Appendices

Appendix A. Priority Area Analysis

Appendix B. Descriptive Statistics Analysis

Appendix C. High Injury Network

Appendix D. Systemic Safety Analysis

Appendix E. Project Prioritization and Methodology

Appendix F. Policy Analysis

Appendix G. Literature & Best Practices Review

Appendix H. Public Comments

Priority Areas for Safety Action Plan

To determine the priority Focus Areas for the MACOG Regional Safety Action Plan, the project team aggregated the 10 population IPD scores and categorized census block groups into the same structure ranging from well below average to well above average. Priority Focus Areas for the plan include the census block groups identified as above average and well above average. Based on the IPD methodology, these are the areas within Michiana where there are concentrations of the indicators of potential disadvantage and should therefore be prioritized during community engagement, analysis, recommendations development, and implementation of the MACOG Regional Safety Action Plan.

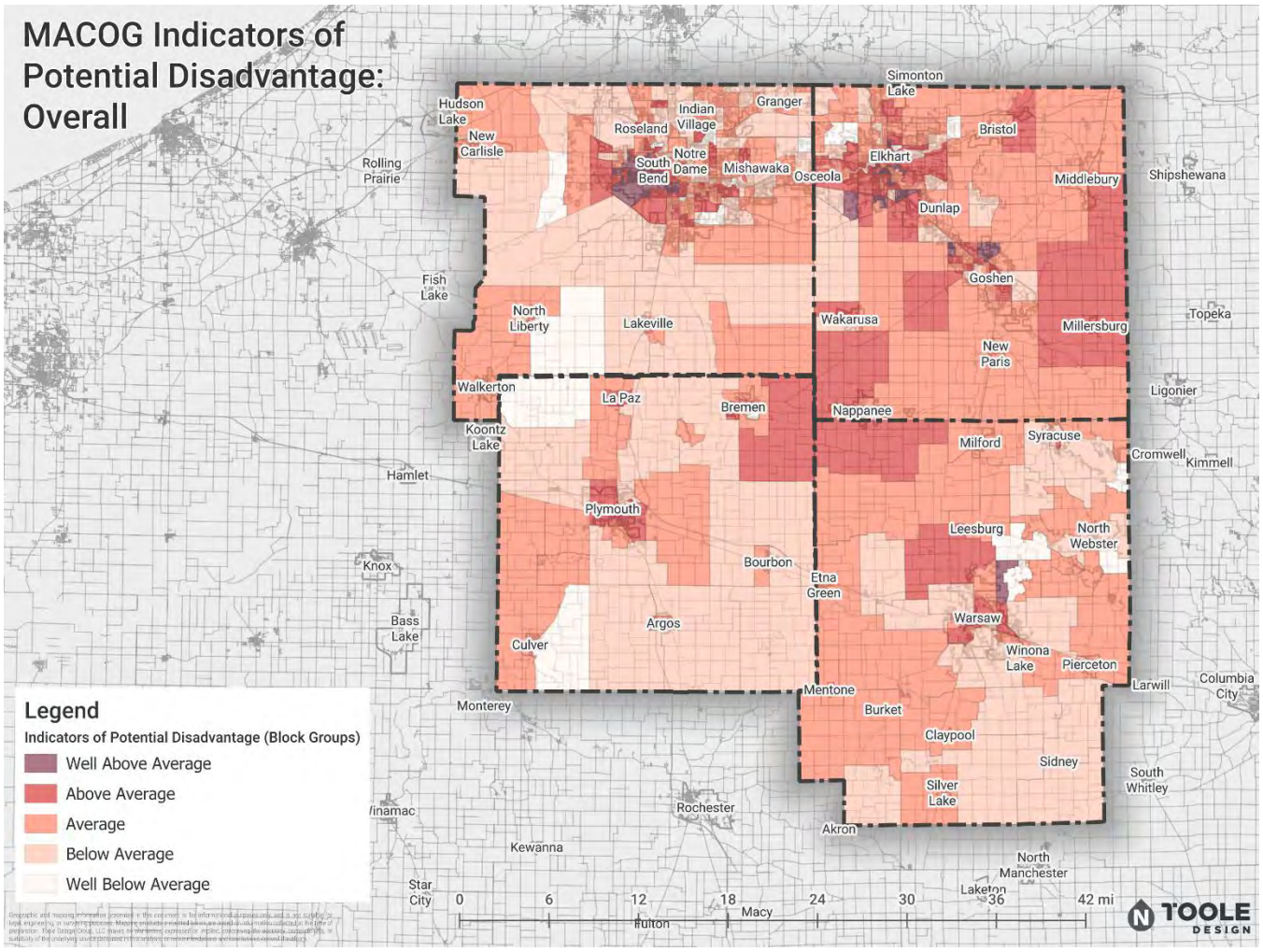


Figure 13: MACOG Indicators of Potential Disadvantage: Overall.

PRIORITY AREA ANALYSIS

Introduction

This memo explains the framework for the Michiana Area Council of Governments (MACOG) Regional Safety Action Plan's priority area analysis, which provides priority focus areas to guide plan recommendations and implementation.

Analysis Approach

Achieving a transportation system for all users requires understanding how impacts are distributed throughout a community. Communities or populations that have been historical underserved such as people with disabilities, low-income individuals, or English language learners, are more likely to shoulder the burdens of the transportation system. This results in disparate transportation experiences.

A priority area analysis is one component of unraveling experiences and advancing transportation safety for all users. It provides information that must be used in concert with knowledge learned through engagement to determine actions that improve the lived experiences of people that have been traditionally underserved.

The analysis can be used to determine how people with sociodemographic may have the potential for disparate transportation experiences. It can identify communities that have disproportionate safety, access, or other transportation system outcomes. It can then examine how these communities are impacted and provide insights on how future transportation investments can alleviate disparities and redress past harms. The knowledge gained through the analysis will be used in the MACOG Regional Safety Action Plan to guide engagement planning, recommendations development, project prioritization, and plan implementation to ensure that throughout the planning process there is focus on reducing and, ideally, eliminating transportation disparities.

Information Gathering

Transportation is a key element of people's daily lives. Nearly everyone must use the transportation network to access jobs, healthcare, food, and social networks. However, transportation policies and practices across have often fallen short of serving all roadway users.

Households with low incomes and people with disabilities have also been marginalized and excluded from transportation system benefits and overly burdened by negative outcomes of the system. Both these demographic groups experience negative transportation outcomes, including longer work commutes and the increased likelihood of being killed while biking or walking.

The existing conditions for the groups mentioned above are a result of historical policies and practices, some that are clearly related to transportation and others that, while on the surface are not transportation-related, often impact transportation access. The Safety Action Plan acknowledges these disparities and will create policy and practice recommendations that aim to eliminate disparities and achieve zero deaths and serious injuries on the region's roadways.

Multimodal Investment Strategies

While it may not be feasible to offer every transportation option to every resident in the Michiana area, the lack of programs that improve access to reliable vehicles combined with a heavy emphasis on automobile-oriented investments in many suburban and rural areas, including in Indiana, contributes significantly to different transportation outcomes.

Additionally, contemporary planning frameworks that evaluate system performance are often based on vehicle travel speeds and the typical performance measures emphasize faster being "better". Vehicular level-of-service standards also reinforce the focus on automobile-oriented transportation in investments. These frameworks justify projects that aim to reduce vehicular congestion delays but often fail to consider how higher speeds impact other roadway users and/or and safety.

Cities and towns throughout the MACOG region are working to implement more multimodal planning frameworks to meet the needs of non-drivers. In 2023, MACOG released their transportation plan that included hundreds of active transportation projects in each county.[1] Also in 2023, the City of Plymouth of Marshall County finalized their comprehensive plan, which included a focus on expanding active transportation connectivity.[2] In 2022, Kosciusko County identified the needs of bicyclists and pedestrians as one of their nine priorities in their comprehensive plan and the Town of North Liberty in St. Joseph County wrapped up their comprehensive plan with the trail and sidewalk network as a core investment to the community. [3,4]

That said, current funding structures disproportionately challenge smaller and more rural jurisdictions because these communities often lack staff capacity to seek grant funding, manage large projects, make improvements using in-house implementation crews, or implement fixed route public transit services. This limits their ability to provide multimodal service comparable to growing metropolitan areas and further exacerbates the mobility challenges of low-income people who are priced out of larger cities and move to more rural and suburban areas.

[1] Michiana Area Council of Governments. (2023). *Michiana on the Move: Transportation Plan 2050*.
[2] City of Plymouth, Indiana. (2023). *Plymouth Forward: 2040 Comprehensive Plan*.
[3] County of Kosciusko, Indiana. (2022). *Forward Kosciusko County: County Comprehensive Plan*.
[4] City of North Liberty, Indiana. (2022). *Plan North Liberty Comprehensive Plan*.

Traffic Crashes and Fatalities

Nationwide, crash analyses have found that American Indian and Alaska Native, Black, and Latinx Americans face higher rates of traffic injuries and fatalities.[5,6] These disparities are particularly pronounced for pedestrians[7,8] (see Figure 3). Across the US, the number of people killed while walking reached a new high in 2022, with an estimated 7,500 pedestrians struck and killed, up 19 percent since 2019.[9] In Indiana, there were 132 pedestrian fatalities in 2022, 14 of which were in the Michiana area (10.6%).[10] People of Color, particularly Native Americans and Black Americans, are substantially more likely to die while walking than any other race or ethnic group.[11]

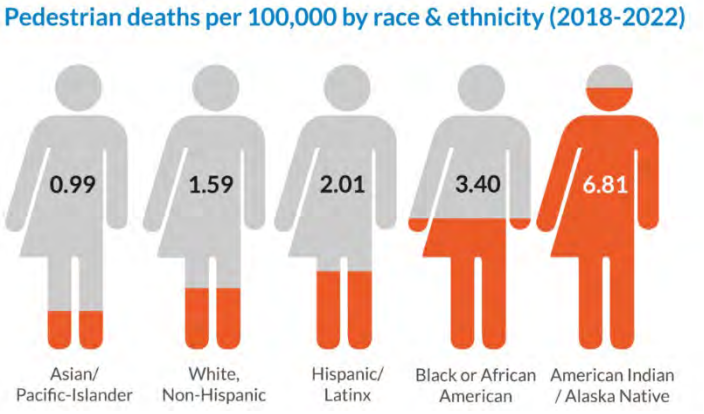


Figure 1: Pedestrian deaths in the United States by race and ethnicity. (Fatality Analysis Reporting System (FARS) data, 2024).[35]

In addition, people walking in lower income areas are killed at higher rates than people walking in higher income areas (see Figure 4).[12] Disparities in transportation safety are closely tied to the road infrastructure present in low-income and BIPOC neighborhoods. Three-quarters of the United States' sixty most dangerous roads for pedestrians are in low-income neighborhoods, and more than half are in predominantly Black or Latinx neighborhoods. The majority of these roads match a particular profile of arterials that were constructed through BIPOC neighborhoods, with five or more travel lanes, speed limits of 30 miles per hour or higher, and a lack of facilities for people walking or riding bikes.[13]



Figure 2: Pedestrian deaths in the United States by census tract income. (FARS data, 2024).[36]

Nationwide trends also show that rural pedestrians are killed at a similar rate to pedestrians in urban areas. From 2010-2019 when controlling for population, there were 1.7 deaths for every 100,000 people in rural areas compared to 1.6

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[5] Governors Highway Safety Association. (2021). An Analysis of Traffic Fatalities by Race and Ethnicity.

[6] Nauman, Rebecca B. and Laurie F. (2013). Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010. *MMWR Morbidity and Mortality Weekly Report*, 62(15):277-282.

[7] Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20, 105–113.

[8] Roll, Josh. (January 19, 2021). Analysis of Pedestrian Injury, Built Environment, Travel Activity, and Social Equity: Pedestrian and Social Equity in Oregon.

[9] Governors Highway Safety Association. (2023). Pedestrian Traffic Fatalities by State: 2022 Preliminary Data.

[10] Jamie Palmer, J. S. (2023). *Indiana County Profiles 2022*. Indianapolis, IN: Indiana Criminal Justice Institute.

[11] Smart Growth America & National Complete Streets Coalition. (2022). *Dangerous by Design*.

[12] Smart Growth America. (2022). Dangerous by Design. https://smartgrowthamerica.org/dangerous-by-design/#custom-tab-0-3b878279a04dc47d60932cb294d96259

[13] NACTO. (2022). Breaking the Cycle: Reevaluating the Laws that Prevent Safe & Inclusive Biking.

pedestrian deaths for every 100,000 people in urban areas.[14] In many rural areas, including parts of the MACOG region, rural pedestrians must navigate village centers along state roads and county thoroughfares, or walk along high-speed arterials with minimal shoulders. The overlap between low-income and rural areas can exasperate transportation safety disparities, especially as it relates to pedestrians.

Demographic Mapping

In the demographic mapping step, populations are distinguished based on demographic factors that reflect communities who have been traditionally underserved. Using available Census and American Community Survey (ACS) data, we can categorize and map these populations. The results will be used later in the planning process to compare outcomes in areas with indicators of potential disadvantage and to develop recommendations for the MACOG Regional Safety Action Plan that do not further contribute to disparate transportation safety outcomes.

In demographic mapping, we identify key populations that are vulnerable to transportation disadvantage based on socioeconomic factors. For instance, children and youth often are not independently mobile and rely on guardians to accompany them as they travel. Households in poverty may spend an outsized portion of their income on travel expenses and members of carless households in predominantly Amish areas may be dependent on the availability of safe multimodal facilities to access their daily needs. Once the key populations are defined, we delineate areas throughout the region where we see the highest proportions of these populations, assuming that these places have greater socioeconomic vulnerability.

Defining Key Populations

As part of the long and short-range planning processes, MACOG has identified seven key populations as populations that face transportation and socioeconomic disparities. These populations were identified using the Indicators of Potential Disadvantage (IPD) method developed by the Delaware Valley Regional Planning Commission. For MACOG's safety action plan, we used the IPD methodology with minor adjustments to account for three additional key populations – people without a high school diploma, people that are unemployed, and youth under 18 years old.

The key populations for the MACOG Regional Safety Action Plan analysis are:

- People of Color, including Hispanic or Latino people
- Households in Poverty
- Limited English Proficiency (LEP)
- Elderly over 65 years of age
- Carless households
- Households with Disabilities
- People without a high school diploma
- Unemployment
- Youth under 18 years of age

Indicators of Potential Disadvantage

The IPD methodology uses regional ACS data at the block group level to delineate areas where key populations are more prevalent. Although identified at the block group level, the data is gathered at the regional level so that regional averages for each population group can be determined. Each block group's population percentage is calculated from the standard

[14] Smart Growth America, (2021). Dangerous by Design 2021 Update.

deviations relative to each indicator's regional average. The calculations range from "well below average" to "well above average." An example of this is shown in Figure 6.

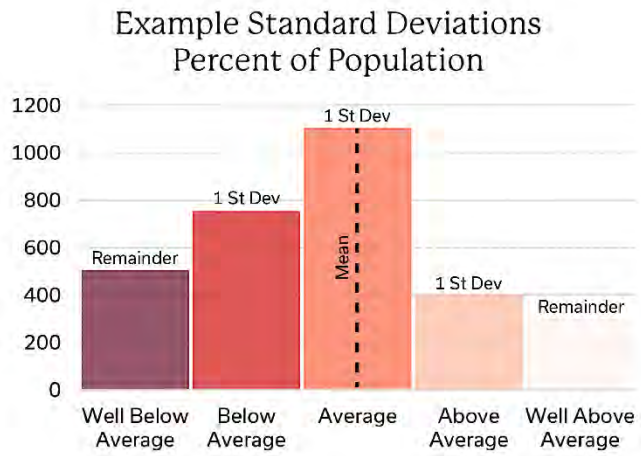


Figure 3: Breakdown of IPD Classification (MACOG IDP Analysis)

In comparison to the 2023 Indicator of Potential Disadvantage Analysis published by MACOG which used 2020 data and identified seven key populations, the MACOG Regional Safety Action Plan team made three minor adjustments to the IPD methodology:

1. As mentioned above, three additional key populations were incorporated into the analysis methodology: people without a high school diploma, unemployed people, and youth under 18 years of age.
2. 2022 American Community Survey (ACS), 5-year estimate data was used, and the standard deviation thresholds were adjusted to match the distributions of each population.
3. Due to the addition of the three key populations, the overall IPD score is calculated by aggregating all 10 key population scores.

For the purposes of the MACOG Regional Safety Action Plan, the overall IPD score was used as the basis for identifying Priority Areas to guide plan engagement, recommendations, and implementation. This is discussed further in Section 3.2 of this document.

Race

The IPD analysis for racial minorities assesses where there are prevalent populations of Black, Native American, Alaska Native, Asian, Native Hawaiian, Pacific Islander, Hispanic or Latino, and multiracial residents. In Marshall County and Kosciusko County, concentrations of racial minorities are limited to one census block group in the Town of Bremen and the City of Warsaw, respectively. In Elkhart County, racial minority populations are primarily located in the cities of Elkhart and Goshen, but they are a few census block groups with above average concentrations of racial minorities near Simonton Lake in Osolo Township and the Town of Bristol.

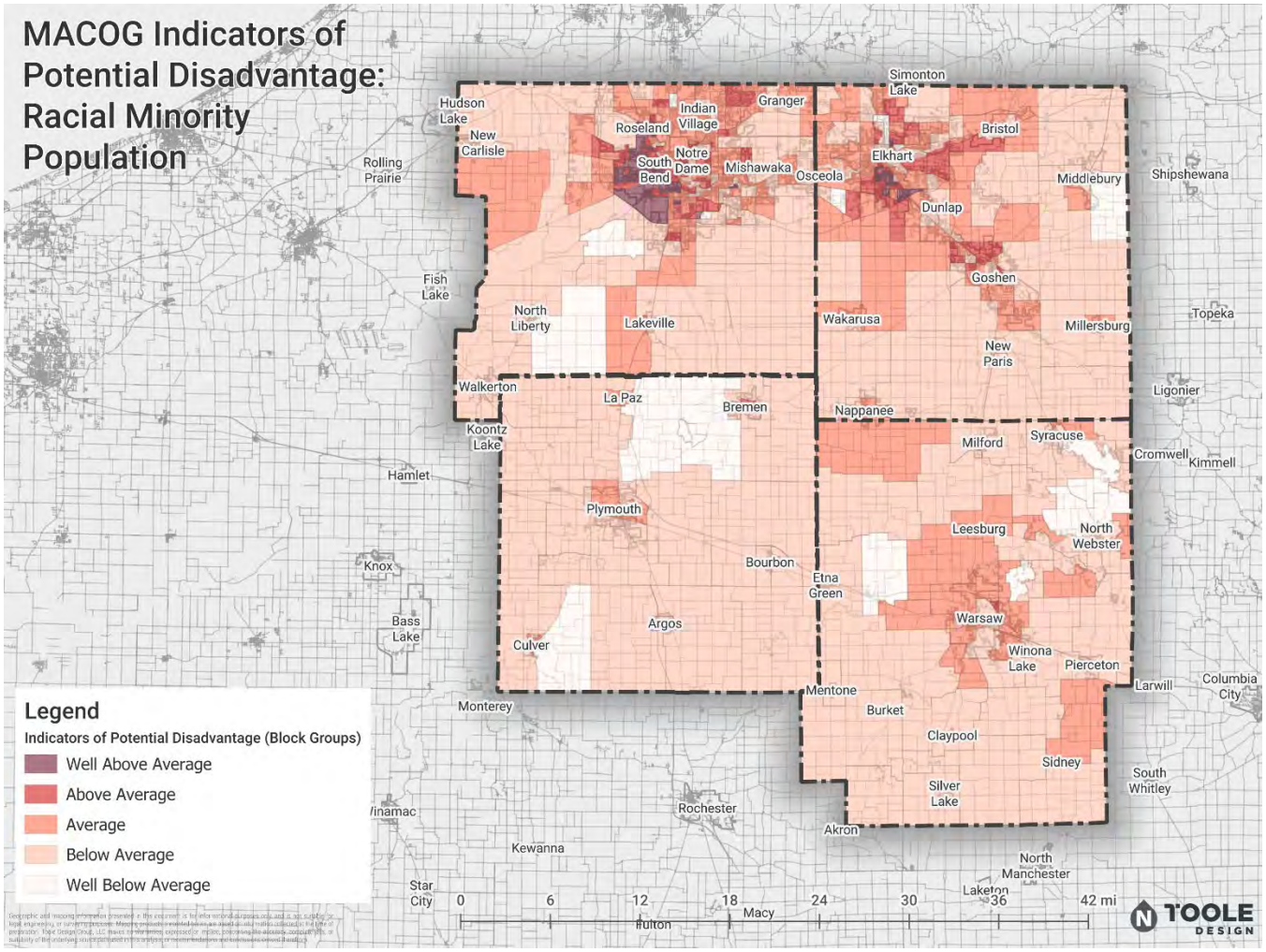


Figure 4: MACOG Indicators of Potential Disadvantage: Racial Minority Population.

Within St. Joseph County, there are concentrated populations of the aforementioned populations in the cities of South Bend and Mishawaka, but also in Harris Township. Across the entire MACOG region, St. Joseph County has the most block groups with a well above average racial minority population, many of which overlap exactly with the redlined neighborhoods that received the worst grades (C or D, or yellow and red) from the HOLC in the 1930s. A comparison is shown in Figure 9.

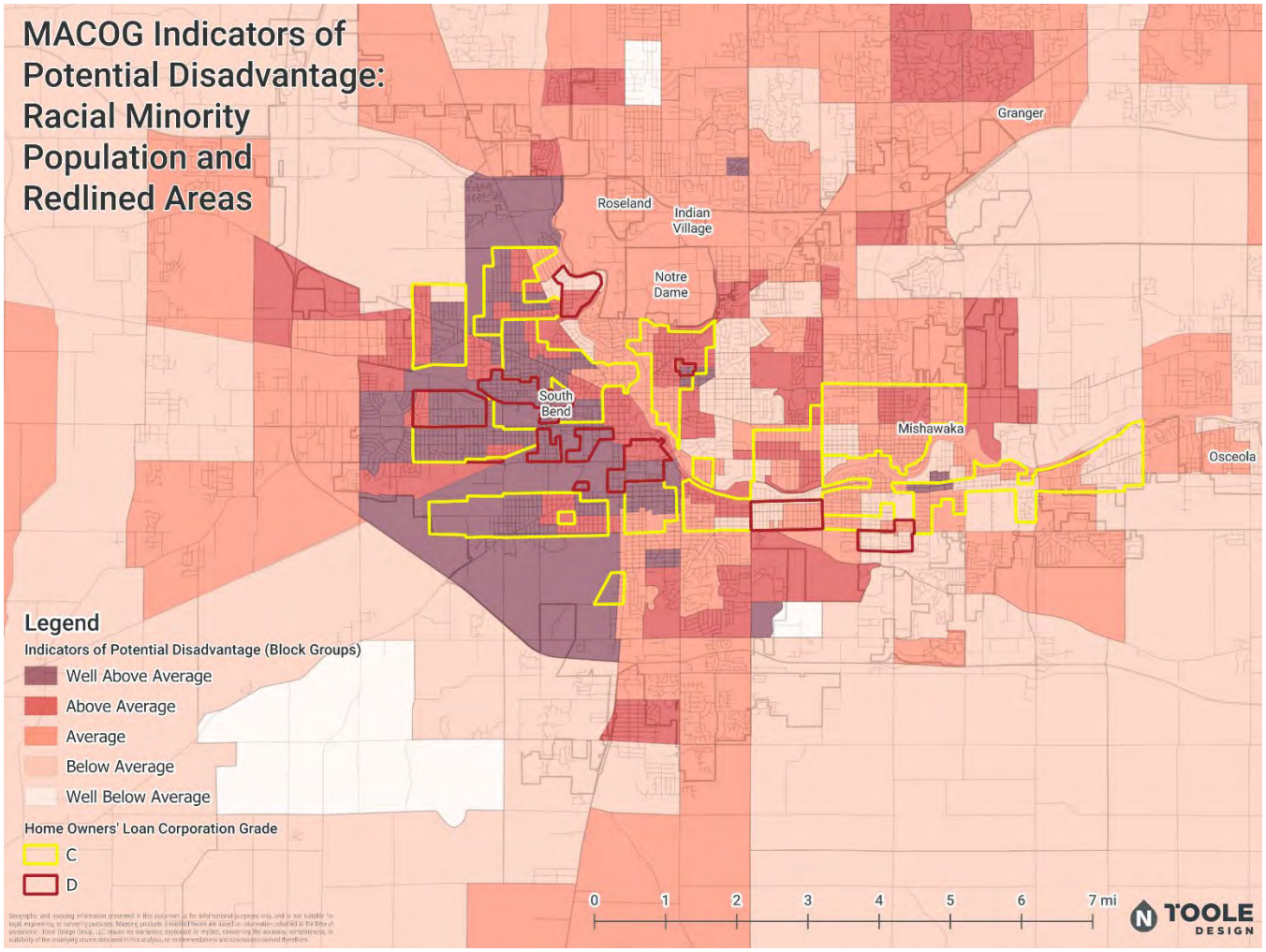


Figure 5: MACOG Indicators of Potential Disadvantage: Racial Minority Population & Home Owners' Loan Corporation Grades.

Hispanic and Latino Population

In St. Joseph and Elkhart Counties, areas with above average and well above average concentrations of Hispanic and Latino residents are primarily located in the cities of South Bend, Elkhart, and Goshen and their surrounding areas. There is also one census block group that has above average prevalence of Hispanic and Latino residents in Nappanee. In Marshall County, the Hispanic and Latino population is located in the Plymouth and Bremen and in Kosciusko County, this demographic group is distributed across the county, which above average prevalence in the north central parts of the county.

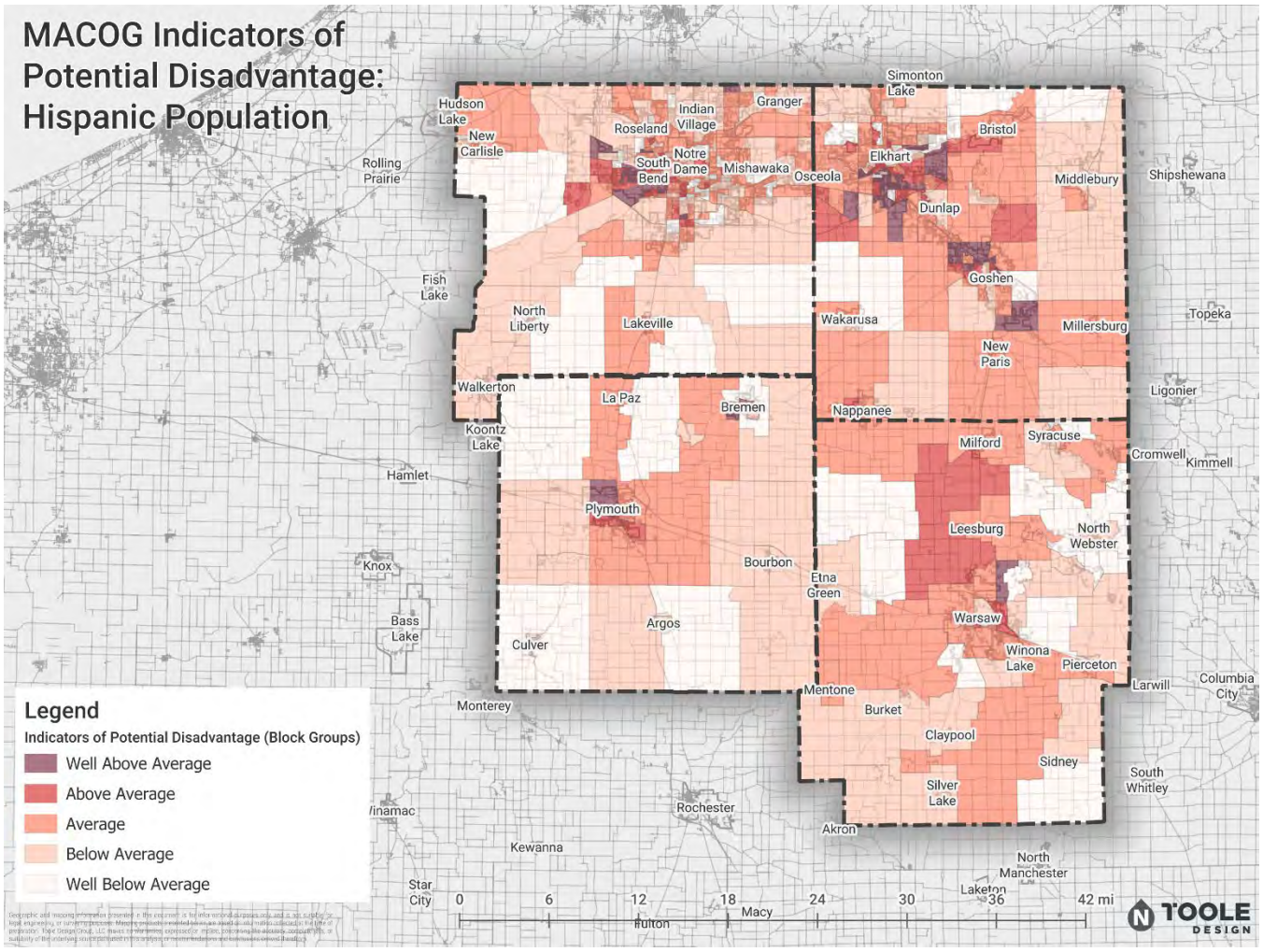


Figure 6: MACOG Indicators of Potential Disadvantage: Hispanic Population.

Households in Poverty

Above average and well above average prevalence of households experiencing poverty are primarily located in Michiana's cities, but not exclusively. In St. Joseph County, households in poverty are mostly in census block groups within South Bend and Mishawaka. Similar to the IDP for racial minorities, many of the census block groups with well above average concentrations of households in poverty are in areas formerly redlined as hazardous. Outside of South Bend and Mishawaka, census block groups in the Towns of North Liberty, Osceola, and Lakeville also show above average concentrations of this demographic.

In Elkhart County, poverty is mainly in Elkhart and near Goshen and the Town of Bristol. In Marshall County, above average poverty levels are seen in three areas: the City of Plymouth, Town of Bourbon, and Town of Culver. In Kosciusko County, above average and well above average prevalence of households in poverty are only seen in the center of the county in the Warsaw area.

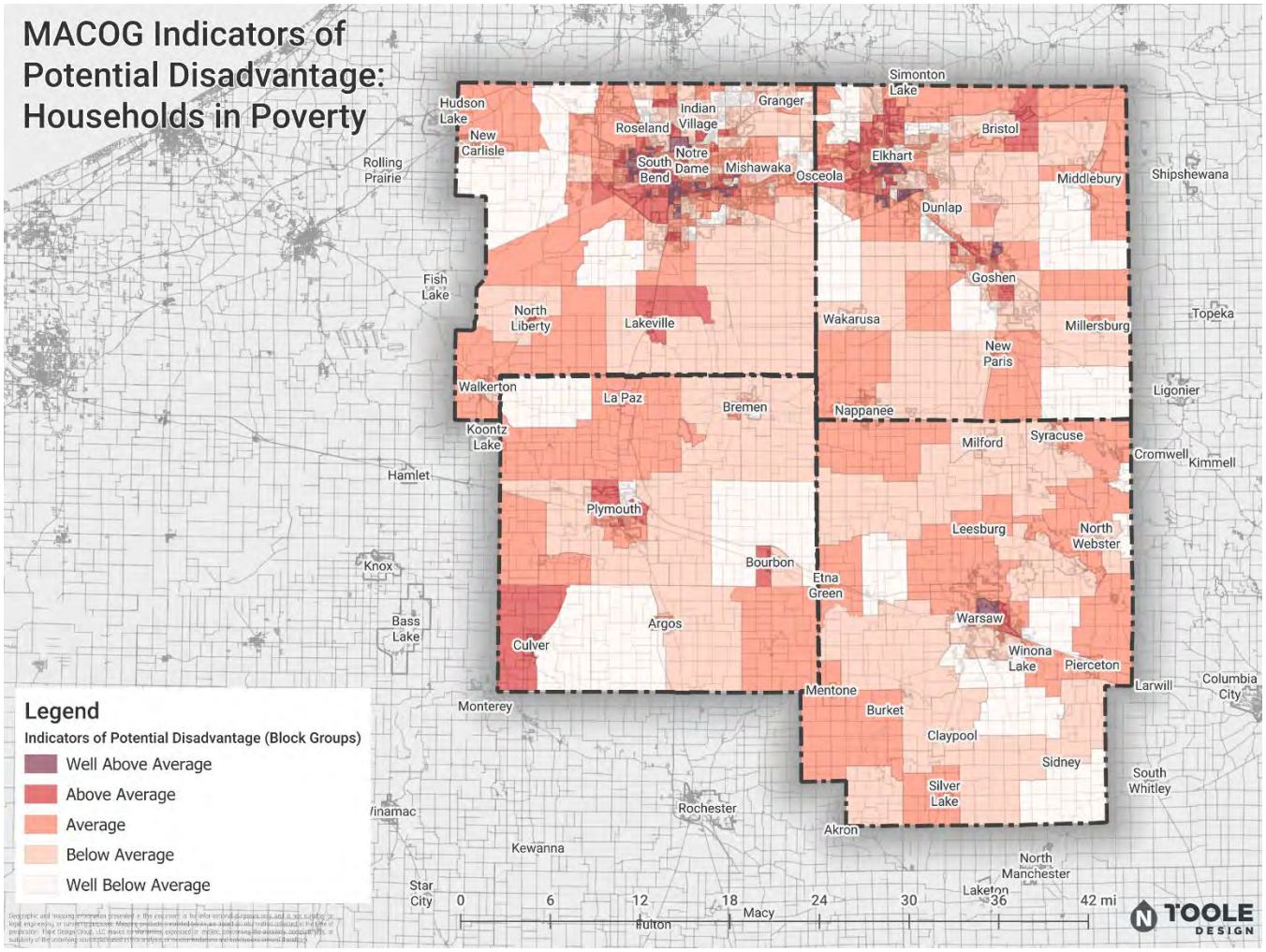


Figure 7: MACOG Indicators of Potential Disadvantage: Households in Poverty.

Limited English Proficiency

Unlike other IPD populations, populations with limited English proficiency are not primarily located in cities. In St. Joseph County, populations with limited English proficiency are seen in the South Bend area and its outskirts, but also near Granger in Harris Township. In Elkhart County, this demographic group is located across the county. There are many above average and well above average block groups in the townships outside of city limits, especially in the southwest portion of the county. Elkhart County appears to have the largest percentage of residents with limited English proficiency in the Michiana area. In Marshall and Kosciusko Counties, populations with limited English proficiency are densely located near Plymouth, Bremen, and Warsaw, but is also seen outside city limits in the northeast corner of Marshall County and northwest corner of Kosciusko County.

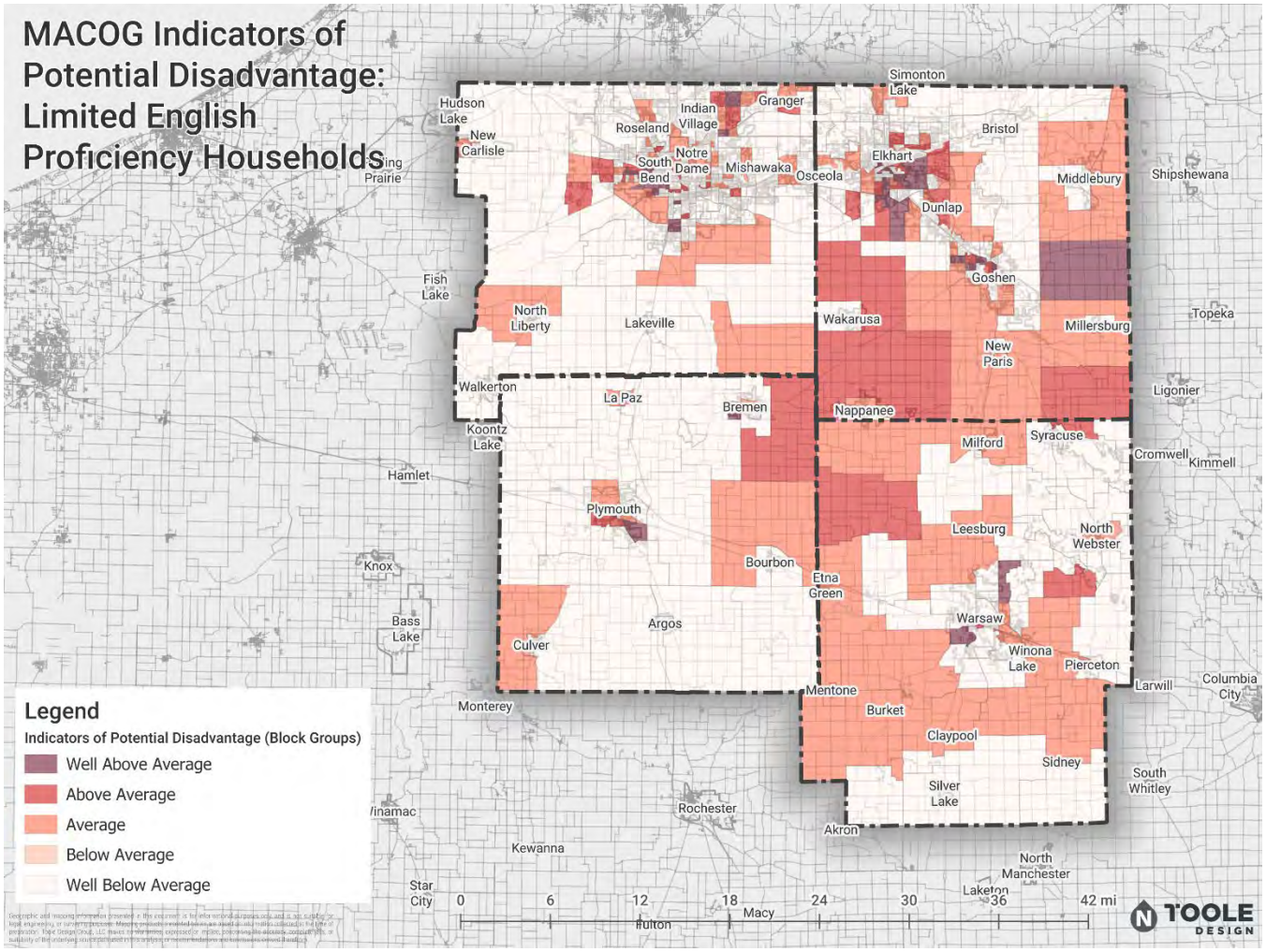


Figure 8: MACOG Indicators of Potential Disadvantage: Limited English Proficiency Households.

Older Adults

The Michiana area has many block groups with above average or well above average percentages of elderly populations. This demographic group does not appear primarily in one area or another and is not concentrated specifically within city limits or solely in rural areas. Above average and well above average concentrations of older adults over the age of 65 years old are found everywhere in this region, particularly the western areas of St. Joseph County including Olive Township, Warren Township, Greene Township, and Union Township.

In Marshall County, above average and well above average census block groups for this IPD population can be found in Union Township, Center Township, German Township, and North Township.

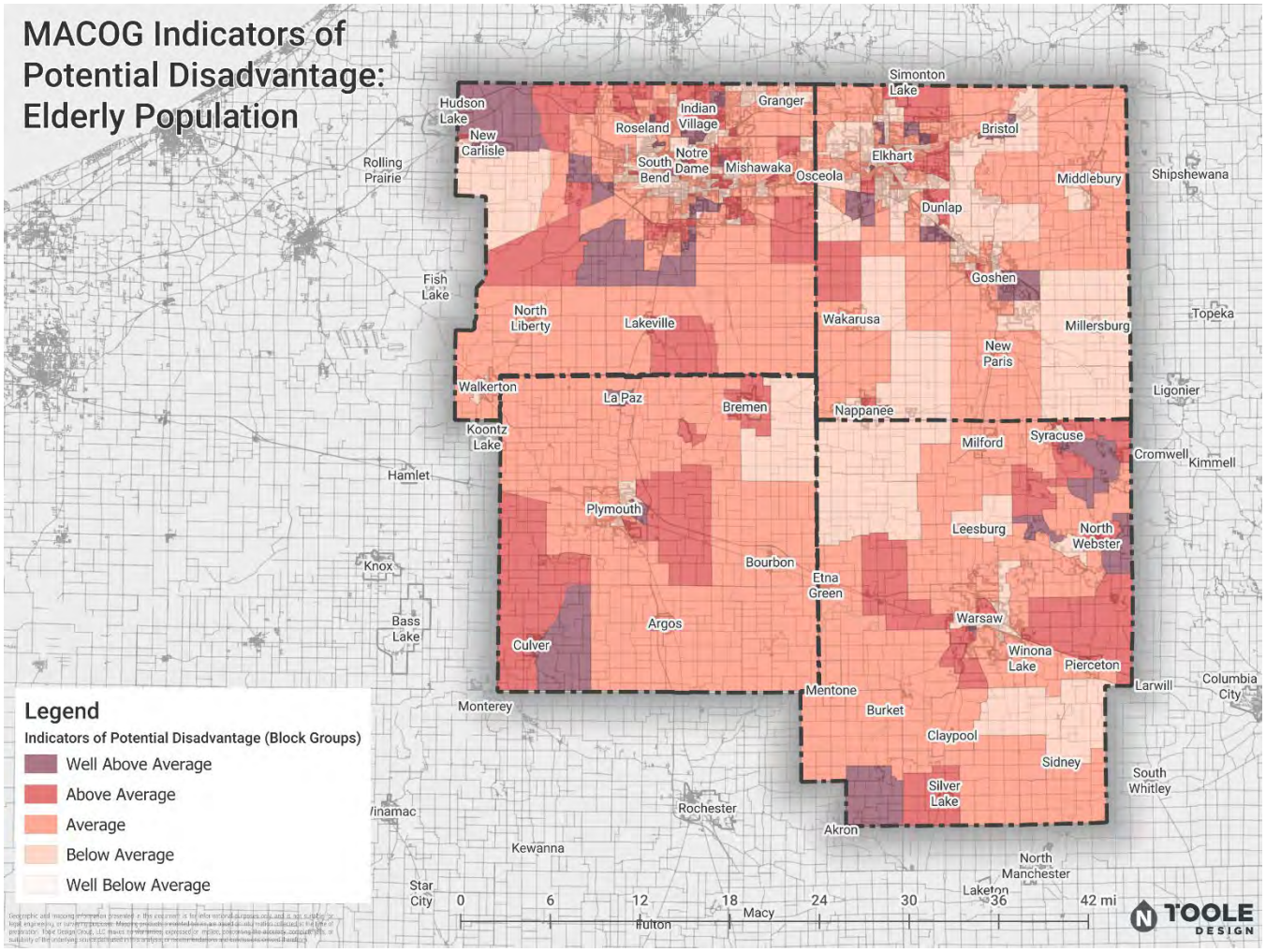


Figure 9: MACOG Indicators of Potential Disadvantage: Older Adults.

Carless Households

Carless households are located across the Michiana region, but there are areas with concentrations of above average percentages of carless households. St. Joseph County has above average percentages of carless households located in the core cities, but also near New Carlisle, Lakeville, and North Liberty. Elkhart County has well above average block groups on the outskirts of city limits on the east side of the county and the southwest corner of the county, which meets other well above average carless populations from Kosciusko and Marshall Counties.

The high number of above average and well above average concentrations of carless households in rural areas – particularly Elkhart County – is likely due to the Michiana region's large Amish population.[15] Local traveling by horse and buggy is a key consideration for developing recommendations to improve transportation safety for carless households.

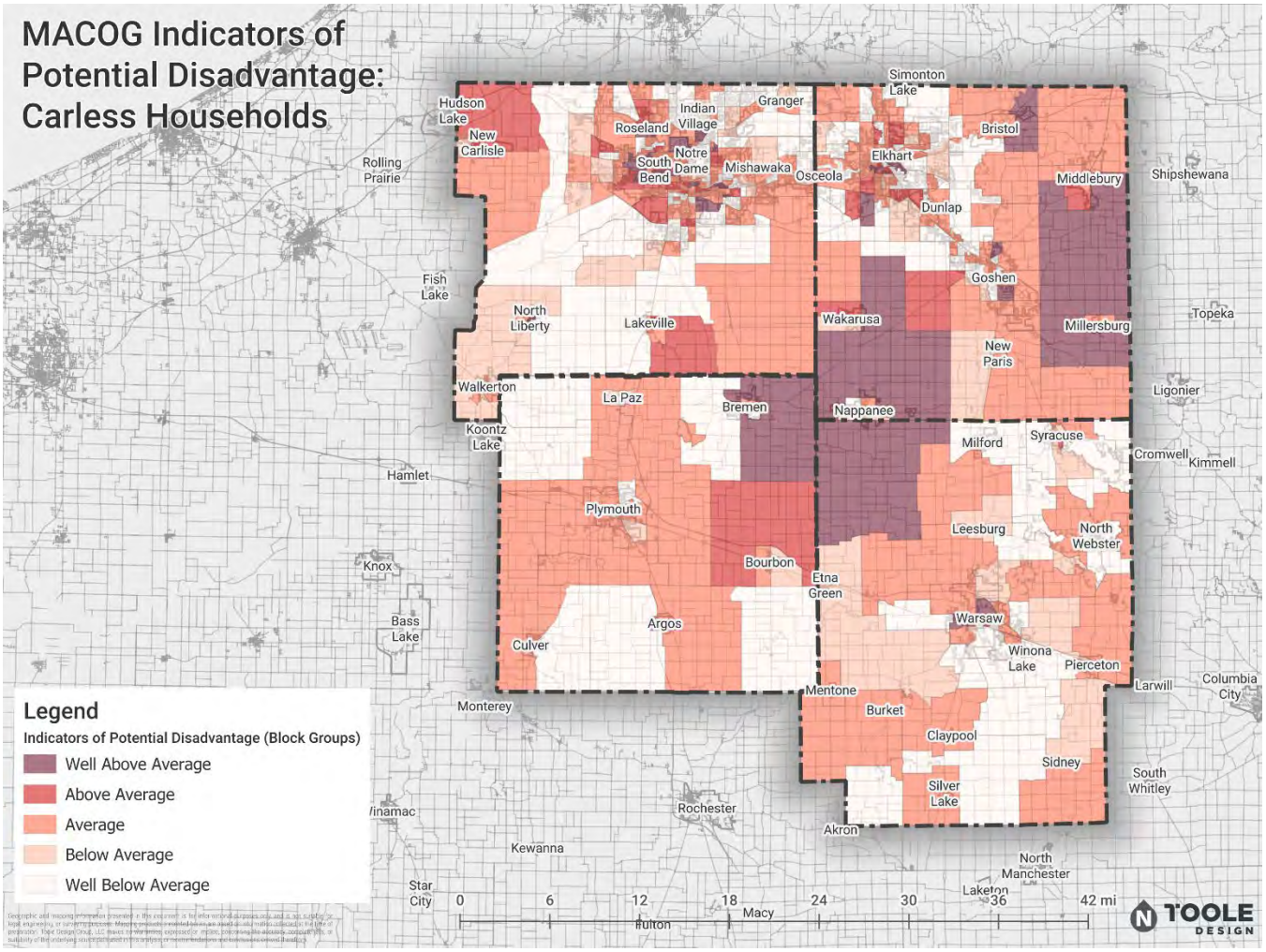


Figure 10: MACOG Indicators of Potential Disadvantage: Carless Households.

[15] Manns, Molly. "Indiana's Amish Population." *IN Context*, Indiana Business Research Center at Indiana University's Kelley School of Business.

Households with Disabilities

Similar to the IPD for older adults, households with disabilities are located across the Michiana area. In St. Joseph County there are well above average percentages of this demographic near the Town of Walkerton as well as South Bend and Mishawaka. In Elkhart County, above average block groups are mostly located near municipalities, like Elkhart, Briston, and Goshen. In Marshall County, there is only one block group with a well above average concentration of households with disability, located in Plymouth. Other areas with above average concentrations of households with disabilities include areas near La Paz, Bourbon, Culver, and outside of Bremen and Plymouth. Kosciusko County has well above average block groups of households with disabilities near Etna Green, Pierceton, Silver Lake, and in Warsaw.

