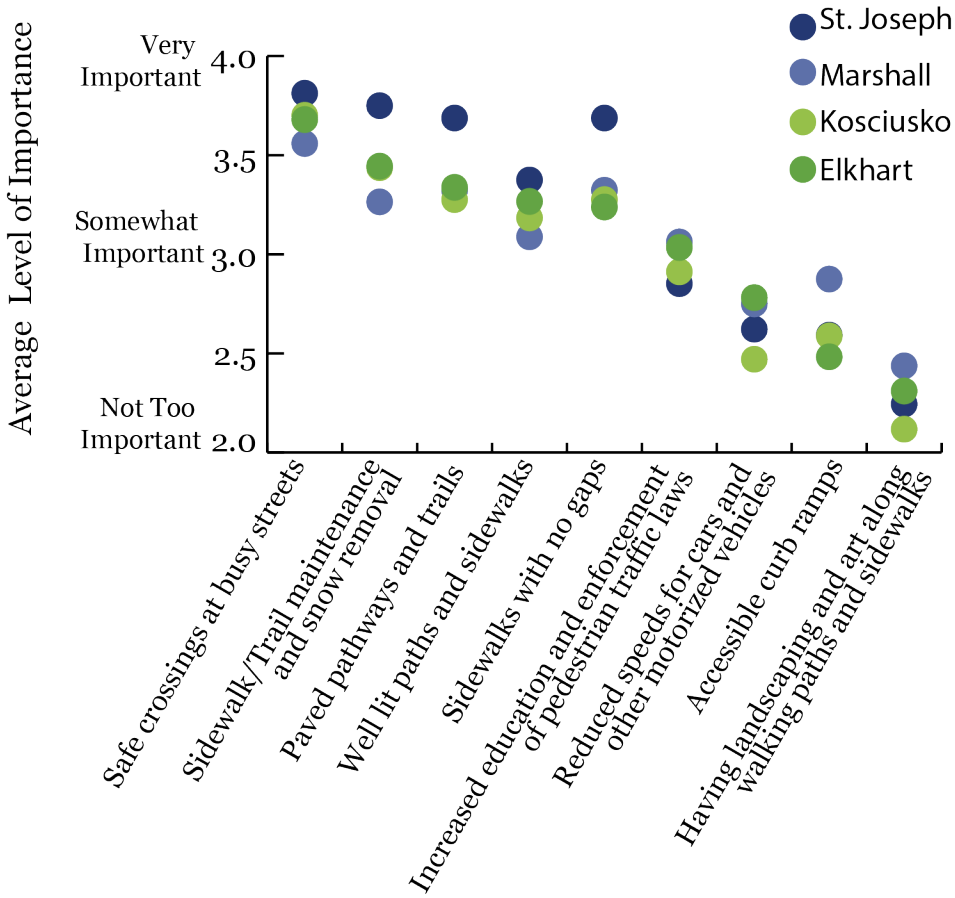
Figure F.4- Frequency of Riding a Bike for Recreation



Walking

Respondents indicated that, for walking, safe crossings at busy streets were most important to them, followed by sidewalk and trail maintenance and snow removal, paved pathway and trails, and well lit paths and sidewalks

Figure F.5- Importance of Factors related to Walking

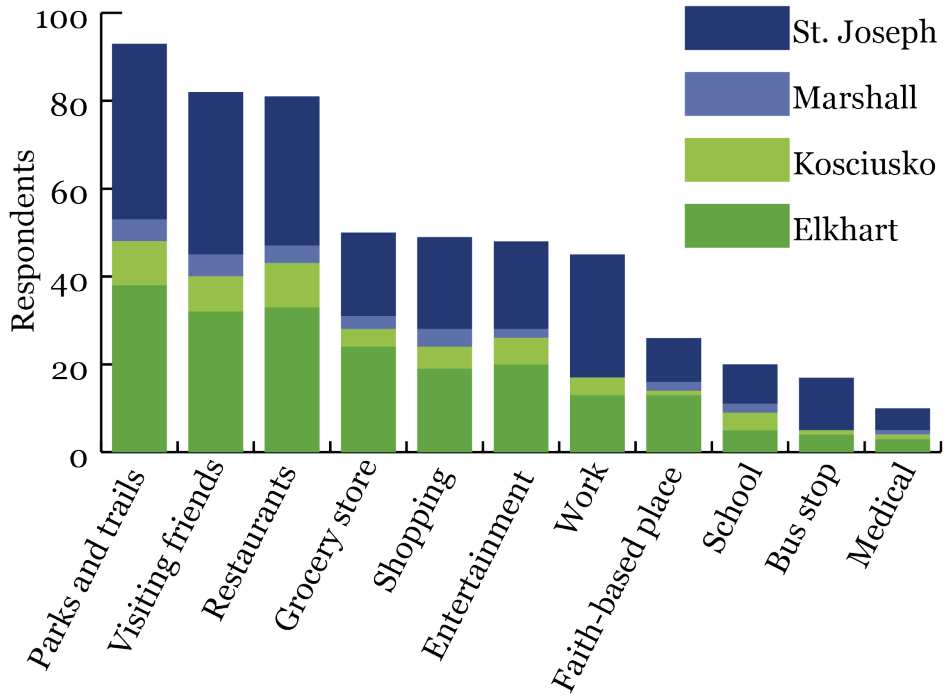


For Transportation

Few respondents walk every day with only 8% reporting daily walking without using their car. However, significant numbers of respondents walk for transportation a few times or at least once a week (30%). A quarter of respondents are only willing to walk less than half a mile, however over half of respondents (54%) are willing to walk ½ mile to 2 miles and 13% are willing to walk further.

Respondents indicated that they walk to several locations including parks, trails, and nature (27%), visiting friends (24%), and restaurants(24%) among other places with only 13% indicating that they walk to work. 33% of respondents are very interested in walking more as a form of transportation and an additional 33% are somewhat interested in walking more for transportation.