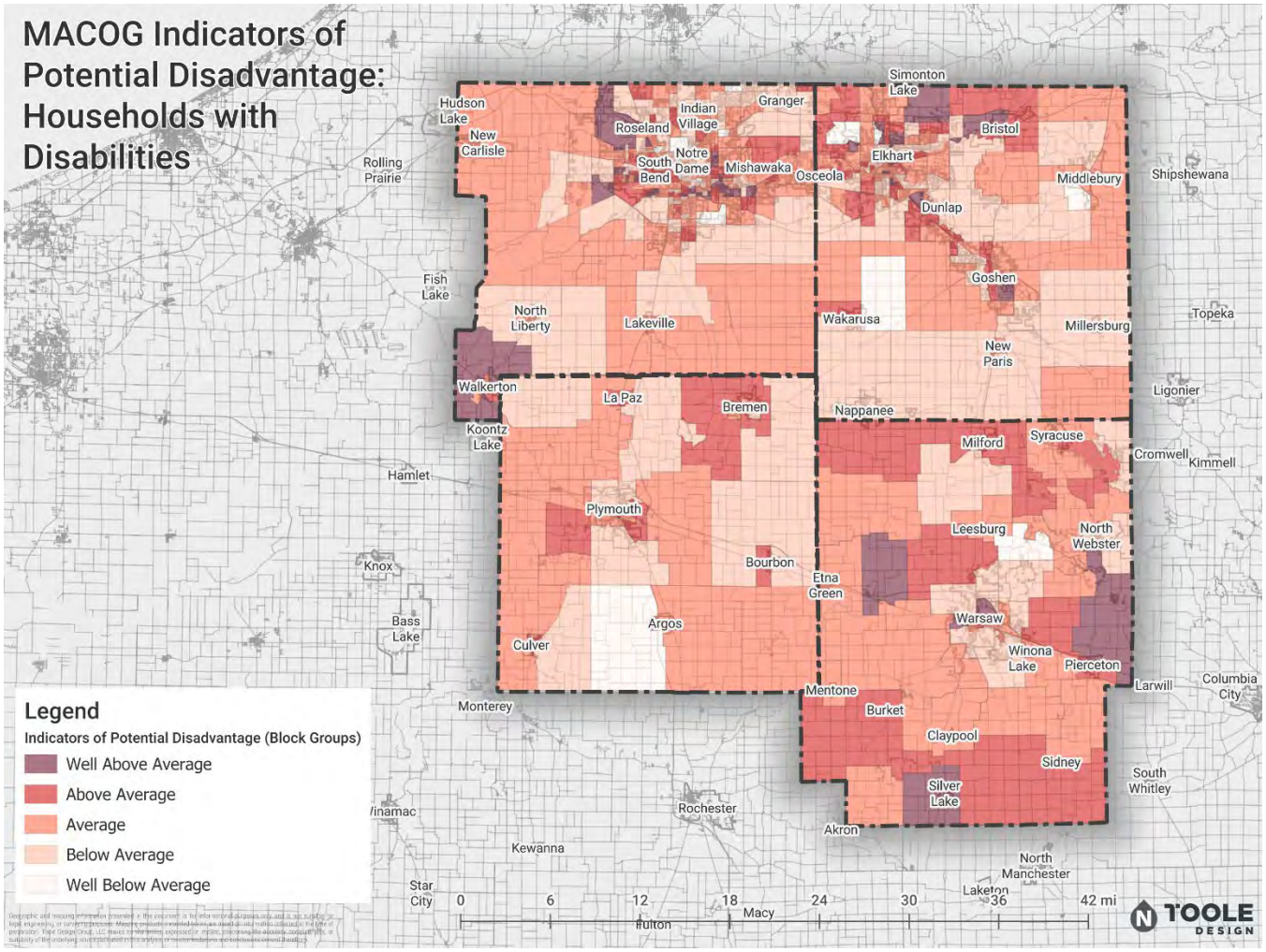


Figure 11: MACOG Indicators of Potential Disadvantage: Households with Disabilities.

Youth Population

Youth populations are also located throughout the Michiana area. Elkhart and Kosciusko Counties have large amounts of above average and well above average percentages of this demographic group. When considering youth populations in transit, connectivity and safety are key elements as youth populations are less likely to be able to drive. When looking at youth populations and where carless households are, there is a lot of overlap, especially in the outskirts of these counties.

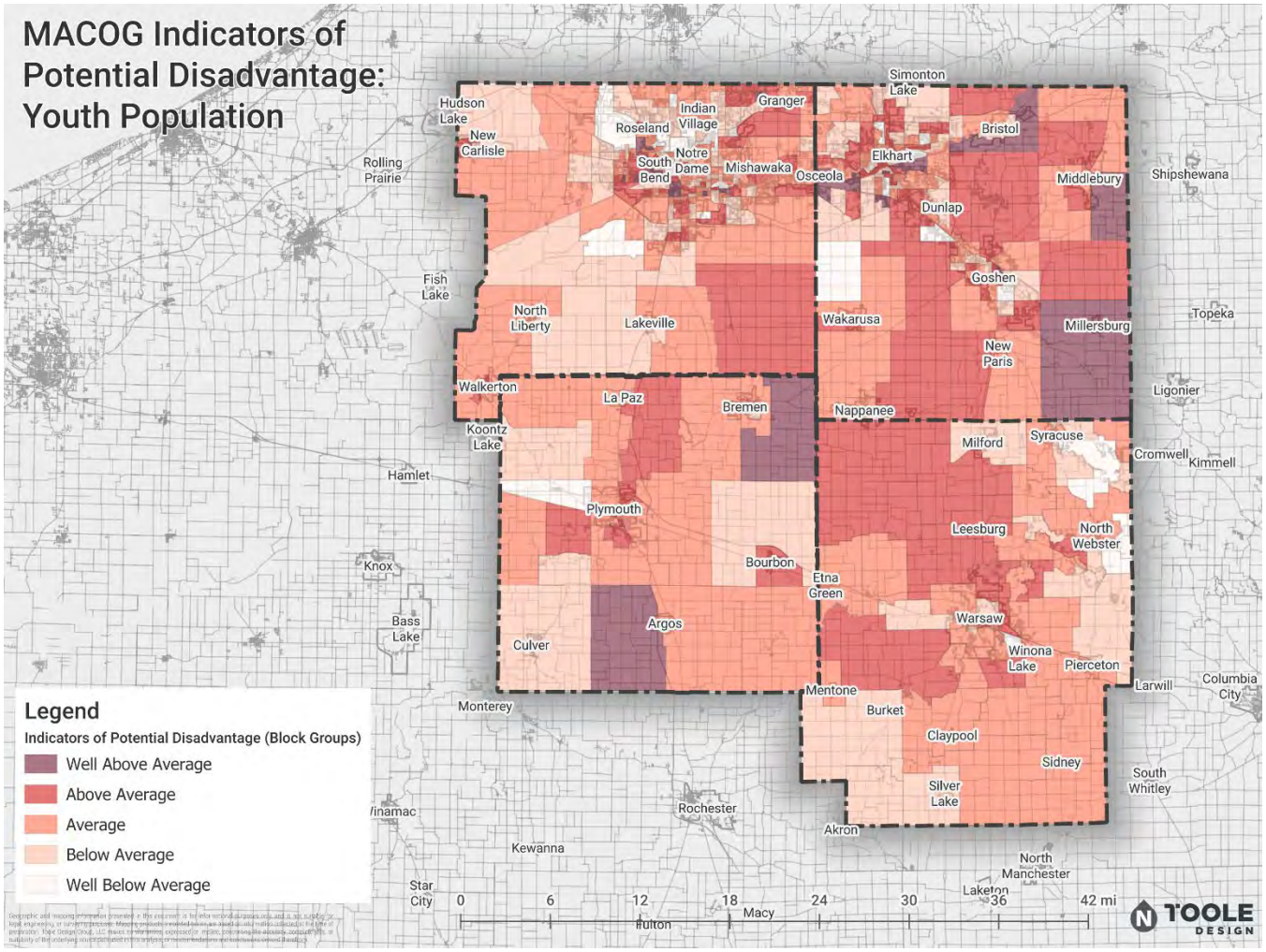


Figure 12: MACOG Indicators of Potential Disadvantage: Youth Population.

Priority Areas for Safety Action Plan

To determine the priority Focus Areas for the MACOG Regional Safety Action Plan, the project team aggregated the 10 population IPD scores and categorized census block groups into the same structure ranging from well below average to well above average. Priority Focus Areas for the plan include the census block groups identified as above average and well above average. Based on the IPD methodology, these are the areas within Michiana where there are concentrations of the indicators of potential disadvantage and should therefore be prioritized during community engagement, analysis, recommendations development, and implementation of the MACOG Regional Safety Action Plan.

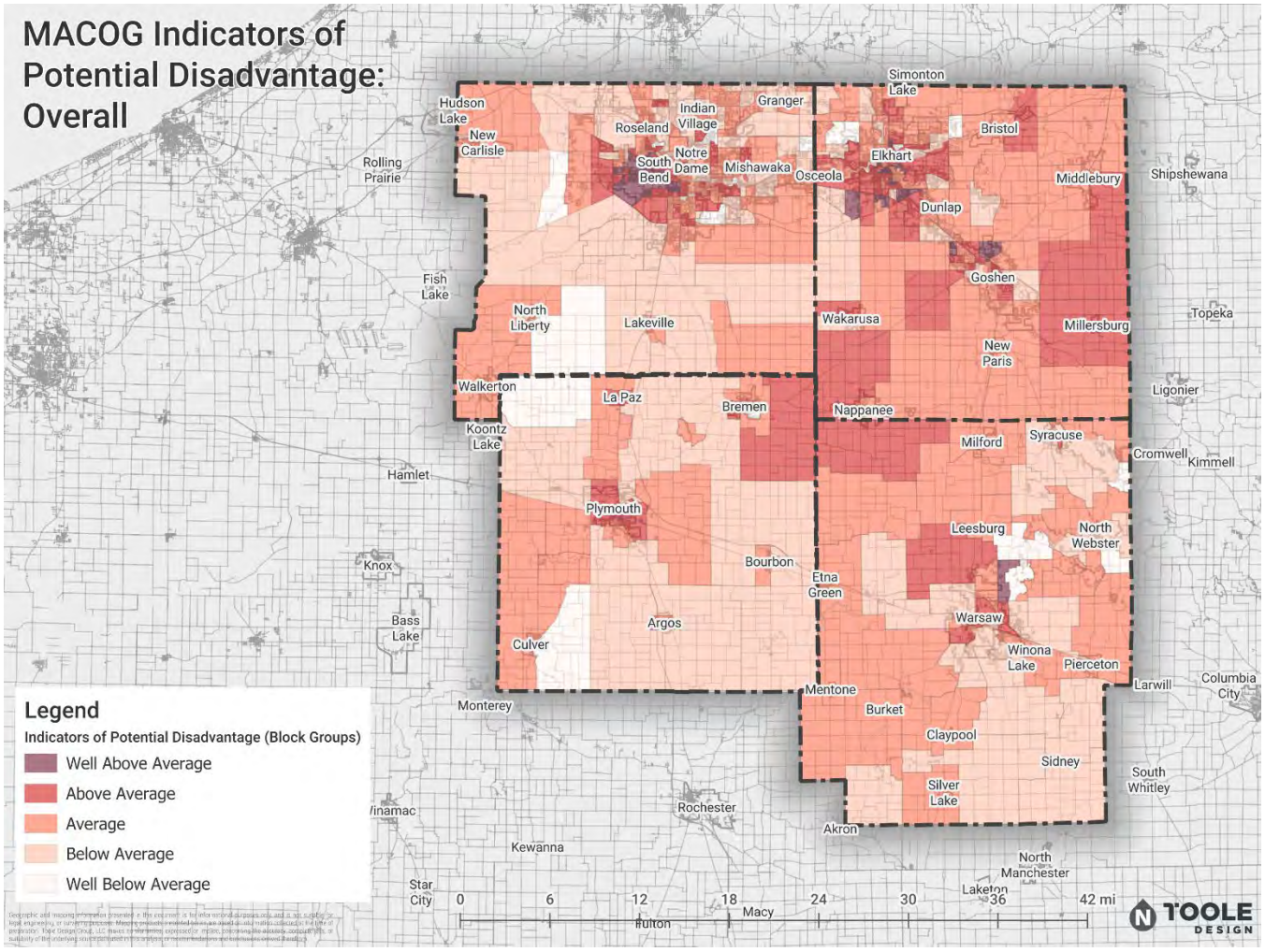


Figure 13: MACOG Indicators of Potential Disadvantage: Overall.

DESCRIPTIVE SAFETY ANALYSIS - FINAL

September 12, 2024

To: Caitlin Stevens
Organization: Michiana Area Council of Governments (MACOG)
From: Catherine Girves, Tariq Shihadah, Ayden Cohen
Project: MACOG Regional Safety Action Plan

Re: Descriptive Safety Analysis - FINAL

The purpose of this memorandum is to document the descriptive statistics and high-injury network analysis processes and results conducted as part of the Michiana Area Council of Governments (MACOG) region. These analyses will provide a data-driven basis for understanding the scope of fatal and serious injury (FSI) traffic crashes in the MACOG area jurisdictions, which includes all streets and roads in the counties of St Joseph, Elkhart, Marshall, and Kosciusko, as well as the cities of Elkhart, Goshen, Mishawaka, Nappanee, Plymouth, South Bend, and Warsaw. The analyses will articulate high-level severe crash trends and identify areas of opportunity to drive severe crashes down through proven, innovative, and comprehensive safety infrastructure and policy strategies.

This memo highlights trends found in the crash data through descriptive analysis and the collection of streets where a disproportionate number of fatalities and serious injury crashes occur in the High Injury Network (HIN), which will be identified in a separate document. Together, these crash types are referred to as FSI crashes within this memo.

Crash Data Overview

FSI crash data was obtained from MACOG through the Automated Reporting Information Exchange System (ARIES) for the most recent 5 years from 2019 through 2023 for Elkhart, Kosciusko, Marshall, and St. Joseph Counties. This data was used for the analyses presented in this memo.

Data Limitations

Local law enforcement agencies submit the crash reports that provide the raw crash data. Although crash reports are currently the best way to obtain information about a large quantity of crashes, they have limitations. Crash severity may have limited accuracy because those completing reports typically don’t have medical training, and victims of crashes may be unaware of internal injuries masked by adrenalin. Total number of crashes may be higher than captured due to unreported crashes due to fears, language barriers, financial concern, and more. Crash reports may not capture accurate speed of crashes, as the first responders are typically on the scene after the crash has occurred and witnesses outside a crash are not typically interviewed about operator speed. Even when crash reports are perfect, they do not record near misses or the self-limiting behavior of travelers who don’t feel safe in currently configured networks. It is useful to keep these limitations in mind when using crash data and to vet data with priority populations as part of the planning process. Due to the complexity of crash data and its origins, some interpretations of the data may change over the course of this project which may impact specific patterns or findings resulting from analysis steps.

Descriptive Safety Analysis

Analysis Summary

The descriptive safety analysis focuses on regional safety trends over the past five years, analyzing crash location and severity, as well as contributing factors and crash types. Crashes are reviewed for patterns over time, a variety of crash characteristics, road user mode, and other factors. Results of the analysis are explored in-depth in the following sections, with several key findings highlighted below:

- Since 2019, serious injury crashes have decreased within the study area, which is partly due to changes in 2021 impacting reporting thresholds for serious injury crashes.
    - However, fatalities have either increased or remained consistent over the last five years.
- The top two fatal and serious injury crash types for all four counties are right angle crashes and roadway departure crashes.
- The highest concentration of fatal and incapacitating injury crashes occurs during lunch hours and the PM commute peak period.
- There is also a high number of fatal and incapacitating injury crashes during the early morning hours between 3AM and 6AM, which may relate to shift changes during these hours.
- Elkhart (23%) and St. Joseph (18%) counties have a relatively large share of fatal motorcycle crashes, despite motorcycle mode being less than 10% of all fatal and incapacitating injury crashes.
- 18% of fatal crashes in St. Joseph County involve a pedestrian.
    - Comparatively, 7% of fatal and incapacitating injury crashes in St. Joseph County involve a pedestrian.
- The majority of fatal and incapacitating injury crashes involving non-motorized road users (pedestrians, bicyclists, and buggy operators) occurred along corridors rather than at intersections.
- Regionally, there is a slight majority (59%) of all FSI crashes occurring in urban areas.
    - St. Joseph and Marshall Counties deviate from this trend. 70.1% of all FSI crashes in St. Joseph County take place in urban areas. Only 23.3% of all FSI crashes in Marshall County take place in urban areas.
- There is a subtle increase in FSI crashes across the region in summer months.
    - Marshall County sees spikes in March and December.

Fatal and Serious Injury Crashes Over Time

Between the years 2019-2023, the MACOG region experienced a total of 5,389 fatal and serious injury (FSI) crashes, as shown in Table 1. Figure 1 displays the frequency of FSI crashes over this period for all counties. To highlight the relative change in FSI crashes during this time, Table 1 exhibits the percent change of crashes for all counties relative to the year 2019. Larger amounts of data from Elkhart and St Joseph Counties will often cause many scenarios in this memo to be viewed by a percent share within each county, independent of the other two. Another important note is that in 2020, the Federal Highway Administration (FHWA) announced new rules for counting and reporting serious injuries. As a result ARIES made changes to reporting requirements in 2021 which has resulted in a significant decrease in crashes reported at this severity in 2022 and following years.

Table 1. Total Fatal and Serious Injury Crash Frequency by County.

Total Fatal and Serious Injury Crash Frequency by County						
	2019	2020	2021	2022	2023	Total
ELKHART	558	498	589	305	190	2140
KOSCIUSKO	49	35	42	39	40	205
MARSHALL	124	106	119	78	49	476
ST JOSEPH	698	600	674	348	248	2568
Total	1429	1239	1424	770	527	5389
% Change	-	-13.3	14.9	-45.9	-31.6	-
Total Fatal Crash Frequency by County						
	2019	2020	2021	2022	2023	Total
ELKHART	27	32	26	42	18	145
KOSCIUSKO	9	10	11	10	14	54
MARSHALL	9	8	7	10	9	43
ST JOSEPH	26	30	30	23	26	135
Total	71	80	74	85	67	377
% Change	-	12.7	-7.5	14.9	-21.2	-

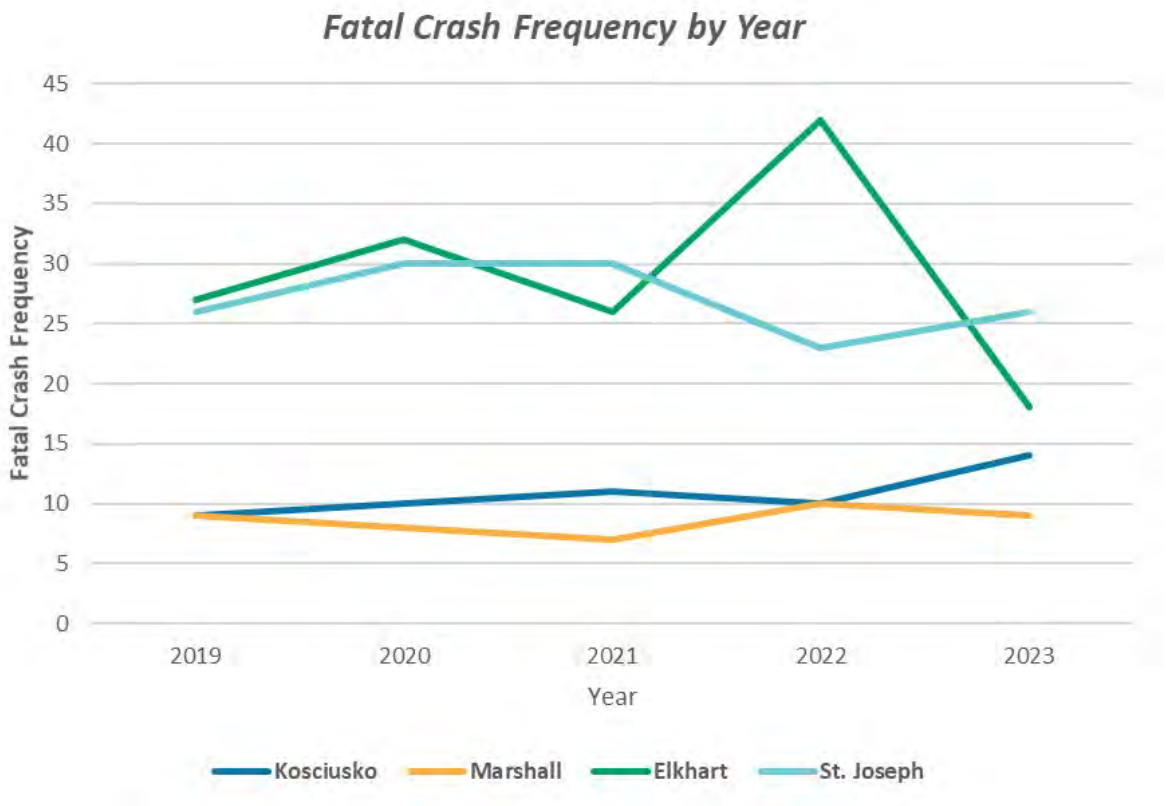


Figure 1. Fatal Crash Frequency by Year

Figure 1, along with the second portion of Table 1 indicate that despite an overall decrease in FSI crashes, fatal crashes remained steady with some fluctuations over the past five years. The exception to the general trend is Elkhart County, which experienced a significant decrease in fatalities, going from 42 in 2022 to 18 in 2023. The decreases in incapacitating injury crashes are largely attributed to changes in crash reporting standards for this severity level.

The data shows there were 416 deaths and 7,482 incapacitating injuries documented as a result of the 5,389 FSI crashes. Figure 2 visualizes the individual trends of the counties by crash severity, where the y-axis on the left is for incapacitating injuries and the y-axis on the right is for fatalities.

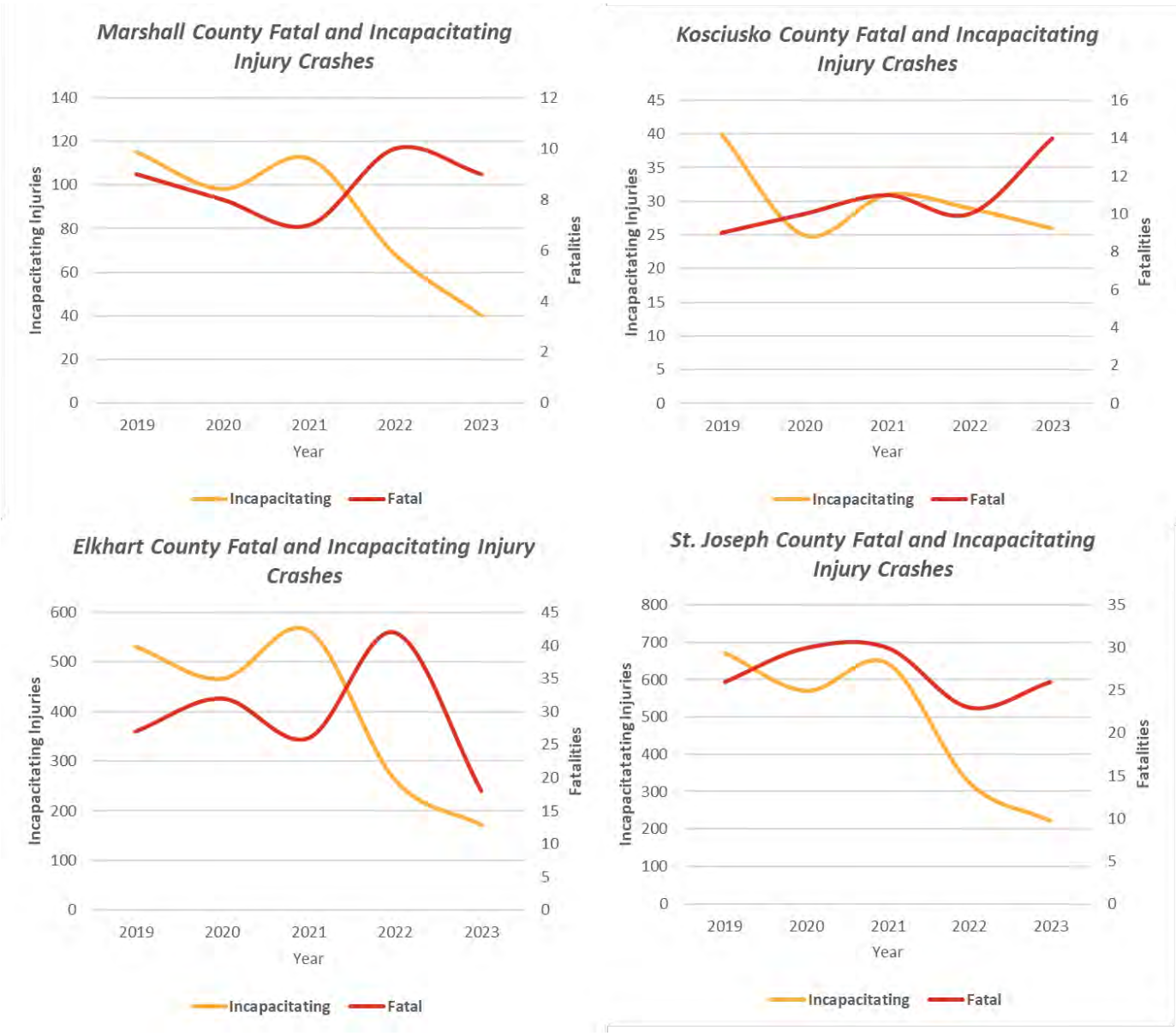


Figure 2. Fatal and Serious Injury Crash Trends by County

Crash Type

In Figure 3, crash types were reviewed for the most recent five years over the course of 2019-2023 to study recent trends. There are 16 crash types for which a crash can be categorized. In this table, left- and right-turn crashes are categorized as "Turning." Sideswipe-opposite direction verses -same direction were combined and categorized as "Sideswipe". Four other remaining crash types account for "Other".

Between 2019-2023, there were 5,389 crashes causing 7,898 fatalities and serious injuries. Figure 3 displays the breakdown of fatal and serious injury crashes for the seven most prevalent types of crashes. Angle crashes and roadway departures yield the most crashes with fatalities or serious injuries. Within Kosciusko and Marshall Counties, roadway departures (ran off road) represent a much larger share of FSI crashes, at about 30% each.

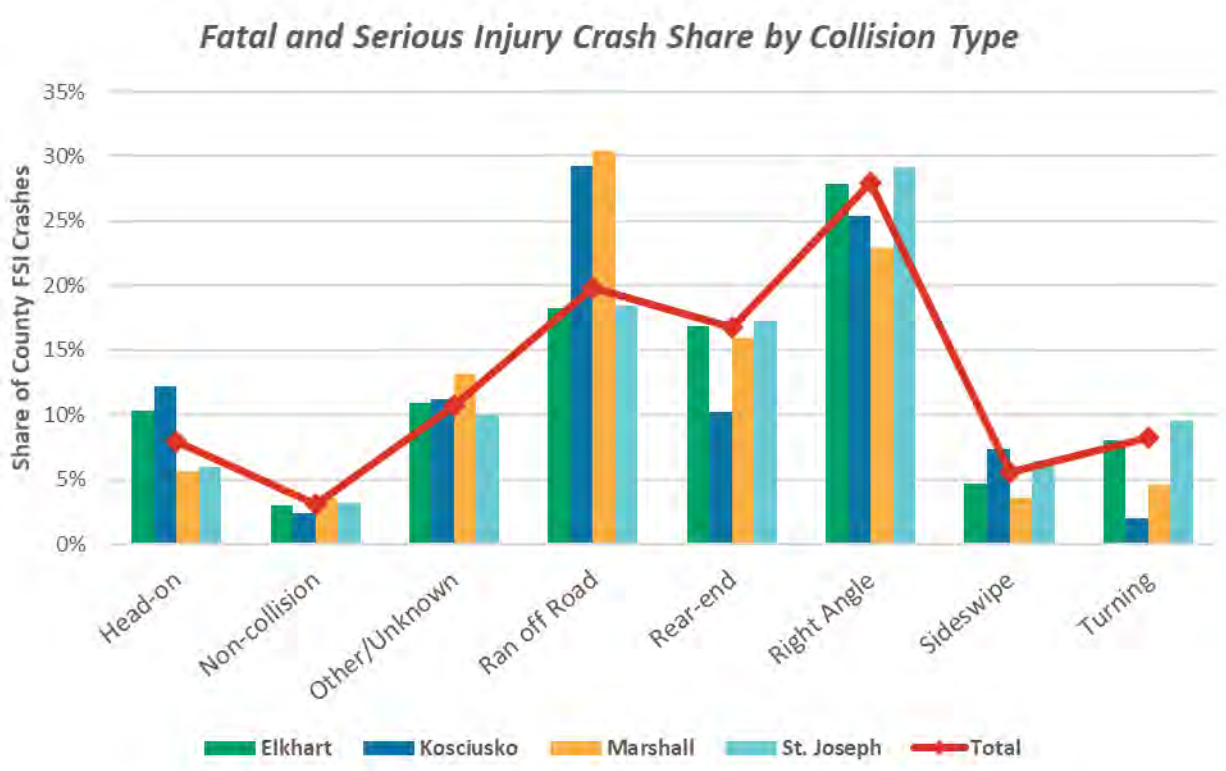


Figure 3. Percent Share of Fatal and Serious Injury Crash Types by County

Road User Mode

The percent share of FSI crashes by mode per County is presented in Figure 4. Except for Marshall County, about 9% of all FSI crashes involve non-motorized road users, which includes pedestrians, bicyclists, and buggy operators and passengers. Kosciusko County also sees an elevated share of motorcycle FSI crashes, representing 16.6% of all FSI crashes within the county.

Figure 5 represents the breakdown of modes involved in fatal crashes by County. In both Elkhart and St. Joseph Counties, there is a significant overrepresentation of fatal pedestrian and motorcyclist crashes.

Viewing geographic locations of fatal and incapacitating injury crashes has the potential to show trends in what could be problem areas or roadways. Appendix A shows the location of pedestrian, bicyclist, motorcycle and buggy FSI crashes over the last 5 years.

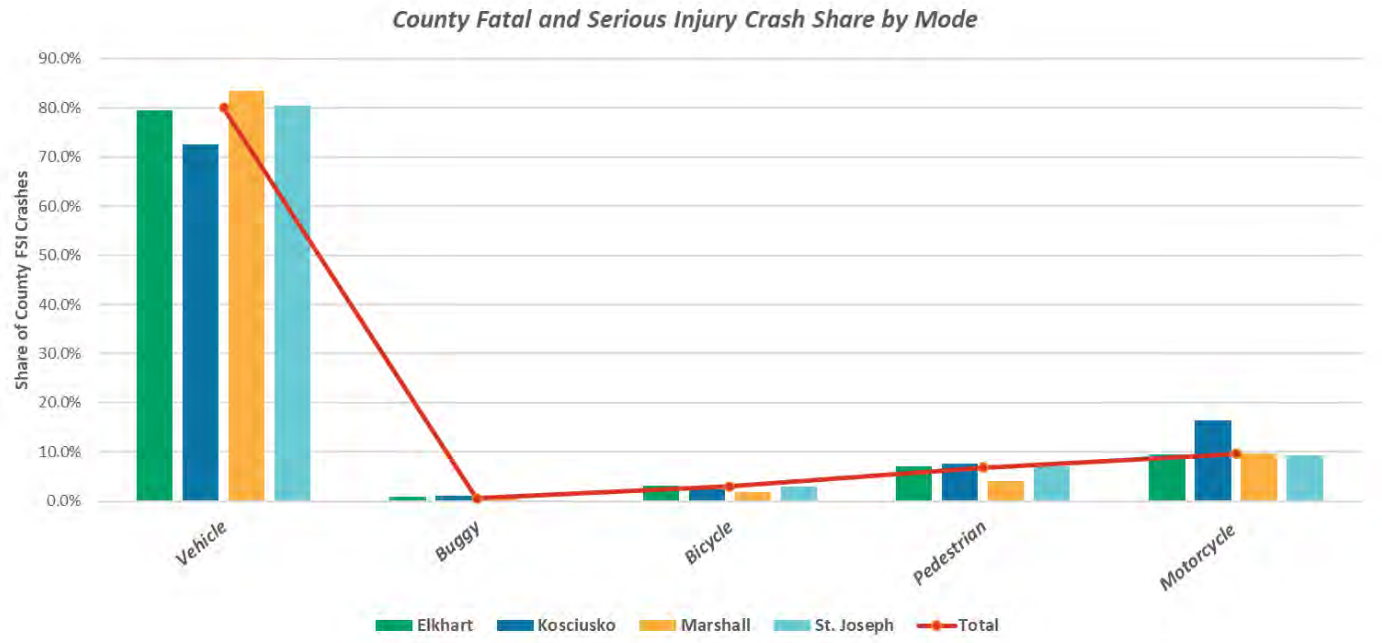


Figure 4. County Fatal and Serious Injury Crash Share by Mode

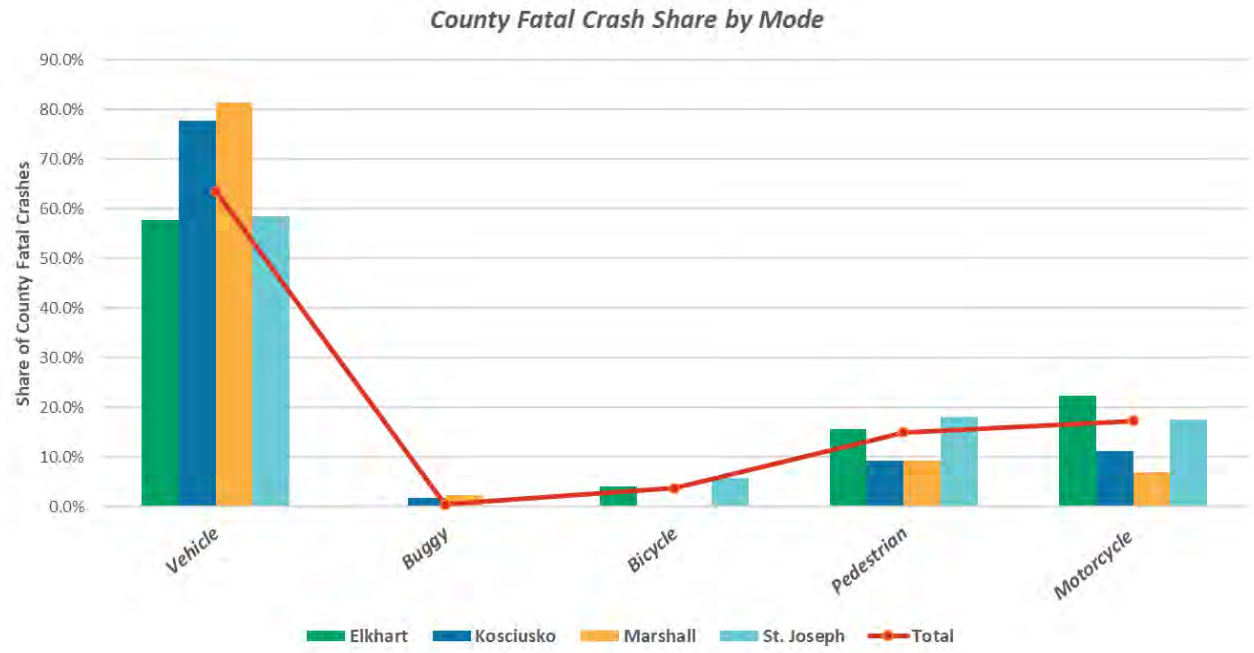


Figure 5. County Fatal Crash Share by Mode

Roadway Junction

The crash data in Figure 6 reveals the majority of FSI crashes across the region are occurring midblock or along corridors, rather than at intersections. The analysis found this to be consistent across all four counties. Table 2 provides a breakdown of

the roadway junction data by both mode and crash severity. Despite the majority of crashes occurring midblock, when looking at the FSI crashes by mode, there are some outliers in the data. According to the data, 46.9% of incapacitating bicyclist crashes occurred at intersections, which is above the regional average for all modes. Additionally, across all modes a much higher share of fatal crashes occurred at non-intersection locations.

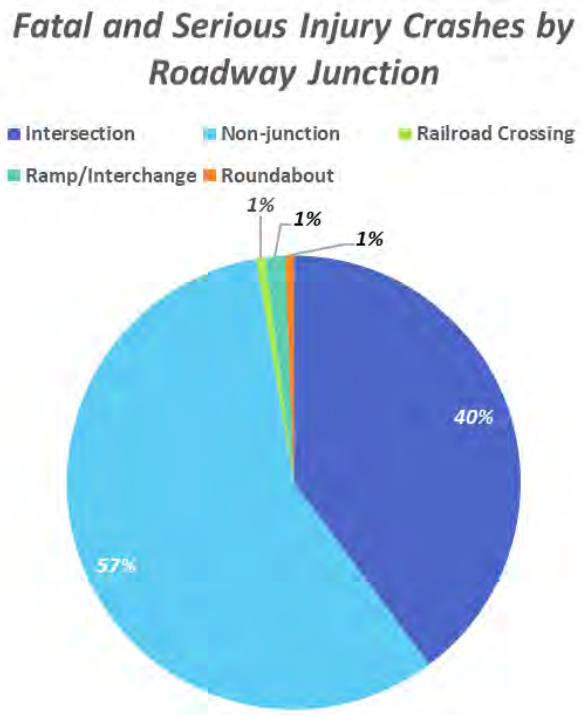


Figure 6. Fatal and Serious Injury Crashes by Roadway Junction

	Pedestrian		Bicyclist		Buggy		Motorcyclist		Motor Vehicle	
	Fatal	Incapacitating	Fatal	Incapacitating	Fatal	Incapacitating	Fatal	Incapacitating	Fatal	Incapacitating
Intersection	22.2%	31.6%	28.6%	46.9%	0.0%	33.3%	36.4%	35.4%	31.0%	41.7%
Non-junction	77.8%	67.3%	71.4%	53.1%	100.0%	61.1%	62.1%	58.3%	65.3%	55.9%
Railroad Crossing	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	2.0%	0.6%
Ramp/Interchange	0.0%	1.0%	0.0%	0.0%	0.0%	5.6%	1.5%	3.3%	0.4%	1.4%
Roundabout	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	1.2%	0.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 2. Fatal and Serious Injury Crashes by Roadway Junction, Mode, and Severity

Roadway Classification

The crash data in Figure 7 breaks down FSI crashes throughout the region by roadway classification. The percentage share varies county by county, with various outliers existing. St. Joseph County has a significantly large share of FSI crashes

occurring on local roads, with just under 80% of all FSI crashes occurring on local roads. This could be due to a variety of factors, including land use context, travel patterns, and more. Kosciusko County sees the largest share of crashes occurring on state roads across all four counties, with just under 30% of all FSI crashes occurring on state roads. In Marshall County, more than a third of FSI crashes occur on US routes.

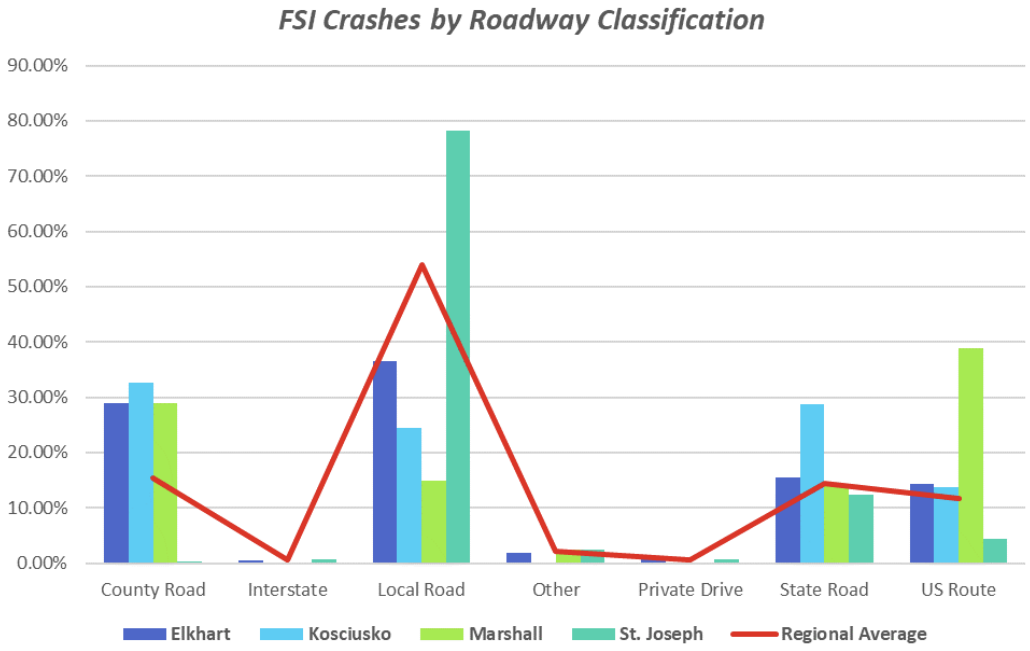


Figure 7. Fatal and Serious Injury Crashes by Roadway Classification

Land Use Context

The data displayed in Figure 8 reveals that regionally, more FSI crashes are occurring in urban areas, at 58.9% of all FSI crashes. However, looking at the crashes at the County level in Figure 7, there are different trends within each County. Two key outliers to note are St. Joseph County and Marshall County. In St. Joseph County, 70.1% of all FSI crashes are occurring in urban areas, with only 29.9% occurring in rural areas. The trend is the opposite in Marshall County, where 23.3% of FSI crashes are taking place in urban areas, and 76.7% in rural settings.

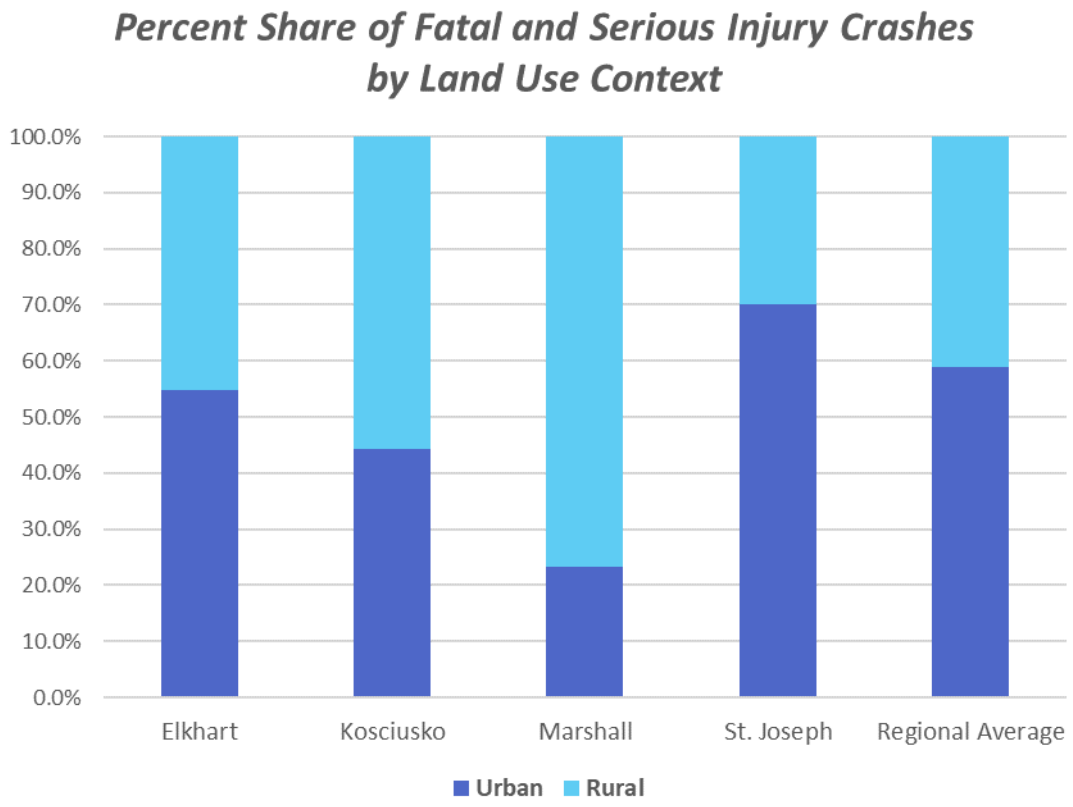


Figure 8. Percent Share of Fatal and Serious Injury Crashes by Land Use Context

Figure 9 displays the breakdown of FSI crashes across the region by the primary contributing factor. Regionally, failure to yield and aggressive driver were the two leading contributing factors, representing 37% and 18% of all FSI crashes, respectively. However, when the data is split between urban and rural, overrepresentations of varying contributing factors can be seen in the different context. Rural areas see a higher share of roadway departure and lane departure FSI crashes, making up a total of 27% of all rural FSI crashes in the region.

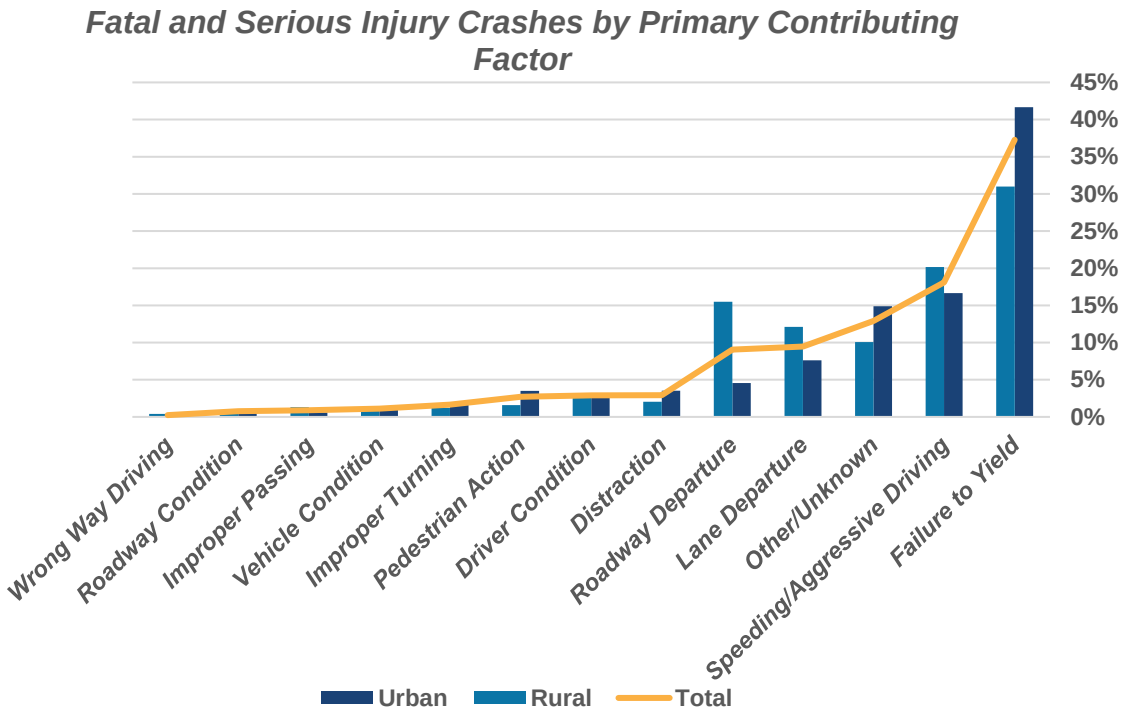


Figure 9. Percent Share of Fatal and Serious Injury Crashes by Contributing Factor, as well as Urban vs. Rural

Month of Year

All counties in the region see an increase in FSI crashes during summer months, as seen in Figure 10. Marshall County's rise is the most sizable between two months with an 83.3% increase between April and May. Marshall County also experiences the lowest percent share of crashes in the late fall months of October and November, and then a 48.4% increase in December. It is not clear what factors led to the increased frequency of crashes throughout the year in the County. Kosciusko County sees a pronounced jump in crash frequency in October, experiencing a 35.3% increase from September.

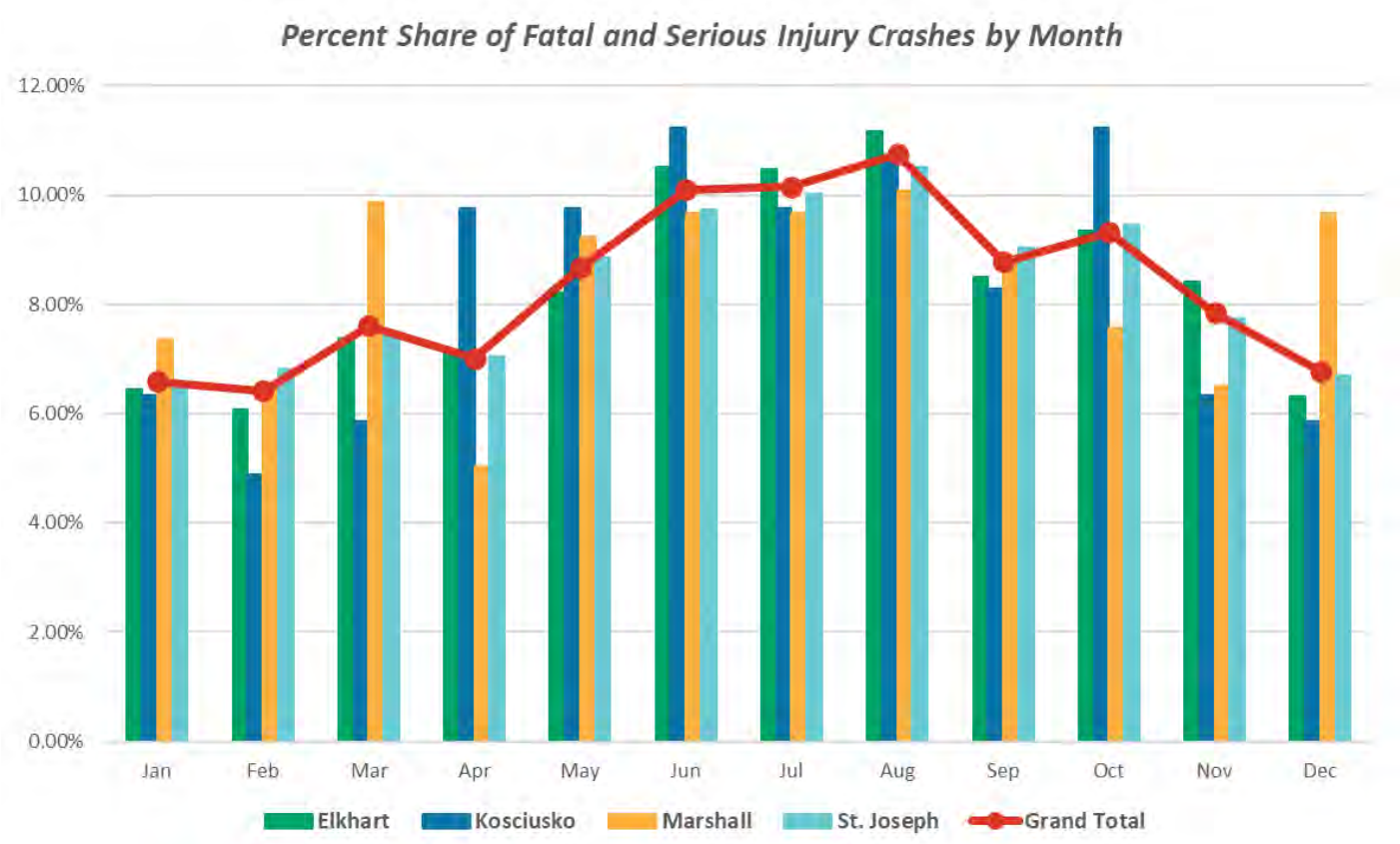


Figure 10. Percent Share of Fatal and Serious Injury Crashes by Month

Day of Week & Time of Day

Breaking down FSI crashes in the region from 2019-2023 by day of week and time of day show most of these crashes occur in the afternoon and evening with the highest concentration during the PM peak periods, as seen in Table 3. There are also a high number of crashes during lunch hours and the early morning (3AM-6AM) across all days of the week, likely relating to shift changes in work places during these hours. A similar breakdown by county is shown in Tables 4 and 5. This trend is also seen within the individual counties, though this most pronounced in Elkhart and St. Joseph Counties.

Table 3. Fatal and Serious Injury Crashes by Day of Week and Time of Day

	MACOG Region	Time of Day								
		12AM - 3AM	3AM - 6AM	6AM - 9AM	9AM - 12PM	12PM - 3PM	3PM - 6PM	6PM - 9PM	9PM - 12AM	
Day of week	Monday	54	94	112	114	134	169	83	52	Weekday
	Tuesday	46	121	103	121	152	160	80	42	
	Wednesday	45	99	108	108	128	148	73	38	
	Thursday	43	116	100	94	126	167	88	41	
	Friday	54	104	124	152	128	144	106	55	
	Saturday	73	85	64	130	126	119	98	70	Wknd
	Sunday	92	98	58	71	82	85	67	45	
		Dark Conditions		AM Peak	Light Conditions		PM Peak	Dark Conditions		

Table 4. Elkhart and Kosciusko County Fatal and Serious Injury Crashes by Day of Week and Time of Day

	Elkhart County	Time of Day								
		12AM - 3AM	3AM - 6AM	6AM - 9AM	9AM - 12PM	12PM - 3PM	3PM - 6PM	6PM - 9PM	9PM - 12AM	
Day of week	Monday	17	47	43	41	59	57	35	19	Weekday
	Tuesday	19	64	34	45	62	74	34	14	
	Wednesday	21	41	48	45	63	61	27	11	
	Thursday	17	57	37	39	60	78	28	12	
	Friday	15	57	51	67	53	63	29	19	
	Saturday	21	23	19	57	53	43	34	27	Wknd
	Sunday	26	36	20	28	36	28	15	11	
		Dark Conditions		AM Peak	Light Conditions		PM Peak	Dark Conditions		
	Kosciusko County	Time of Day								
		12AM - 3AM	3AM - 6AM	6AM - 9AM	9AM - 12PM	12PM - 3PM	3PM - 6PM	6PM - 9PM	9PM - 12AM	
Day of week	Monday	1	1	7	6	3	7	2	1	Weekday
	Tuesday	3	2	8	4	3	6	2	4	
	Wednesday	1	3	1	5	4	4	1	1	
	Thursday	2	5	1	6	4	6	1	1	
	Friday	3	5	4	6	6	3	4	2	
	Saturday	5	6	6	6	4	3	3	2	Wknd
	Sunday	8	5	2	5	4	3	4	0	
		Dark Conditions		AM Peak	Light Conditions		PM Peak	Dark Conditions		

Table 5. Marshall and St. Joseph County Fatal and Serious Injury Crashes by Day of Week and Time of Day

	Marshall County	Time of Day								
		12AM - 3AM	3AM - 6AM	6AM - 9AM	9AM - 12PM	12PM - 3PM	3PM - 6PM	6PM - 9PM	9PM - 12AM	
Day of week	Monday	4	10	12	12	17	23	9	5	Weekday
	Tuesday	4	14	11	12	11	13	3	4	
	Wednesday	5	13	4	8	10	9	5	5	
	Thursday	2	14	7	8	4	9	7	4	
	Friday	1	5	13	14	12	9	14	8	
	Saturday	5	6	4	7	13	9	5	8	Wknd
	Sunday	6	13	6	3	7	15	9	6	
		Dark Conditions		AM Peak	Light Conditions		PM Peak	Dark Conditions		
	St. Joseph County	Time of Day								
		12AM - 3AM	3AM - 6AM	6AM - 9AM	9AM - 12PM	12PM - 3PM	3PM - 6PM	6PM - 9PM	9PM - 12AM	
Day of week	Monday	32	36	50	55	55	82	37	27	Weekday
	Tuesday	20	41	50	60	76	67	41	20	
	Wednesday	18	42	55	50	51	74	40	21	
	Thursday	22	40	55	41	58	74	52	24	
	Friday	35	37	56	65	57	69	59	26	
	Saturday	42	50	35	60	56	64	56	33	Wknd
	Sunday	52	44	30	35	35	39	39	28	

Weather Conditions

Weather conditions are not a factor of great concern as the majority of FSI crashes occurred in clear weather conditions. Figure 11 displays the breakdown of weather conditions for all FSI crashes in the region.

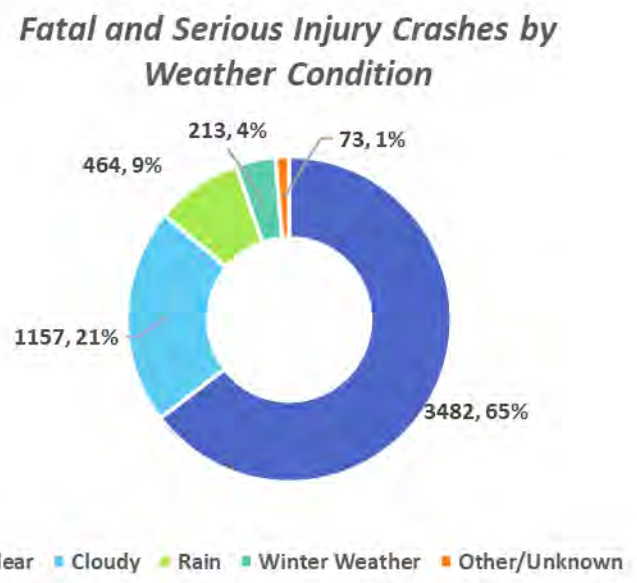


Figure 11. Fatal and Serious Injury Crashes by Weather Condition

Lighting Conditions

Lighting conditions are not a factor of great concern as the majority of FSI crashes occurred during daylight or dark, lit conditions. Figure 12 displays the breakdown of lighting conditions for all FSI crashes in the region.

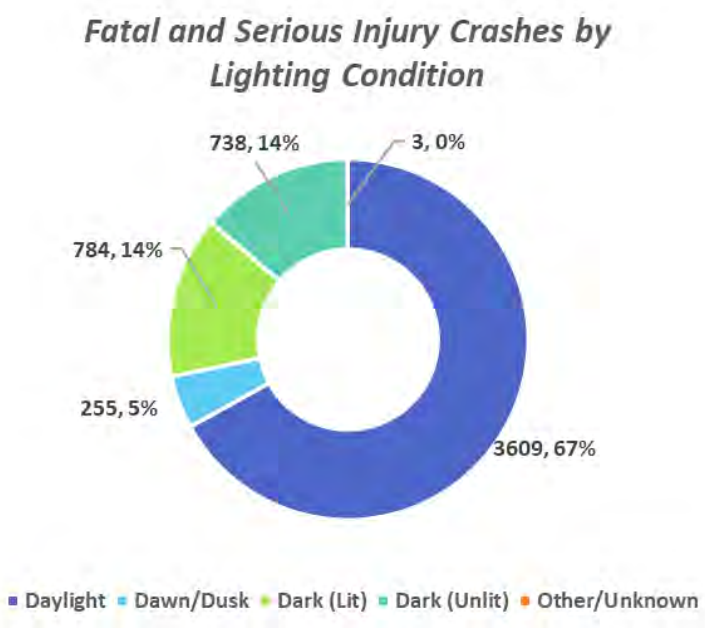


Figure 12. Fatal and Serious Injury Crashes by Lighting Condition

Demographic Data

As displayed below, FSI crashes in the MACOG region more predominately involve males. Across both genders, the fluctuation in age is consistent. The largest share of crashes involve ages 15-34, and the share decreases as age increases. The one variance from this trend is the small share of crashes involves ages 15 and under. Figure 13 displays the full breakdown of both age and gender for all FSI crashes in the region.

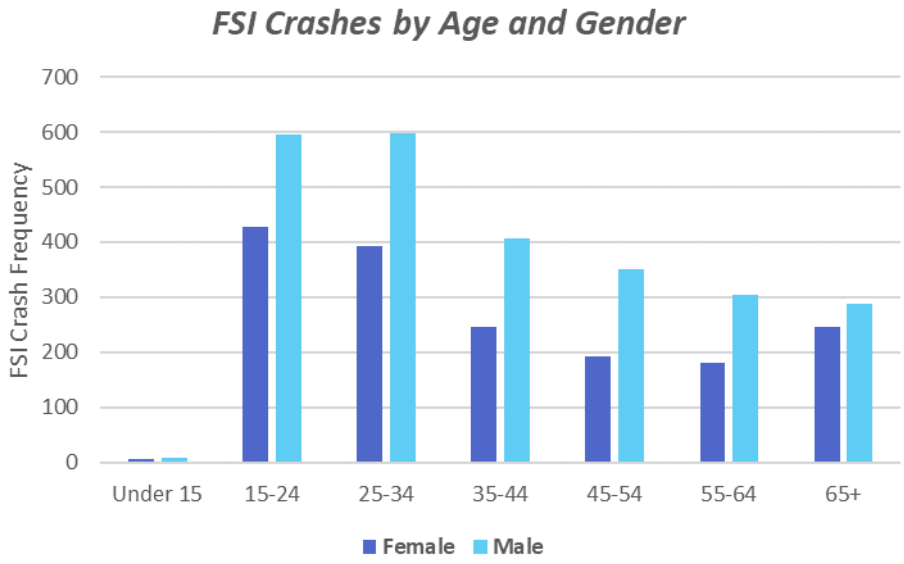


Figure 13. Fatal and Serious Injury Crashes by Age and Gender

Sincerely,



Catherine Girves | Project Manager

TOOLE DESIGN
20 East Broad Street | Columbus, OH 43215
cgirves@tooledesign.com | 614.407.9122 x459

Appendix A: Maps of Fatal and Serious Injury Crashes by County and Mode

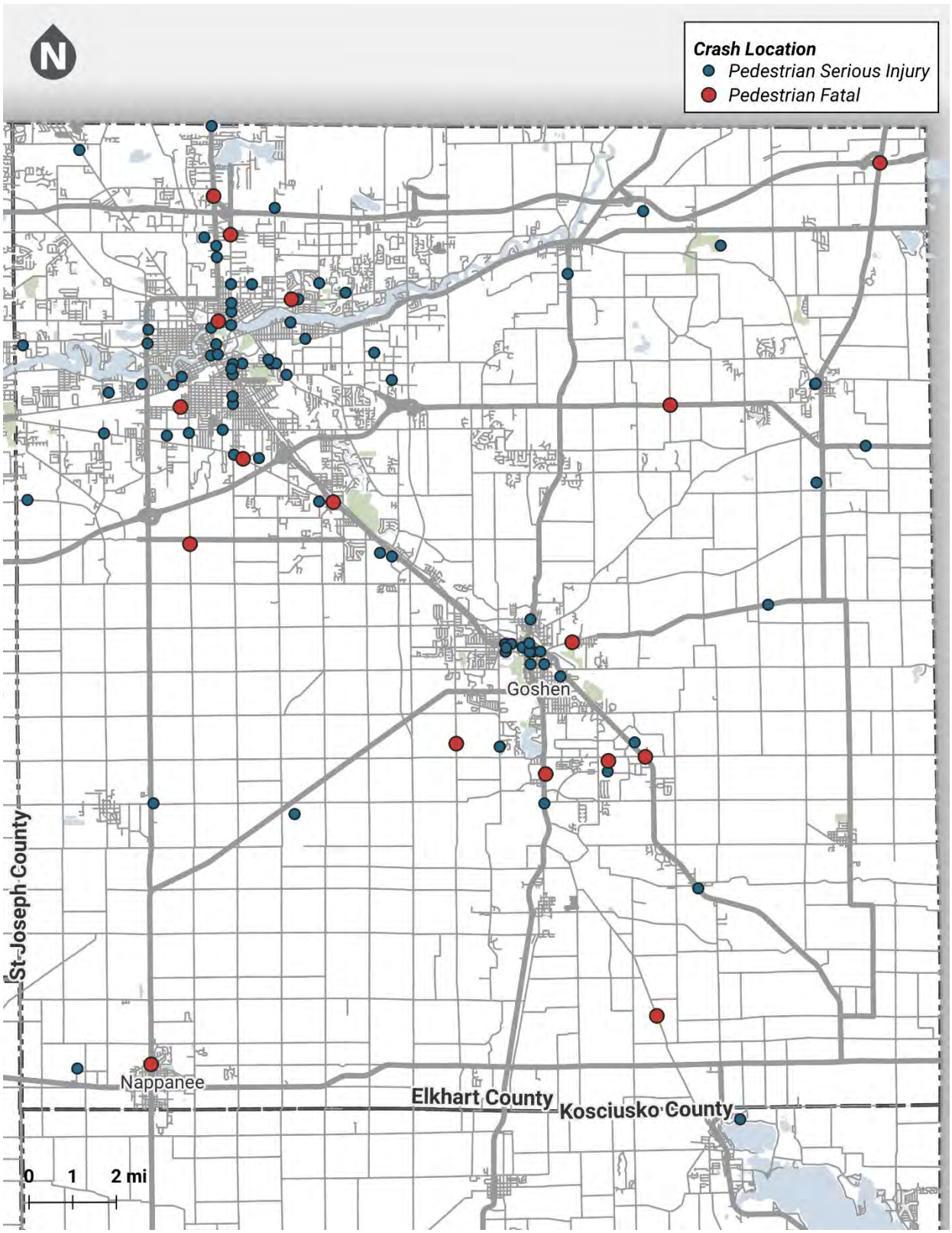


Figure 12. Pedestrian Fatal and Serious Injury Crashes in Elkhart County

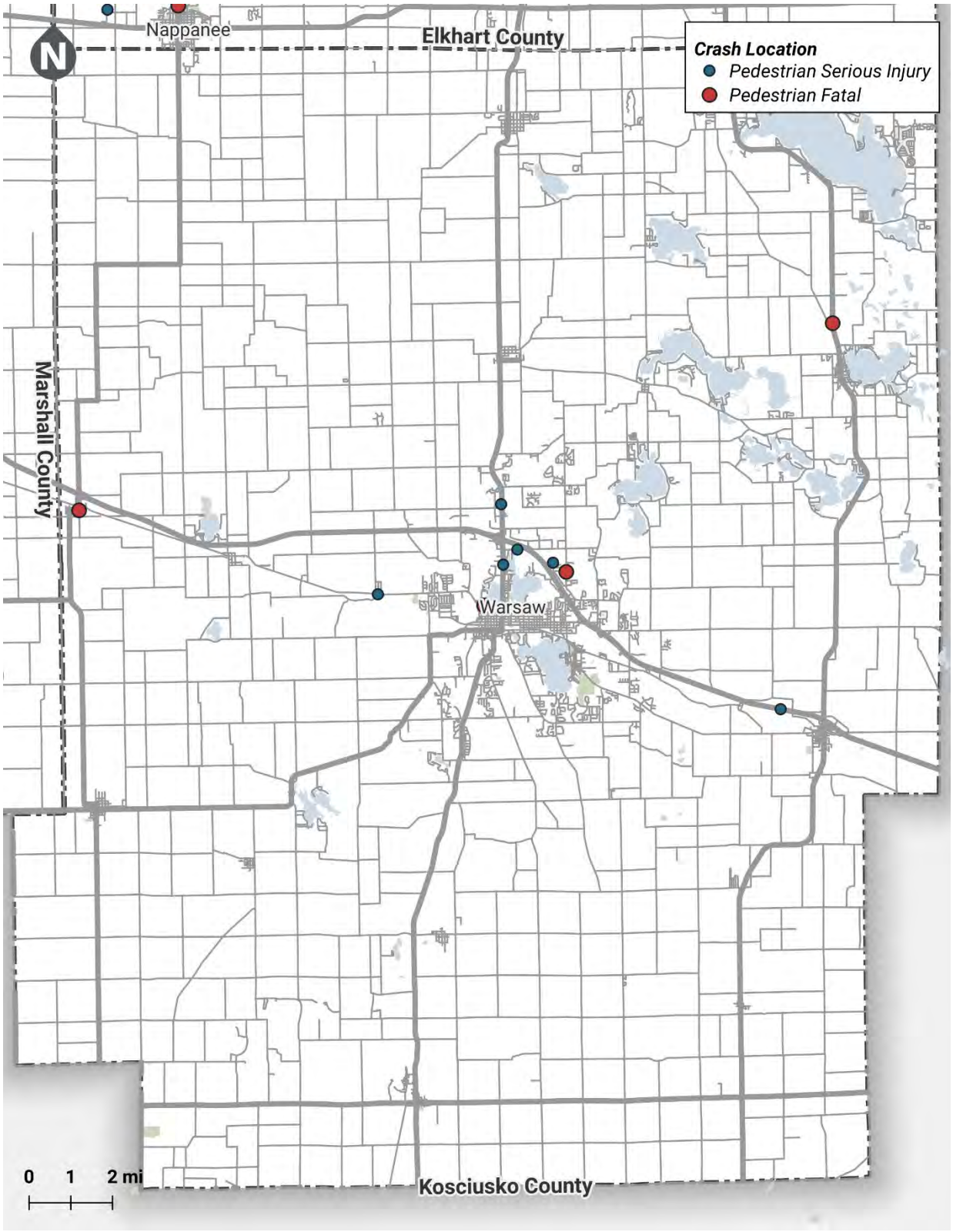


Figure 13. Pedestrian Fatal and Serious Injury Crashes in Kosciusko County

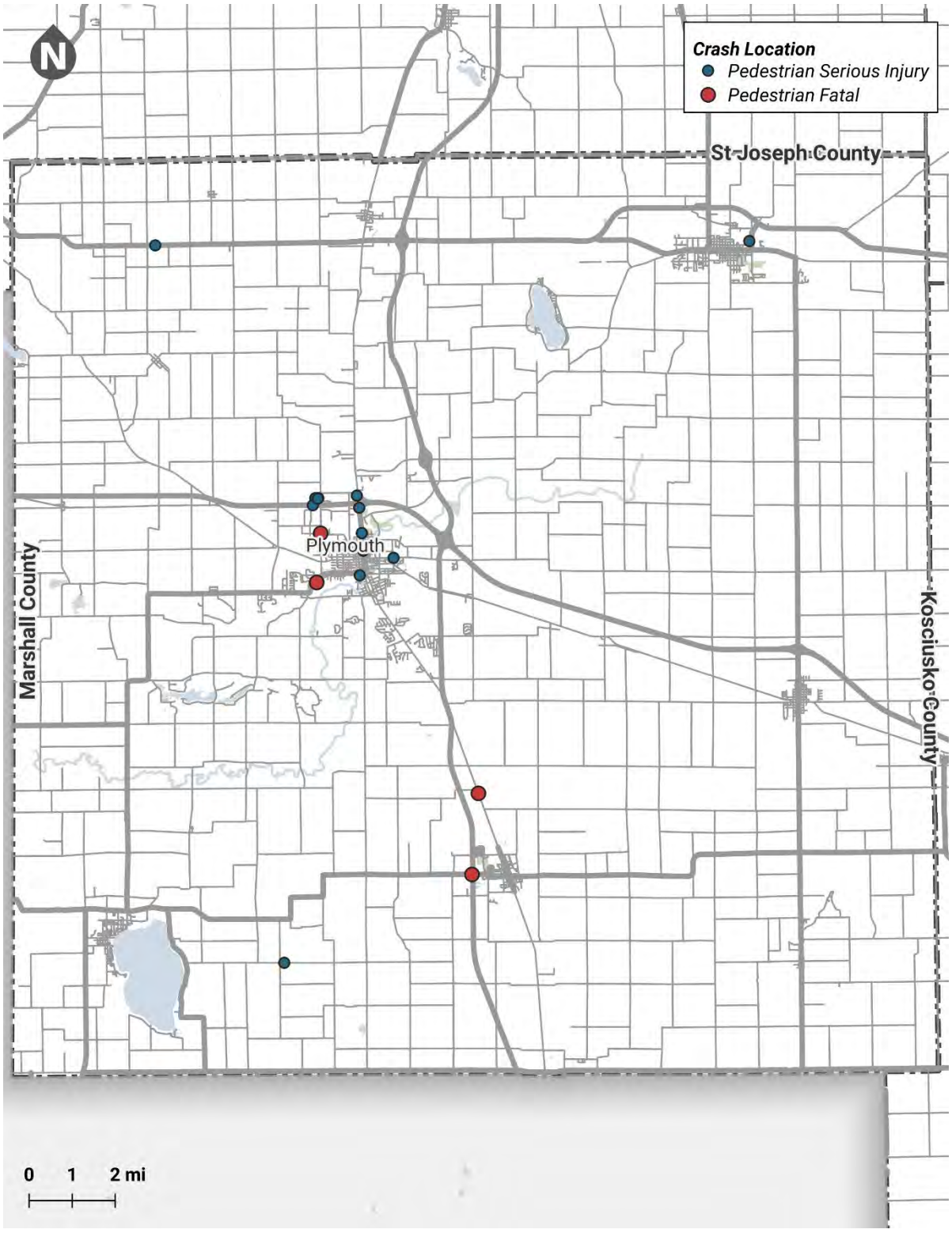
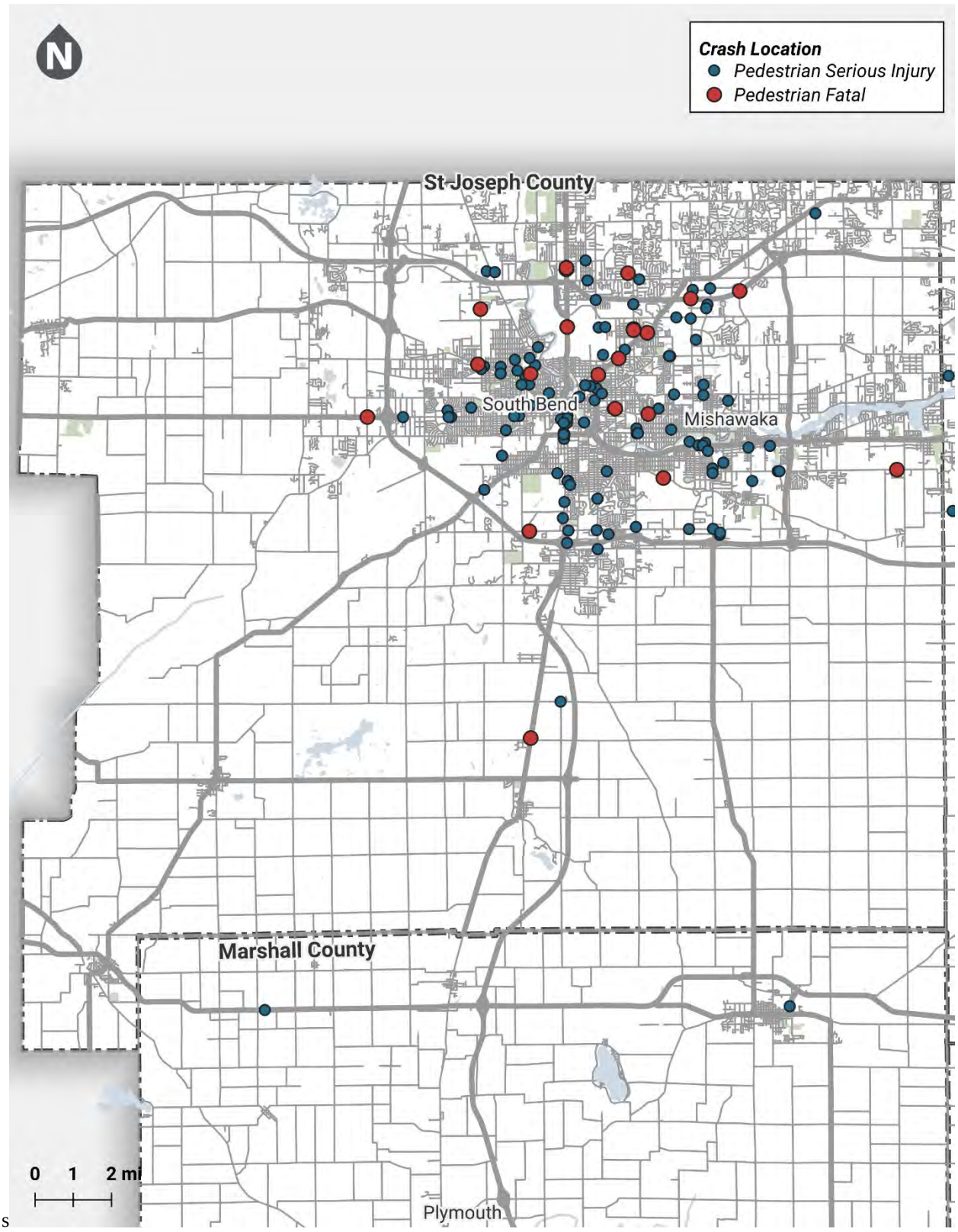


Figure 14. Pedestrian Fatal and Serious Injury Crashes in Marshall County



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Figure 15. Pedestrian Fatal and Serious Injury Crashes in St. Joseph County