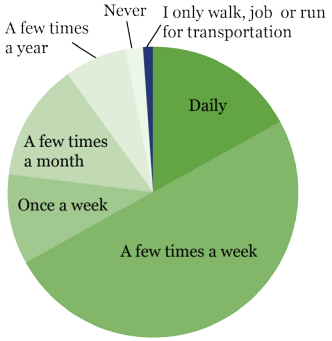
Figure F.6- Types of Places Traveled to by Walking



For Recreation

Many respondents (50%) walk for recreational purposes a few times a week and 17% of respondents walk for recreation daily. Many are willing to walk, jog, or run longer distances for recreation rather than transportation with 31% of respondents willing to travel 1/2 mile to 2 miles and 47% of respondents willing to travel 2-6 miles.

Figure F.7 Frequency of Walking for Recreation



Barriers and Opportunities for Biking and Walking

Major barriers to biking are vehicle speeds (indicated by 74% of respondents), weather (67%), and too few paths (54%). Respondents indicated that well connected routes were most important to them followed by paved and separated bike pathways or trails, street maintenance, dedicated bike lanes or roads, and increased education and enforcement for traffic laws. Major barriers to walking include a lack of sidewalks (indicated by 65% of respondents), travel time length (50%), and travel distances (43%). Respondents indicated that safe crossings at busy streets were most important to them followed by sidewalk and trail maintenance and snow removal, well lit paths and sidewalks, and paved pathways and trails for walking. Respondents are most comfortable on shared use paths, natural trails, and separated bike lanes.