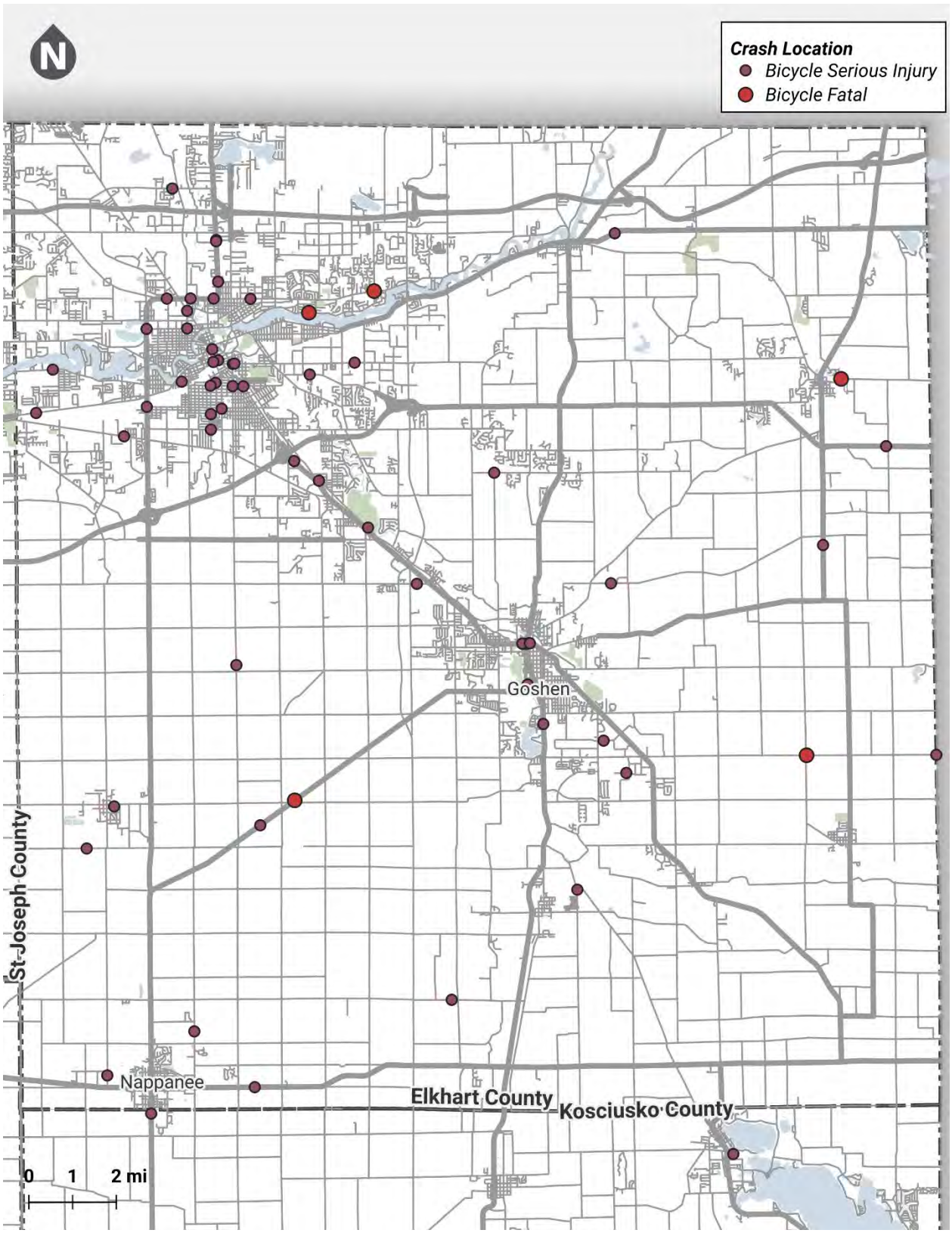


Figure 16. Bicycle Fatal and Serious Injury Crashes in Elkhart County

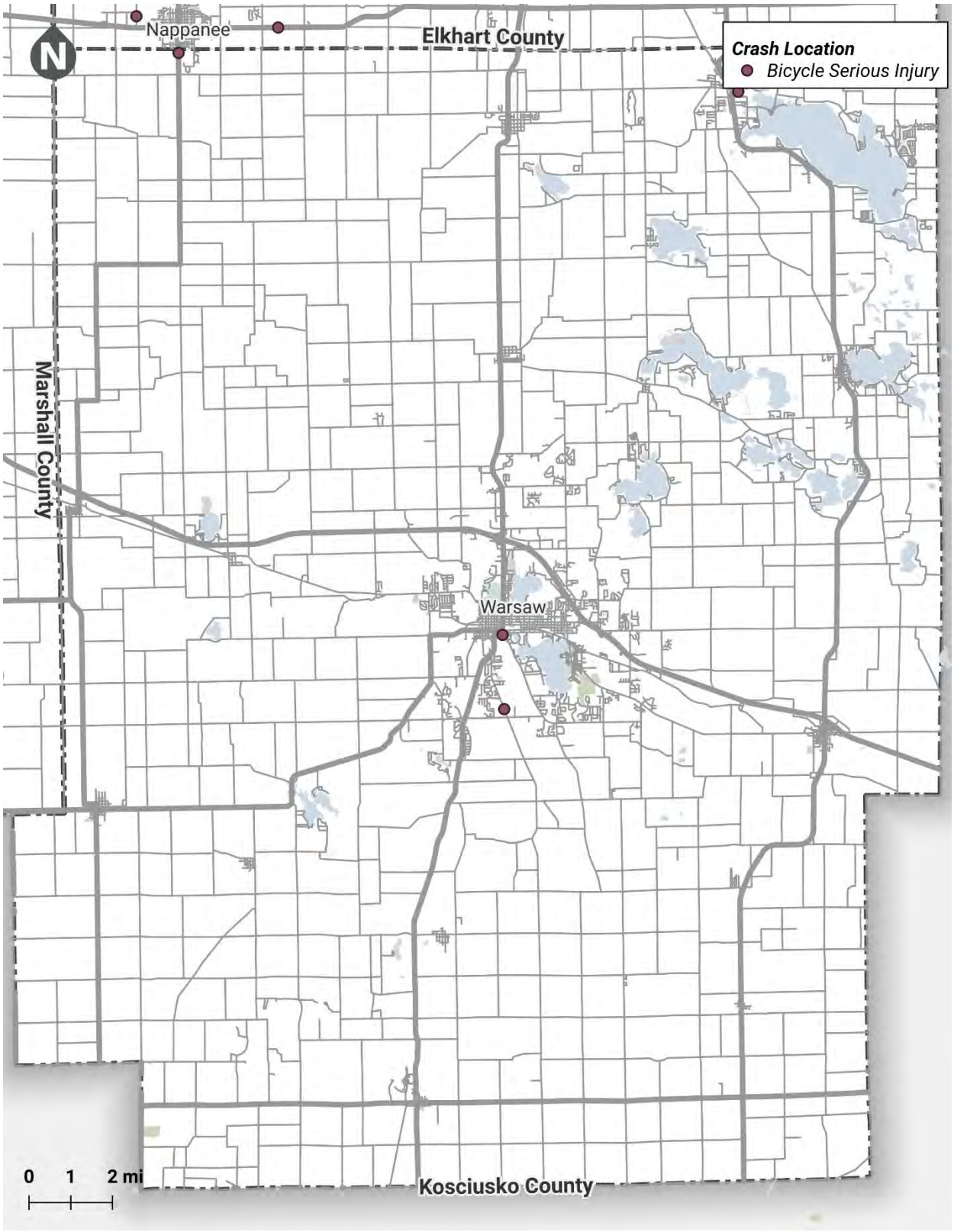


Figure 17. Bicycle Fatal and Serious Injury Crashes in Kosciusko County

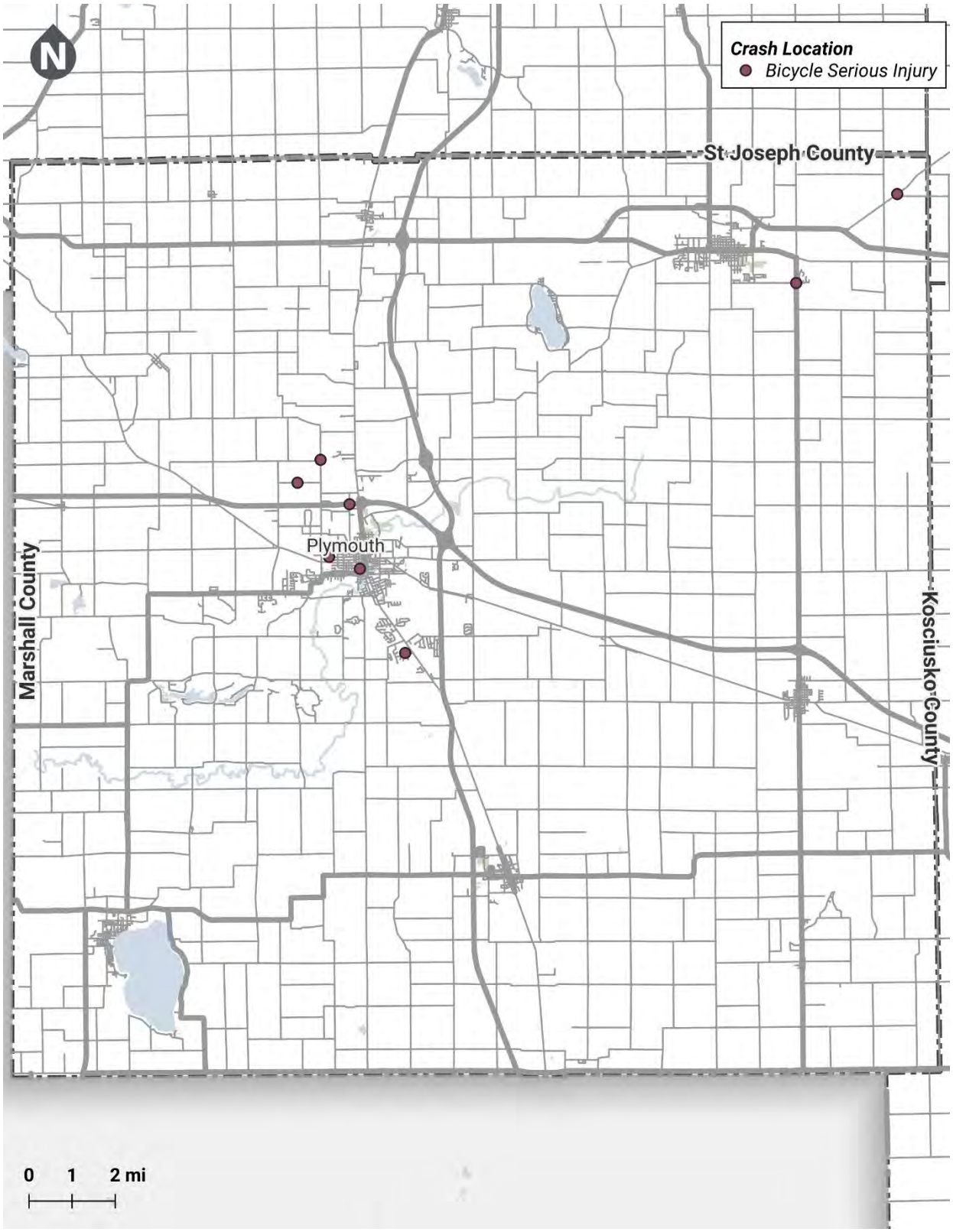


Figure 18. Bicycle Fatal and Serious Injury Crashes in Marshall County

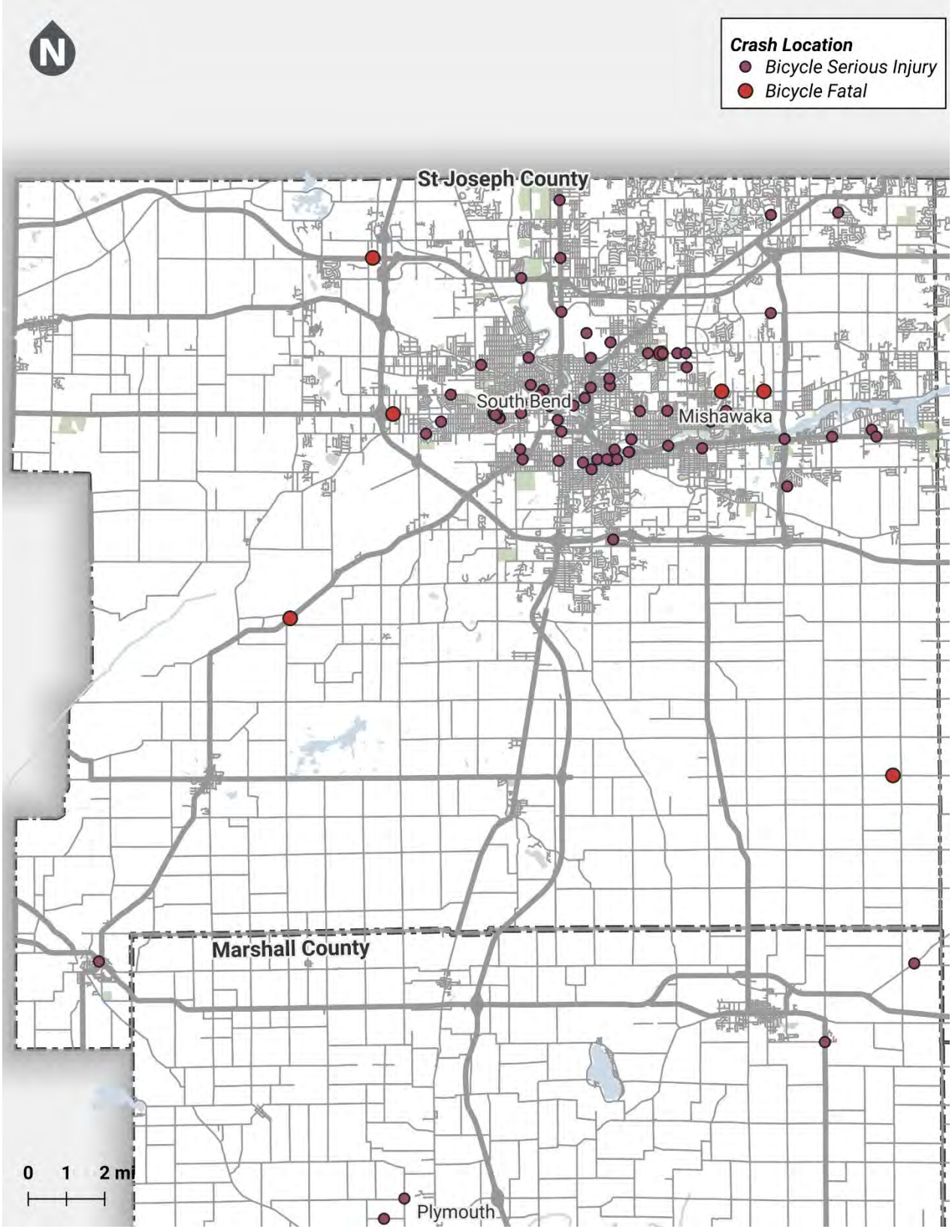


Figure 19. Bicycle Fatal and Serious Injury Crashes in St. Joseph County

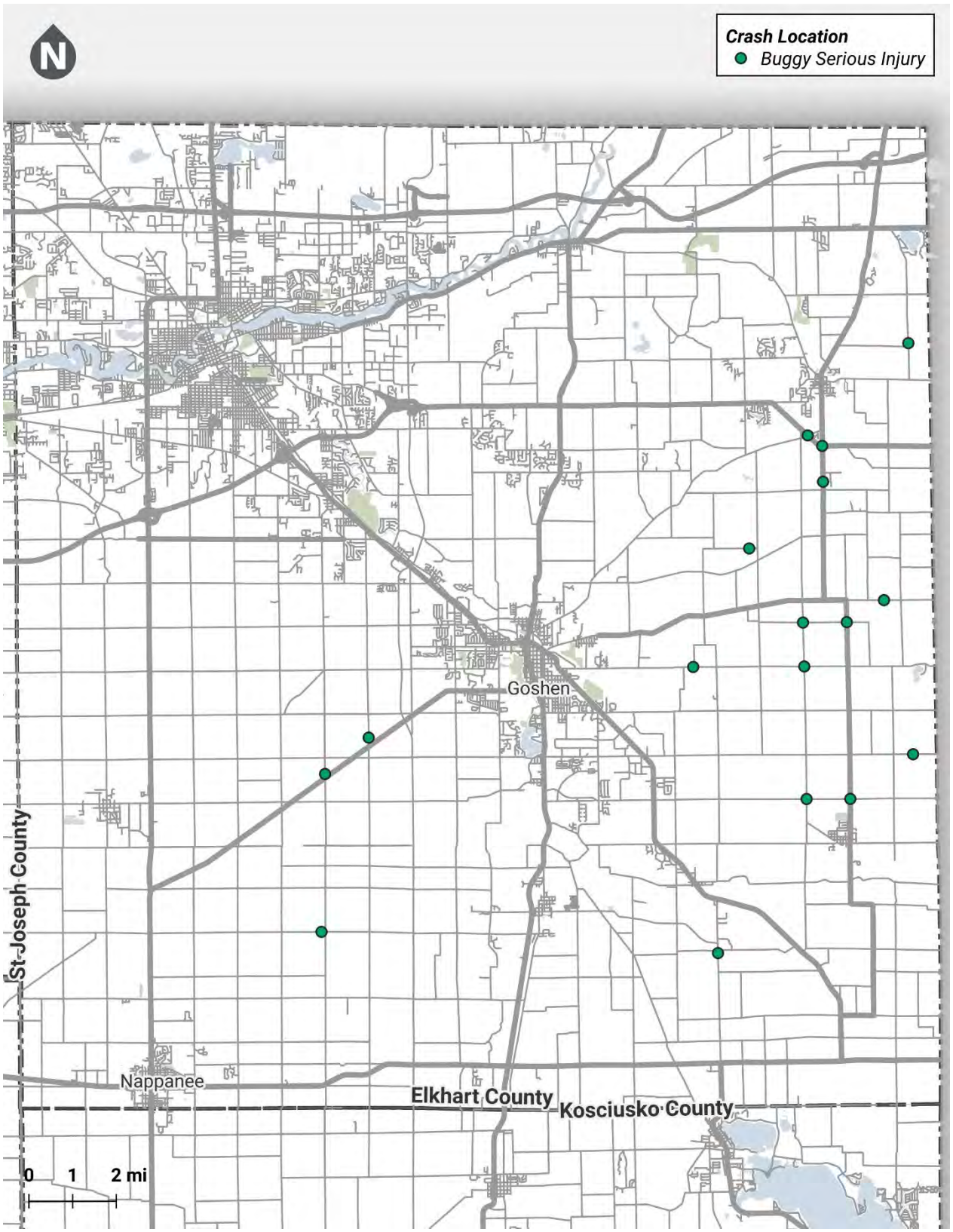


Figure 20. Buggy Fatal and Serious Injury Crashes in Elkhart County

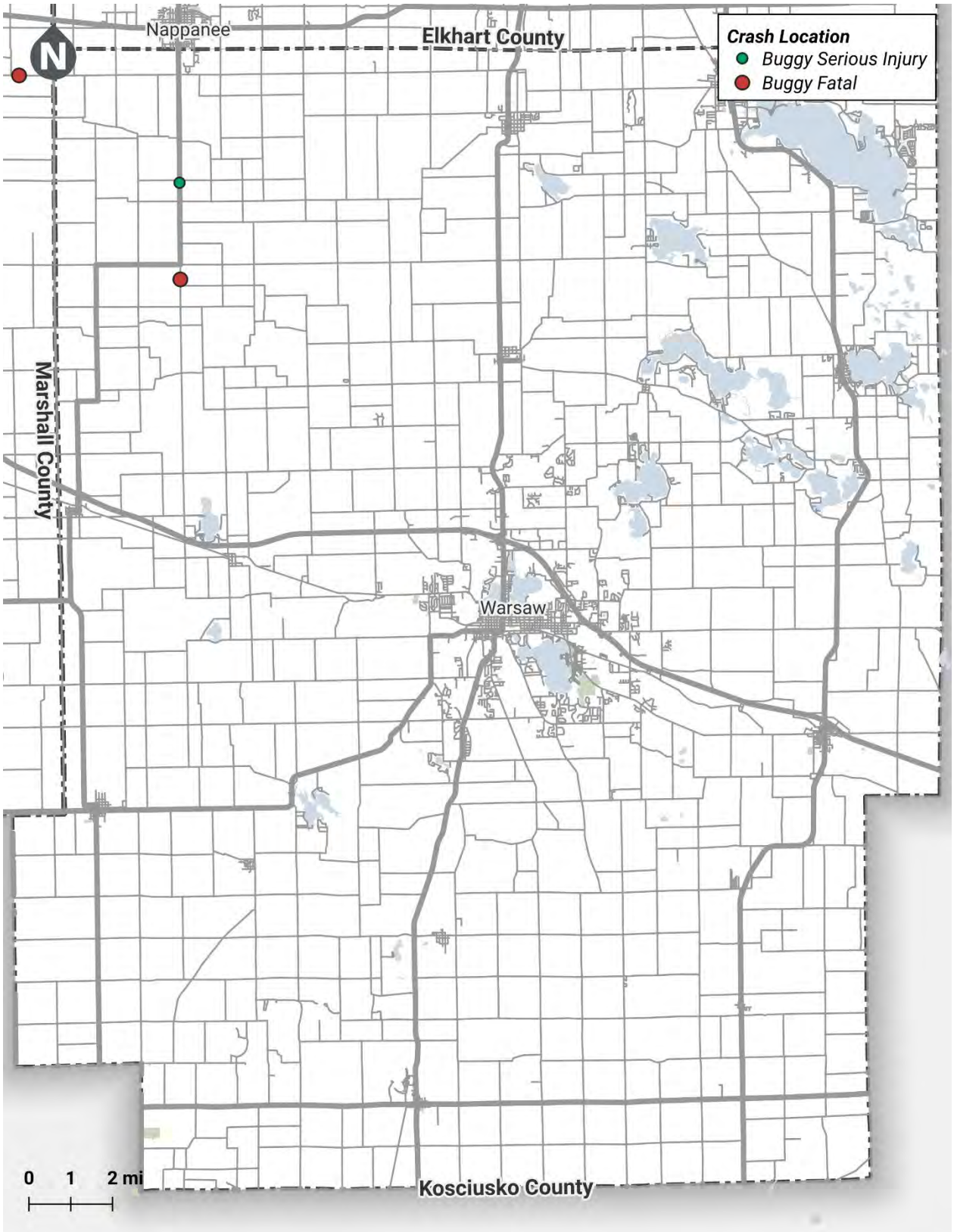


Figure 21. Buggy Fatal and Serious Injury Crashes in Kosciusko County



Figure 22. Buggy Fatal and Serious Injury Crashes in Marshall County

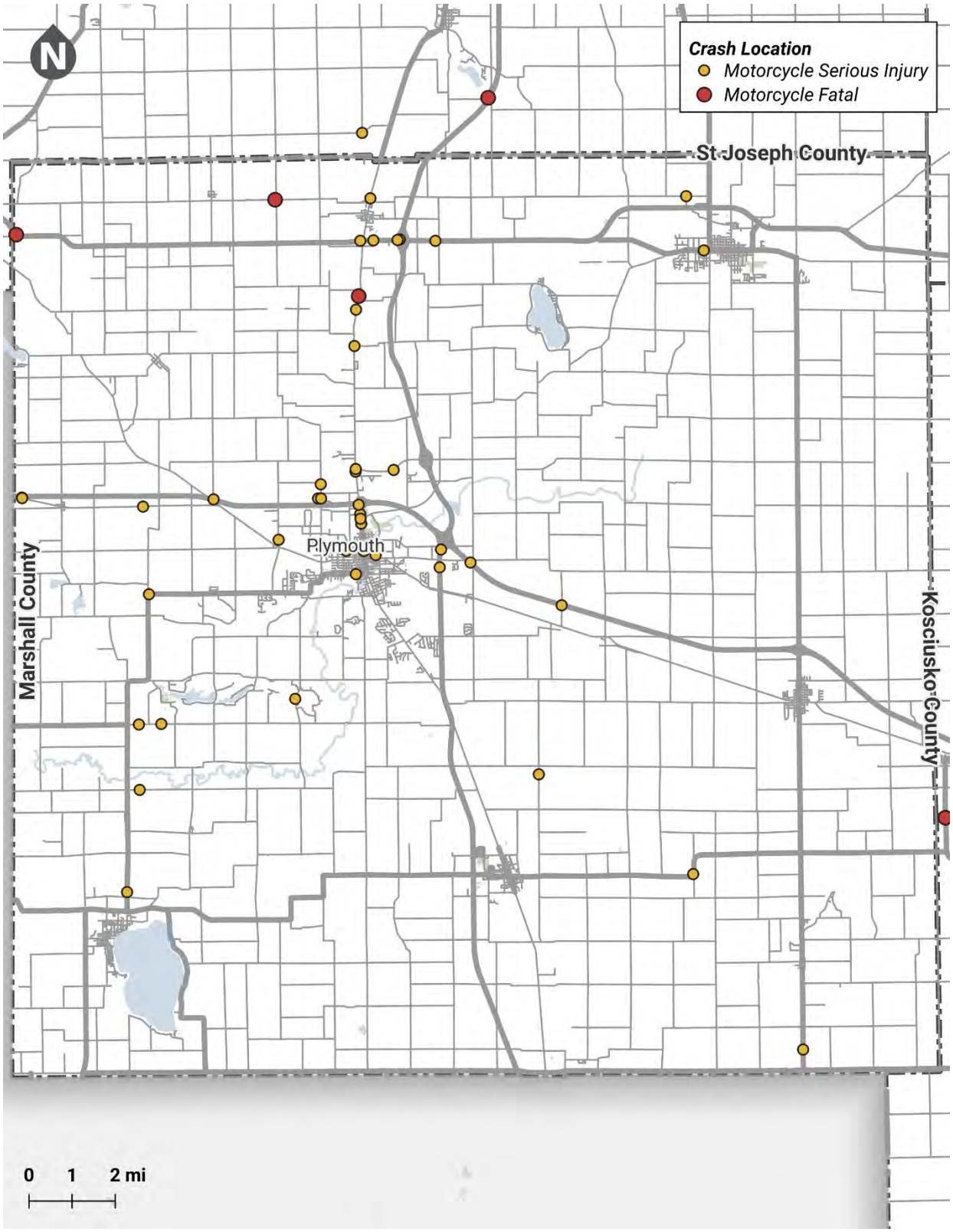


Figure 23. Motorcycle Fatal and Serious Injury Crashes in Marshall County

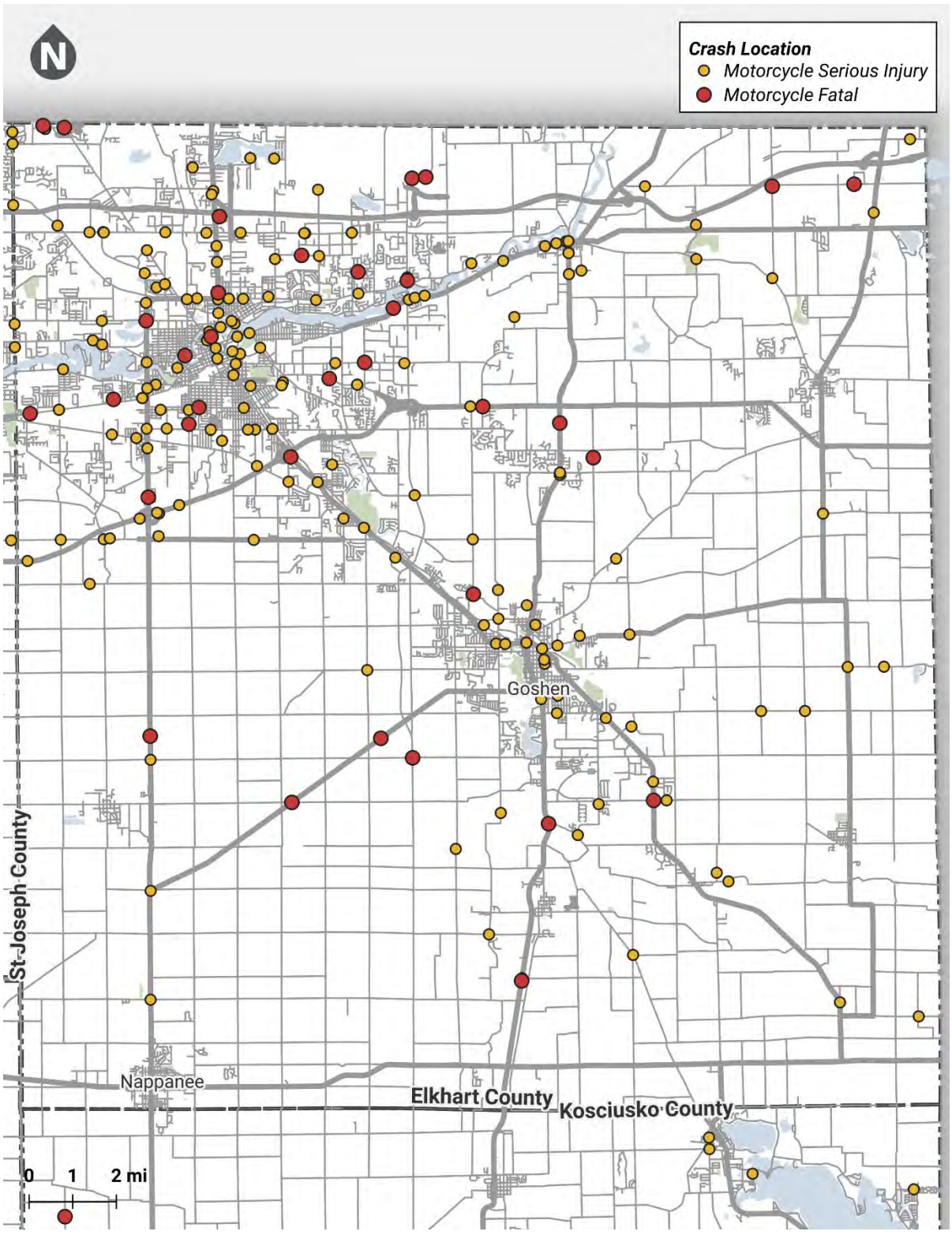


Figure 24. Motorcycle Fatal and Serious Injury Crashes in Elkhart County

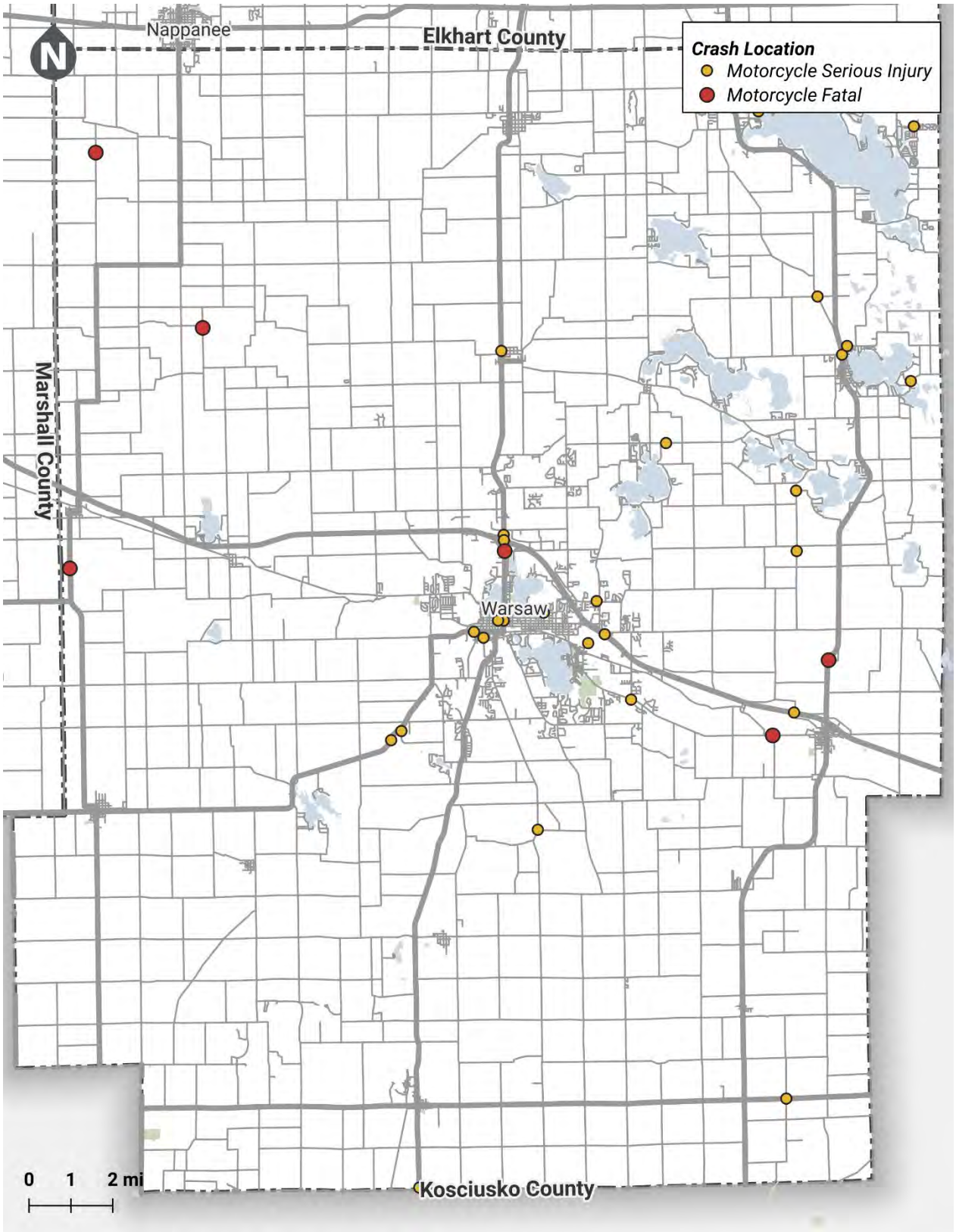


Figure 25. Motorcycle Fatal and Serious Injury Crashes in Kosciusko County

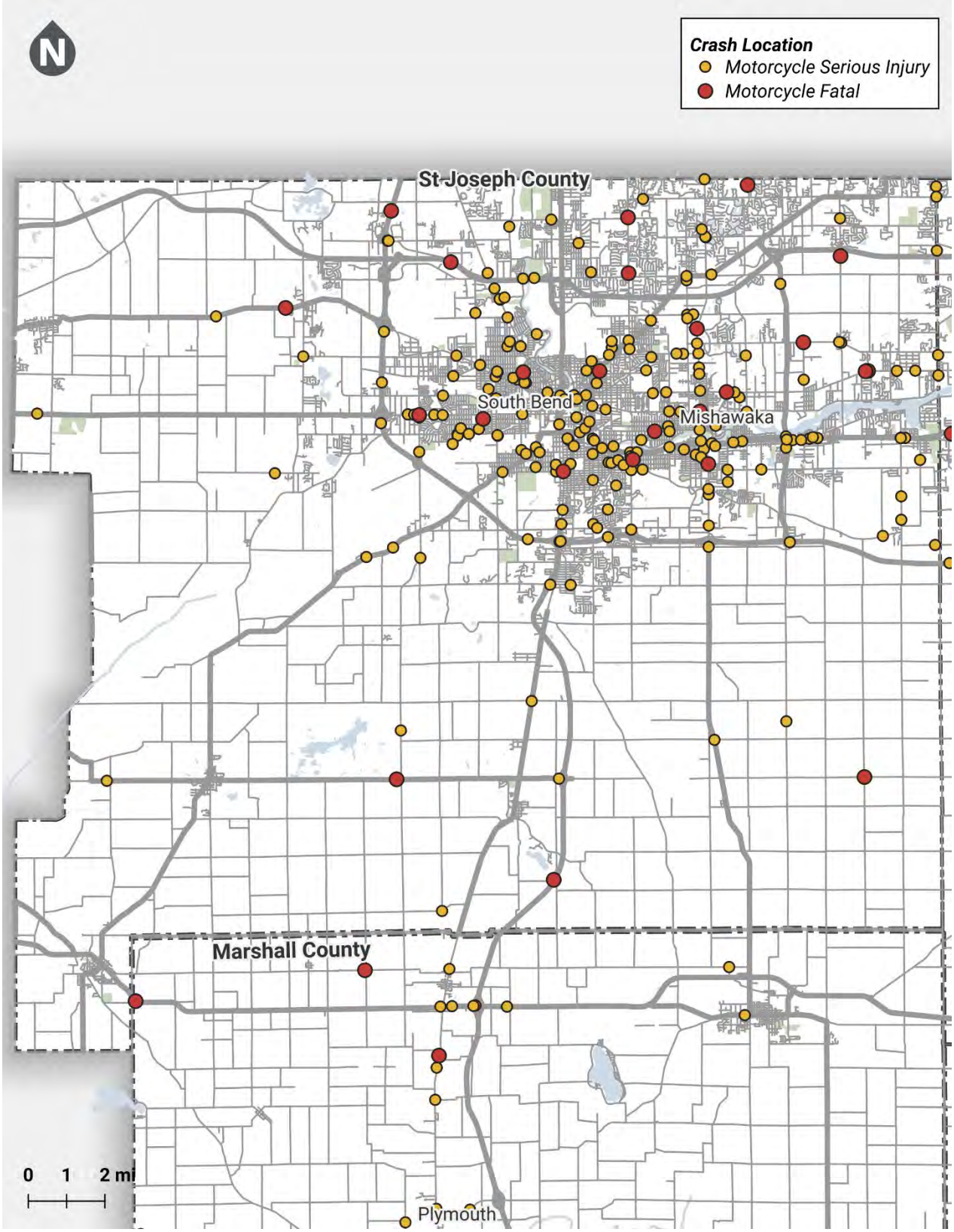


Figure 27. Motorcycle Fatal and Serious Injury Crashes in St. Joseph County

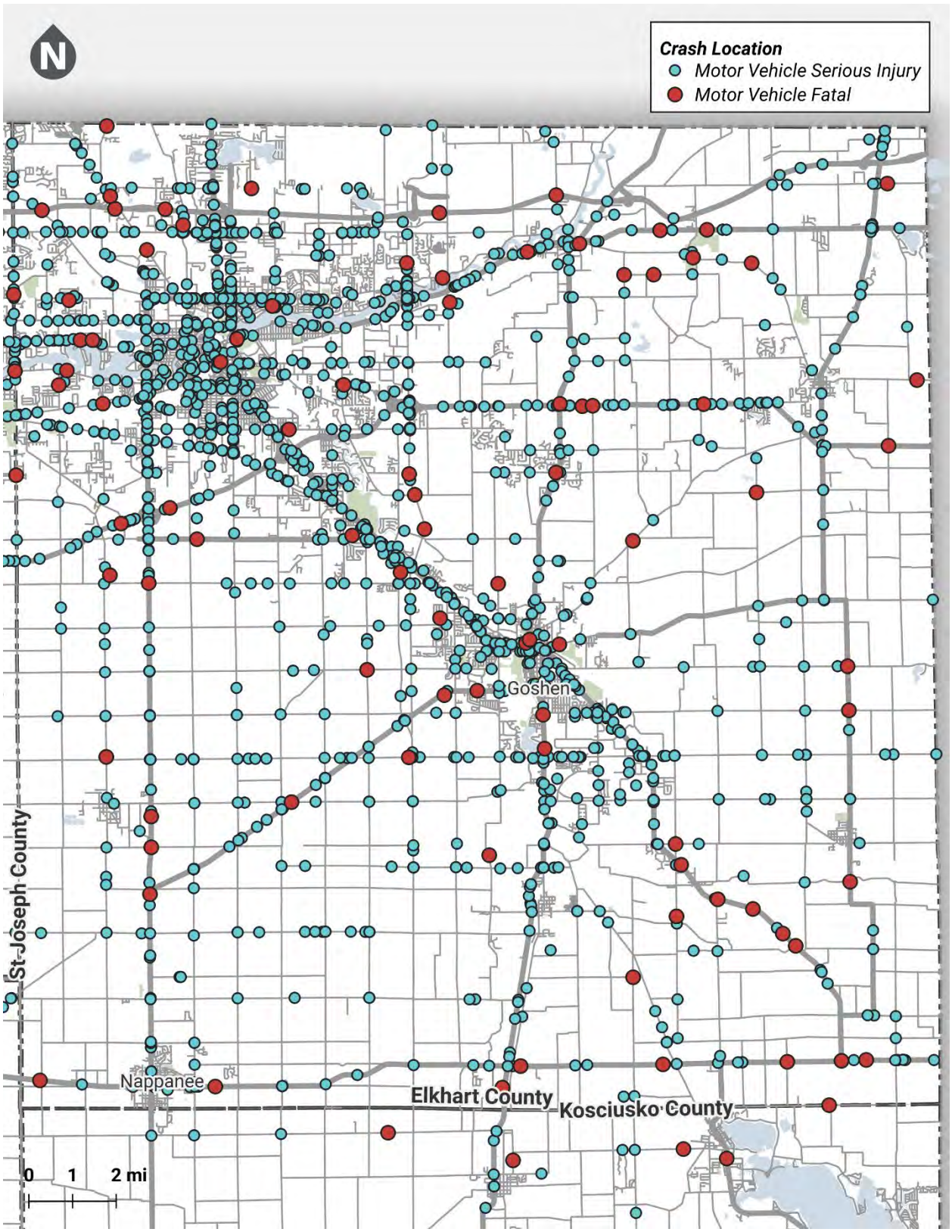


Figure 28. Motor Vehicle Fatal and Serious Injury Crashes in Elkhart County

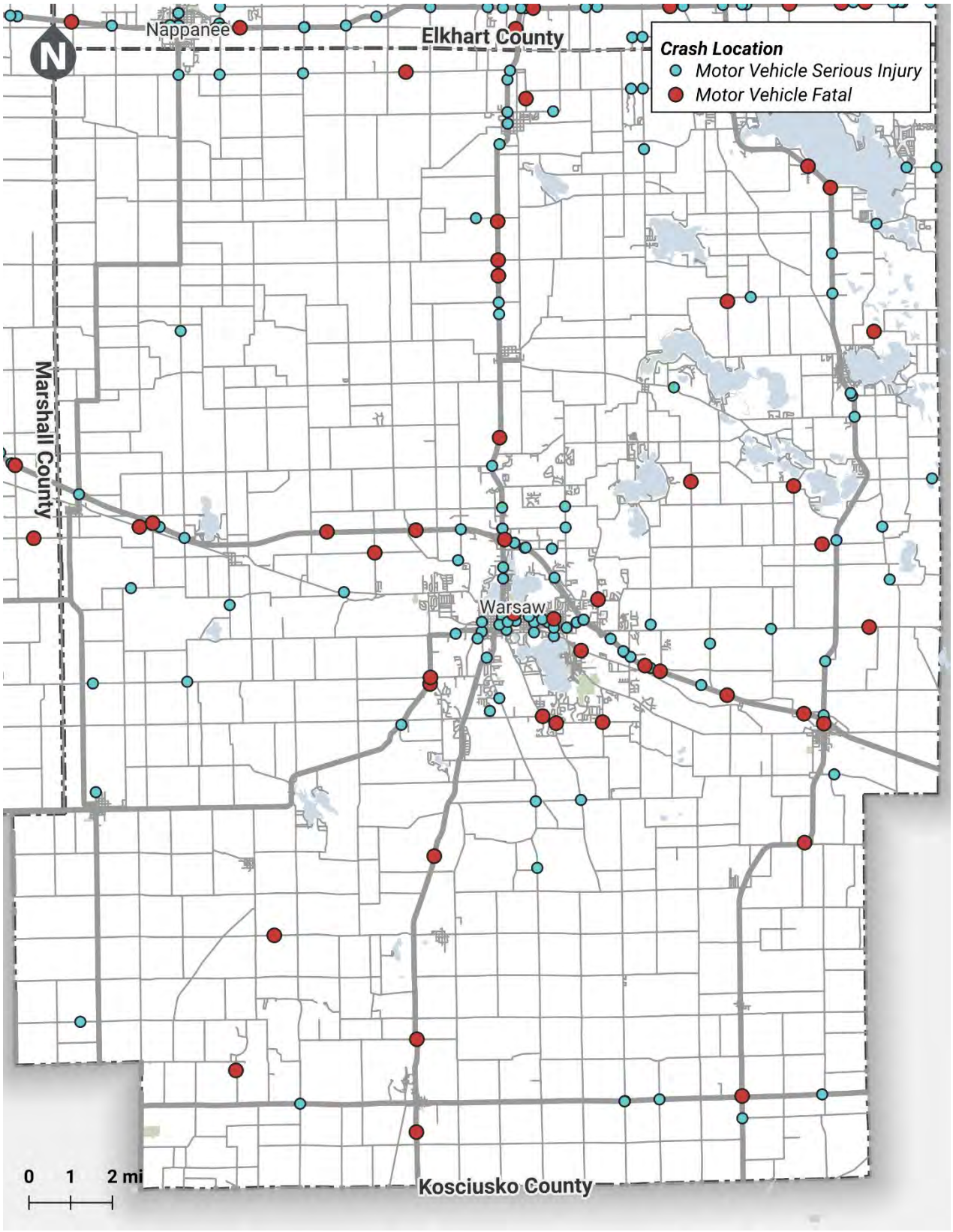


Figure 29. Motor Vehicle Fatal and Serious Injury Crashes in Kosciusko County

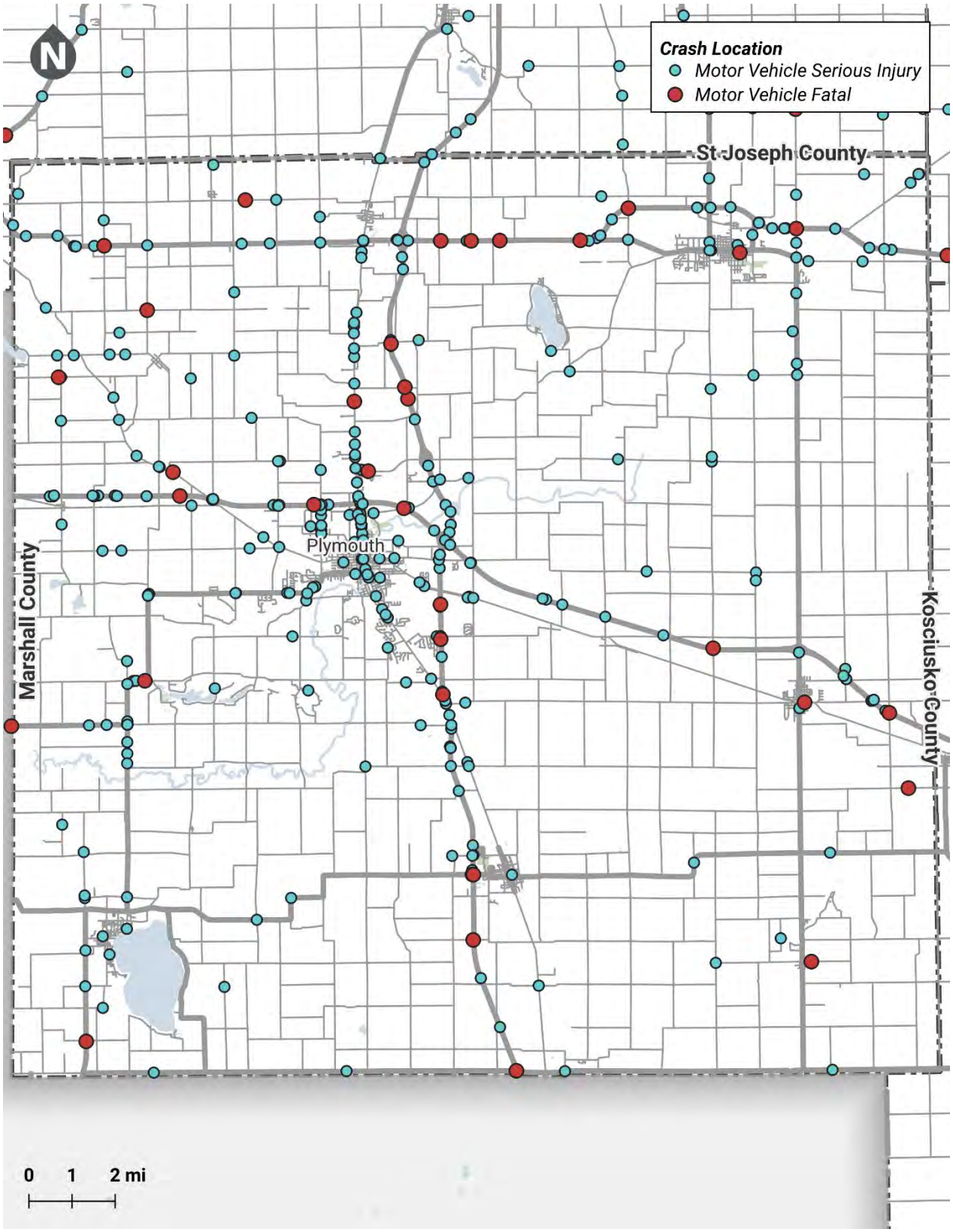


Figure 30. Motor Vehicle Fatal and Serious Injury Crashes in Marshall County

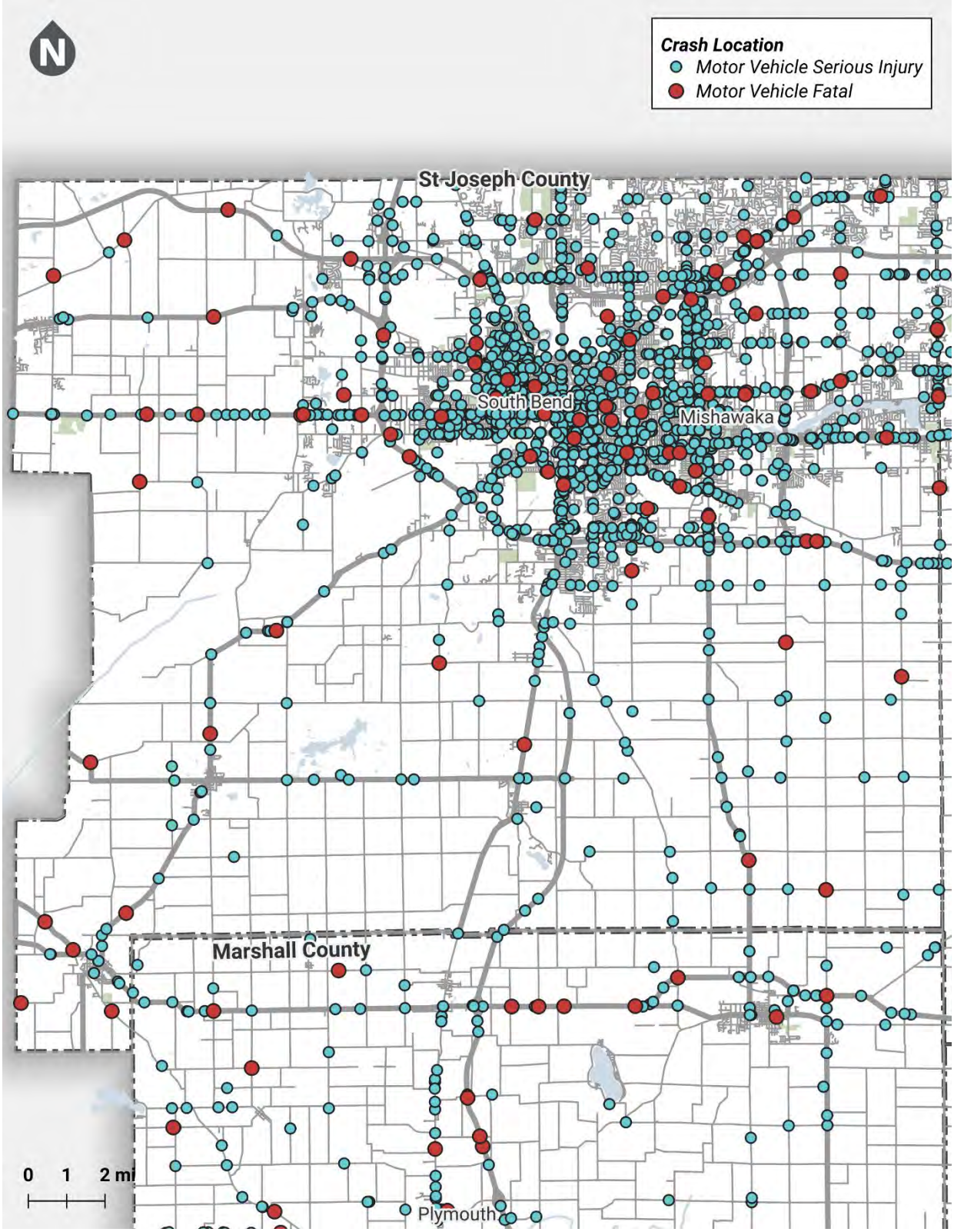


Figure 31. Motor Vehicle Fatal and Serious Injury Crashes in St. Joseph County

SS4A HIGH INJURY NETWORK METHODOLOGY MEMORANDUM

January 2, 2025

To: Caitlin Stevens and David Harker
Organization: Michiana Area Council of Governments (MACOG)
From: Catherine Girves, Rahul Rajbhara, and Tariq Shihadah
Project: MACOG Regional Safety Action Plan

Re: High Injury Network Methodology Memorandum

The subject memorandum outlines the methodology used to determine the High Injury Network (HIN) for the Michiana Area Council of Governments (MACOG) Regional Safety Action Plan, which aims to identify roadway segments with a history of significant fatal and serious injury (FSI) crashes.

High Injury Network Methodology

For Task 4 of the MACOG Safe Streets & Roads for All (SS4A) Regional Safety Action Plan, the project team identified High Injury Networks (HIN) using FSI crash data from 2019-2023 within the MACOG study area. The methodology also utilized comprehensive roadway inventory data provided by MACOG to enhance the accuracy of HIN determinations.

Methodology

To create the High Injury Network (HIN), the network screening process as outlined in AASHTO's Highway Safety Manual (HSM) was utilized. This screening process objectively considers the crash history and roadway factors that may contribute to future FSI crashes, aiding MACOG in identifying and prioritizing locations for potential safety investments. The five-step HIN methodology presented in **Figure 1** consists of the following:

1. **Establish Focus:** This step is used to define the problem and determine the reason for applying a network screening effort. For a large-scale initiative like the MACOG Regional Safety Action Plan, the focus is on identifying all roadway segments that require safety treatments to reduce FSI crash frequency and severity across all modes of travel, namely pedestrian, bicycle, horse-drawn buggies, motorcycles, and motor vehicles.
2. **Identify Network:** This step involves dividing the roadways into smaller segments for a more detailed analysis. The results of this segmentation can then be collectively evaluated for corridor safety assessments, allowing for a thorough examination of specific areas. For this purpose, the roadway network was broken into 0.25-mile-long segments throughout the study area network.
3. **Select Performance Measure:** Identifying areas with high frequencies of FSI crashes helps pinpoint specific corridors where safety interventions can be most effective at saving lives. In our methodology, the frequency of FSI crashes of each mode was utilized as the primary performance measure.
4. **Select Screening Method:** The sliding window method was employed to identify high-risk roadway networks by systematically analyzing crash data within overlapping segments or "windows" of a fixed length. By moving this window incrementally along the roadway, we collected and assessed the relative frequency of FSI crashes along each segment, creating a continuous risk profile of the entire network. This approach helps pinpoint specific roadway corridors with relatively high concentrations of FSI crashes of each mode, allowing for data driven safety

interventions. The sliding window analysis approach tallies length weighted FSI crash frequency values along each 0.25 mile segment, producing non-integer crash frequency values.

5. **Screen and Evaluate Results:** In this final step, individual HINs are developed for each mode of transportation throughout the region by selecting minimum weighted FSI crash frequency threshold values within each county and visualizing roads in each county which exceed this threshold for each mode. For our methodology, the average frequencies of FSI crashes were used to identify HINs for each individual mode for the four counties within MACOG. This approach ensures that all modes of transportation are accounted for and that all counties receive adequate mileage for prioritization.

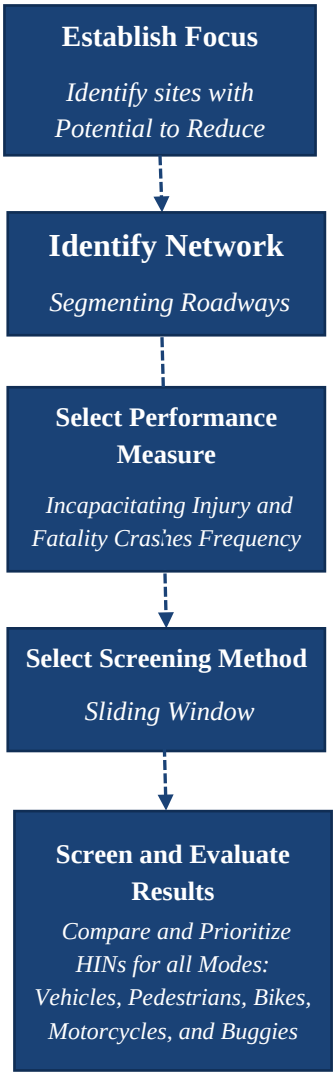


Figure 1: High Injury Network (HIN) Methodology

Results

Based on the methodology outlined in the memo, the roadway segments for each travel mode in the four counties were categorized according to the threshold frequency of FSI crashes presented in **Table 1**. These crash thresholds are a result of the steps outlined in the methodology section of the report. Given this methodology, the results are non-integer numbers as it is a compilation of weighted crash scores on overlapping roadway segments. Any segment that scores higher than the threshold identified in the analysis appears on the High Injury Netowrk (HIN). The High Injury Network (HIN) results for each mode are presented by mode and by county in maps included in **Appendix A**.

Table 1: High Injury Network (HIN) Fatal and Serious Injury (FSI) Crash Frequency Thresholds (All Modes)

County	Pedestrians	Bikes	Buggies	Motorcycles	Vehicles
Elkhart	0.363	0.316	0.226	0.342	0.810
Kosciusko	0.294	0.810	0.222	0.312	0.322
Marshall	0.333	0.311	0.240	0.337	0.476
St. Joseph	0.401	0.324	0.290	0.391	1.019

Tables 2-6 provide a summary of the key observations for each travel mode across four counties. For each county, it lists:

- **County Centerline Miles.** The total centerline miles of all study area roads within the county.
- **HIN Centerline Miles.** The centerline miles of the identified HIN roadways.
- **HIN Mileage Share.** The percentage of study area centerline miles within the county which are included in the HIN.
- **County FSI Crash Frequency.** The total number of FSI crashes within the county during the five-year study period.
- **HIN FSI Crash Frequency.** The length-weighted number of FSI crashes represented on the HIN.
- **HIN FSI Crash Share.** The percentage of study period FSI crashes within the county which are represented on the HIN.

Table 2: County High Injury Network (HIN) Statistic Summaries for People Walking and Using Mobility Devices

County	Centerline Miles	HIN Centerline Miles	HIN Mileage Share	County FSI Crash Frequency	HIN FSI Crash Frequency	HIN FSI Crash Share
Elkhart	1847	25.5	1.4%	76	54	71.1%
Kosciusko	1532	3.5	0.2%	9	9	100%
Marshall	1214	5.7	0.5%	12	11	91.7%
St. Joseph	2064	40.6	2.0%	118	82	69.5%

In Elkhart County, 71% of all fatal and serious injury crashes involving pedestrians occurred on 1.4% of the roads in the County. In Kosciusko County, 100% of all fatal and serious injury crashes involving pedestrians occurred on 0.2% of the roads in the County. In Marshall County, 92% of all fatal and serious injury crashes involving pedestrians occurred on 0.5%

of the roads in the County. In St. Joseph County, 70% of all fatal and serious injury crashes involving pedestrians occurred on 2% of the roads in the County.

Table 3: County High Injury Network (HIN) Statistic Summaries for People on Bicycles

County	County Centerline Miles	HIN Centerline Miles	HIN Mileage Share	County FSI Crash Frequency	HIN FSI Crash Frequency	HIN FSI Crash Share
Elkhart	1847	31	1.7%	63	62	98.4%
Kosciusko	1532	0.7	0.1%	3	2	66.7%
Marshall	1214	4.4	0.4%	8	7	87.5%
St. Joseph	2064	44.2	2.1%	71	70	98.6%

In Elkhart County, 98% of all fatal and serious injury crashes involving bicyclists occurred on 1.7% of the roads in the County. In Kosciusko County, 67% of all fatal and serious injury crashes involving bicyclists occurred on 0.1% of the roads in the County. In Marshall County, 88% of all fatal and serious injury crashes involving bicyclists occurred on 0.4% of the roads in the County. In St. Joseph County, 99% of all fatal and serious injury crashes involving bicyclists occurred on 2.1% of the roads in the County.

Table 4: County High Injury Network (HIN) Statistic Summaries for People in Buggies

County	County Centerline Miles	HIN Centerline Miles	HIN Mileage Share	County FSI Crash Frequency	HIN FSI Crash Frequency	HIN FSI Crash Share
Elkhart	1847	8.9	0.5%	17	14.9	100%
Kosciusko	1532	1.2	0.1%	2	1.0	100%
Marshall	1214	0.2	0.0%	1	3.3	100%
St. Joseph	2064	0	0.0%	0	5.8	0%

In Elkhart County, 100% of all fatal and serious injury crashes involving people in buggies occurred on 0.5% of the roads in the County. In Kosciusko County, 100% of all fatal and serious injury crashes involving people in buggies occurred on 0.1% of the roads in the County. In Marshall County, 100% of all fatal and serious injury crashes involving people in buggies occurred on 0.01% of the roads in the County.

Table 5: County High Injury Network (HIN) Statistic Summaries for People on Motorcycles

County	County Centerline Miles	HIN Centerline Miles	HIN Mileage Share	County FSI Crash Frequency	HIN FSI Crash Frequency	HIN FSI Crash Share
Elkhart	1847	76.8	4.2%	209	160	76.6%
Kosciusko	1532	19.2	1.3%	34	33	97.1%
Marshall	1214	12.3	1.0%	44	29	65.9%
St. Joseph	2064	93.5	4.5%	235	168	71.5%

In Elkhart County, 77% of all fatal and serious injury crashes involving people on motorcycles occurred on 4.2% of the roads in the County. In Kosciusko County, 97% of all fatal and serious injury crashes involving people on motorcycles occurred on 1.3% of the roads in the County. In Marshall County, 66% of all fatal and serious injury crashes involving people on motorcycles occurred on 1% of the roads in the County. In St. Joseph County, 72% of all fatal and serious injury crashes involving people on motorcycles occurred on 4.5% of the roads in the County.

Table 6: County High Injury Network (HIN) Statistic Summaries for People in Vehicles

County	County Centerline Miles	HIN Centerline Miles	HIN Mileage Share	County FSI Crash Frequency	HIN FSI Crash Frequency	HIN FSI Crash Share
Elkhart	1847	286.2	15.5%	1724	1266	73.4%
Kosciusko	1532	77.6	5.1%	150	145	96.7%
Marshall	1214	100.1	8.2%	395	294	74.4%
St. Joseph	2064	265.3	12.9%	2059	1513	73.5%

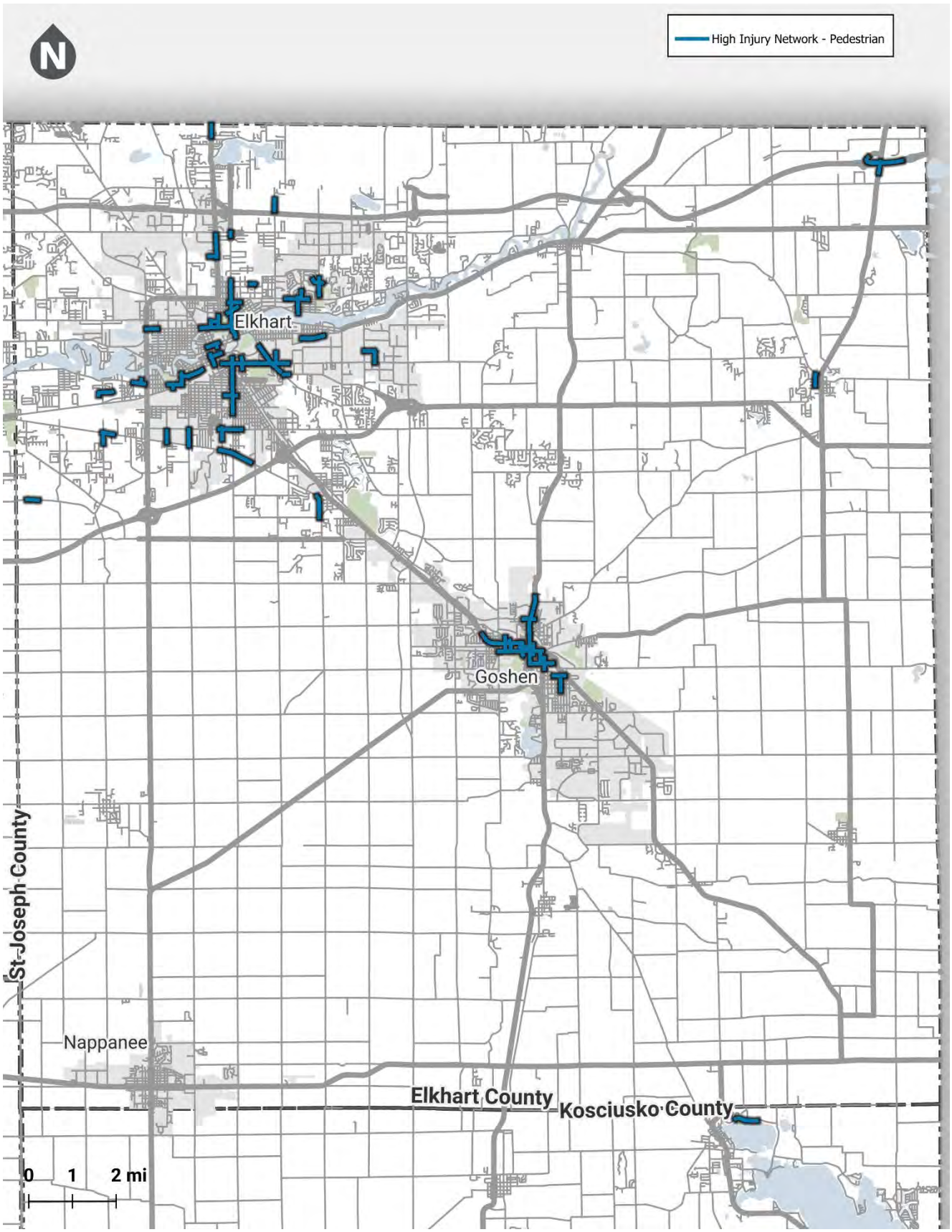
In Elkhart County, 73% of all fatal and serious injury crashes involving people in vehicles occurred on 16% of the roads in the County. In Kosciusko County, 97% of all fatal and serious injury crashes involving people in vehicles occurred on 5.1% of the roads in the County. In Marshall County, 74% of all fatal and serious injury crashes involving people in vehicles occurred on 8.2% of the roads in the County. In St. Joseph County, 74% of all fatal and serious injury crashes involving people in vehicles occurred on 12.9% of the roads in the County.