Figure F.8 Barriers to Biking for Transportation

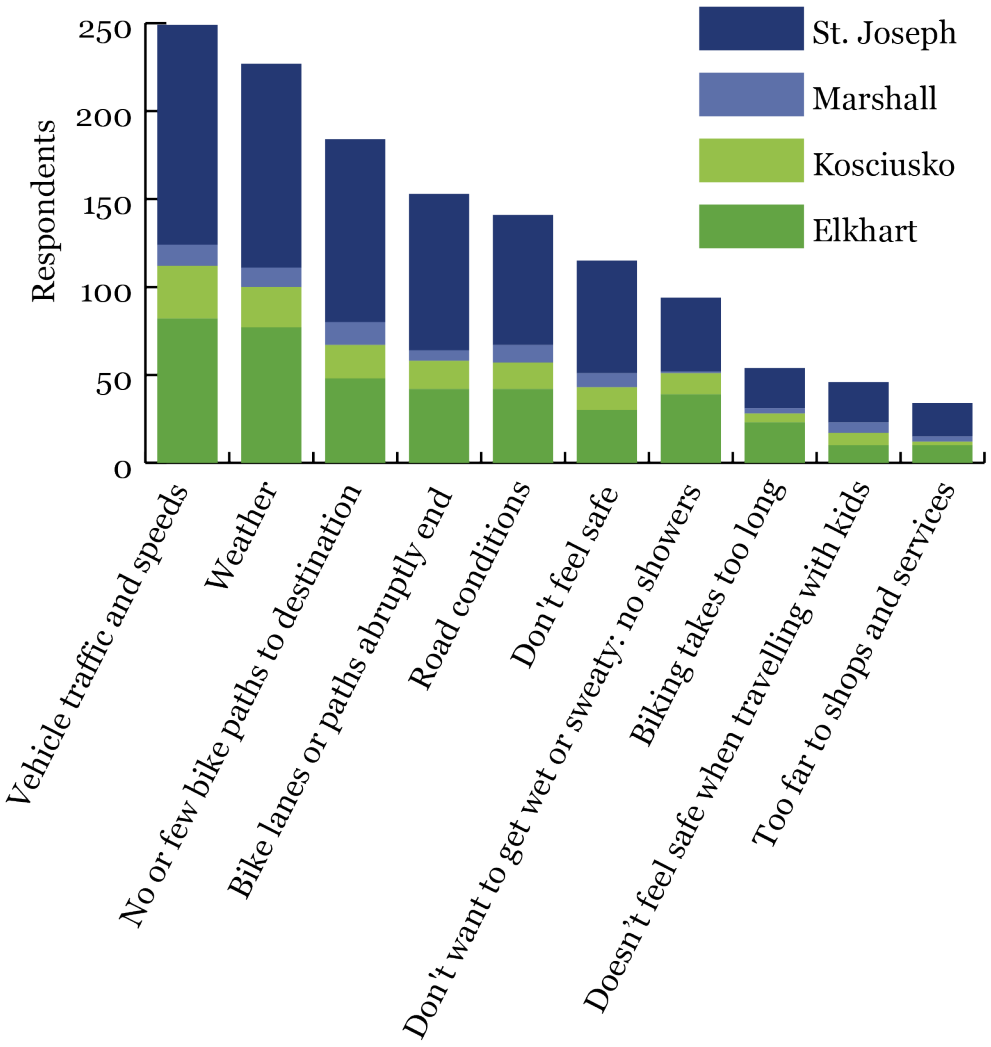


Figure F.9 Importance of Factors related to Biking

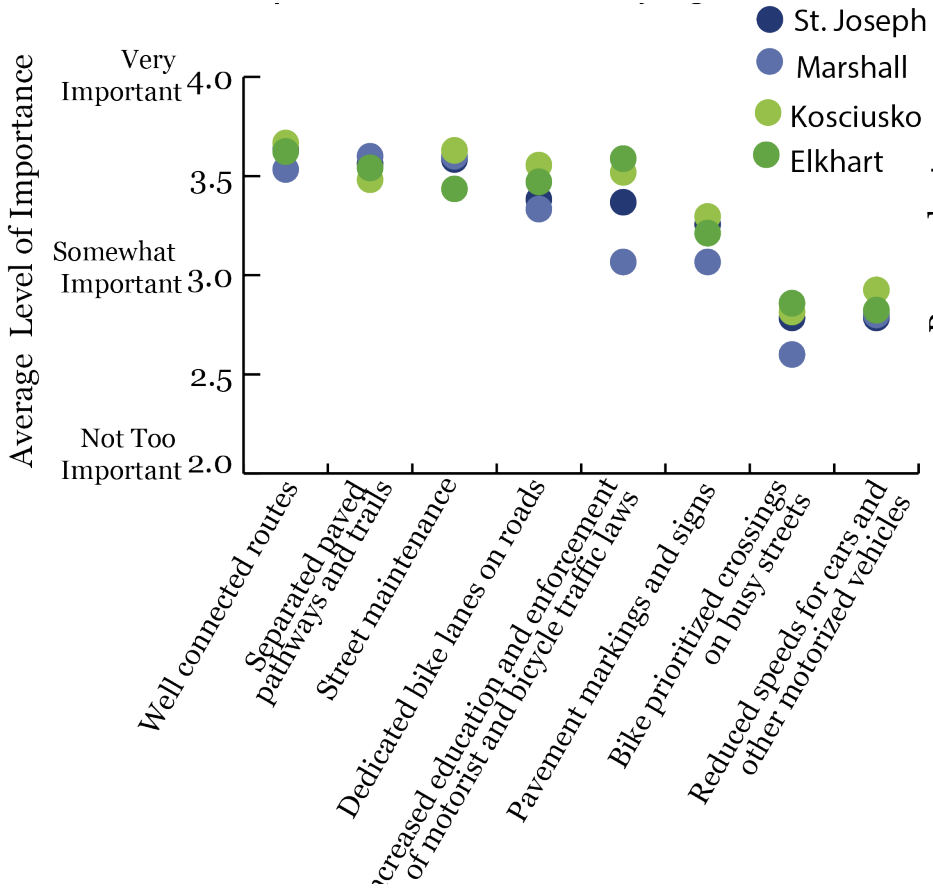
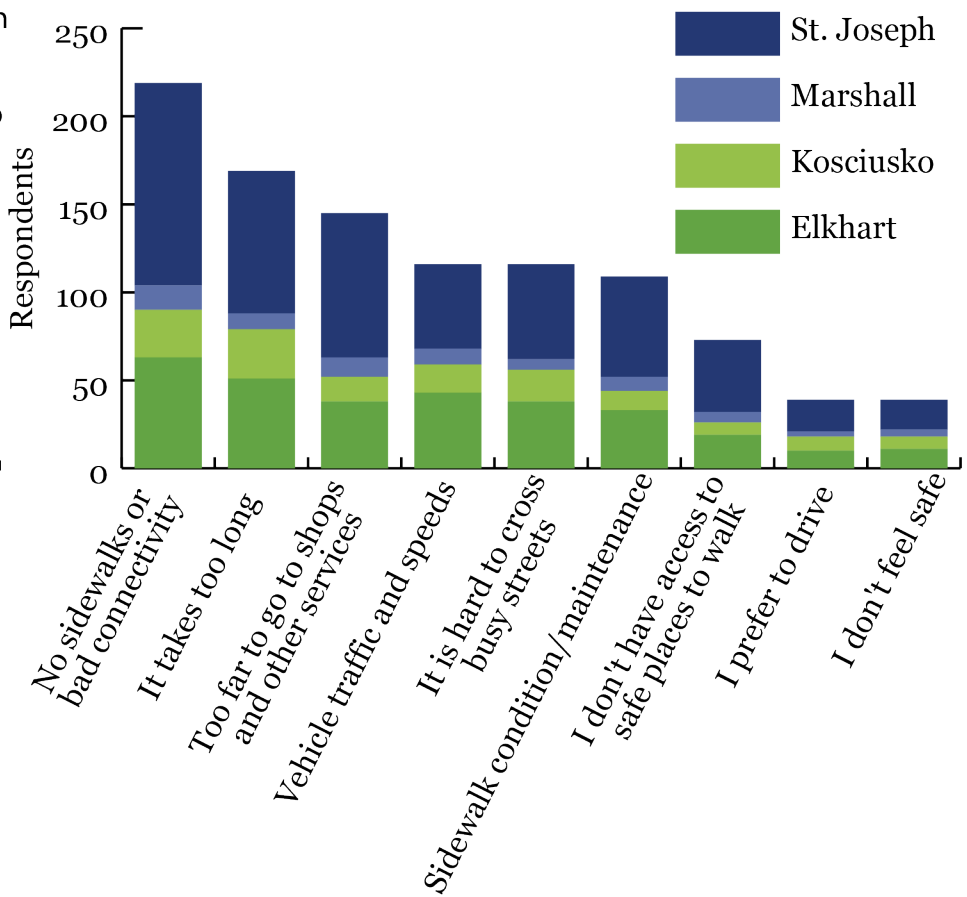


Figure F.10 Barriers to Walking for Transportation



Overall, the majority of respondents (86%) believe that it is very important to have access to safe and convenient bicycle and pedestrian routes in their community. Just over 3/4 of respondents consider bicycling and walking when looking for a place to live or work. 55% of respondents currently live 6 miles or closer to school or work, with 1/3 of respondents currently living 2 to 6 miles from school or work.

The top reasons why respondents walk or bike for transportation is because it is good for their health (84%), it is enjoyable (81%), and it is good for the environment (64%). The goal respondents thought most important was increasing health and physical activity, following by creating safe routes to school, enhancing access to natural environments, and improving facilities in downtowns, main streets, and transit stops. The average level of importance for all goals, however, were valued by the respondents, ranging from somewhat important to very important.