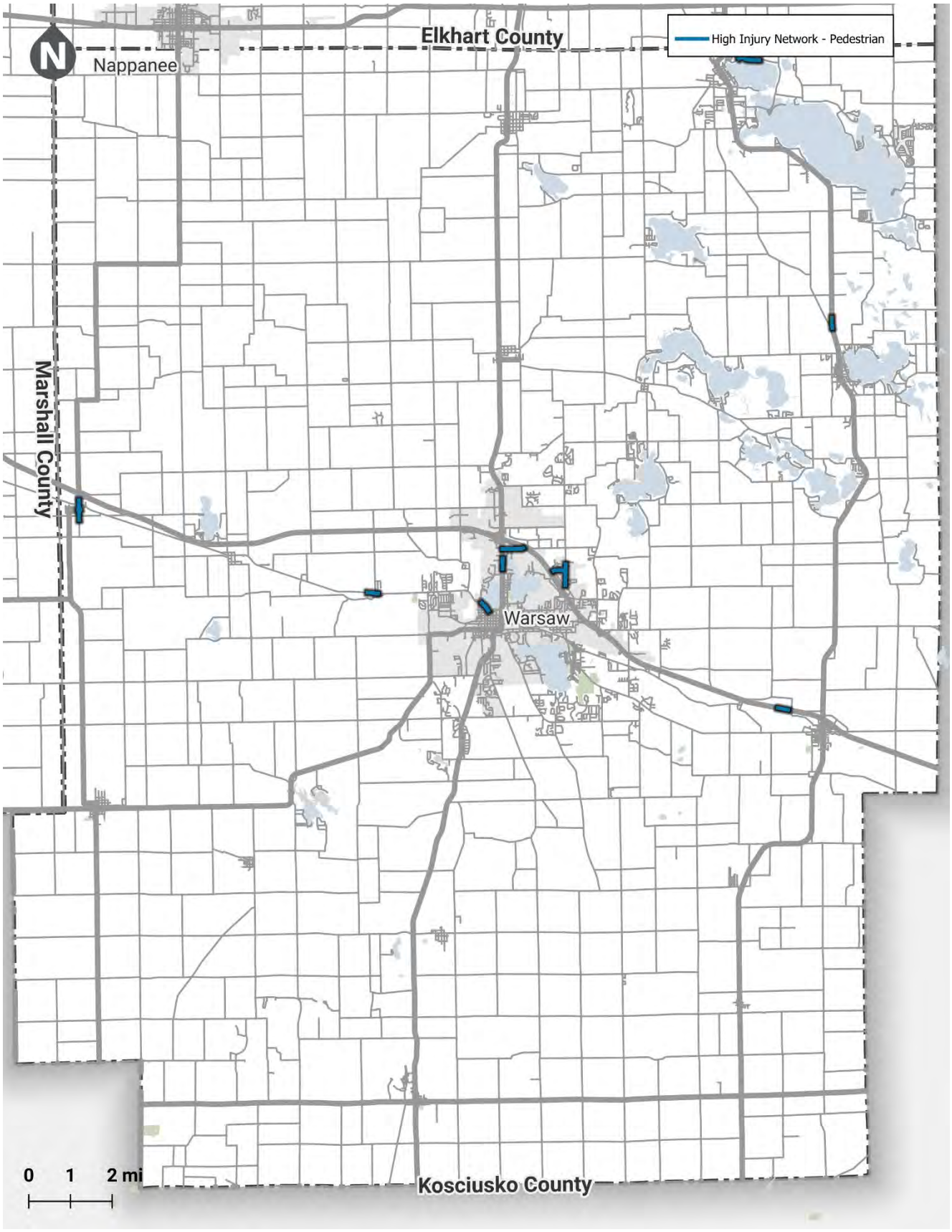
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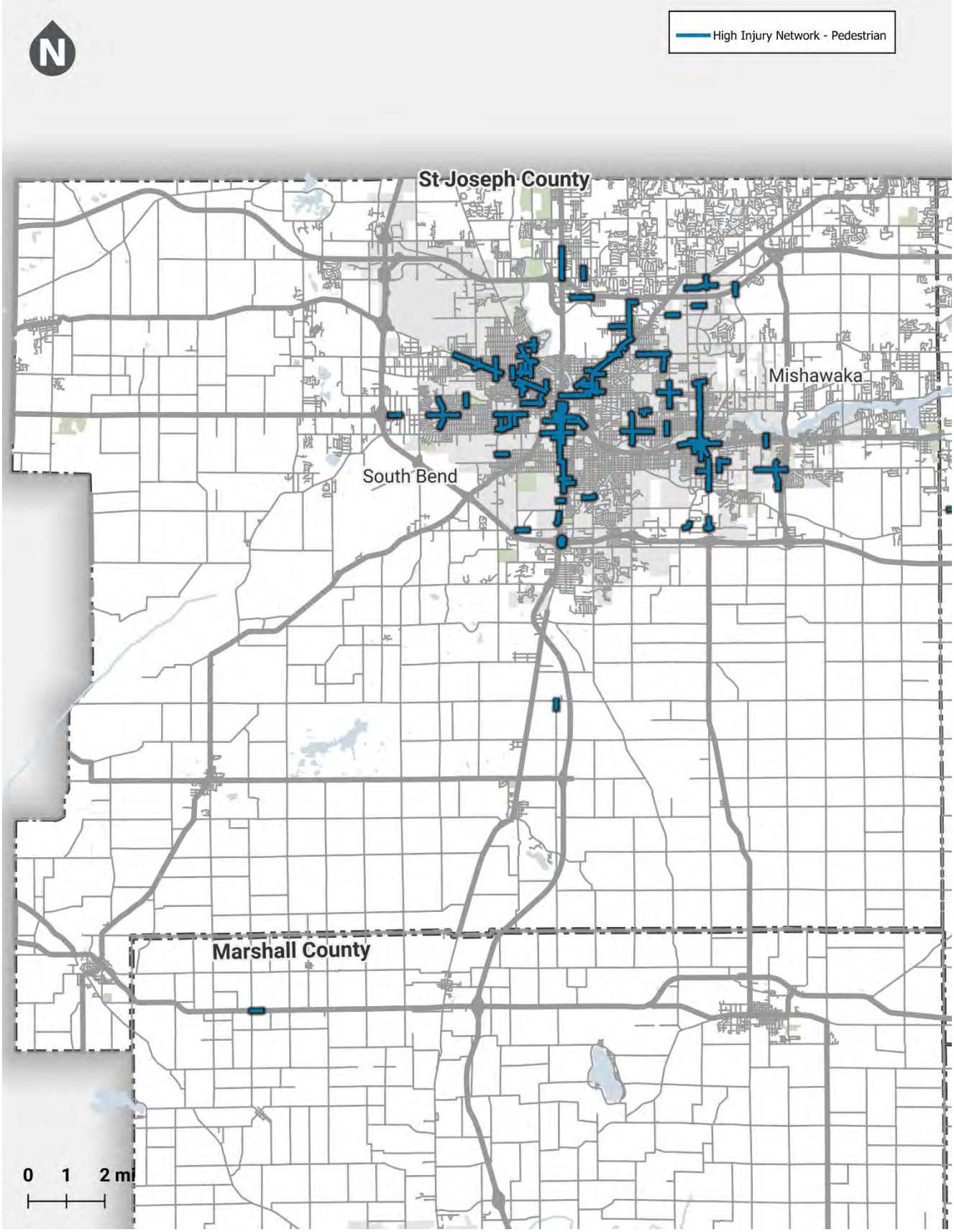


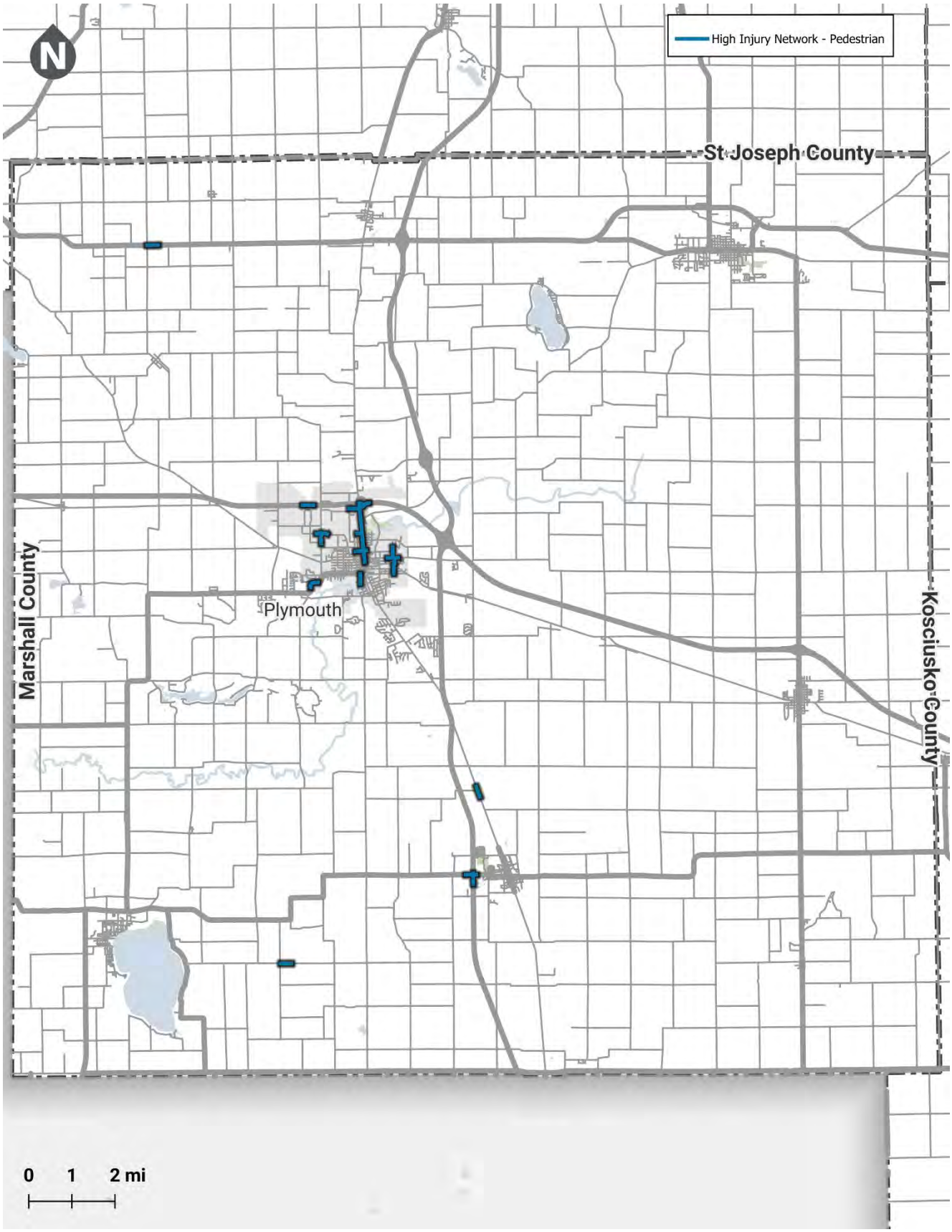
Catherine Girves | Project Manager
TOOLE DESIGN
20 East Broad Street | Columbus, OH 43215
cgirves@tooledesign.com | 614.407.9122 x459

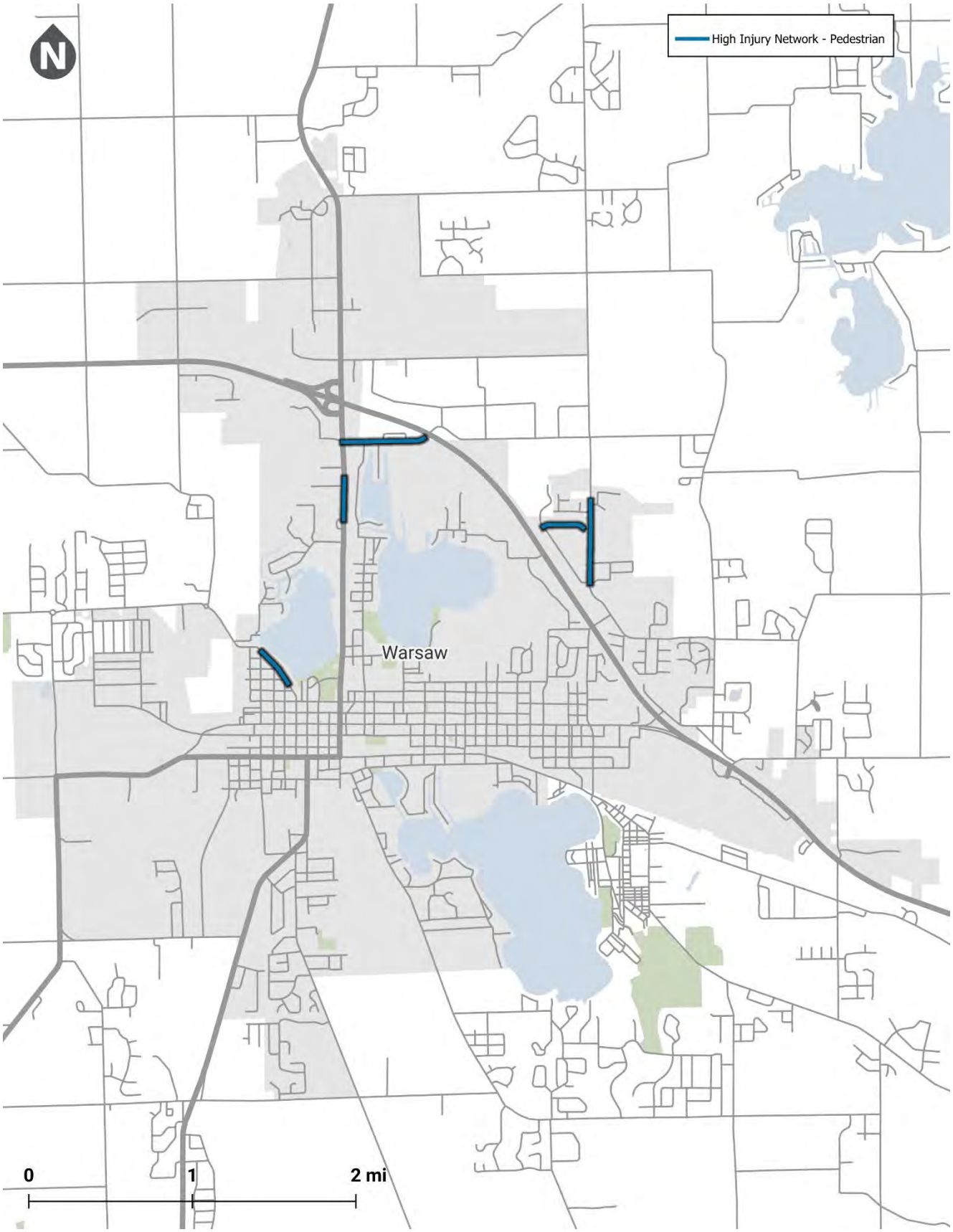
Appendix A: Maps of High-injury Networks by Travel Mode, County, and City

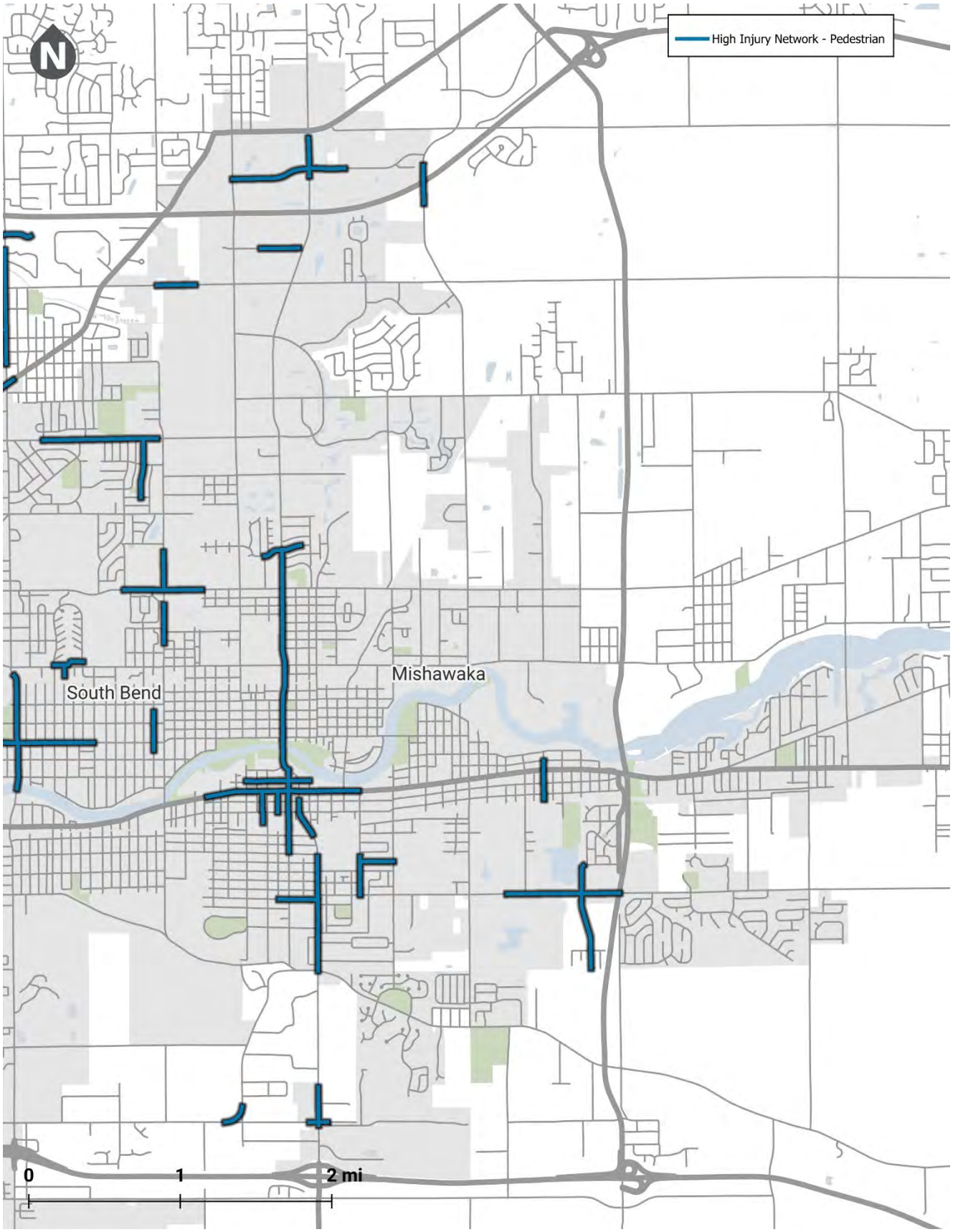

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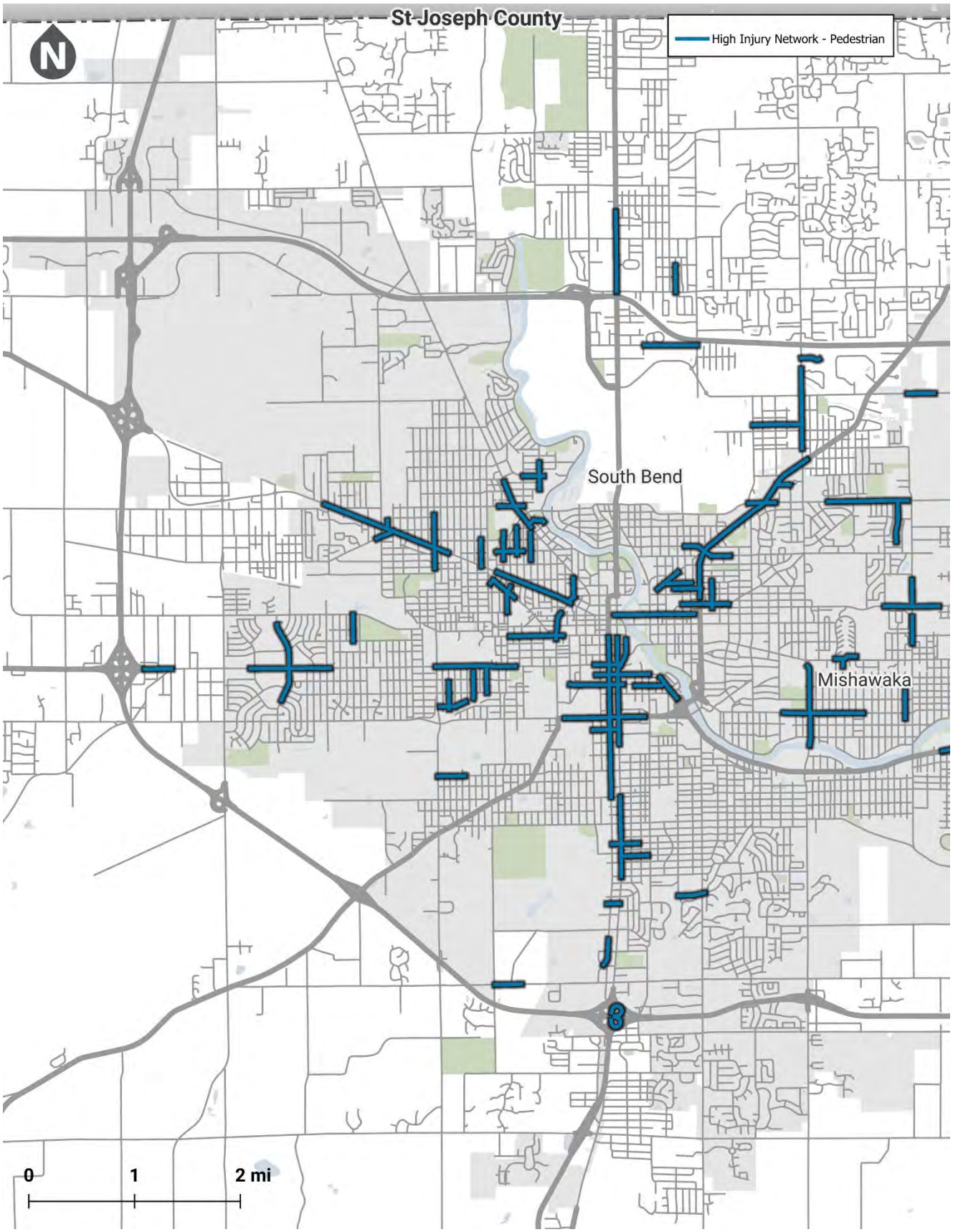

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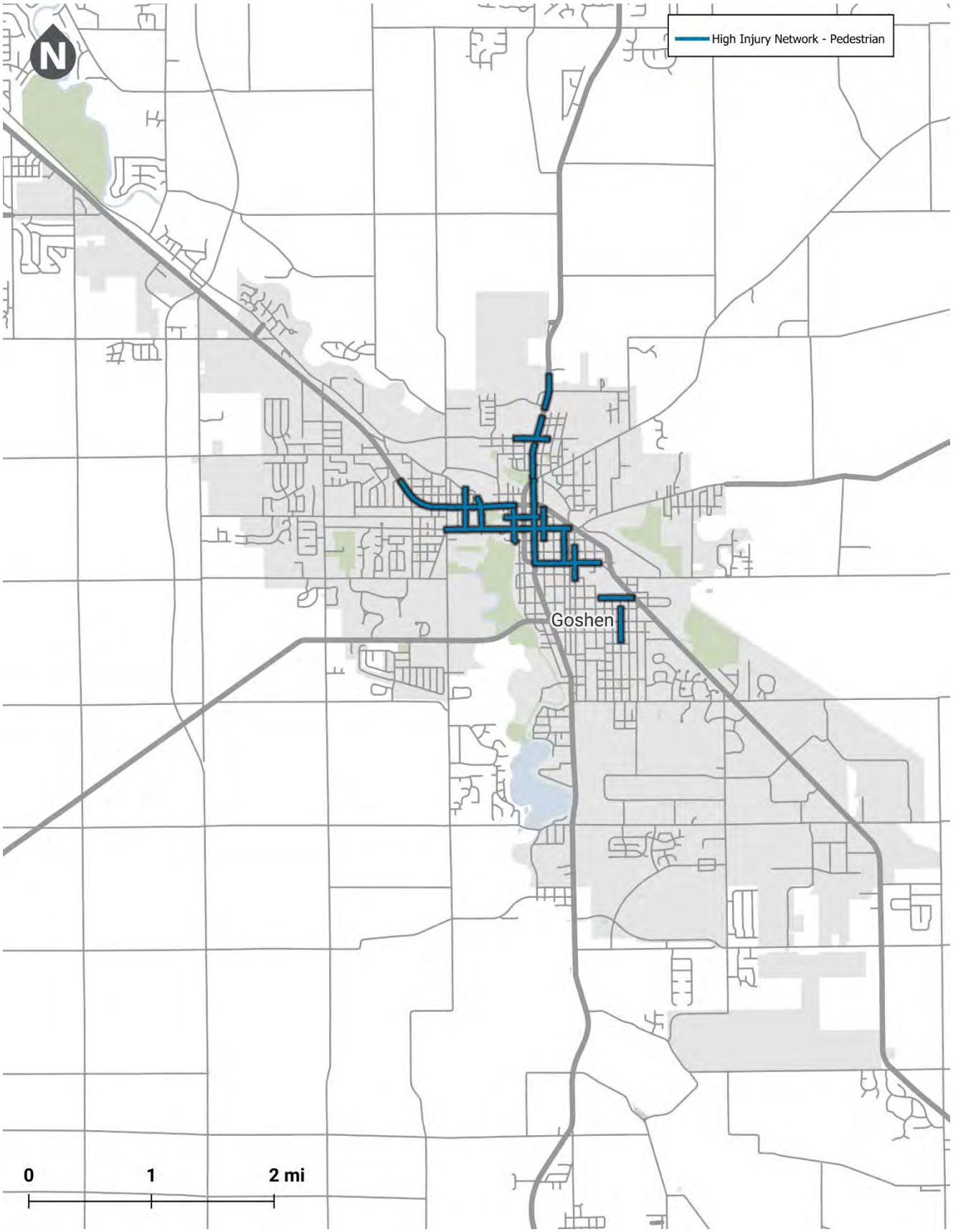

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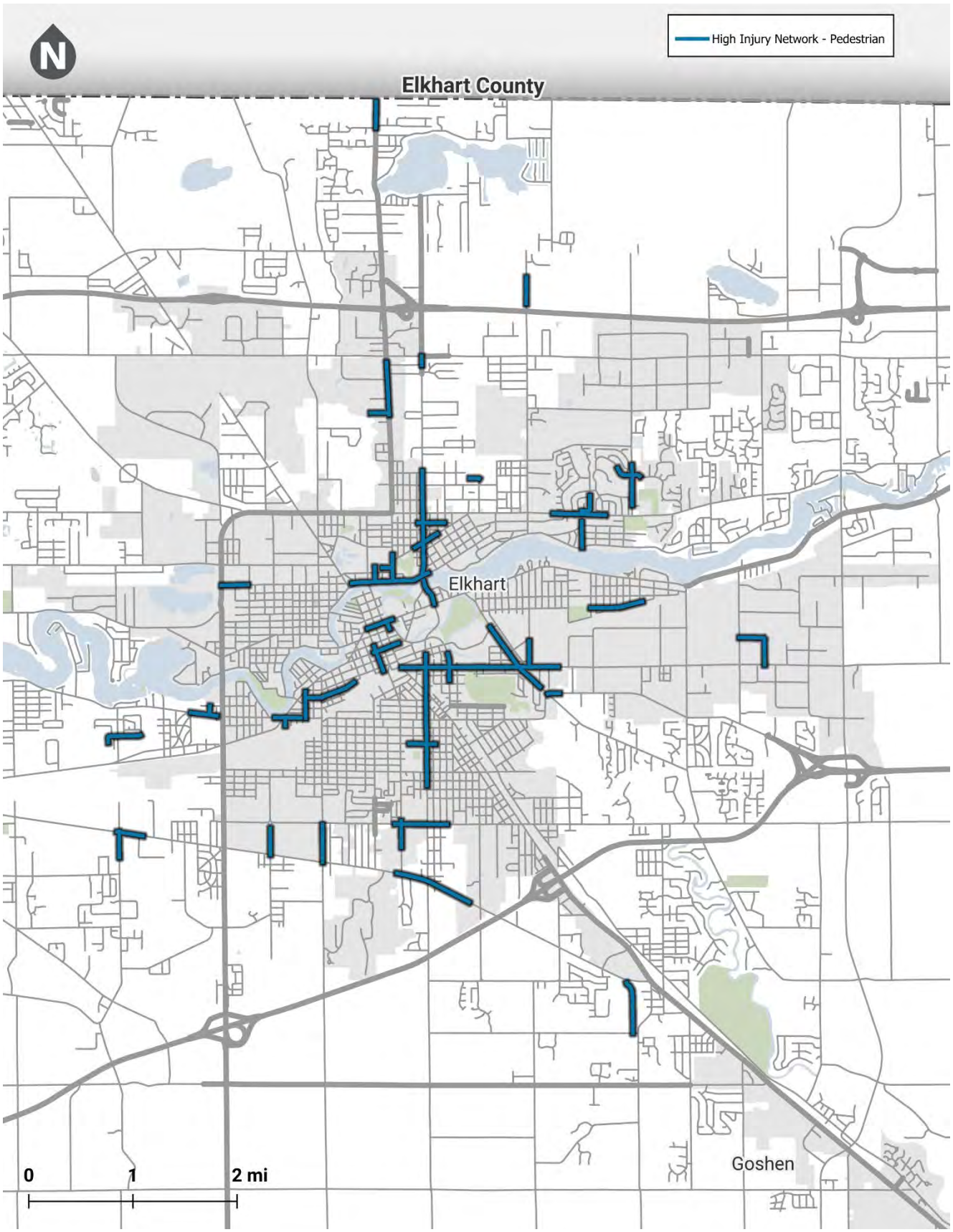

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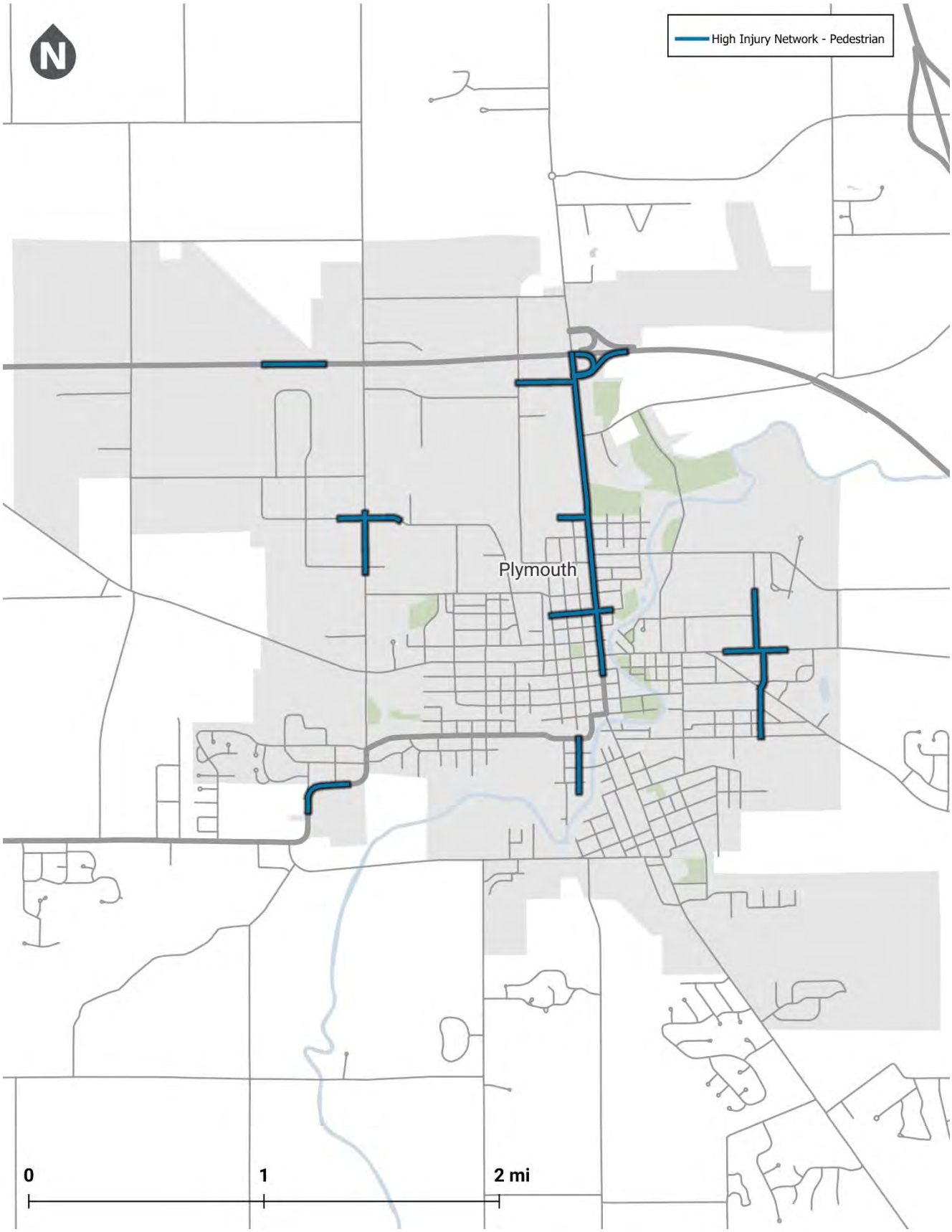

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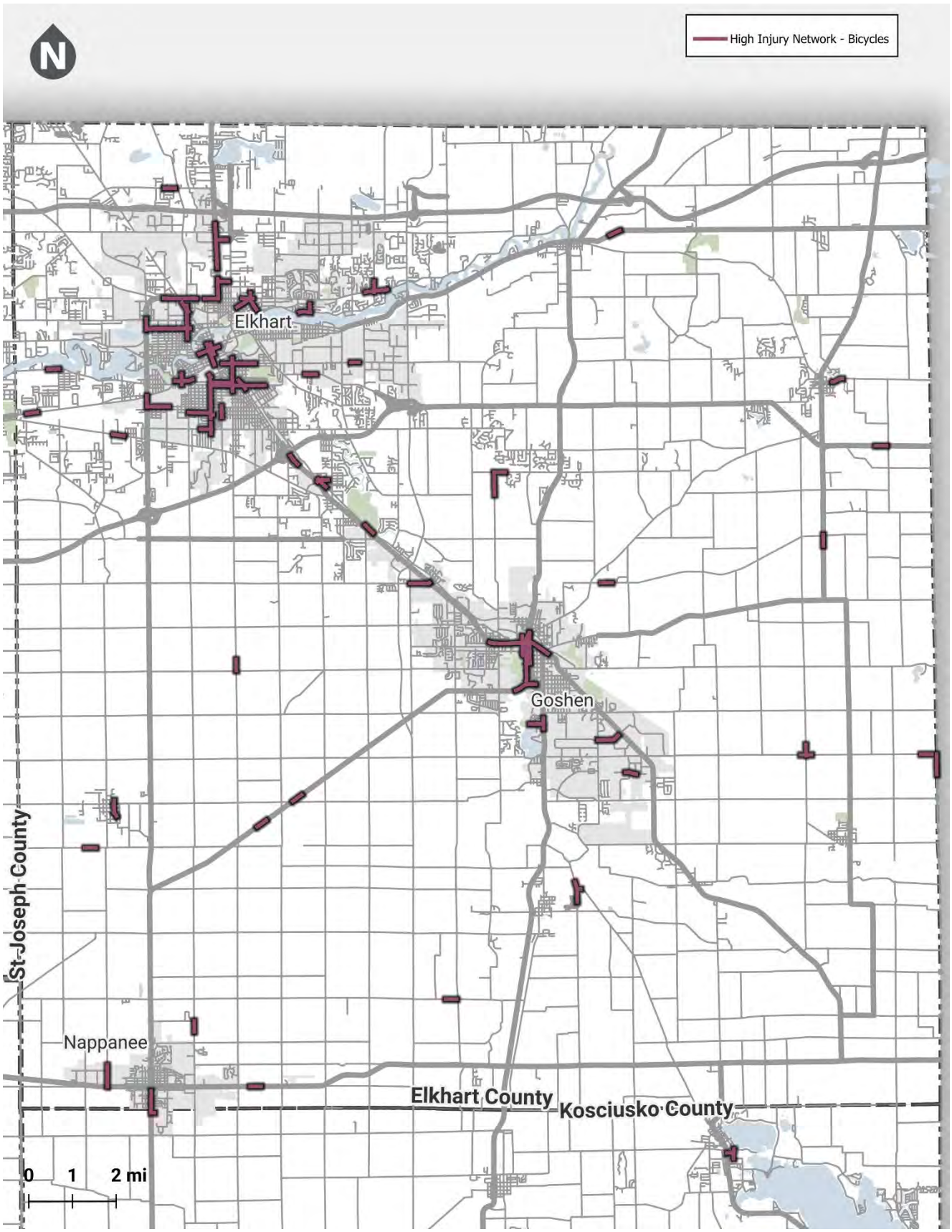

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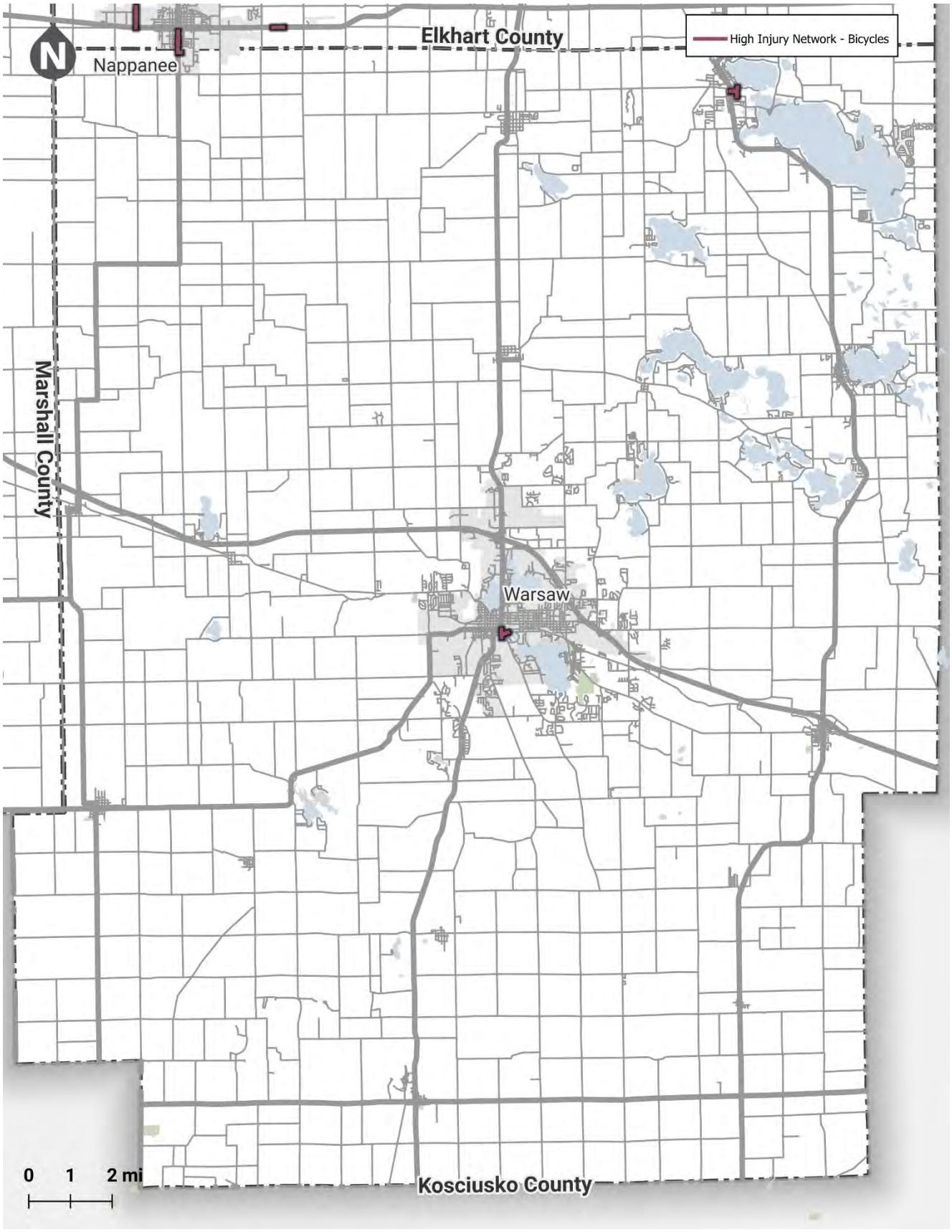

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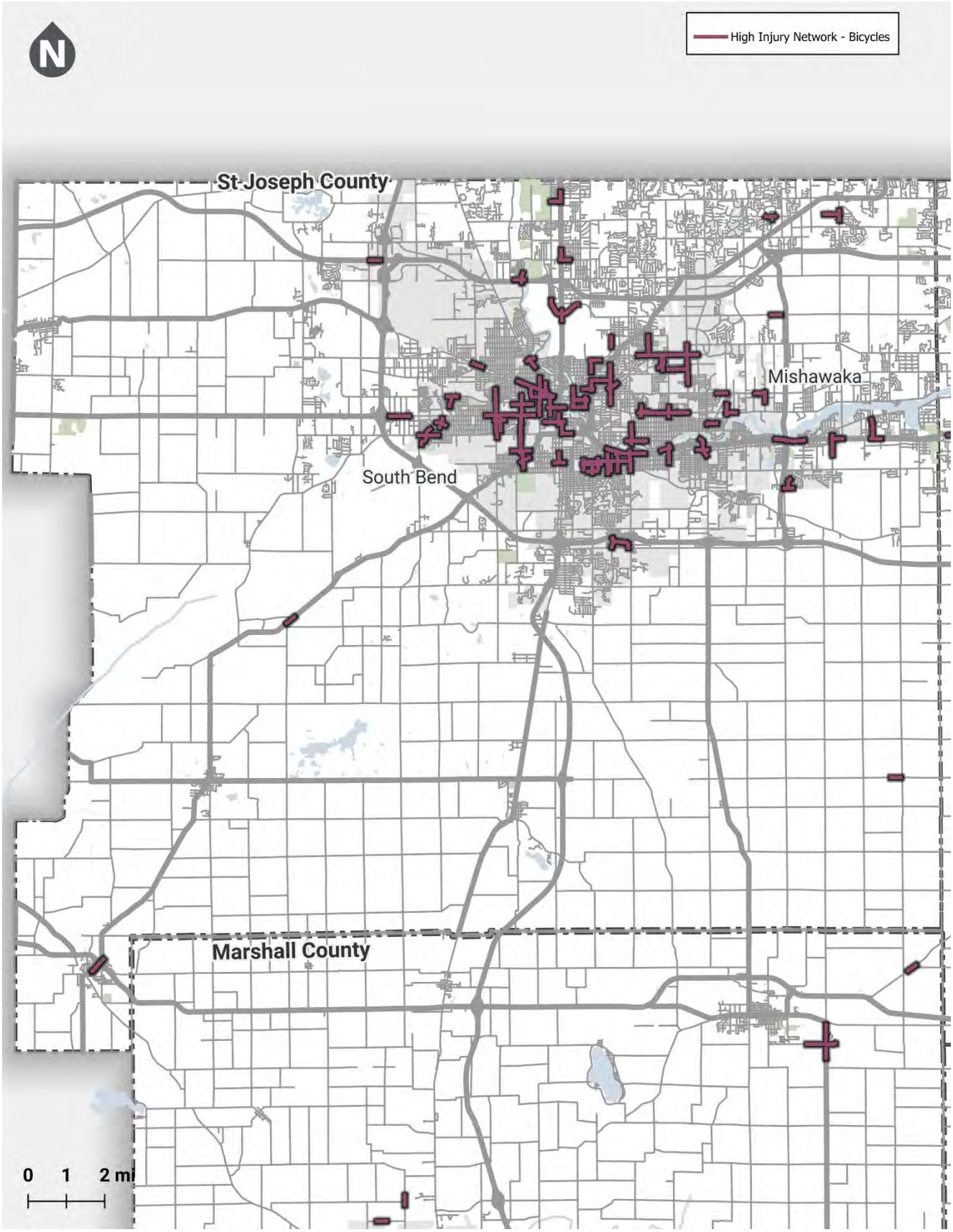

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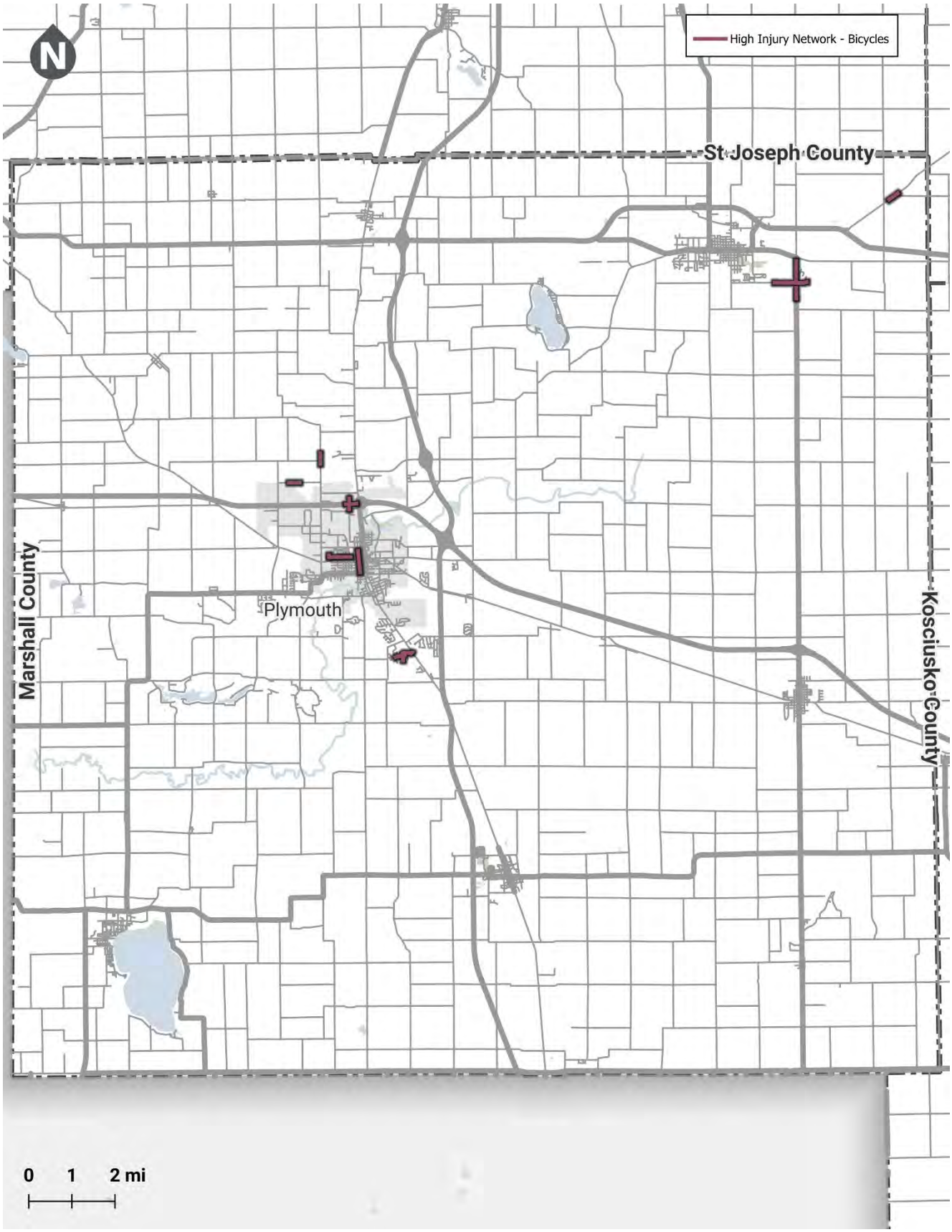

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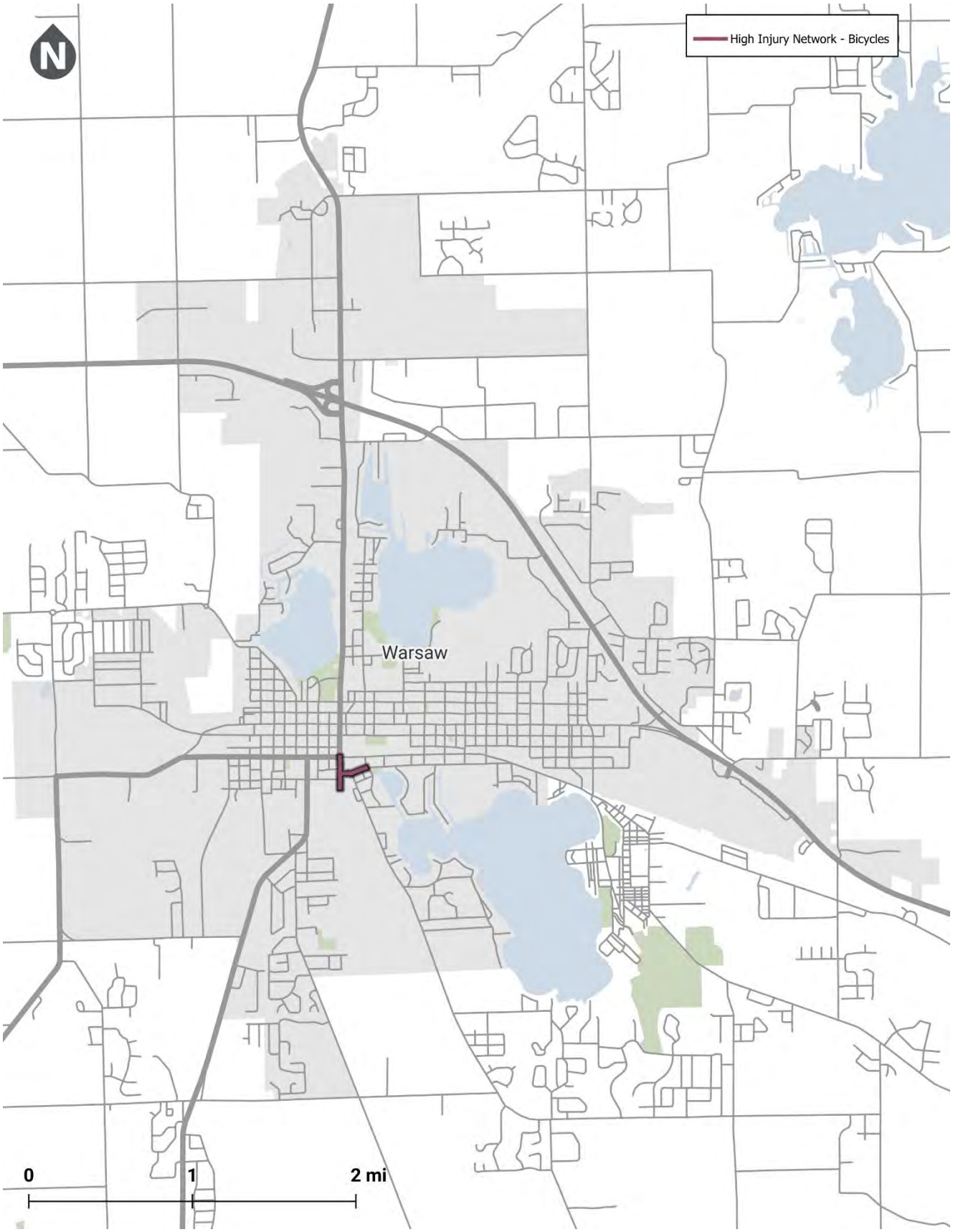