Figure F.11 Considering bicycling and walking when choosing a place to live or work

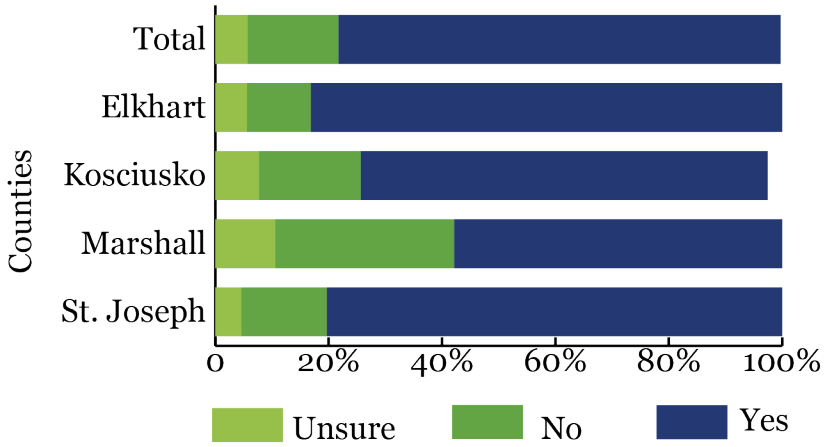


Figure F.12 Top reasons to walk or bike

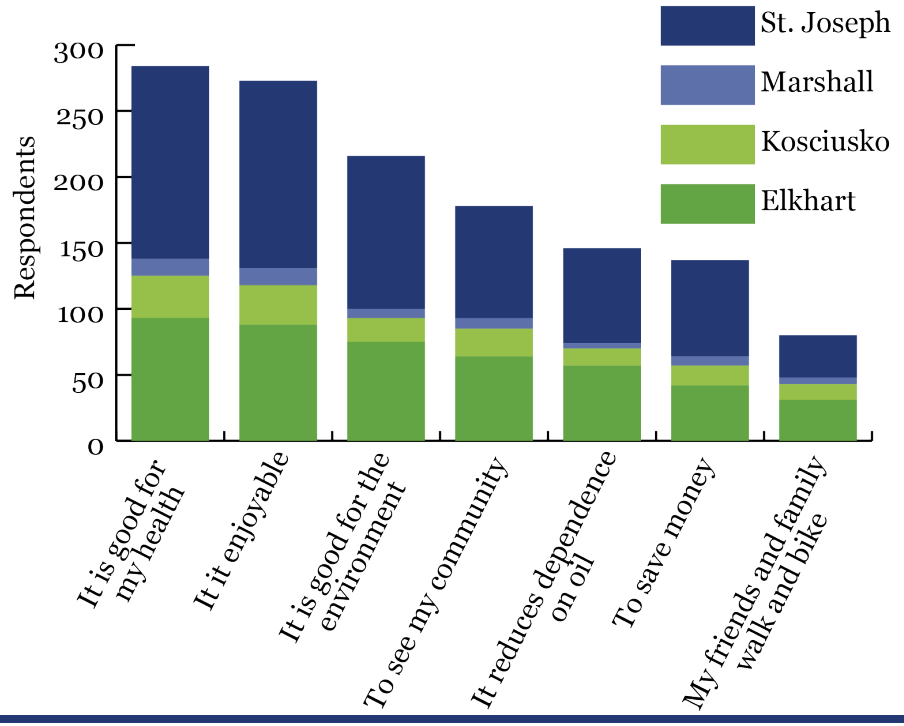
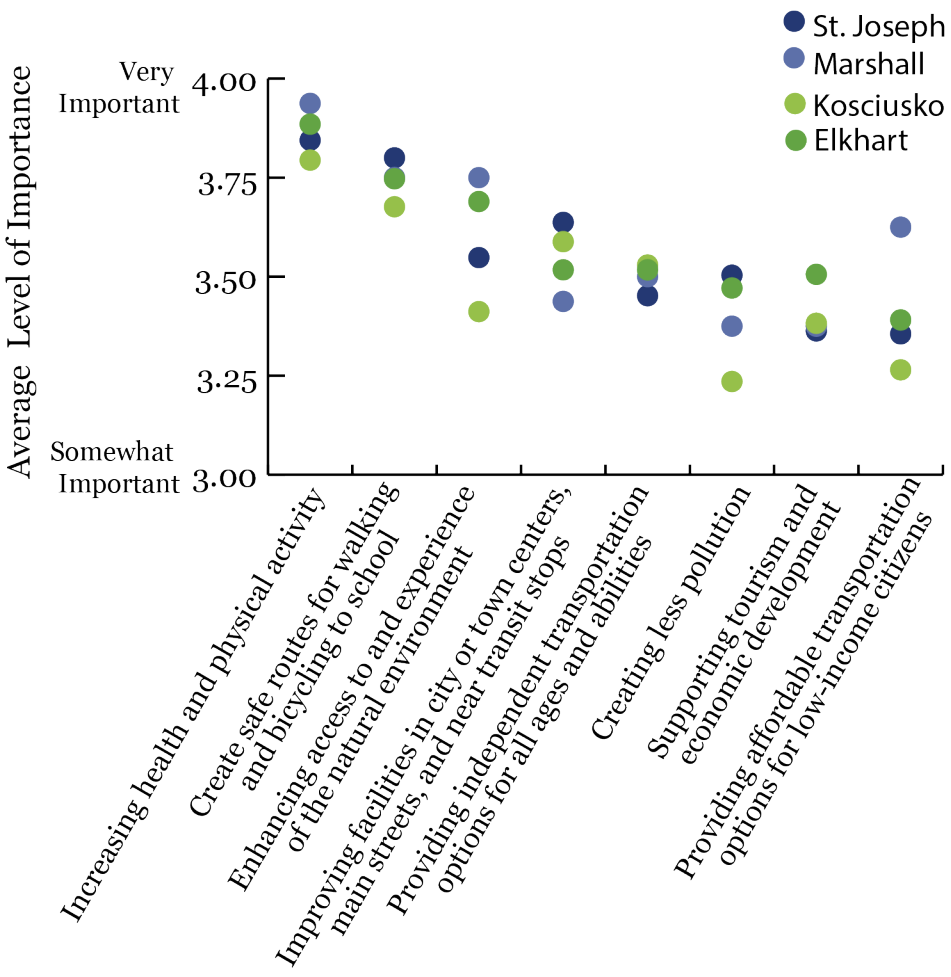
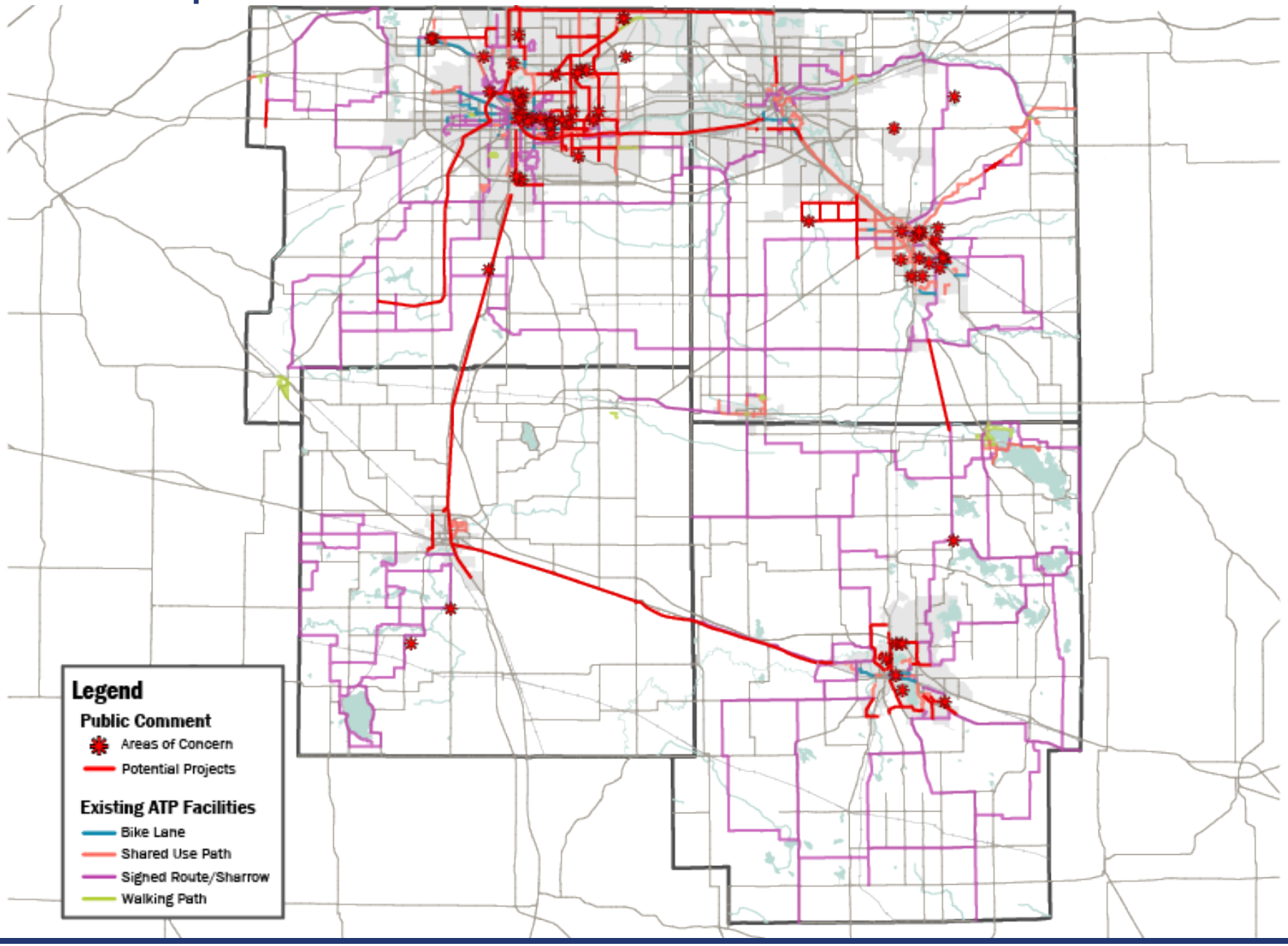