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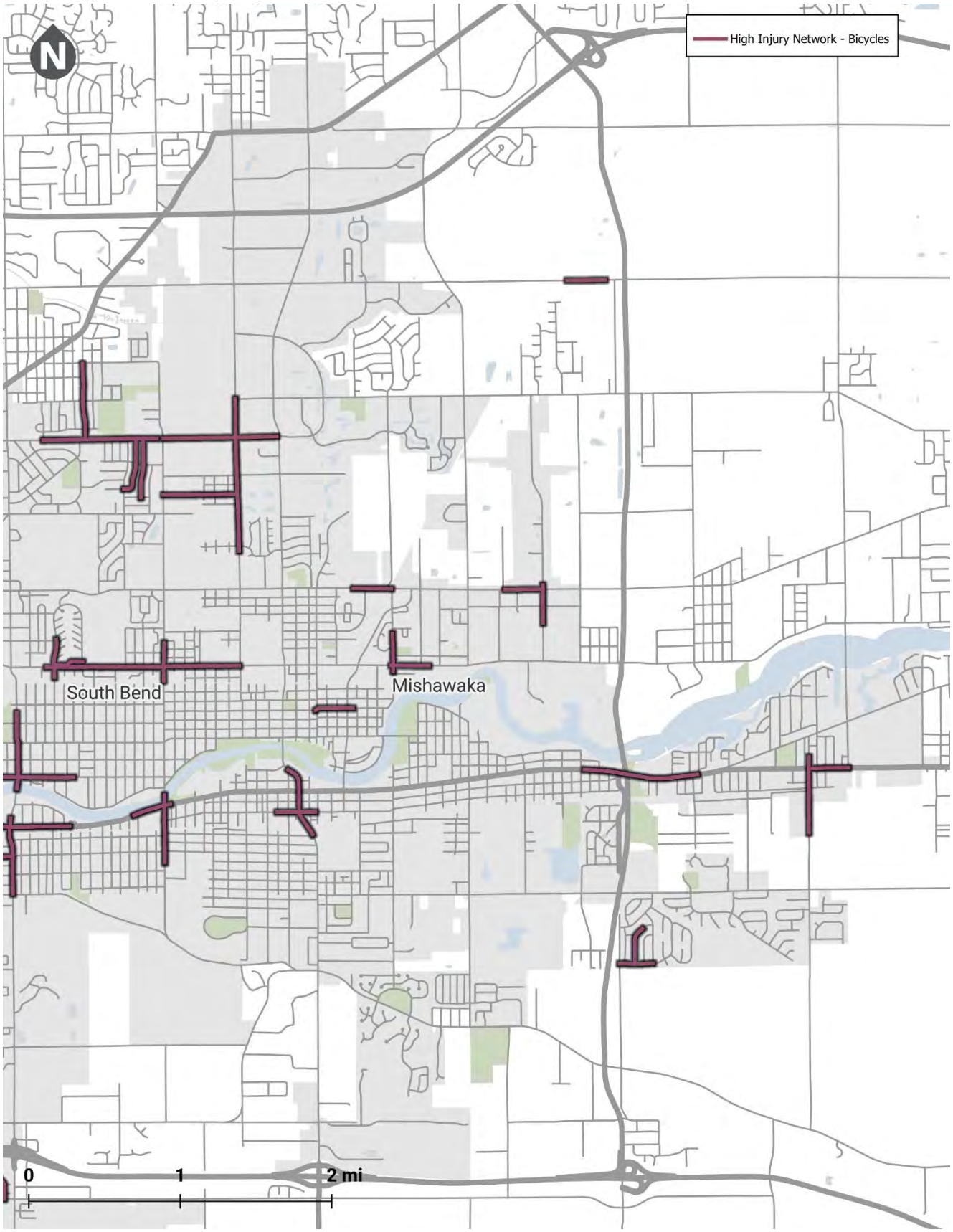

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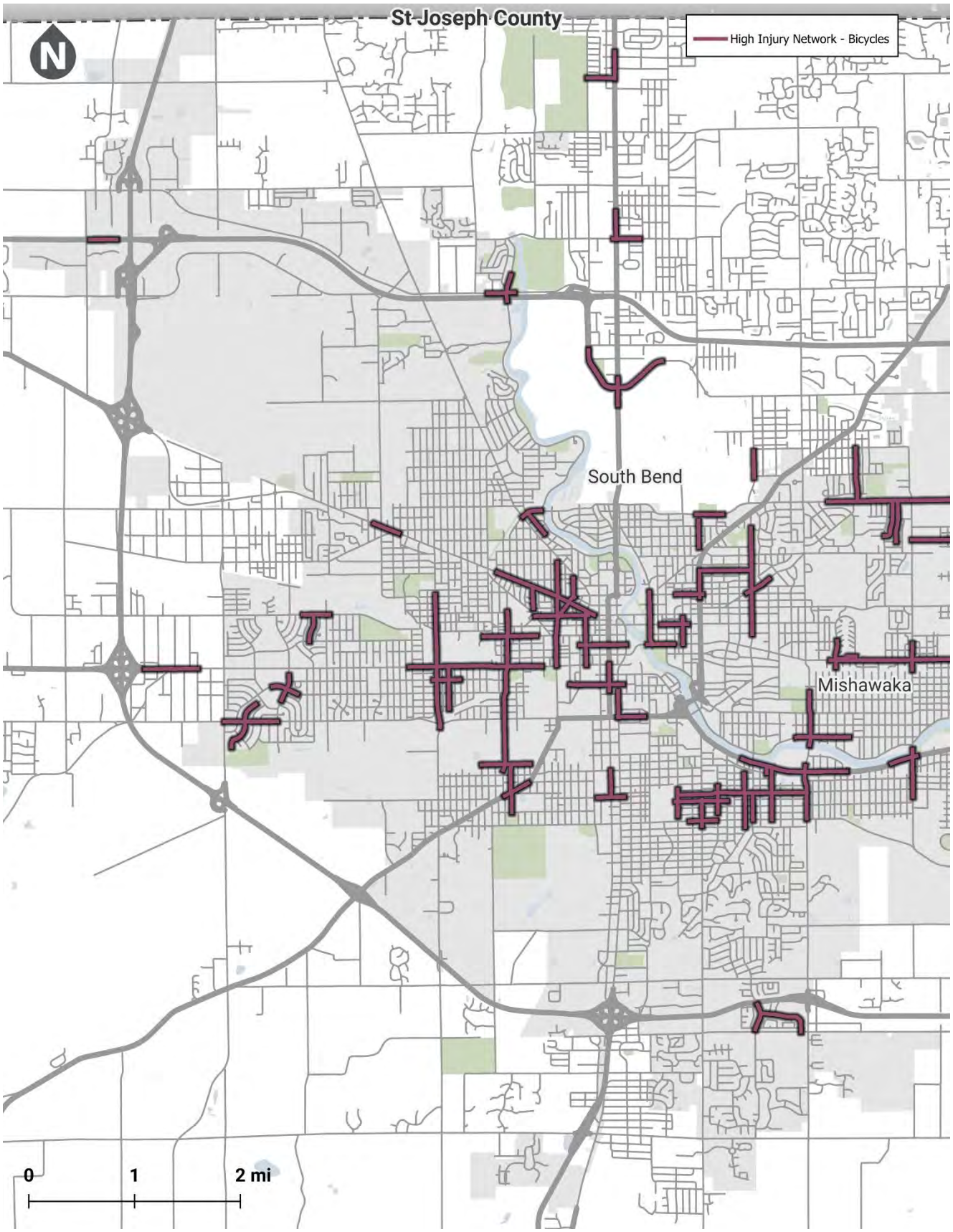

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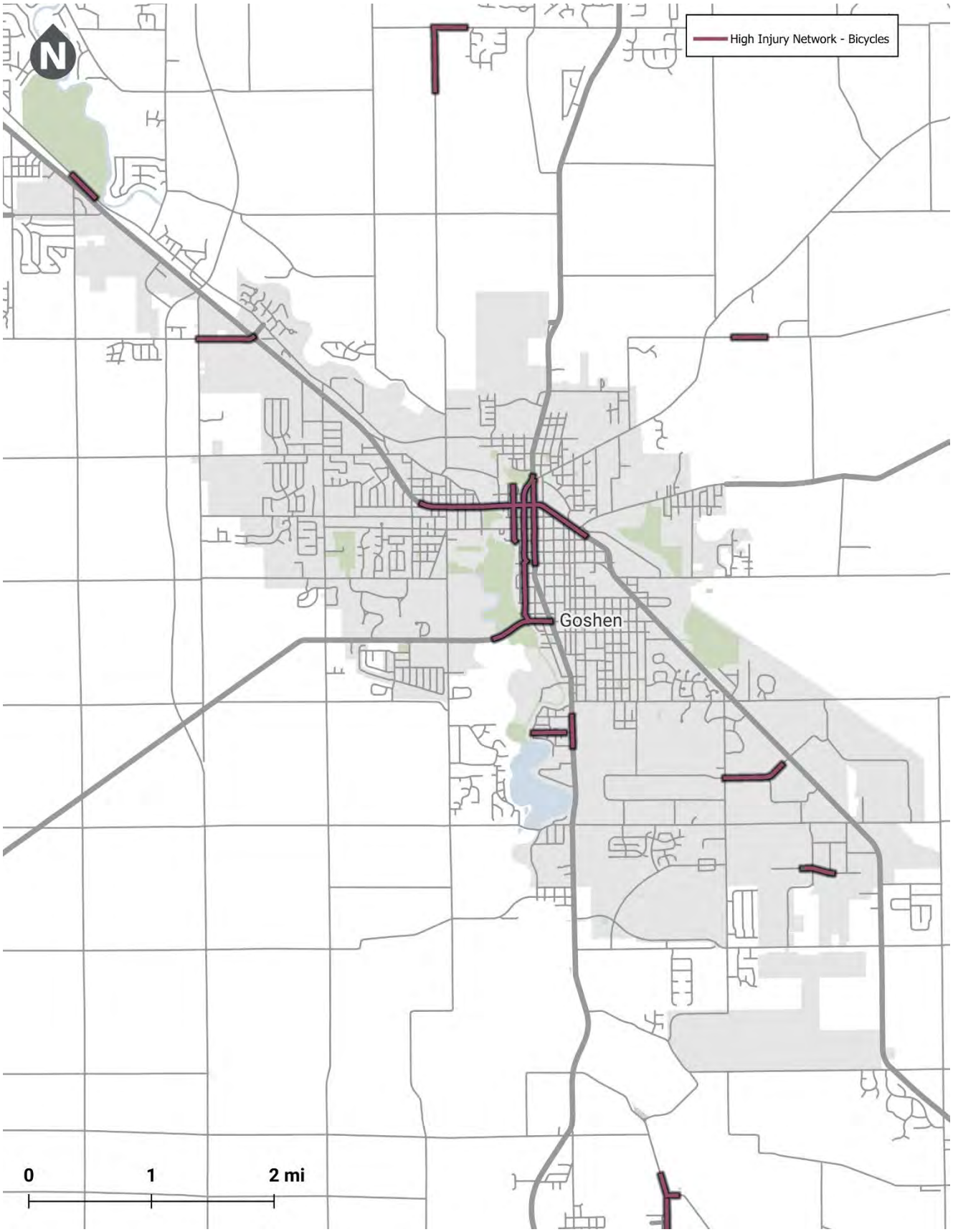

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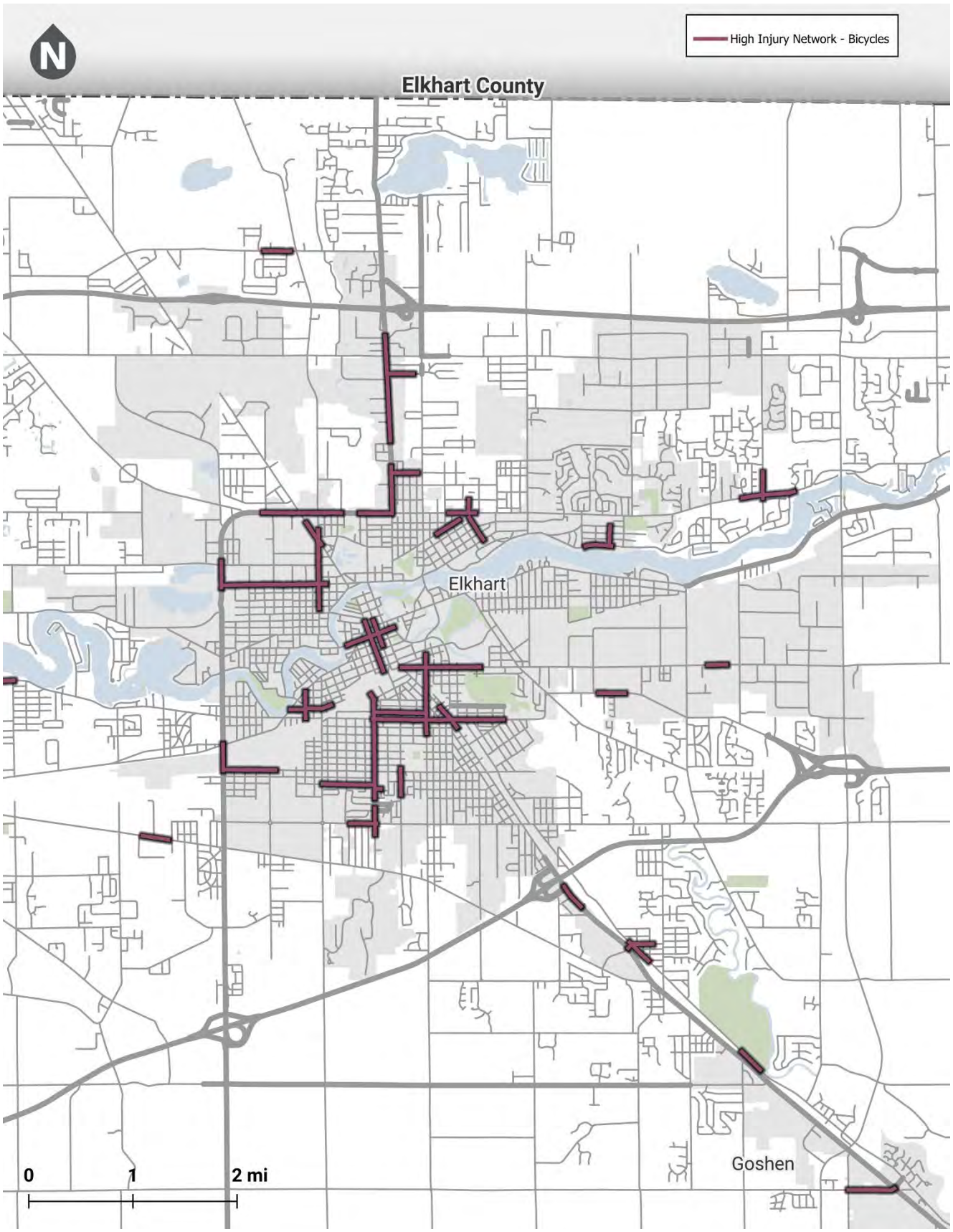

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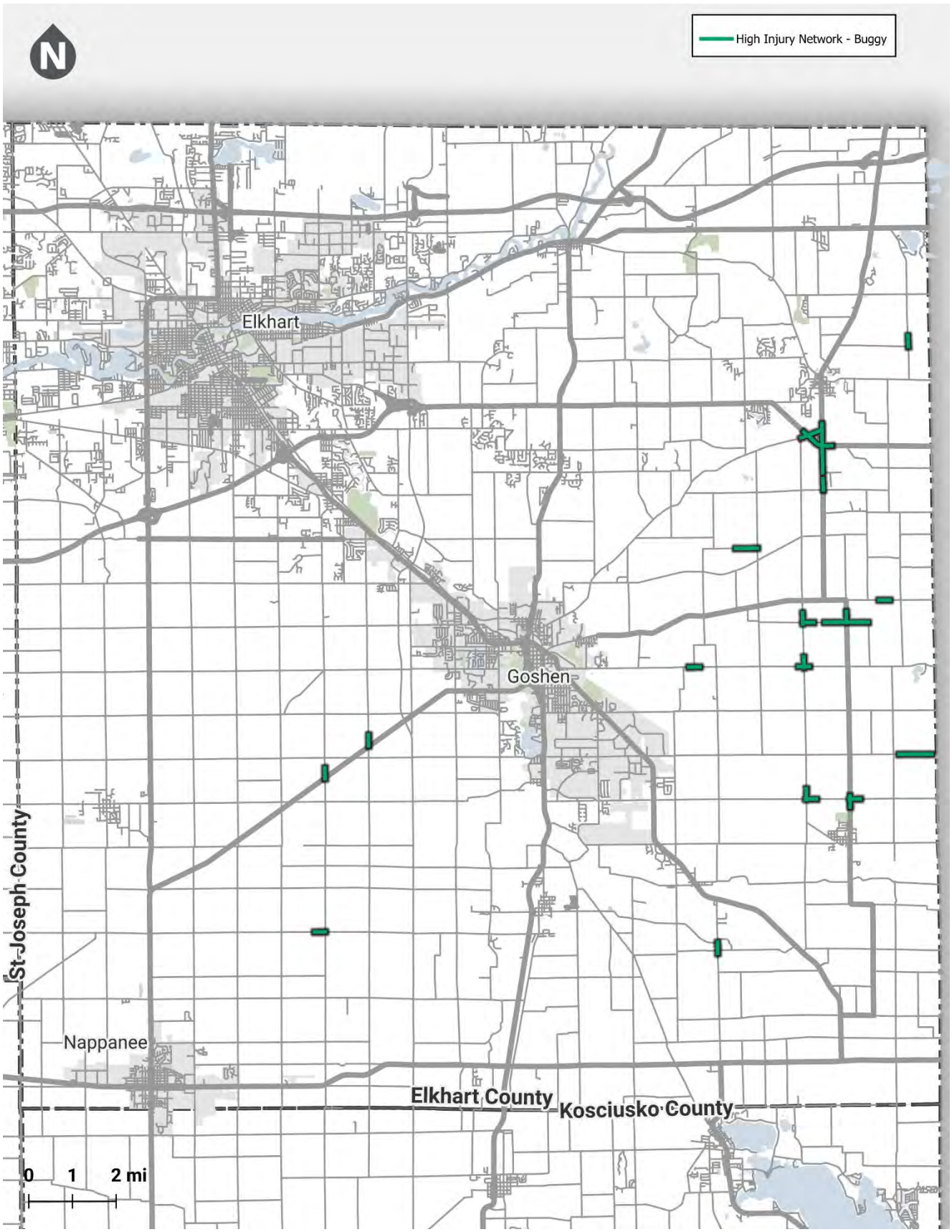

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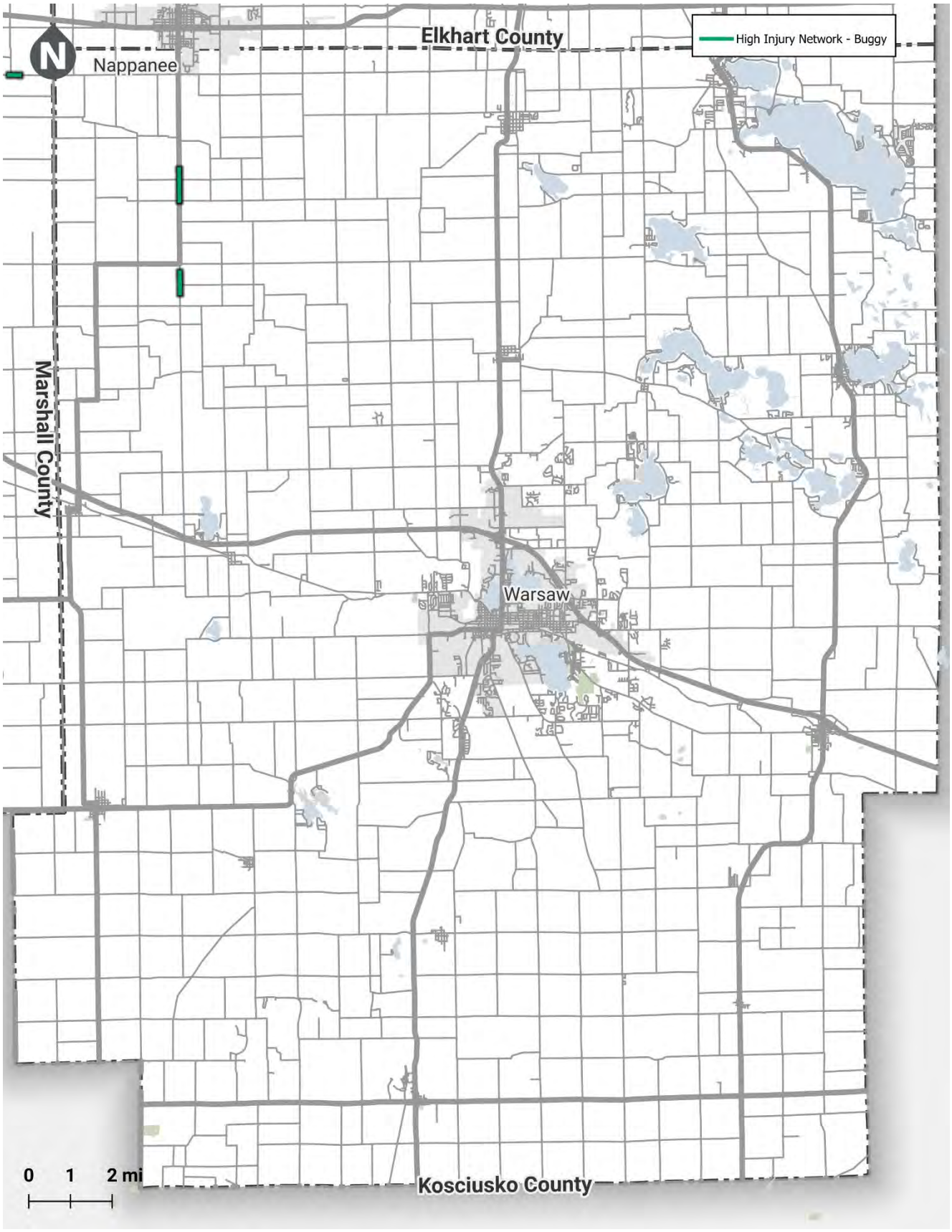

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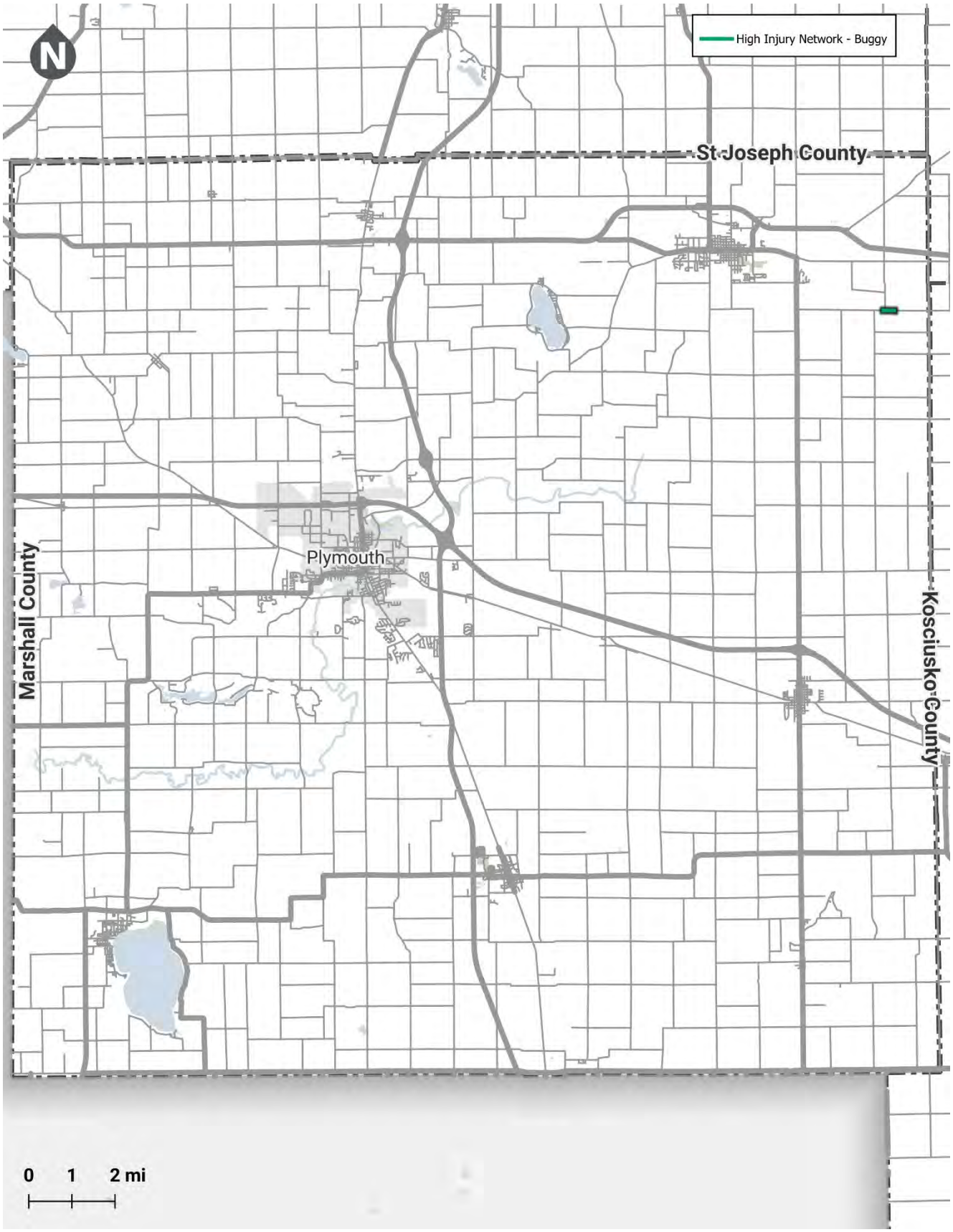

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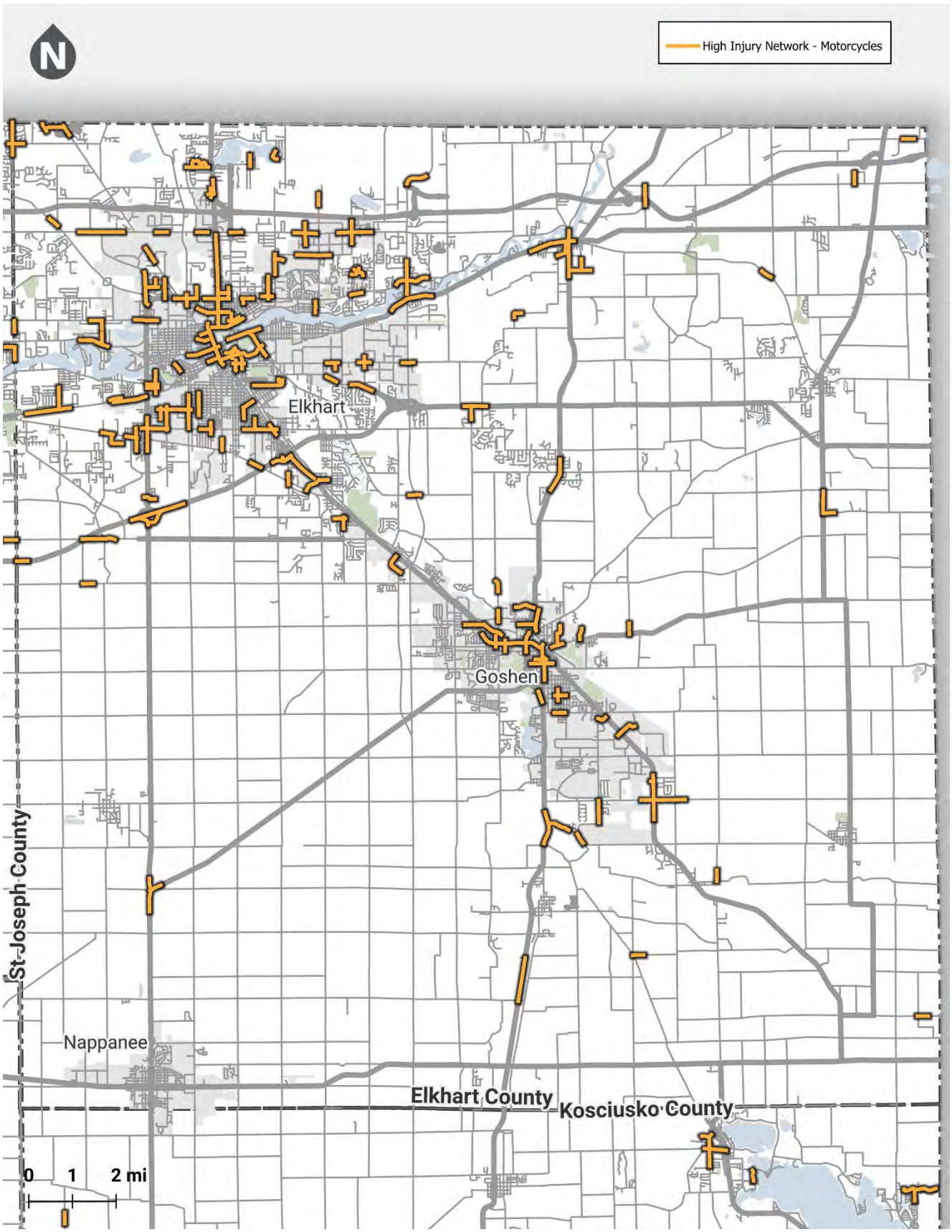

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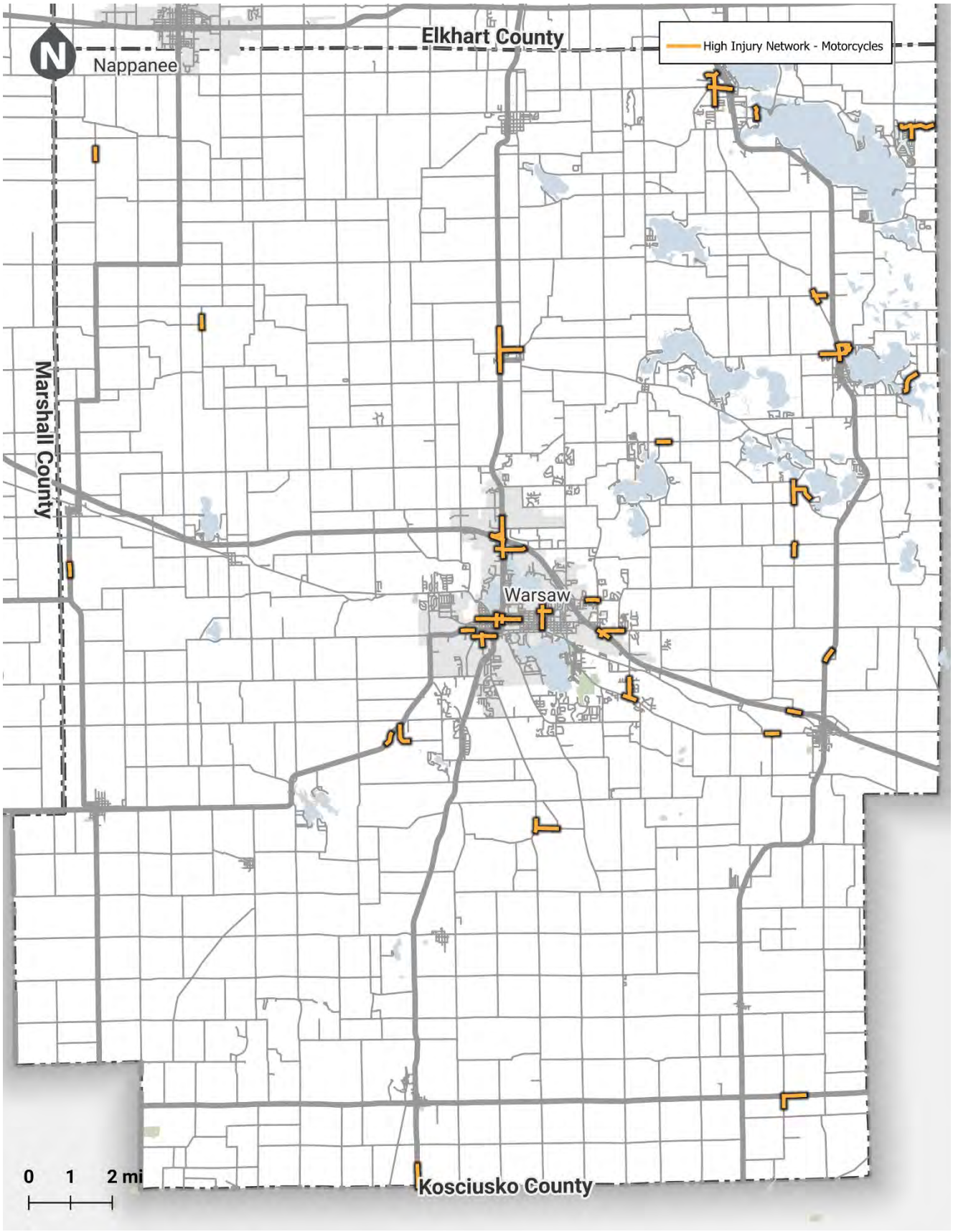

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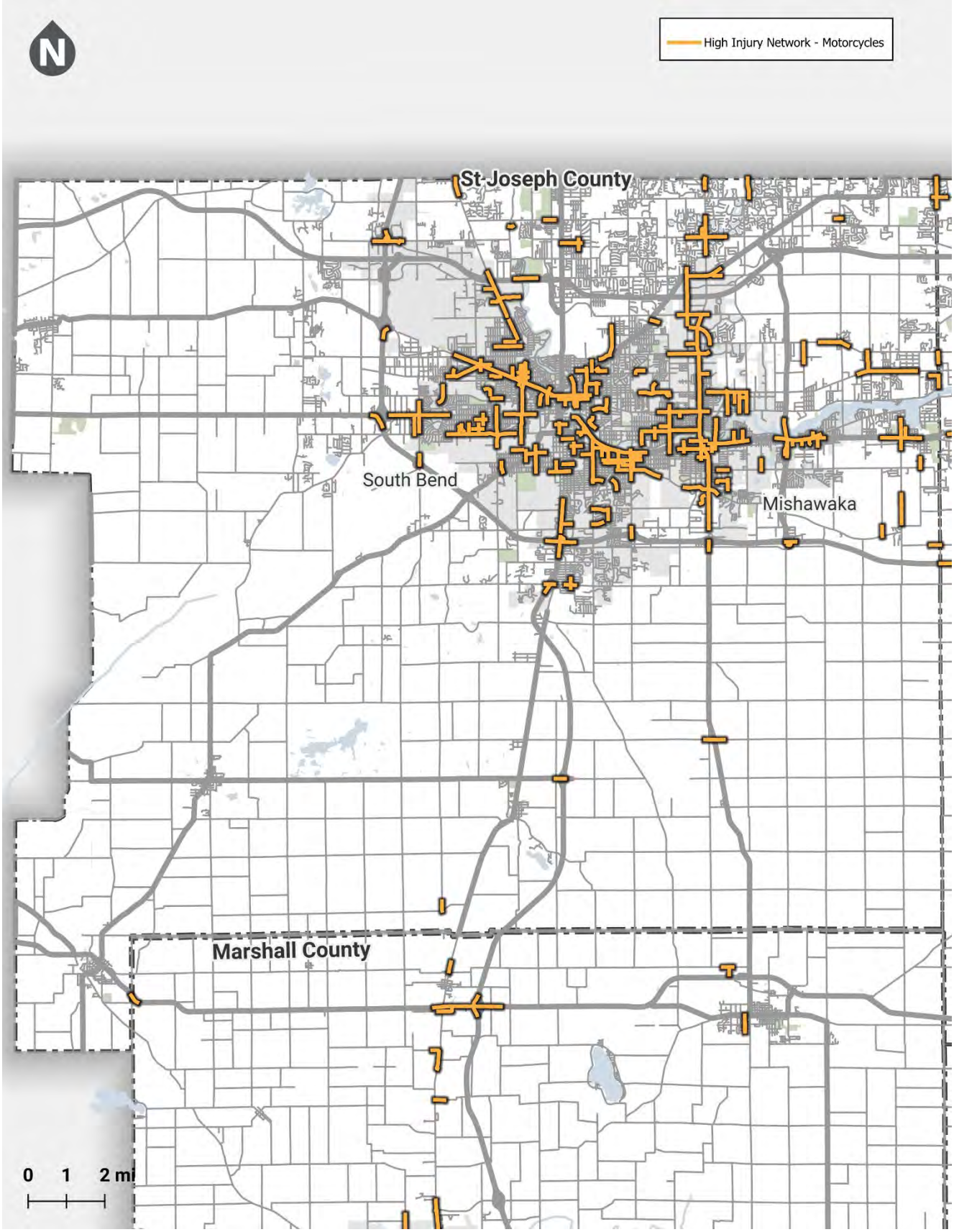

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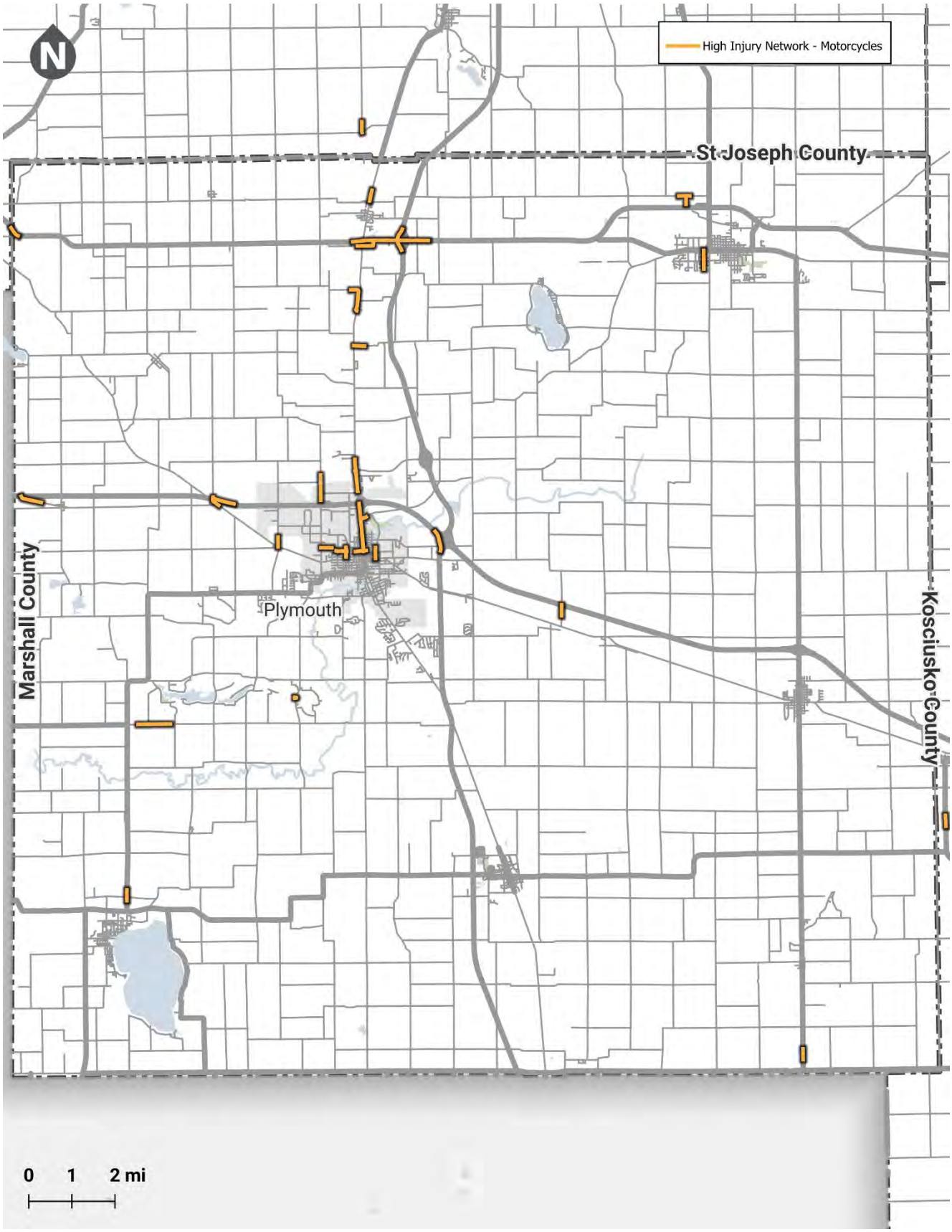

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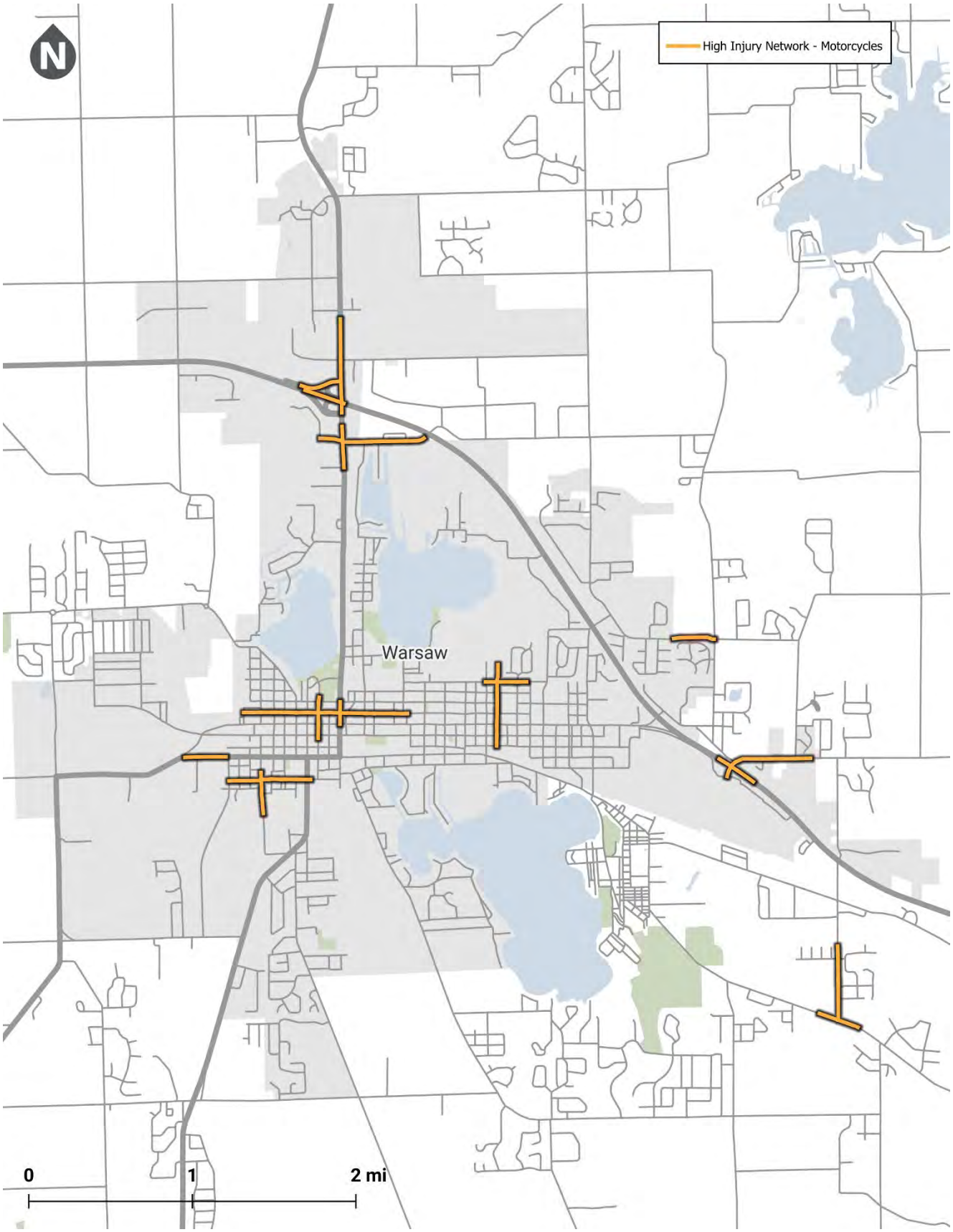

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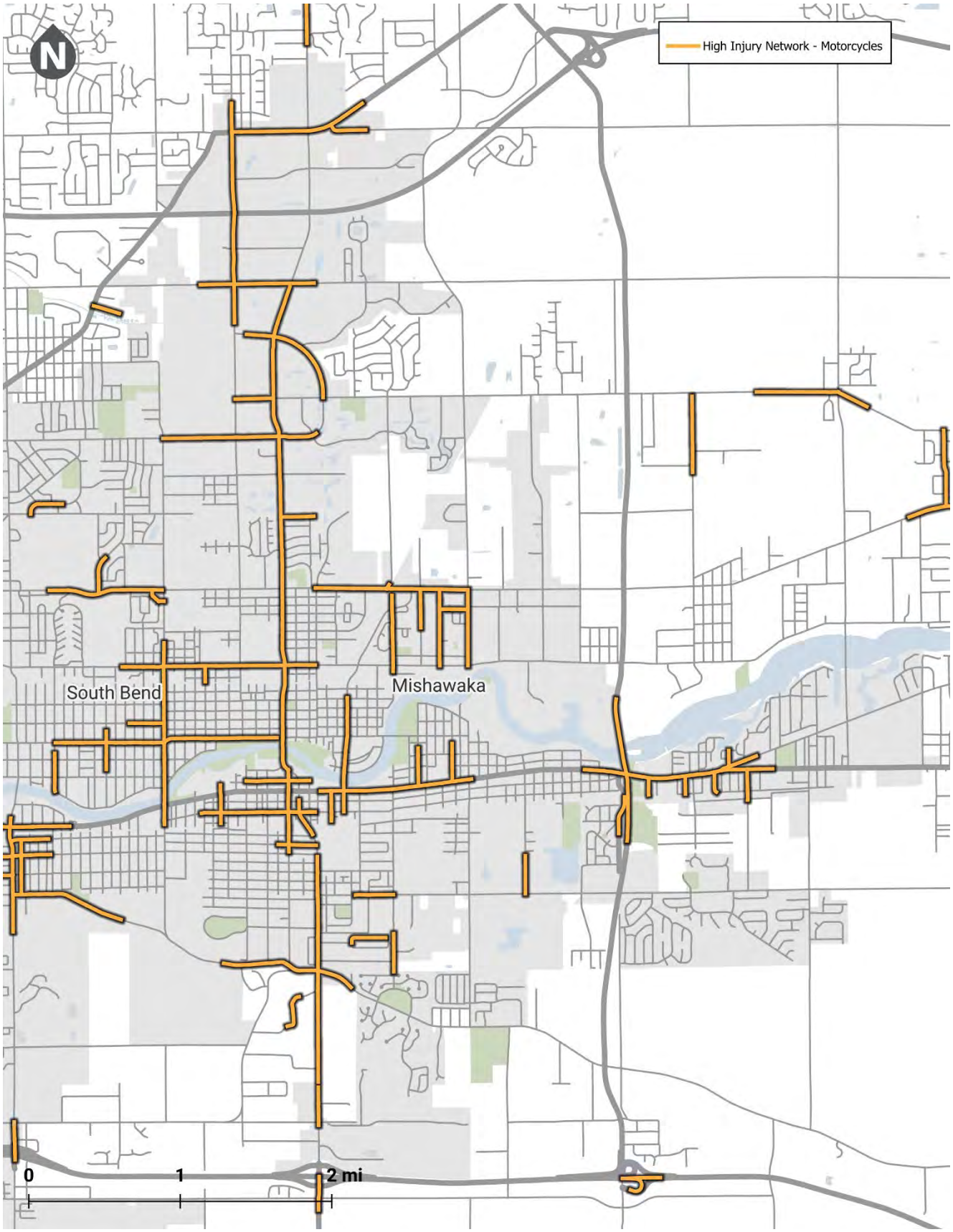