Figure F.13 Importance of various Goals



Interactive Map Results



Active Transportation Survey Results

Bicycling

Question #1: Which of the following best describes your level of comfort or confidence in bicycling?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
I don't ride a bicycle and have no plans to start	9	3%	3%	0%	0%	3%
Less confident: only feel safe on separated paths with few traffic crossings and local streets	57	16%	9%	10%	26%	20%
Casual: prefer separated paths, but will ride on some roads where space is available and traffic is manageable	157	45%	47%	36%	53%	47%
Experienced: confident and comfortable riding with traffic on the road in most traffic situations	127	36%	41%	54%	21%	30%

Transportation

Question #2: How often do you ride a bicycle for transportation purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Daily	22	6%	7%	0%	5%	7%
A few times a week	64	18%	21%	26%	21%	16%
Once a week	22	6%	9%	5%	5%	5%
A few times a month	49	14%	10%	18%	11%	16%
A few times a year	52	15%	15%	15%	11%	16%
Never	33	9%	7%	10%	11%	9%
I only ride my bike for exercise and/or recreation	107	31%	31%	26%	37%	31%
Unsure	1	0%	0%	0%	0%	1%

Question #3: How far are you willing to ride a bike for transportation purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Less than 2 miles (12 mins)	52	15%	15%	10%	11%	15%
2 - 5 miles (30 mins)	136	39%	43%	33%	32%	40%
5 - 10 miles (60 mins)	89	25%	19%	44%	37%	25%
10 - 15 miles (90 mins)	34	10%	10%	5%	11%	9%
More than 15 miles (90+ mins)	16	5%	6%	5%	0%	5%
Unsure	19	5%	6%	3%	11%	5%

Question #4: What type of places do you travel to by riding a bike? Check all that apply.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Grocery store	65	19%	22%	18%	21%	16%
Work	76	22%	21%	21%	16%	24%
Visiting friends	86	25%	27%	26%	16%	24%
Shopping	52	15%	17%	18%	16%	13%
Parks, trails and nature	96	27%	34%	31%	26%	24%
Entertainment	66	19%	20%	23%	21%	17%
Restaurant, eating out	75	21%	23%	26%	26%	19%
Bus stop	8	2%	1%	0%	0%	4%
Medical	21	6%	8%	8%	16%	2%
School	26	7%	5%	5%	5%	10%
Faith-based place	34	10%	16%	5%	11%	8%

Question #5: How interested are you in biking more often as a form of transportation?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Very interested	195	56%	51%	64%	63%	57%
Somewhat interested	103	29%	34%	23%	16%	31%
Not too interested	31	9%	9%	10%	5%	6%
Not at all interested	17	5%	3%	3%	16%	5%
Unsure	4	1%	3%	0%	0%	1%

Question #6: Thinking about your community, what are some barriers to riding a bicycle for transportation? Check all that you consider to be a barrier to you personally.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Vehicle traffic and speeds	258	74%	77%	77%	63%	72%
Bike lanes or paths abruptly end	158	45%	39%	41%	32%	51%
Weather (rain or snow)	234	67%	72%	59%	58%	67%
I don't want to get wet or sweaty: no showers	95	27%	36%	31%	5%	24%
I don't feel safe	119	34%	28%	33%	42%	37%
Hills	13	4%	2%	3%	11%	5%
It takes too long	59	17%	21%	13%	16%	13%
I travel with my kids, and it doesn't feel safe	49	14%	9%	18%	32%	13%
There are no or few bicycle paths to where I want to go	189	54%	45%	49%	68%	60%
It's too far to go to shops and other services	37	11%	9%	5%	16%	11%
Road conditions	147	42%	39%	38%	53%	43%
I don't have a bicycle	16	5%	5%	3%	0%	5%
I prefer to drive	31	9%	7%	15%	16%	7%
*Other	21	6%	4%	3%	5%	7%

* Other Responses (I don’t know where I can ride a bicycle, I don’t know anyone who rides a bicycle, I don’t like to ride a bicycle, I don’t know how to ride a bicycle, or Unsure.

Recreation

Question #7: How often do you ride a bicycle for recreational purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Daily	21	6%	6%	3%	16%	5%
A few times a week	129	37%	41%	49%	21%	35%
Once a week	42	12%	12%	10%	16%	13%
A few times a month	67	19%	19%	13%	21%	20%
A few times a year	69	20%	17%	21%	26%	20%
Never	18	5%	4%	5%	0%	6%
I only ride my bike for transportation purposes	3	1%	1%	0%	0%	1%
Unsure	1	0%	1%	0%	0%	0%

Question #8: How far are you willing to ride a bike for recreational purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Less than 2 miles (12 mins)	9	3%	2%	0%	5%	3%
2 - 5 miles (30 mins)	33	9%	9%	8%	0%	10%
5 - 10 miles (60 mins)	69	20%	19%	13%	37%	21%
10 - 15 miles (90 mins)	56	16%	12%	21%	16%	18%
More than 15 miles	169	48%	54%	54%	42%	44%
Unsure	6	2%	2%	3%	0%	2%

Question #9: When riding your bike for recreational purposes, what type of route would your prefer most? Check all that apply.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Shared Use Path	137	39%	48%	44%	26%	35%
Bike Lane	144	41%	44%	44%	53%	39%
Signed Route/Share the Road Sign	69	20%	24%	26%	32%	14%
Separated Bike Lane	118	34%	36%	44%	42%	31%
Cycle Track	23	7%	6%	13%	0%	6%

***Question #10: How important are each of the following?**

	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Bike prioritized crossings on busy streets (i.e. upfront before cars to have 1st priority)	2.8	2.7	2.7	2.6	2.8
Paved pathways and trails, separated from traffic	3.6	3.5	3.5	3.6	3.6
Dedicated bike lanes on roads	3.4	3.4	3.5	3.2	3.4
Reduced speeds for cars and other motorized vehicles	2.8	2.8	2.9	2.7	2.8
Street maintenance, like filling potholes or clearing debris/snow	3.5	3.4	3.5	3.4	3.6
Well connected routes	3.6	3.6	3.6	3.5	3.6
Pavement markings and signs	3.2	3.2	3.3	3.1	3.3
Increased education and enforcement of motorist and bicycle traffic laws	3.4	3.6	3.4	2.9	3.4

* Survey respondents were asked to rate the importance of each the above. To analyze the data more effectively the degree of importance was averaged as follows. (Very important = 4), (Somewhat Important = 3), (Not Too Important = 2), (Not at all Important = 1), (Unsure=0)

Walking

Transportation

Question #11: How often do you walk for transportation purposes that does not include using your car?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Daily	28	8%	4%	8%	16%	9%
A few times a week	77	22%	28%	18%	16%	20%
Once a week	28	8%	11%	8%	0%	7%
A few times a month	54	15%	11%	18%	11%	18%
A few times a year	56	16%	21%	21%	5%	14%
Never	39	11%	8%	13%	21%	11%
I only walk for exercise and/or recreation	65	19%	16%	13%	32%	20%
Unsure	3	1%	1%	3%	0%	1%

Question #12: How far would you be willing to walk for transportation purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Less than 1/2 mile (10 mins)	86	25%	25%	28%	32%	23%
1/2 - 2 miles (40 mins)	188	54%	59%	49%	47%	53%
2 - 3 miles (60 mins)	49	14%	8%	18%	16%	17%
3 - 6 miles (2 hrs)	13	4%	2%	5%	5%	4%
More than 6 miles (2+ hrs)	1	0%	0%	0%	0%	1%
Unsure	10	3%	3%	0%	0%	3%