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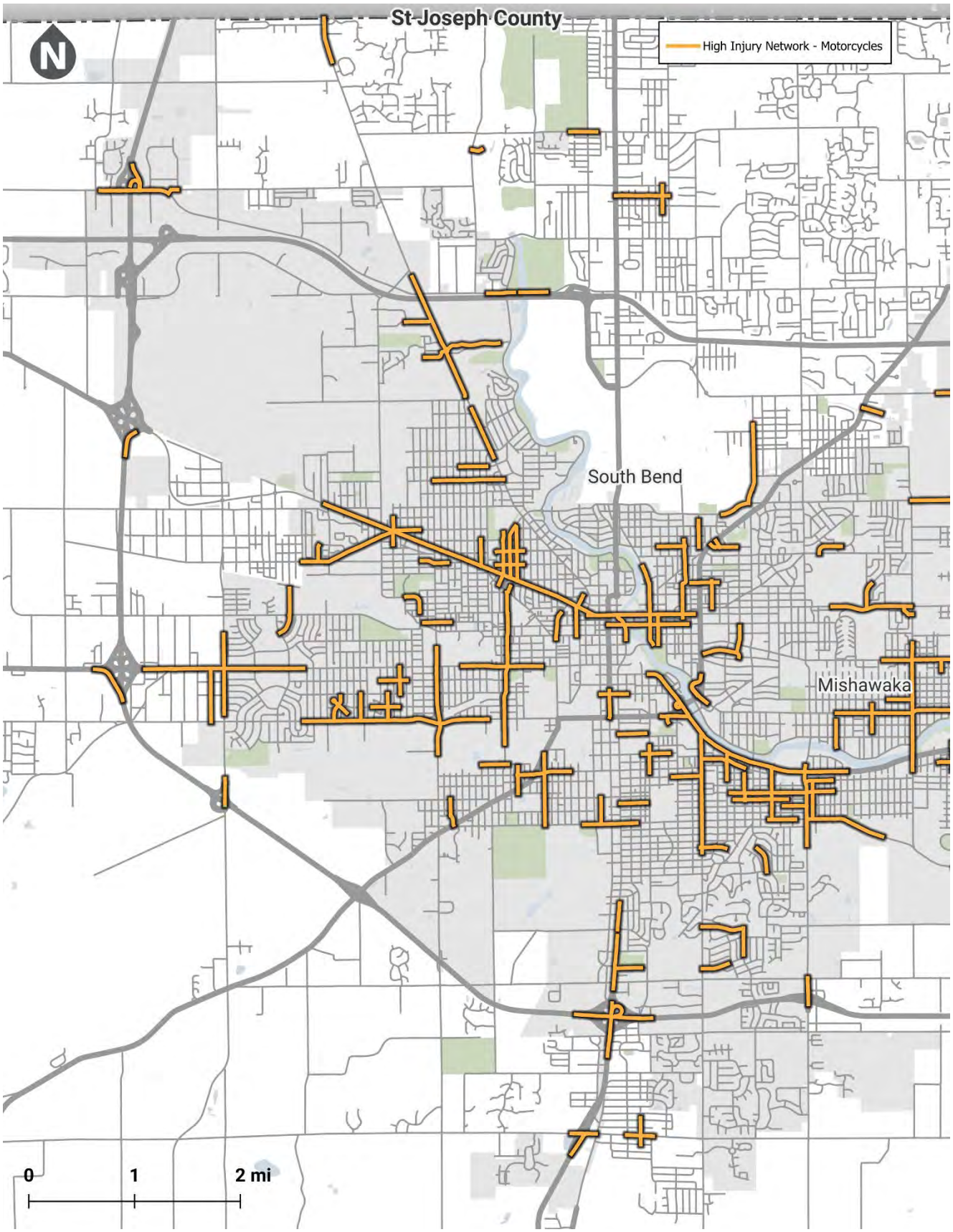

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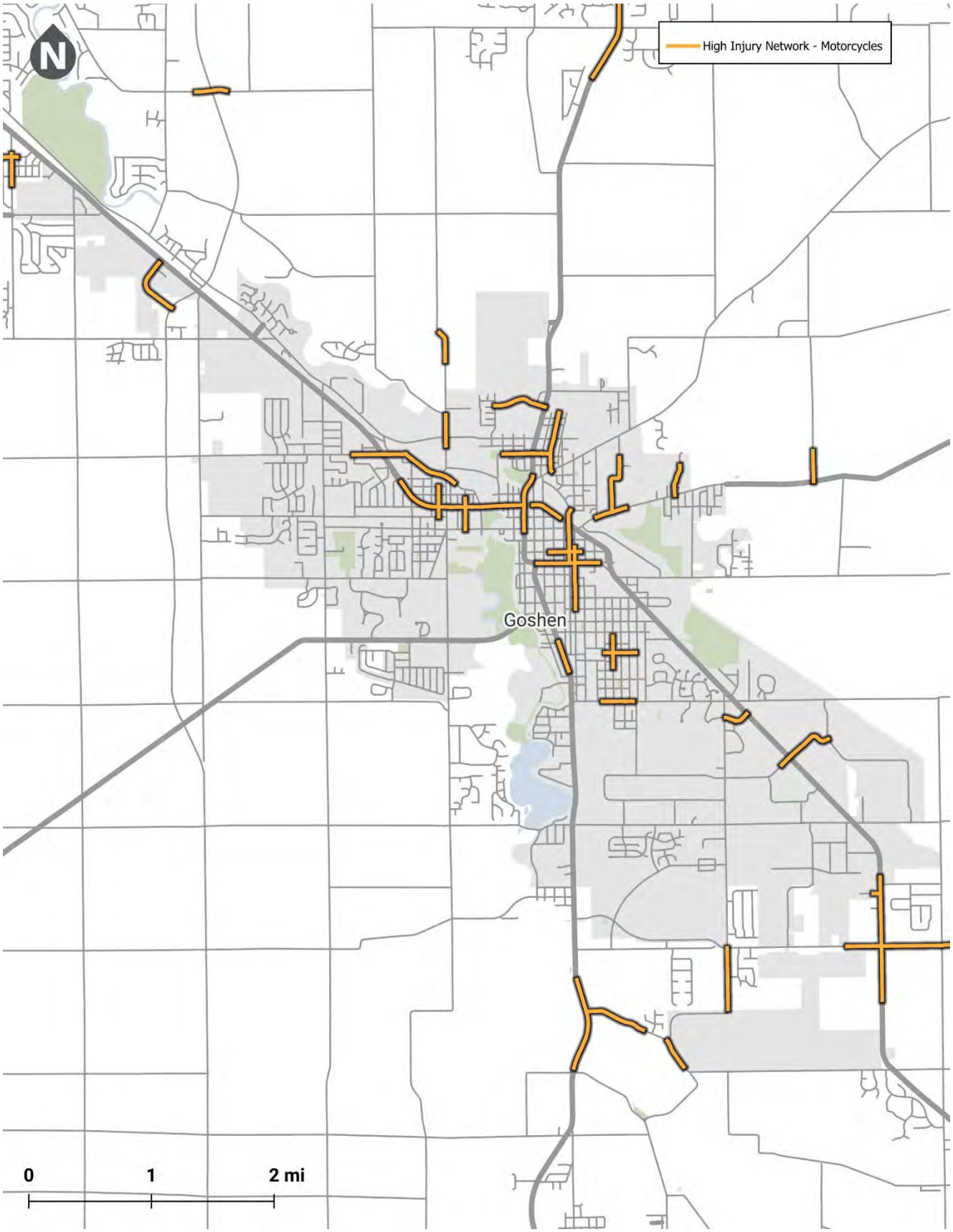

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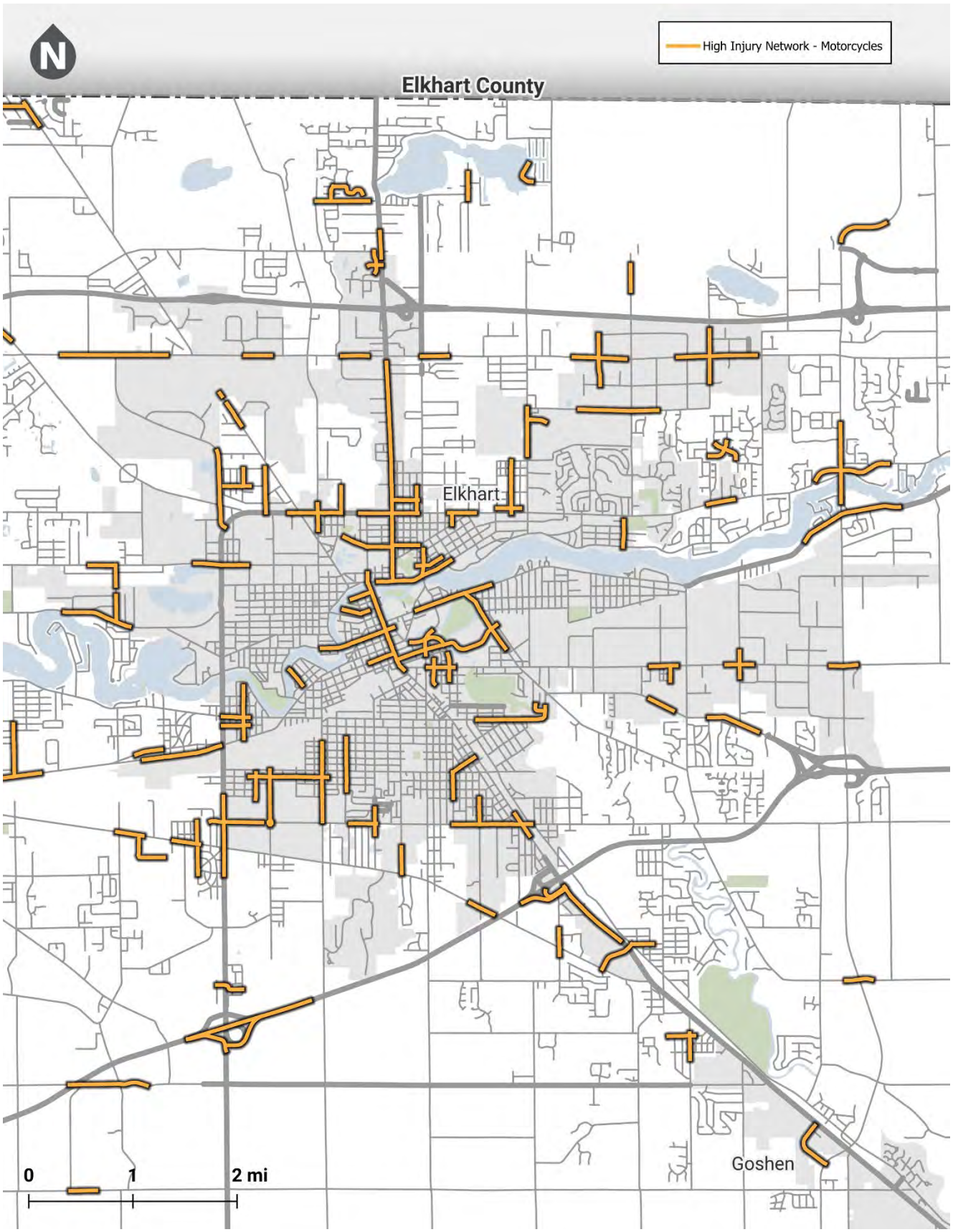

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Plymouth
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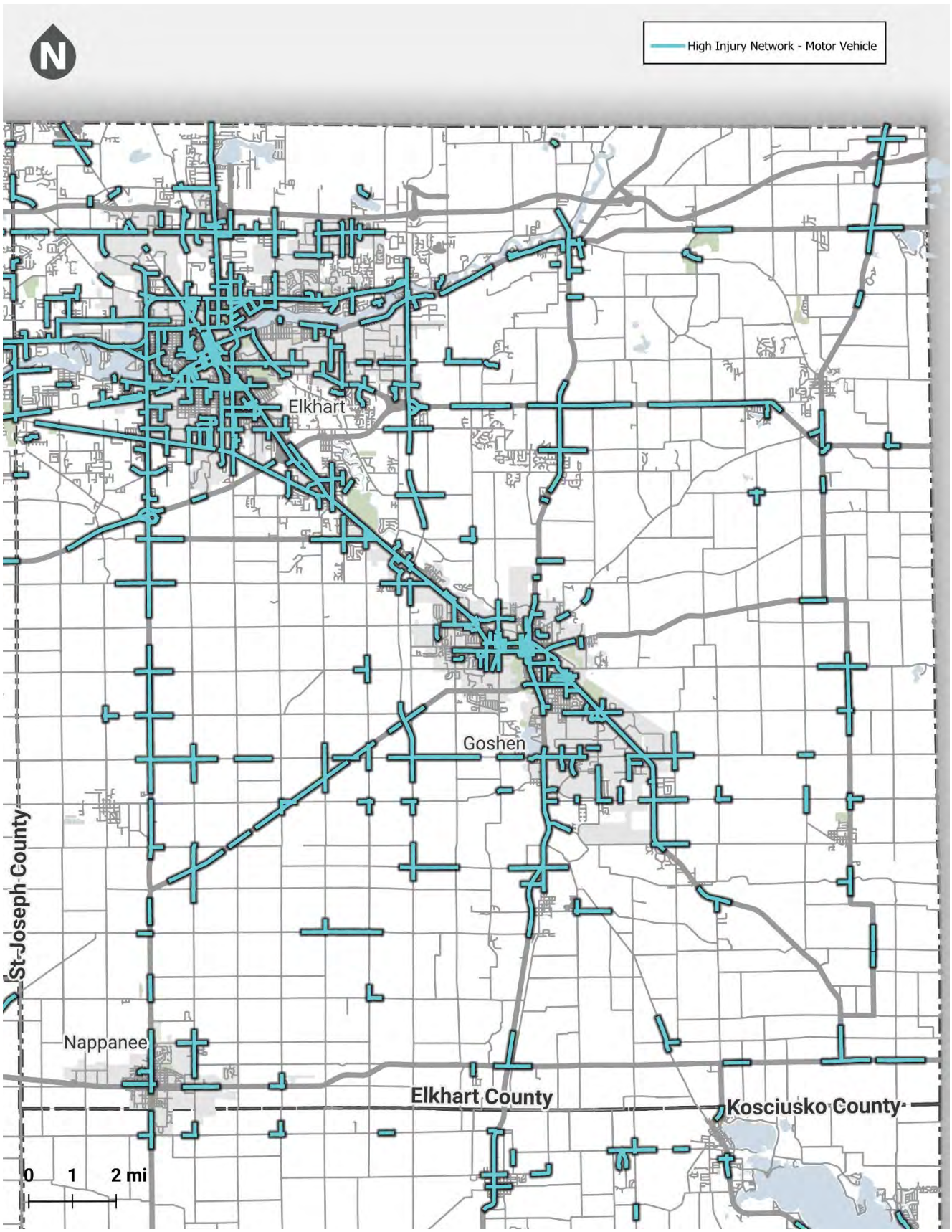

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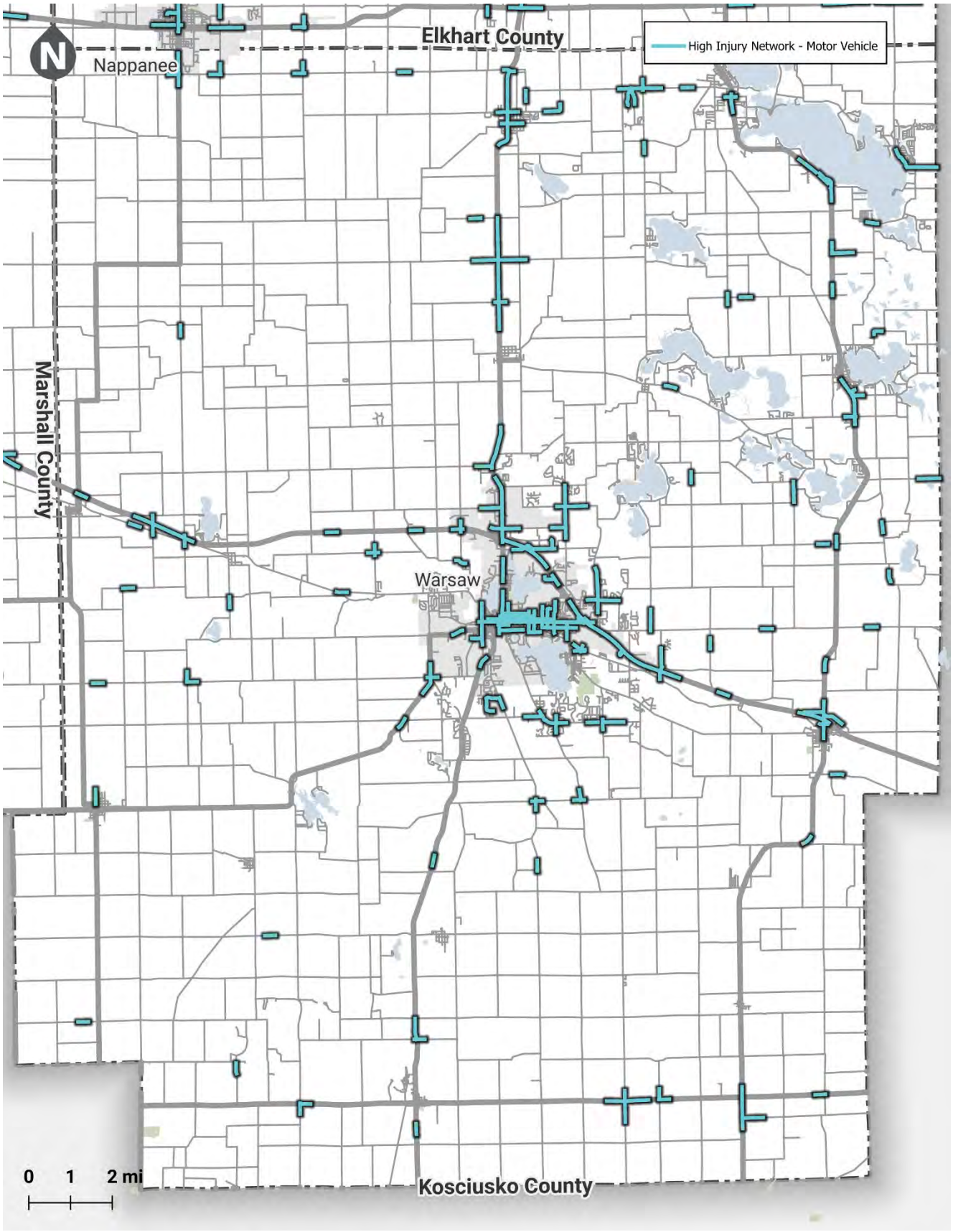

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High Injury Network - Motorcycles
South Bend
Mishawaka
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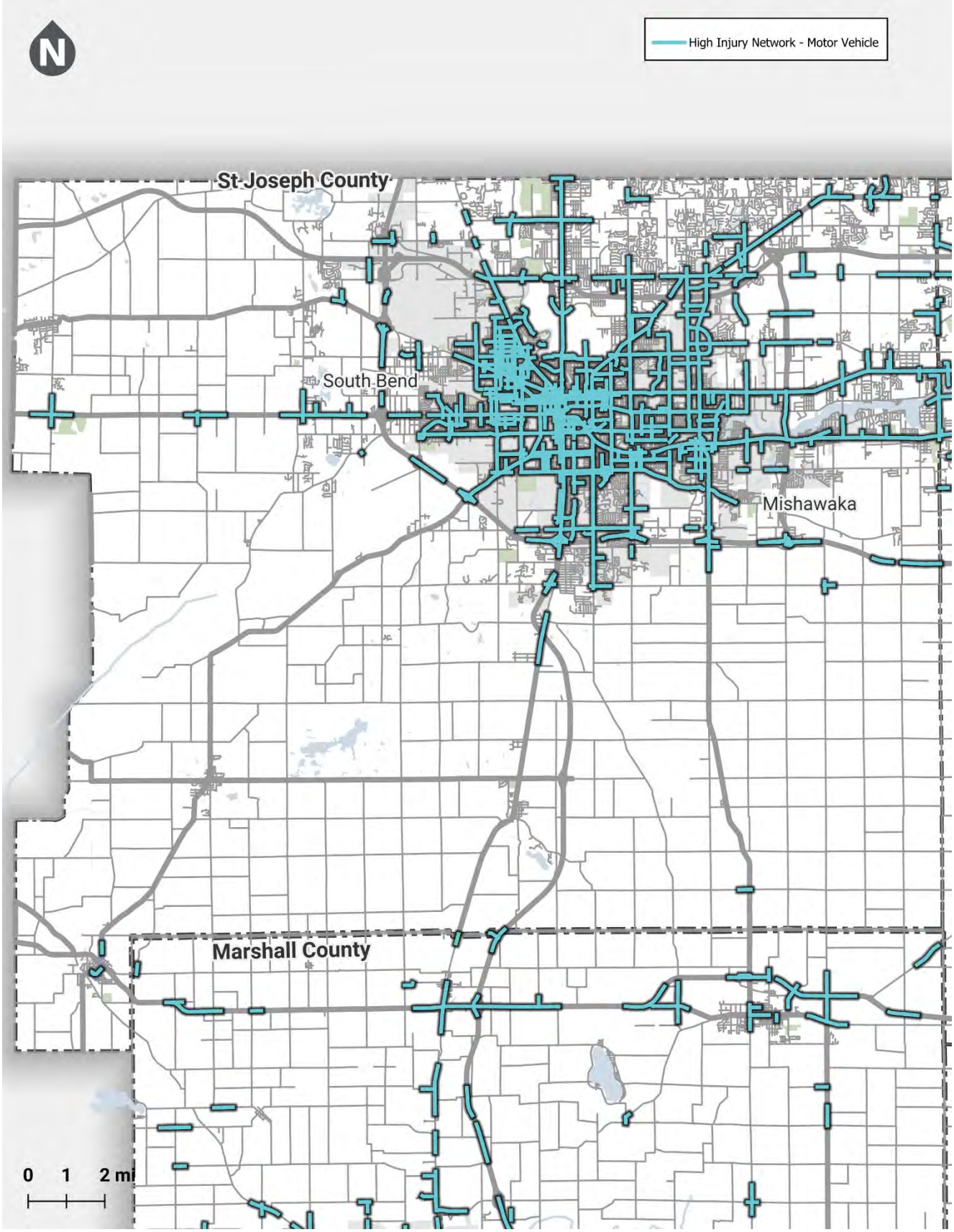

St Joseph County
High Injury Network - Motorcycles
South Bend
Mishawaka
0
1
2 mi

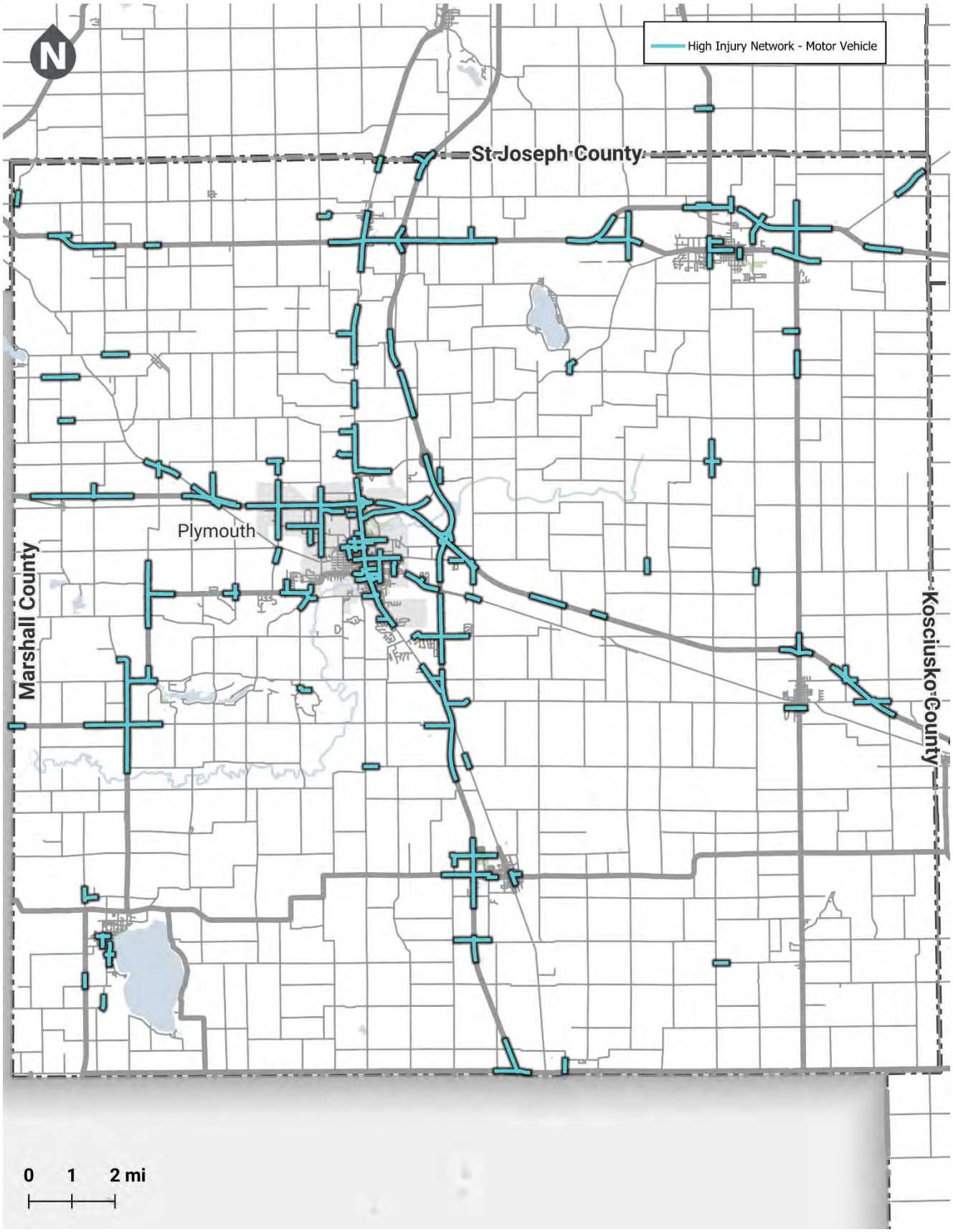

High Injury Network - Motorcycles
N
Goshen
0
1
2 mi

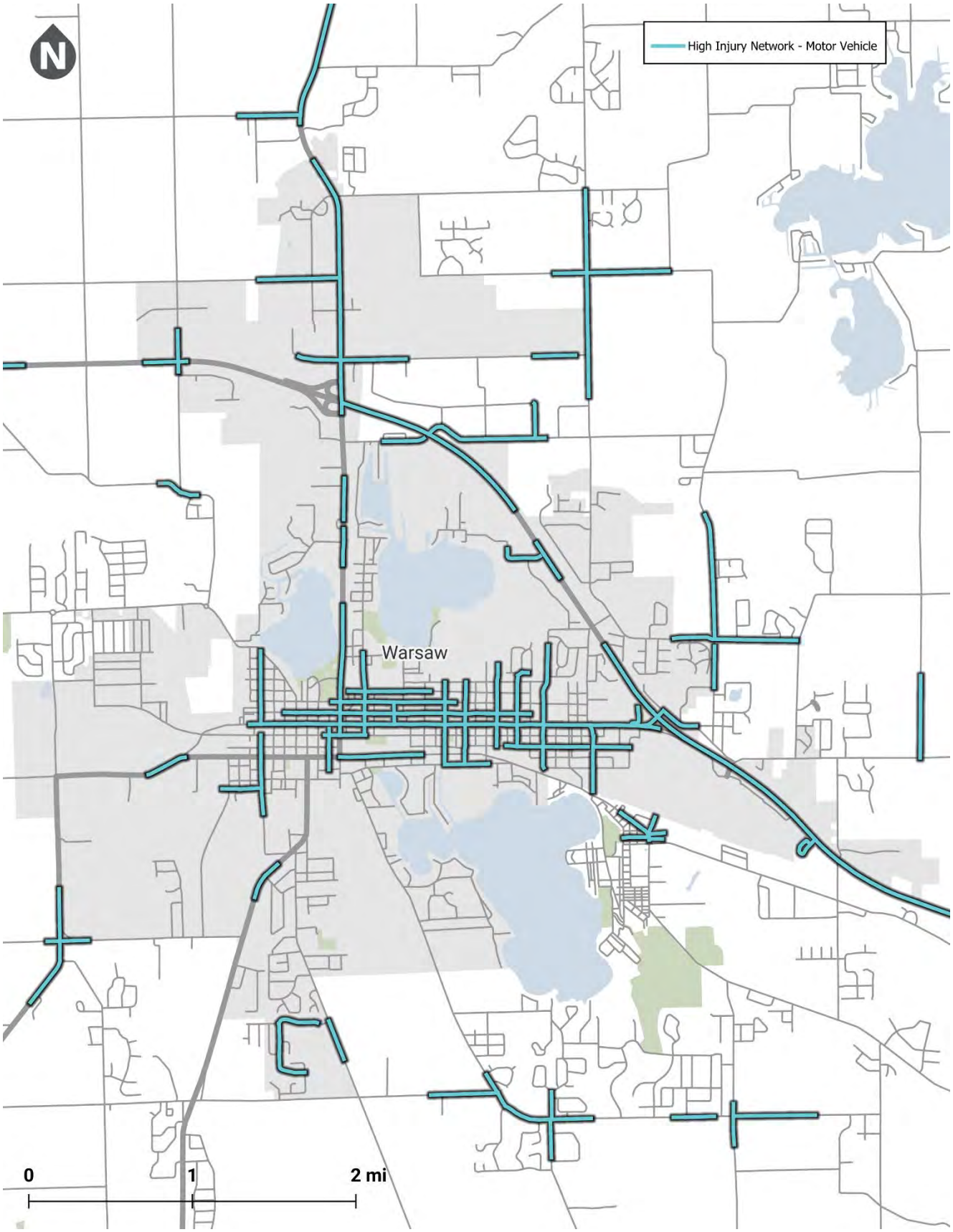

N
High Injury Network - Motorcycles
Elkhart County
Elkhart
Goshen
0
1
2 mi

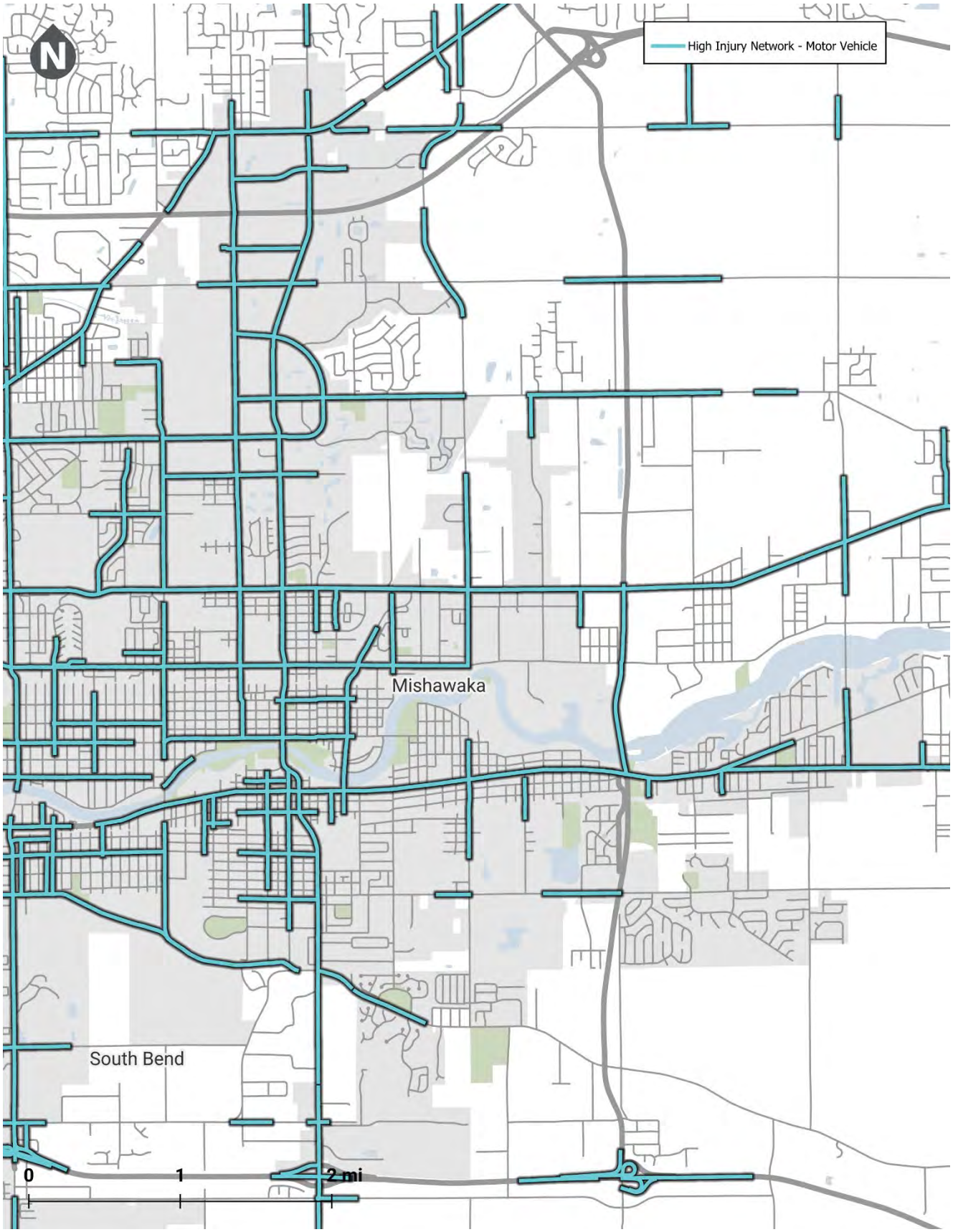

N
High Injury Network - Motor Vehicle
Elkhart
Goshen
Nappanee
St Joseph County
Elkhart County
Kosciusko County
0 1 2 mi

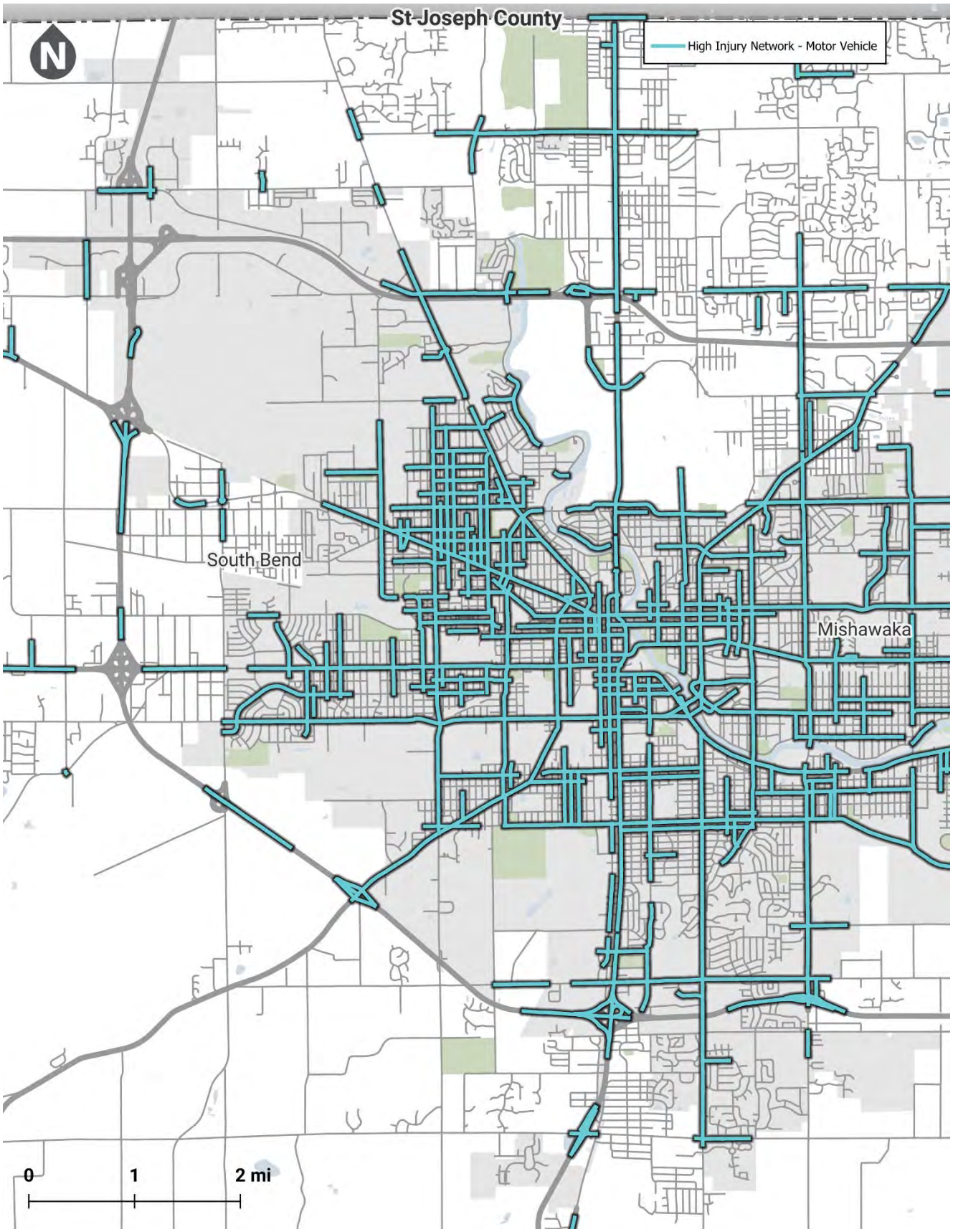

Elkhart County
High Injury Network - Motor Vehicle
N
Nappanee
Marshall County
Warsaw
Kosciusko County
0 1 2 mi

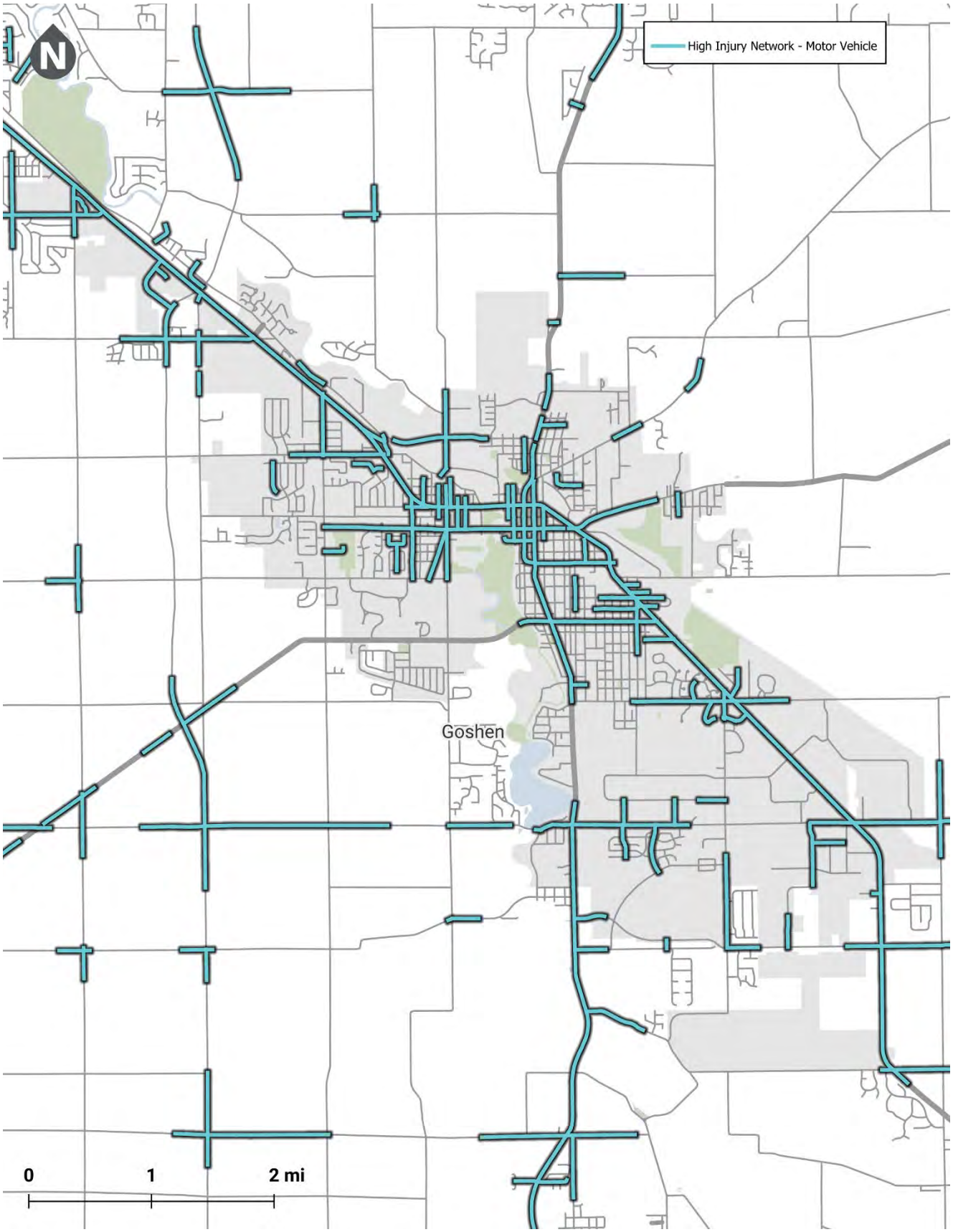

High Injury Network - Motor Vehicle
St Joseph County
South Bend
Mishawaka
Marshall County
0 1 2 mi

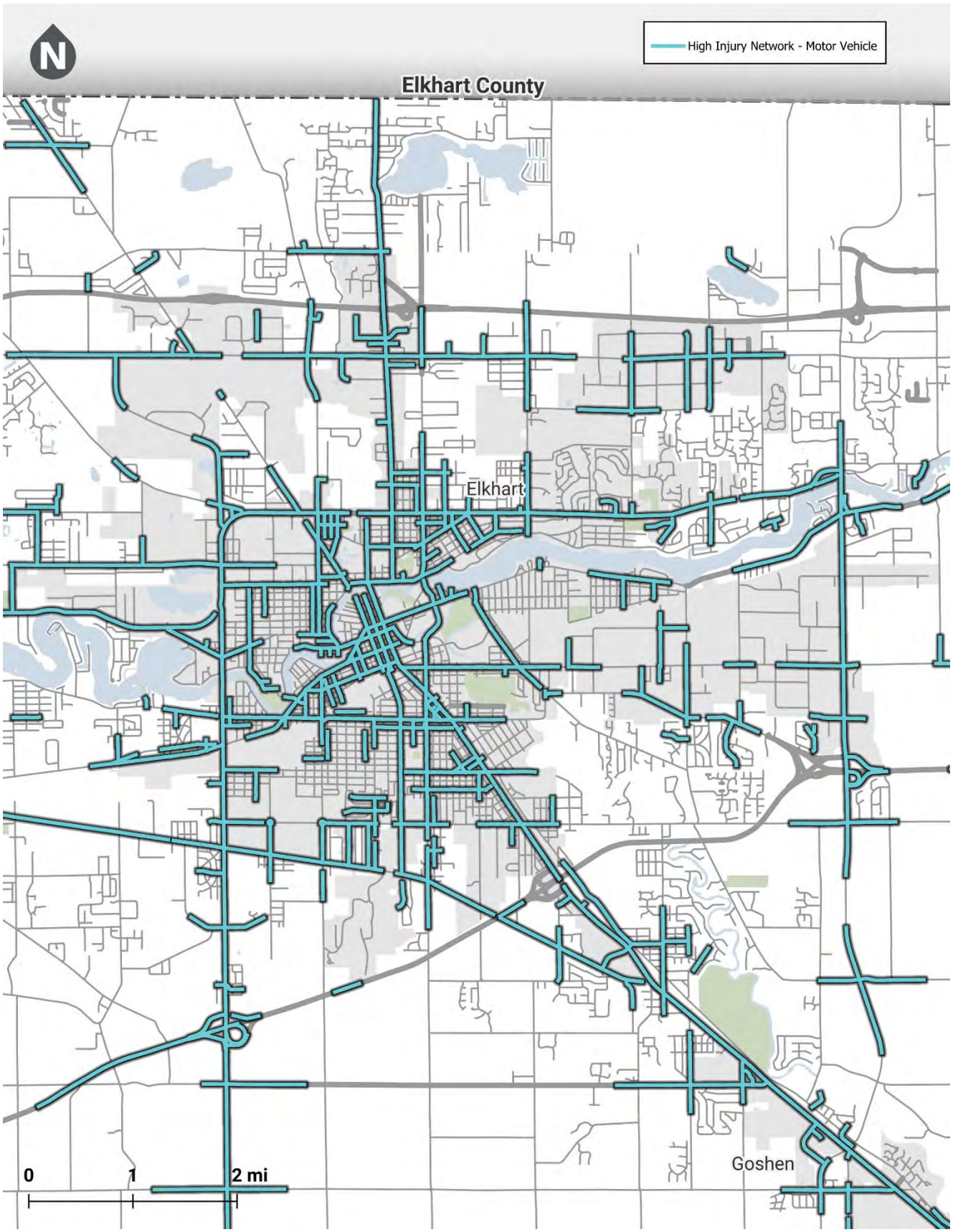

N
High Injury Network - Motor Vehicle
St Joseph County
Plymouth
Marshall County
Kosciusko County
0 1 2 mi

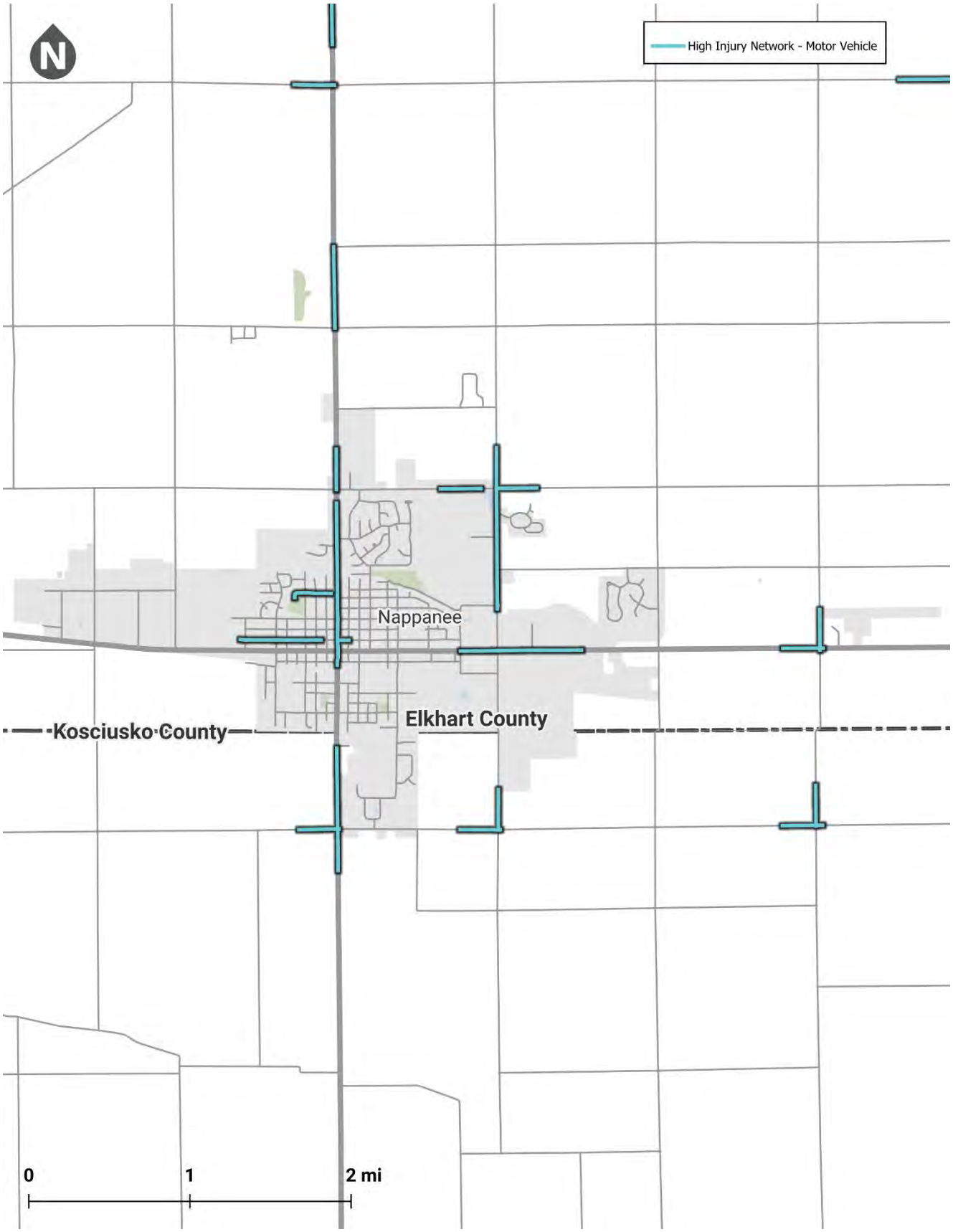

N
High Injury Network - Motor Vehicle
Warsaw
0
1
2 mi

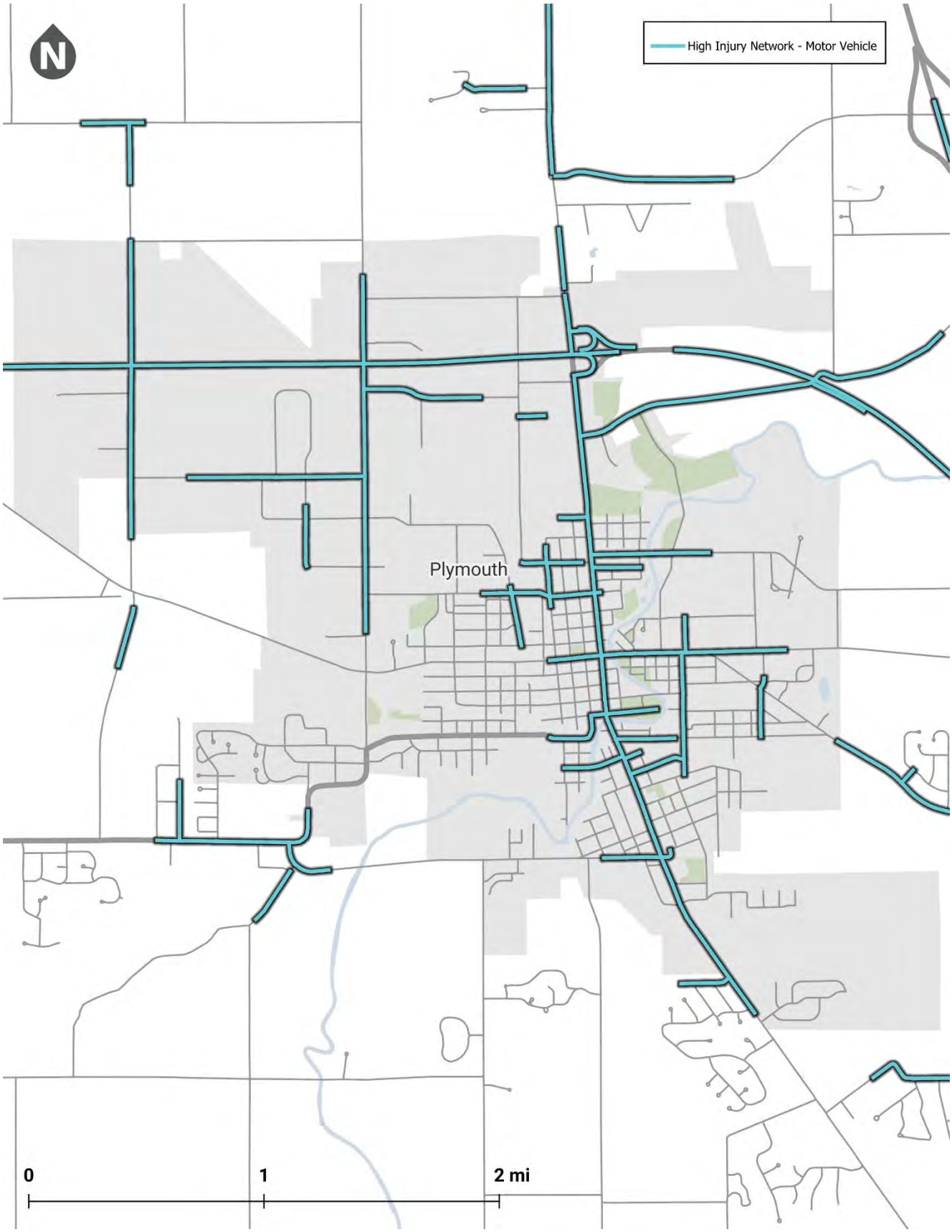

N
High Injury Network - Motor Vehicle
Mishawaka
South Bend
0
1
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St Joseph County
High Injury Network - Motor Vehicle
South Bend
Mishawaka
0
1
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High Injury Network - Motor Vehicle
N
Goshen
0
1
2 mi


High Injury Network - Motor Vehicle
Elkhart County
Elkhart
Goshen
0
1
2 mi


N
High Injury Network - Motor Vehicle
Nappanee
Kosciusko County
Elkhart County
0
1
2 mi


N
High Injury Network - Motor Vehicle
Plymouth
0
1
2 mi

SS4A HIGH RISK NETWORK METHODOLOGY MEMORANDUM

August 29, 2024

To: Caitlin Stevens and David Harker
Organization: Michiana Area Council of Governments (MACOG)
From: Catherine Girves, Tariq Shihadah, and Katie Sieb
Project: MACOG Regional Safety Action Plan

Re: High Risk Network Methodology Memorandum

The purpose of this memorandum is to document the methodology used to determine the High Risk Network (HRN) for the Michiana Area Council of Governments (MACOG) Regional Safety Action Plan. This systemic analysis will help the agency identify roadway facilities with the greatest potential for safety improvement by identifying combinations of roadway attributes associated with elevated average serious crash frequencies.