Question #13: What type of places do you travel to by walking? Check all that apply.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Grocery store	53	15%	22%	10%	16%	11%
Work	46	13%	12%	10%	0%	16%
Visiting friends	83	24%	30%	21%	26%	21%
Shopping	52	15%	18%	13%	21%	12%
Parks, trails and nature	96	27%	36%	26%	26%	23%
Entertainment	49	14%	19%	15%	11%	12%
Restaurant, eating out	83	24%	31%	26%	21%	20%
Bus stop	17	5%	4%	3%	0%	7%
Medical	11	3%	3%	3%	5%	3%
School	20	6%	5%	10%	11%	5%
Faith-based place	26	7%	12%	3%	11%	6%

Question #14: How interested are you in walking more often as a form of transportation?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Very interested	114	33%	25%	33%	47%	37%
Somewhat interested	116	33%	36%	31%	16%	33%
Not too interested	86	25%	31%	26%	11%	21%
Not at all interested	28	8%	6%	5%	26%	8%
Unsure	6	2%	2%	5%	0%	1%

Question #15: Thinking about your community, what are some barriers to walking for transportation? Check all that you consider a barrier to you personally.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
It takes too long	175	50%	48%	72%	47%	47%
It is too far to go to shops and other services	151	43%	36%	36%	58%	47%
Sidewalks end/there are no sidewalks	228	65%	59%	69%	74%	66%
It is hard to cross busy streets	118	34%	36%	46%	32%	31%
Vehicle traffic and speeds	121	35%	40%	41%	47%	28%
Sidewalk condition/maintenance	114	33%	31%	28%	42%	33%
Hills	11	3%	1%	0%	11%	5%
I prefer to drive	43	12%	9%	21%	16%	10%
I don't have access to safe places to walk	75	21%	18%	18%	32%	24%
I don't feel safe	39	11%	10%	18%	21%	10%
I don't like to walk	8	2%	1%	3%	5%	3%
Unsure	3	1%	1%	0%	5%	1%

Recreation

Question #16: How often do you walk, jog or run for recreational purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Daily	59	17%	14%	21%	32%	16%
A few times a week	176	50%	55%	44%	42%	51%
Once a week	35	10%	8%	8%	11%	10%
A few times a month	46	13%	12%	21%	11%	12%
A few times a year	26	7%	7%	5%	5%	9%
Never	6	2%	3%	3%	0%	1%
I only walk, jog or run for transportation	2	1%	1%	0%	0%	1%
Unsure	0	0%	0%	0%	0%	0%

Question #17: How far would you be willing to walk, jog, or run for recreational purposes?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Less than 1/2 mile (10 mins)	12	3%	5%	5%	0%	3%
1/2 - 2 miles (40 mins)	107	31%	36%	26%	21%	29%
2 - 6 miles (2 hrs)	159	45%	47%	46%	53%	42%
6 - 12 miles (4 hrs)	33	9%	6%	3%	16%	13%
More than 12 miles	28	8%	4%	18%	11%	9%
Unsure	4	1%	1%	0%	0%	2%

Question #18: When you walk, jog or run for recreational purposes, what type of route would your prefer most? Check all that apply.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Shared Use Path	182	52%	55%	49%	37%	52%
Sidewalk	174	50%	51%	38%	42%	53%
Natural Trail	210	60%	67%	51%	79%	56%
Neighborhood Street	120	34%	40%	36%	37%	31%
Cycle Track	23	7%	6%	13%	0%	6%

***Question #19: How important are each of the following?**

	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Safe crossings at busy streets	3.7	3.7	3.7	3.7	3.7
Paved pathways and trails for walking	3.3	3.3	3.5	3.6	3.3
Sidewalks with no gaps	3.2	3.3	3.5	3.6	3.3
Reduced speeds for cars and other motorized vehicles	2.7	2.7	2.8	2.6	2.7
Well lit paths and sidewalks	3.3	3.1	3.3	3.3	3.4
Sidewalk/Trail maintenance and snow clearing	3.5	3.5	3.4	3.7	3.5
Accessible curb ramps	2.6	2.4	2.6	2.5	2.6
Having landscaping and art along walking paths and sidewalks	2.3	2.3	2.3	2.3	2.3
Increased education and enforcement of pedestrian traffic laws	3.0	3.1	3.0	2.7	2.9

* Survey respondents were asked to rate the importance of each the above. To analyze the data more effectively the degree of importance was averaged as follows. (Very important = 4), (Somewhat Important = 3), (Not Too Important = 2), (Not at all Important = 1), (Unsure=0)

Values

Question #20: How important is it to you to have access to safe and convenient bicycle and pedestrian routes in your community?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Very important	302	86%	90%	90%	89%	85%
Somewhat important	40	11%	8%	8%	11%	13%
Not too important	5	1%	1%	3%	0%	1%
Not at all important	3	1%	1%	0%	0%	1%
Unsure	0	0%	0%	0%	0%	0%

***Question #21: How comfortable are you with the following Active Transportation routes?**

	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Shared Use Path	3.5	3.6	3.5	2.8	3.4
Bike Lane	3.2	3.3	3.3	2.8	3.1
Signed Route/Share the Road Sign	2.7	2.8	3.1	2.6	2.6
Separated Bike Lane	3.3	3.4	3.5	3.5	3.2
Cycle Track	1.8	1.5	2.2	1.8	1.9
Sharrow	1.4	1.2	1.8	1.2	1.4
Natural Trail	3.4	3.6	3.4	3.4	3.3

* Survey respondents were asked to rate the importance of each the above. To analyze the data more effectively the degree of importance was averaged as follows. (Very important = 4), (Somewhat Important = 3), (Not Too Important = 2), (Not at all Important = 1), (Unsure=0)

Question #22: Do you consider bicycling and walking when looking for a place to live and/or work?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Yes	273	78%	83%	72%	58%	80%
No	56	16%	11%	18%	32%	15%
Unsure	20	6%	6%	8%	11%	5%

Question #23: How far do you live from where you work or go to school?

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Less than 1/2 mile	20	6%	3%	5%	0%	8%
1/2 - 2 miles	64	18%	21%	13%	11%	20%
2 - 6 miles	107	31%	27%	44%	21%	32%
6 - 12 miles	63	18%	16%	10%	11%	22%
More than 12 miles	54	15%	15%	18%	42%	10%
Not Applicable	36	10%	16%	10%	16%	6%

Question #24: Why do you walk and/or bicycle for transportation? Check all that apply.

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
It is good for my health	294	84%	87%	82%	68%	84%
It is good for the environment	224	64%	70%	46%	37%	67%
It it enjoyable	283	81%	82%	77%	68%	82%
To save money	142	41%	39%	38%	37%	42%
It reduces dependence on oil	150	43%	53%	33%	21%	42%
To see my community	183	52%	60%	54%	42%	49%
I do not like to drive	33	9%	7%	5%	5%	12%
It is the fastest way to get around	32	9%	14%	5%	11%	7%
I do not have access to a car	4	1%	1%	0%	0%	1%
My employer provides incentives	3	1%	1%	3%	0%	1%
My friends and family walk and bike	84	24%	29%	31%	26%	18%
Unsure	0	0%	0%	0%	0%	0%
I do not walk and/or bicycle for transportation	50	14%	12%	18%	32%	13%

***Question #25: How important are each of the following reasons for investing in bicycling or walking?**

	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Providing independent transportation options for all ages and abilities (youth, senior citizens, persons with disabilities)	3.5	3.6	3.5	3.3	3.5
Increasing health and physical activity	3.8	3.9	3.8	3.8	3.8
Improving facilities in city or town centers, main streets, and near transit stops	3.6	3.5	3.8	3.3	3.6
Creating less pollution	3.5	3.6	3.2	3.2	3.5
Create safe routes for walking and bicycling to school	3.8	3.8	3.7	3.8	3.8
Supporting tourism and economic development	3.4	3.5	3.6	3.3	3.3
Providing affordable transportation options for low-income citizens	3.4	3.4	3.4	3.4	3.4
Enhancing access to and experience of the natural environment	3.6	3.7	3.5	3.8	3.5

* Survey respondents were asked to rate the importance of each the above. To analyze the data more effectively the degree of importance was averaged as follows. (Very important = 4), (Somewhat Important = 3), (Not Too Important = 2), (Not at all Important = 1), (Unsure=0)

About You

Question #26: County of Residence

	Total Responses	MACOG Region
Elkhart	107	31%
Kosciusko	39	11%
Marshall	19	5%
St. Joseph (IN)	173	49%
Other	12	3%

Question #27: Age

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Under 18	1	0%	1%	0%	0%	0%
18-24	14	4%	3%	8%	0%	5%
25-34	73	21%	13%	15%	11%	29%
35-44	62	18%	11%	21%	21%	21%
45-54	80	23%	21%	28%	37%	20%
55-64	79	23%	30%	13%	16%	21%
65+	39	11%	21%	13%	16%	4%

Question #28: Gender

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Male	182	52%	64%	59%	42%	45%
Female	163	47%	36%	38%	58%	53%
NA	5	1%	0%	3%	0%	2%

Question #29: Ethnicity

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Hispanic	9	3%	2%	3%	11%	2%
Non-Hispanic	330	94%	94%	95%	89%	95%

Question #30: Race

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Asian	2	1%	0%	0%	0%	1%
Black/African American	4	1%	0%	0%	5%	1%
Native American	2	1%	1%	0%	0%	1%
Pacific Islander	0	0%	0%	0%	0%	0%
White/Caucasian	320	91%	93%	95%	89%	90%
Two or more races	6	2%	2%	0%	5%	2%
Some Other	5	1%	1%	3%	0%	2%

Question #31: Household Size

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
1 - Just me	54	15%	9%	10%	16%	21%
2	144	41%	58%	28%	21%	34%
3	45	13%	9%	13%	26%	13%
4	48	14%	10%	21%	21%	14%
5	31	9%	4%	15%	11%	10%
6+	23	7%	7%	10%	0%	5%

Question #32: Highest level of education completed

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
8th grade or less	0	0%	0%	0%	0%	0%
Some high school	2	1%	2%	0%	0%	0%
High school graduate	15	4%	3%	3%	5%	5%
Some college/community college/2-yr degree	54	15%	16%	18%	5%	16%
College degree/4-yr degree	144	41%	38%	38%	47%	43%
Post graduate	129	37%	41%	38%	42%	34%

Question #33: Employment status

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Full Time	241	69%	62%	72%	68%	72%
Part Time	33	9%	10%	10%	5%	10%
Student	16	5%	3%	3%	0%	7%
Not employed outside home	14	4%	2%	5%	5%	5%
Retired	34	10%	21%	5%	16%	4%
Other or Multiple	5	1%	2%	3%	5%	1%
Unemployed	2	1%	1%	0%	0%	1%

Question #34: Estimated household income before taxes

	Total Responses	MACOG Region	Elkhart	Kosciusko	Marshall	St. Joseph (IN)
Less than $10,000	7	2%	2%	3%	0%	2%
$10,000 - $14,999	4	1%	2%	0%	0%	1%
$15,000 - $24,999	10	3%	0%	0%	0%	6%
$25,000 - $34,999	15	4%	3%	0%	0%	6%
$35,000 - $49,999	30	9%	8%	13%	11%	8%
$50,000 - $74,999	67	19%	19%	5%	32%	21%
$75,000 - $99,999	56	16%	21%	8%	11%	16%
$100,000 - $149,999	79	23%	25%	36%	21%	18%
$150,000 - $199,999	29	8%	7%	15%	5%	7%
$200,000 or more	22	6%	3%	13%	16%	6%