Systemic Screening Factors

One of the key outcomes of the HRN analysis process is the identification of attributes of roadways that correlate with relatively high crash frequency. These are known as systemic screening factors or risk factors. Combinations of these factors compose roadway facility profiles that are associated with higher crash frequencies. It is important to note that the factors do not necessarily indicate a causal relationship, and the individual factors should not necessarily be the target of treatments. For example, though the presence of nearby pedestrian generators such as schools and parks may be found as a factor that correlates with elevated pedestrian crash frequencies, this does not mean that these generators should be removed. Instead, facilities near pedestrian generators may require additional safety investment.

Screening factors and roadway facility profiles should be studied from a practical and policy-driven perspective to distinguish between components that may be reasonable opportunities for safety improvements and those that should be viewed primarily as non-causal correlations.

Table 1 describes the roadway attributes that were identified as possible risk factors for consideration in the analysis. These factors were limited by data quality and availability.

Table 1. Possible Risk Factors Screened for Systemic Analysis

Screening Factor	Description
Functional Class	High functional class (arterials), medium functional class (collectors), or low functional class (local streets)
Incorporation Status	Incorporated (city code not equal to '0000') or Unincorporated (city code equal to '0000')
Racial Minority Score *	1 (well below average) through 5 (well above average)
Hispanic, Any Race Score *	1 (well below average) through 5 (well above average)
Households Below Poverty Score *	1 (well below average) through 5 (well above average)
Limited English Households Score *	1 (well below average) through 5 (well above average)
Population Over 64 Score *	1 (well below average) through 5 (well above average)
Population Under 18 Score *	1 (well below average) through 5 (well above average)
Zero Vehicle Households Score *	1 (well below average) through 5 (well above average)
Households with Disability Score *	1 (well below average) through 5 (well above average)
Population with No High School Score *	1 (well below average) through 5 (well above average)
Population Unemployed Score *	1 (well below average) through 5 (well above average)
Environmental Justice Score *	1 (well below average) through 5 (well above average)

** Equity attributes were developed for this project and are described in the Equity Analysis technical documentation*

Analysis Process

The High Risk Network analysis focused on years 2019 through 2023. The analysis included all public roadways, except for access-controlled roads. Consolidated roadway data was analyzed to retain all relevant roadway cross-sectional and contextual attributes. Additional contextual equity attributes were applied to the segmented data from the project's equity analysis results to include as potential screening factors.

The High Risk Network analysis process is based on a decision tree machine learning algorithm that screens each factor individually to determine whether the factor distinguishes between locations with relatively high and low average crash densities per mile. For categorical factors such as functional classification, the algorithm considers each unique classification category individually. For numerical factors, such as the Zero Vehicle Households Score, which ranges from one to five, the algorithm considers all potential breakpoints by which the numerical values could be split. The algorithm screens all factors recursively to identify the next most correlated factor and continues until a unique combination of factors is identified as a facility profile. Figure 1 illustrates the decision tree algorithm where three correlated factors define a high-risk facility profile.

In summary, the purpose of the High Risk Network is to identify sets of characteristics that are most associated with high average crash densities in the MACOG region. This is a proactive analysis that captures types of roadways with characteristics that result in higher crashes across the MACOG region, even if some individual locations lack a recent crash history.

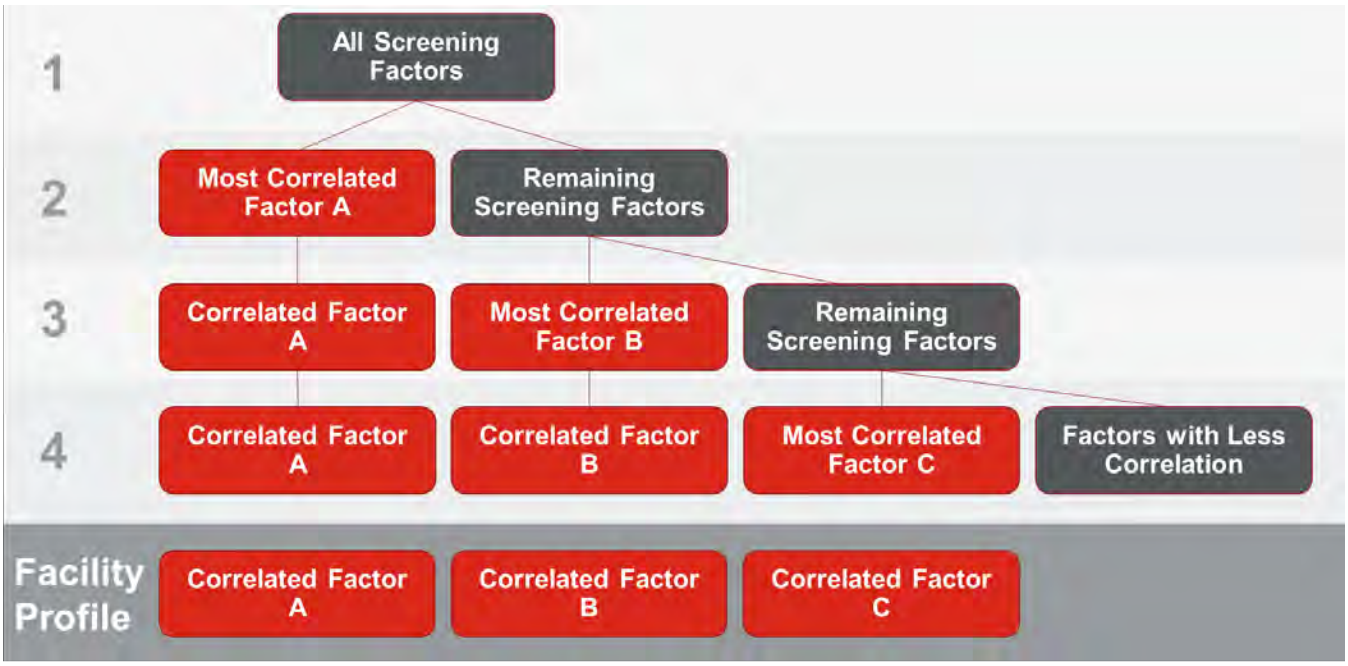


Figure 1. Illustration of Decision Tree Screening Process

Crash Data Overview

FSI crash data was obtained from MACOG through the Indiana Department of Transportation (INDOT) for the most recent 5 years (2019-2023) for Elkhart, Kosciusko, Marshall, and St. Joseph Counties. This data was used for the analyses presented in this memo.

Data Limitations

Local law enforcement agencies submit the crash reports that provide the raw crash data. Although crash reports are currently the best way to obtain information about a large quantity of crashes, they have limitations. Crash severity may have limited accuracy because those completing reports typically don't have medical training, and victims of crashes may be unaware of internal injuries masked by adrenalin. Additionally, crashes may be underreported due to negative conceptions about enforcement, language barriers, financial concern, and more. Crash reports may not capture the speed of vehicles involved in a crash, as the first responders are typically on the scene after the crash has occurred and witnesses outside a crash may not be aware of or interviewed about vehicle speed. Even when crash reports are accurate, they do not capture near misses or the self-limiting behavior of travelers who don't feel safe on today's roadways. It is useful to keep these limitations in mind when using crash data and to vet data with priority populations as part of the planning process. Due to the complexity of crash data and its origins, some interpretations of the data may change over the course of this project which may impact specific patterns or findings resulting from analysis steps.

Analysis Results

MACOG's High Risk Network is defined for all modes and vulnerable road user (VRU) modes, including pedestrians and bicyclists, each outlining the unique risk factors and priority rankings associated with each facility profile. Each subsection defines the combinations of characteristics most associated with higher versus lower risks for serious or fatal crashes. These

characteristics result in a facility profile for critical, high, medium, low, and minimal risk areas. Metrics associated with these profiles, like crash scores and mileage are summarized in a separate table. Profiles are grouped into five tiers, from critical to minimal, highlighting the facilities that are associated with the highest to lowest risk for severe crashes based on present risk factors. Based on these profiles and their tiers, we were able to identify those roadway segments associated with higher levels of crash risks for each mode in the MACOG region.

All Modes – Incorporated Areas in Elkhart and St. Joseph Counties

The following tables and figures show the facility profiles for all modes on roadways within incorporated areas in Elkhart and St. Joseph counties. The analysis was conducted using crashes of fatal and serious injury (FSI) severities. Critical, high, and medium tiers are included within the final high risk network maps (included in the Appendix).

Table 2 All Mode Facility Profile Definitions, Incorporated Areas in Elkhart and St. Joseph Counties

Facility Profile Tier	Facility Profile Definition				
	Functional Class Category	*Population Over 64 Score*	*Households with Disability Score*	*Environmental Justice Score*	*Population with No High School Degree Score*
Critical	High Medium	1-2	3-5	5	
High	High Medium High	1-2 3-5	1-2	1-4	1
Medium	Medium			1-4	2-5
Low	Low	1-2			
Minimal	Low	3-5			

Table 3 All Mode Facility Profile Metrics, Incorporated Areas in Elkhart and St. Joseph Counties

Facility Profile Tier	Facility Profile Metrics				
	Avg. Fatal and Serious Injury Crashes per Mile	*Miles*	*Fatal and Serious Injury Crashes*	*Miles Share*	*Fatal And Serious Injury Crashes Share*
Critical	13.50	44.7	603.0	3.6%	14.7%
High	8.57	128.3	1,101.0	10.3%	26.8%
Medium	3.92	143.2	562.0	11.4%	13.7%
Low	2.63	450.8	1,187.0	36.0%	28.9%
Minimal	1.36	485.0	660.0	38.7%	16.0%

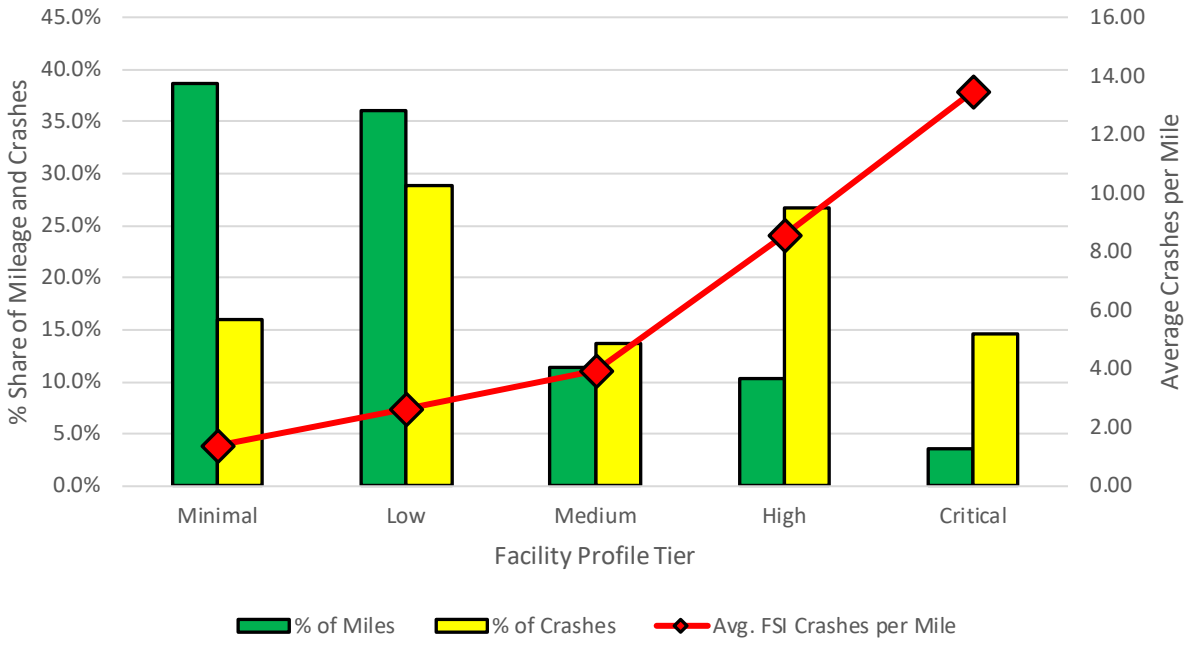


Figure 2 All Mode Facility Profile Summary, Incorporated Areas in Elkhart and St. Joseph Counties

All Modes – Incorporated Areas in Kosciusko and Marshall Counties

Figures in this section represent results for all modes on roadways within incorporated areas in Kosciusko and Marshall counties. The analysis was conducted using crashes of fatal and serious injury (FSI) severities. Critical, high, and medium tiers are included within the final high risk network maps (included in the Appendix).

Table 4 All Mode Facility Profile Definitions, Incorporated Areas in Kosciusko and Marshall Counties

Facility Profile Tier	Facility Profile Definition					
	Functional Class Category	*Households with Disability Score*	*Households Below Poverty Score*	*Racial Minority Score*	*Population Over 64 Score*	*Zero Vehicle Households Score*
Critical	High	1-2	3-5			
High	Medium	1-2	3-5			
Medium	Not Low	1-2	1-2	1-2		
Low	Not Low	3-5				
	Low				1-2	1
Minimal	Low				1-2	2-5
	Low				3-5	
	Not Low	1-2	1-2	3-5		

Table 5 All Mode Facility Profile Metrics, Incorporated Areas in Kosciusko and Marshall Counties

Facility Profile Tier	Facility Profile Metrics				
	Avg. Fatal and Serious Injury Crashes per Mile	*Miles*	*Fatal and Serious Injury Crashes*	*Miles Share*	*Fatal and Serious Injury Crashes Share*
Critical	3.57	6.7	24.0	1.9%	11.1%
High	2.39	10.0	24.0	2.9%	11.1%
Medium	1.38	18.1	25.0	5.2%	11.5%
Low	0.96	71.6	69.0	20.4%	31.8%
Minimal	0.31	244.1	75.0	69.6%	34.6%

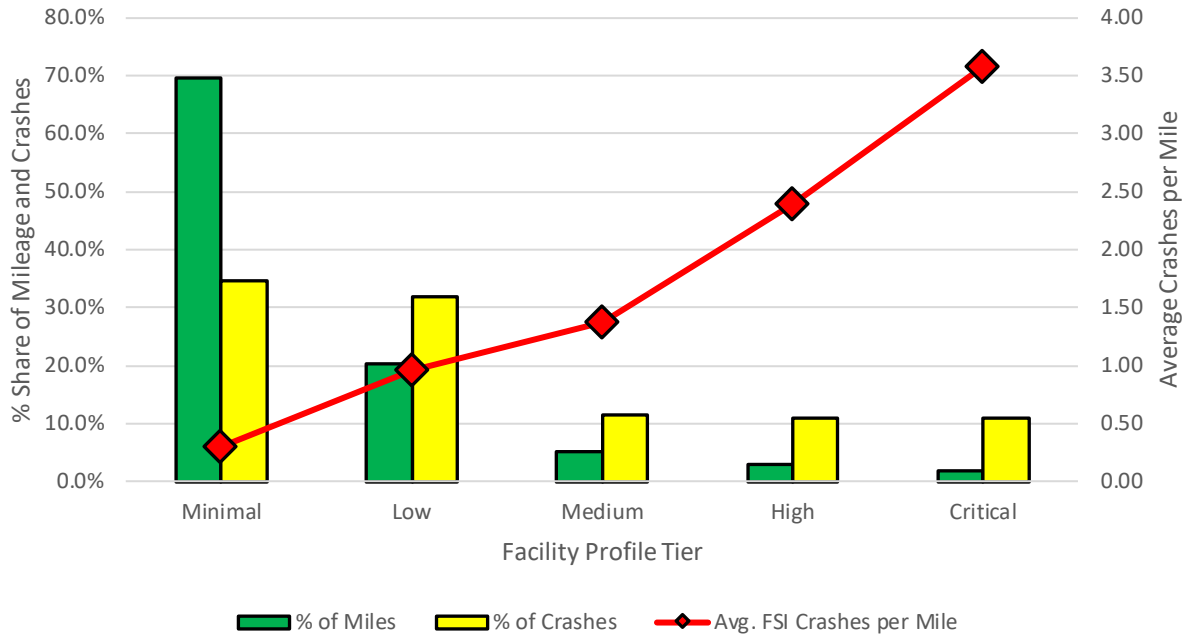


Figure 3 All Mode Facility Profile Summary, Incorporated Areas in Kosciusko and Marshall Counties

All Modes – Unincorporated Areas, Regionwide

Figures in this section represent results for all modes on roadways outside of incorporated areas, regionwide. The analysis was conducted using crashes of fatal and serious injury (FSI) severities. Critical, high, and medium tiers are included within the final high risk network maps (included in the Appendix).

Table 6 All Mode Facility Profile Definitions, Unincorporated Areas, Regionwide

Facility Profile Tier	Facility Profile Definition				
	Functional Class Category	*Racial Minority Score*	*Population Over 64 Score*	*Limited English Households Score*	*Households Below Poverty Score*
Critical	High	4-5			
High	High	1-3	1-2	1-2	
Medium	Medium		1-2		3-5
	High	1-3	1-2	3-5	
	High	1-3	3-5		
Low	Medium		1-2		1-2
	Medium		3-5		
Minimal	Low				

Table 7 All Mode Facility Profile Metrics, Unincorporated Areas, Regionwide

Facility Profile Tier	Facility Profile Metrics				
	Avg. Fatal and Serious Injury Crashes per Mile	*Miles*	*Fatal and Serious Injury Crashes*	*Miles Share*	*Fatal and Serious Injury Crashes Share*
Critical	13.26	12.4	164.0	0.3%	4.0%
High	5.49	110.0	604.0	2.3%	14.8%
Medium	2.75	487.4	1,342.0	10.1%	32.8%
Low	0.92	1,058.8	979.0	22.0%	23.9%
Minimal	0.32	3,150.7	1,004.0	65.4%	24.5%

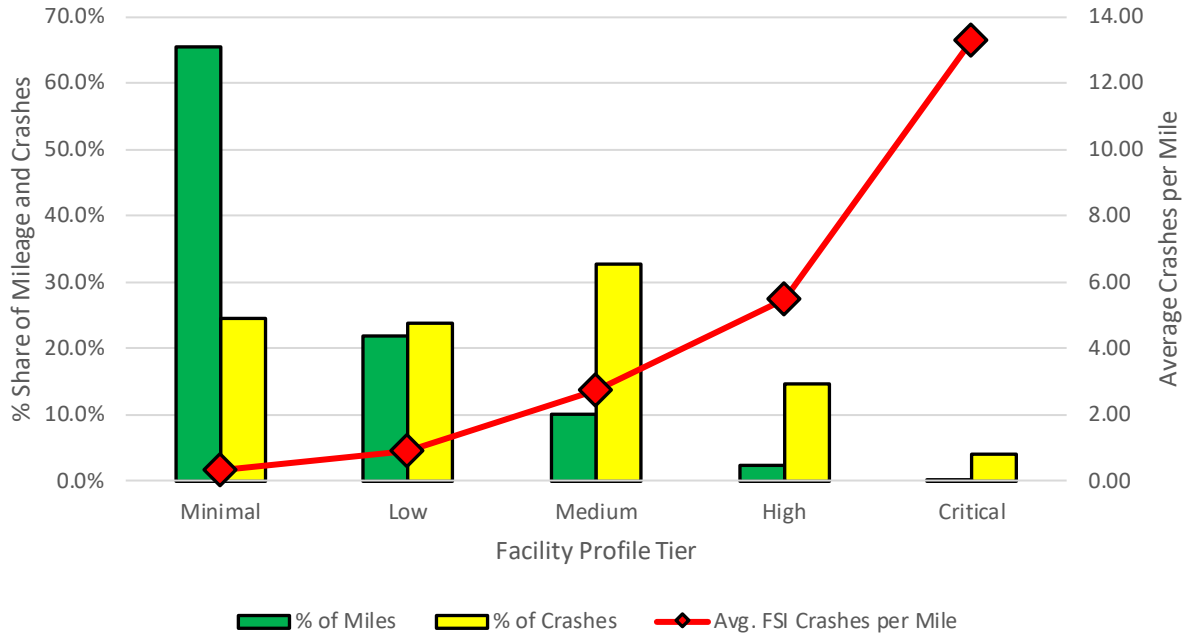


Figure 4 All Mode Facility Profile Summary, Unincorporated Areas, Regionwide

Vulnerable Road User Modes – Incorporated Areas, Regionwide

Figures in this section represent results for pedestrian and bicycle modes on roadways within incorporated areas, regionwide. The analysis was conducted using crashes of fatal and serious injury (FSI) severities. Critical, high, and medium tiers are included within the final high risk network maps (included in the Appendix).

Table 8 Vulnerable Road User Facility Profile Definitions, Incorporated Areas, Regionwide

Facility Profile Tier	Facility Profile Definition					
	Functional Class Category	*Households Below Poverty Score*	*Households with Disability Score*	*Unemployed Population Score*	*Racial Minority Score*	*Population Over 64 Score*
Critical	High	3-5	3-5	1-3		
	Not High		1		4-5	
High	High	3-5	1-2			
Medium	High	3-5	3-5	4-5		
	Not High		1		1-3	
	High	1-2				
Low	Not High		2-5			1-2
Minimal	Not High		2-5			3-5

Table 9 Vulnerable Road User Facility Profile Metrics, Incorporated Areas, Regionwide

Facility Profile Tier	Facility Profile Metrics				
	Avg. Fatal and Serious Injury Crashes per Mile	*Miles*	*Fatal and Serious Injury Crashes*	*Miles Share*	*Fatal and Serious Injury Crashes Share*
Critical	1.61	62.6	101.0	3.9%	21.4%
High	0.88	39.9	35.0	2.5%	7.4%
Medium	0.51	130.3	66.0	8.1%	14.0%
Low	0.29	596.8	170.0	37.2%	36.0%
Minimal	0.13	773.0	100.0	48.2%	21.2%

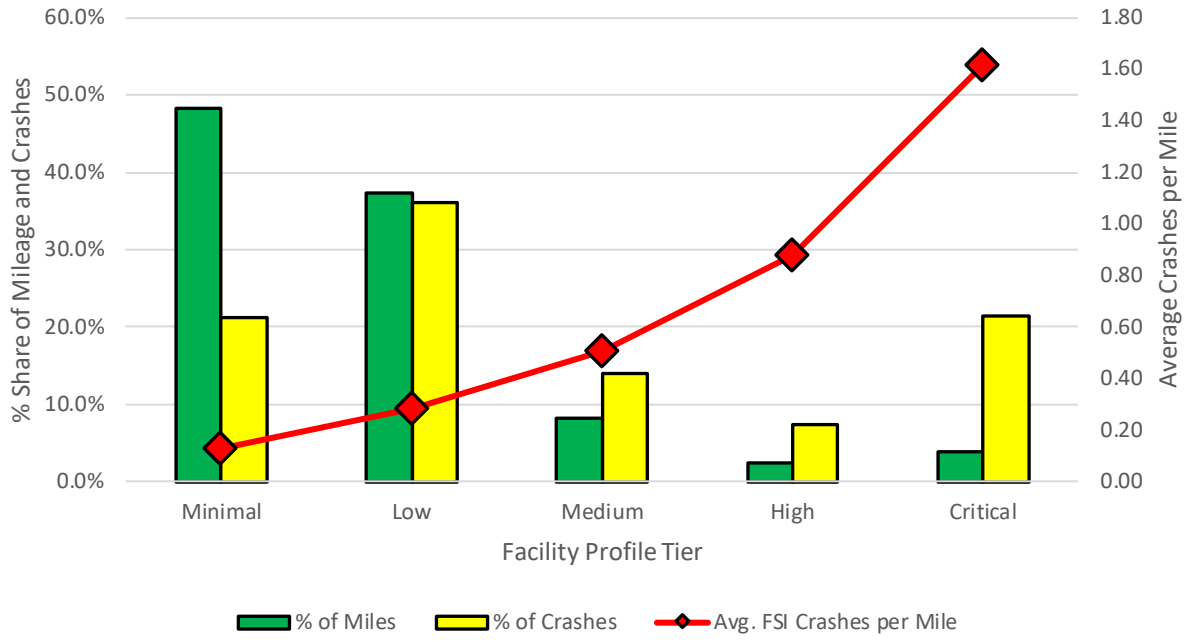


Figure 5 Vulnerable Road User Facility Profile Summary, Incorporated Areas, Regionwide

Vulnerable Road User Modes – Unincorporated Areas, Regionwide

Figures in this section represent results for pedestrian and bicycle modes on roadways outside of incorporated areas, regionwide. The analysis was conducted using crashes of fatal and serious injury (FSI) severities. Critical, high, and medium tiers are included within the final high risk network maps (included in the Appendix).

Table 10 Vulnerable Road User Facility Profile Definitions, Unincorporated Areas, Regionwide

Facility Profile Tier	Facility Profile Definition				
	Functional Class Category	*Racial Minority Score*	*Households Below Poverty Score*	*Unemployed Population Score*	*Population Over 64 Score*
Critical	High	4-5			
High	High	1-3	4-5	1-2	
Medium	High	1-3	3		
Low	High	1-3	4-5	3-5	
	Medium				1-2
	High	1-3	1-2		
Minimal	Low				1-2
	Not High				3-5

Table 11 Vulnerable Road User Facility Profile Metrics, Unincorporated Areas, Regionwide

Facility Profile Tier	Facility Profile Metrics				
	Avg. Fatal and Serious Injury Crashes per Mile	*Miles*	*Fatal and Serious Injury Crashes*	*Miles Share*	*Fatal and Serious Injury Crashes Share*
Critical	1.86	12.4	23.0	0.3%	9.7%
High	1.29	7.0	9.0	0.1%	3.8%
Medium	0.26	108.9	28.0	2.3%	11.8%
Low	0.12	782.8	92.0	16.2%	38.7%
Minimal	0.02	3,908.3	86.0	81.1%	36.1%

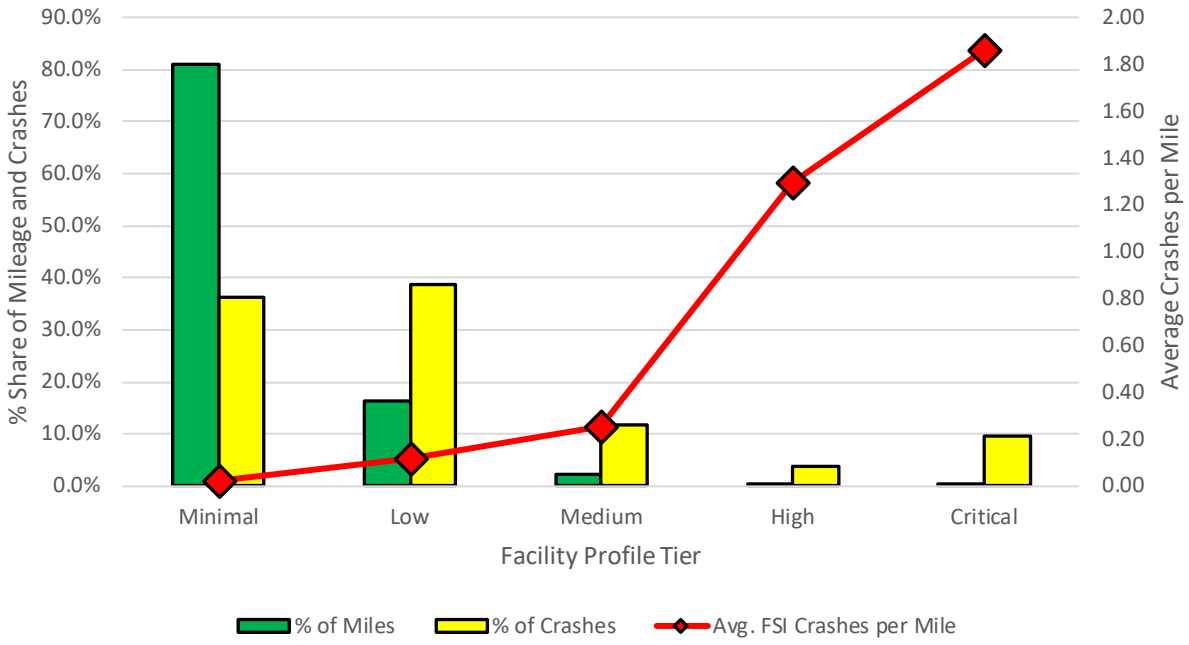


Figure 6 Vulnerable Road User Facility Profile Summary, Unincorporated Areas, Regionwide

Sincerely,

Catherine Girves | Project Manager

TOOLE DESIGN
20 East Broad Street | Columbus, OH 43215
cgirves@tooledesign.com | 614.407.9122 x459

Appendix A: Maps of All Mode High-risk Networks by County

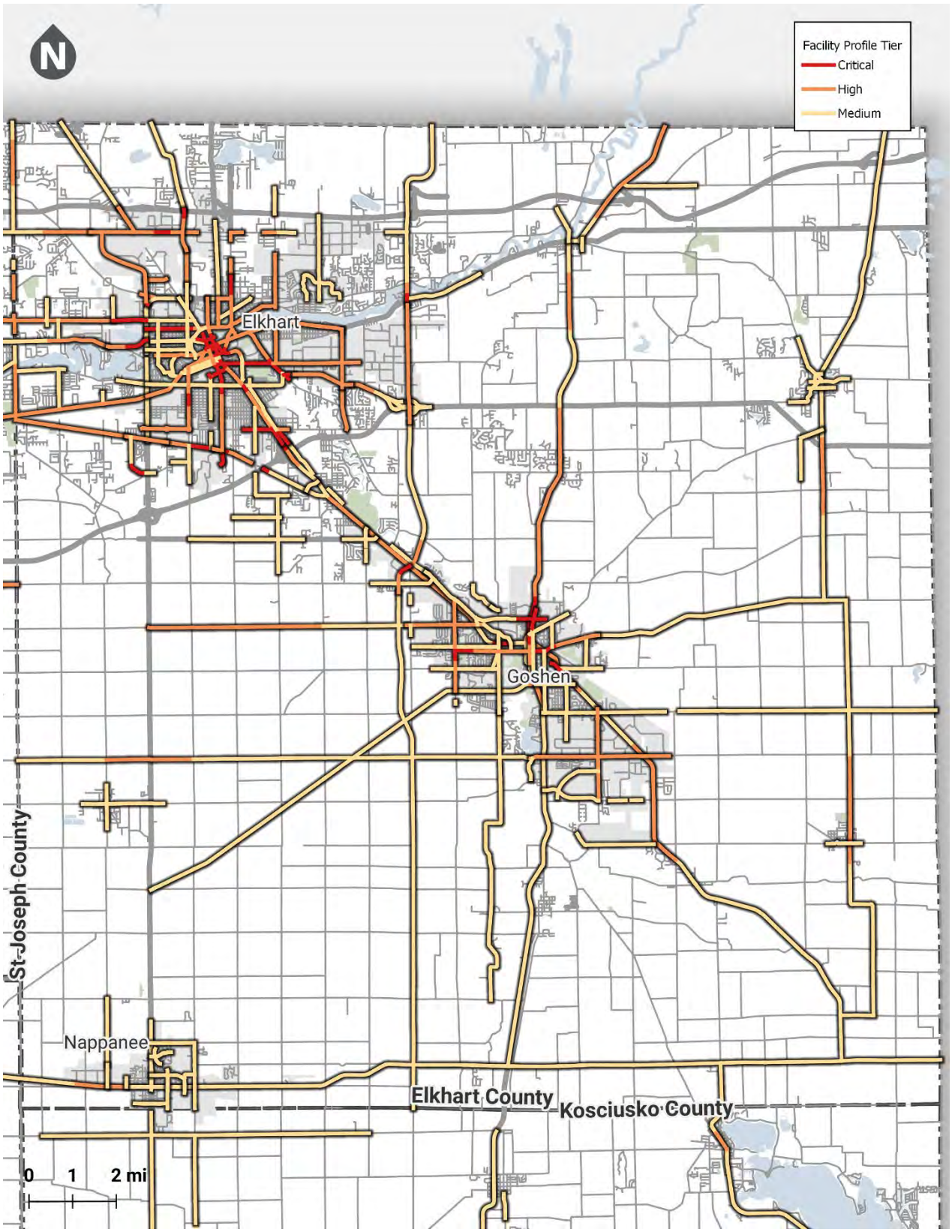


Figure 7 All Mode High Risk Network Map, Elkhart County

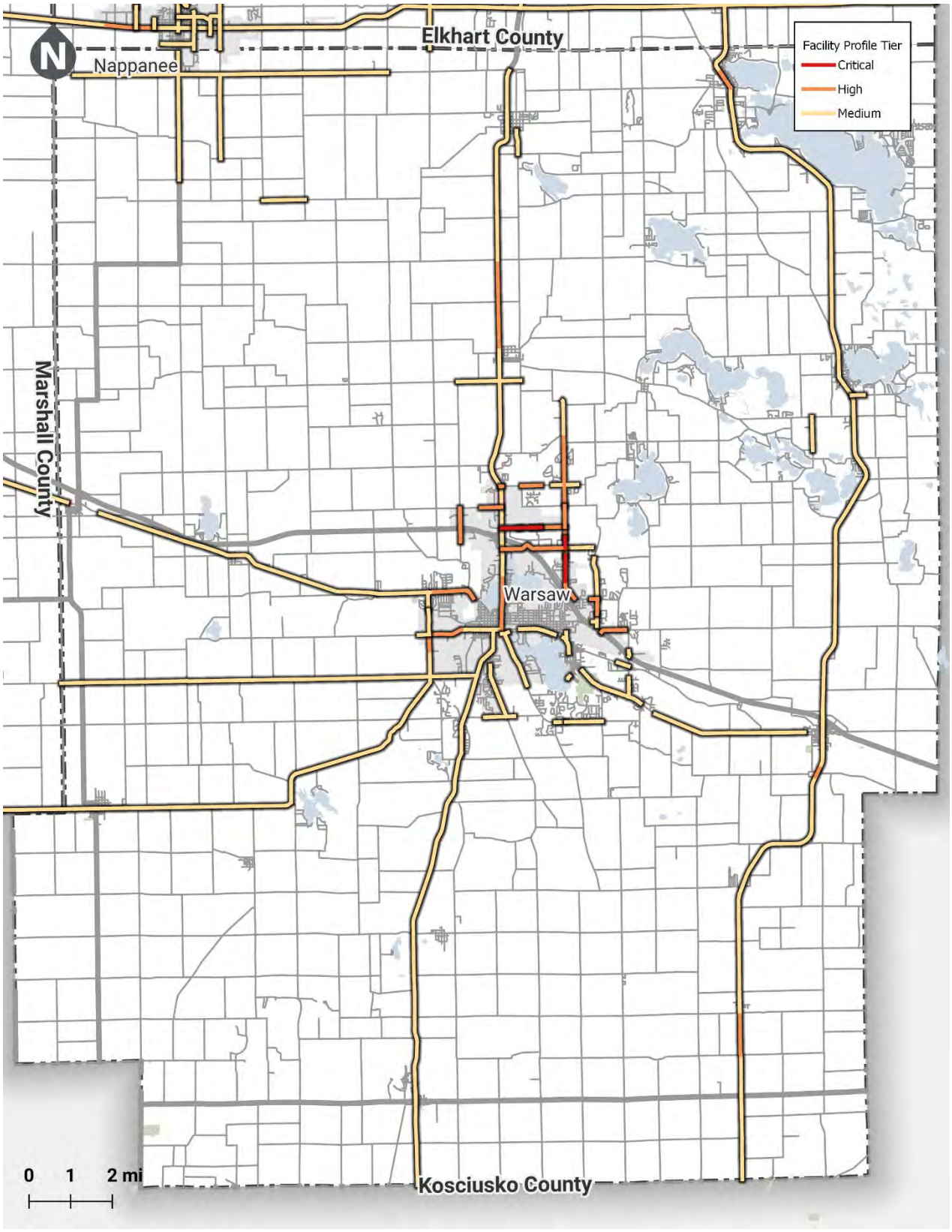


Figure 8 All Mode High Risk Network Map, Kosciusko County

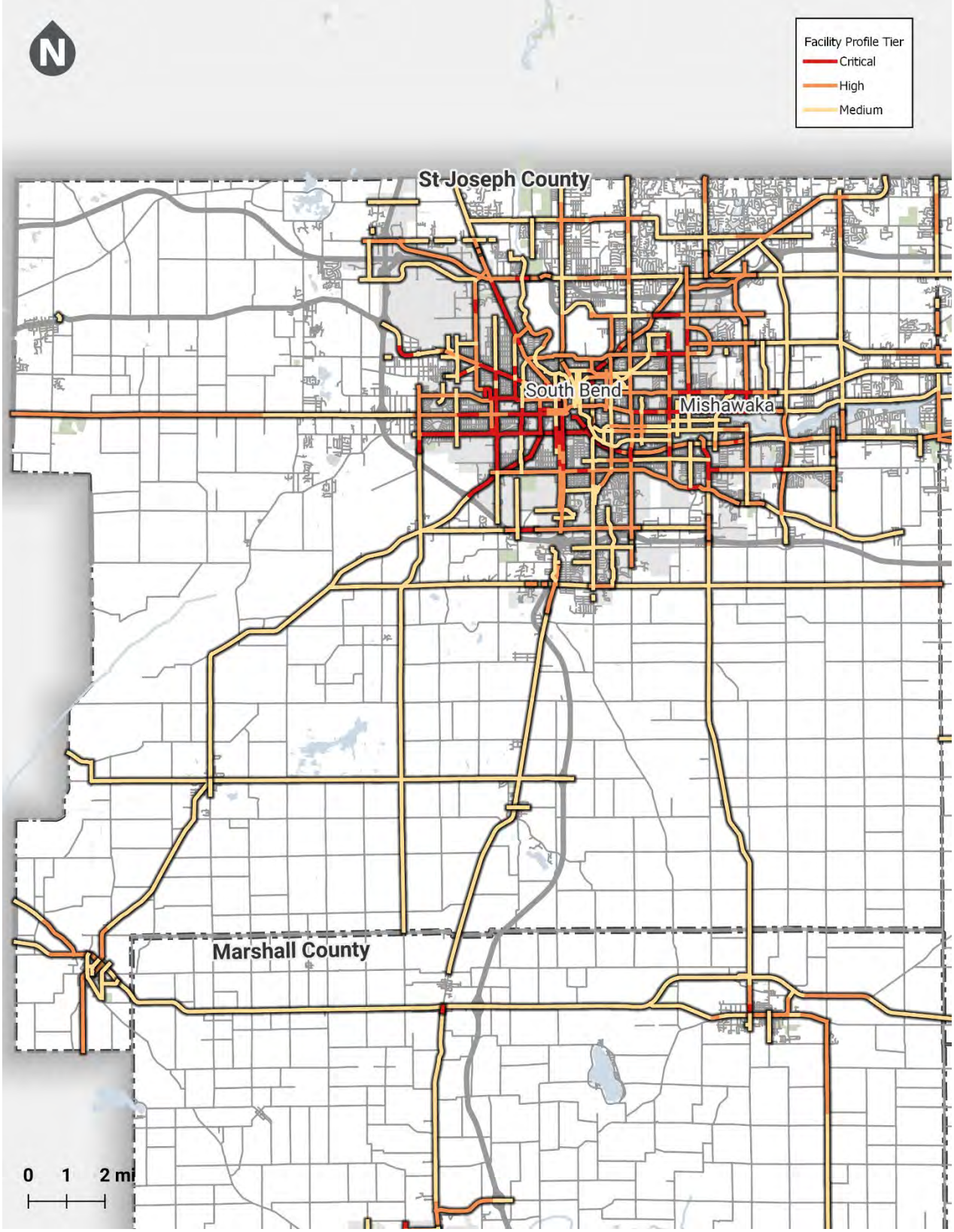


Figure 9 All Mode High Risk Network Map, St. Joseph County

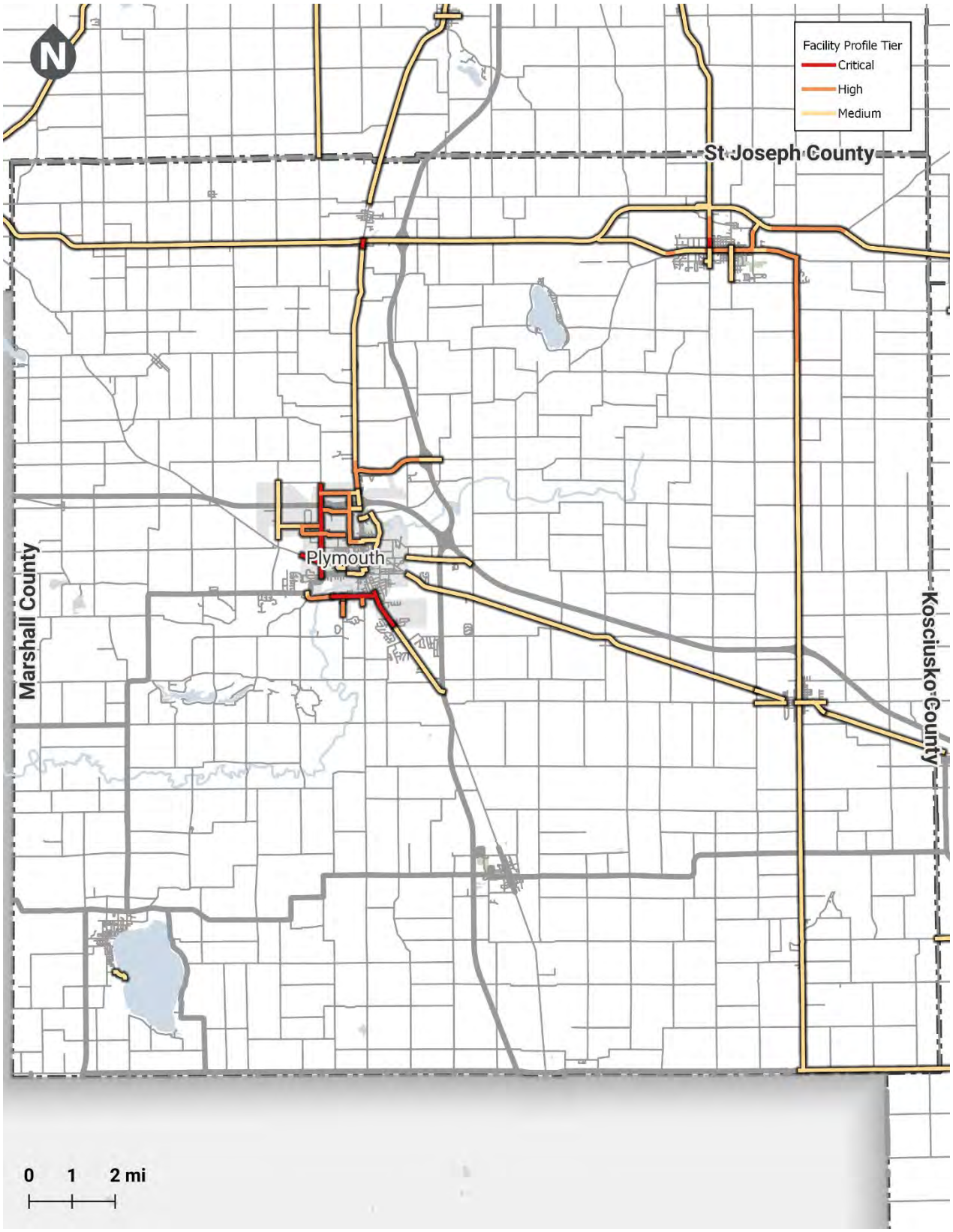


Figure 10 All Mode High Risk Network Map, Marshall County

Appendix A: Maps of VRU High-risk Networks by County

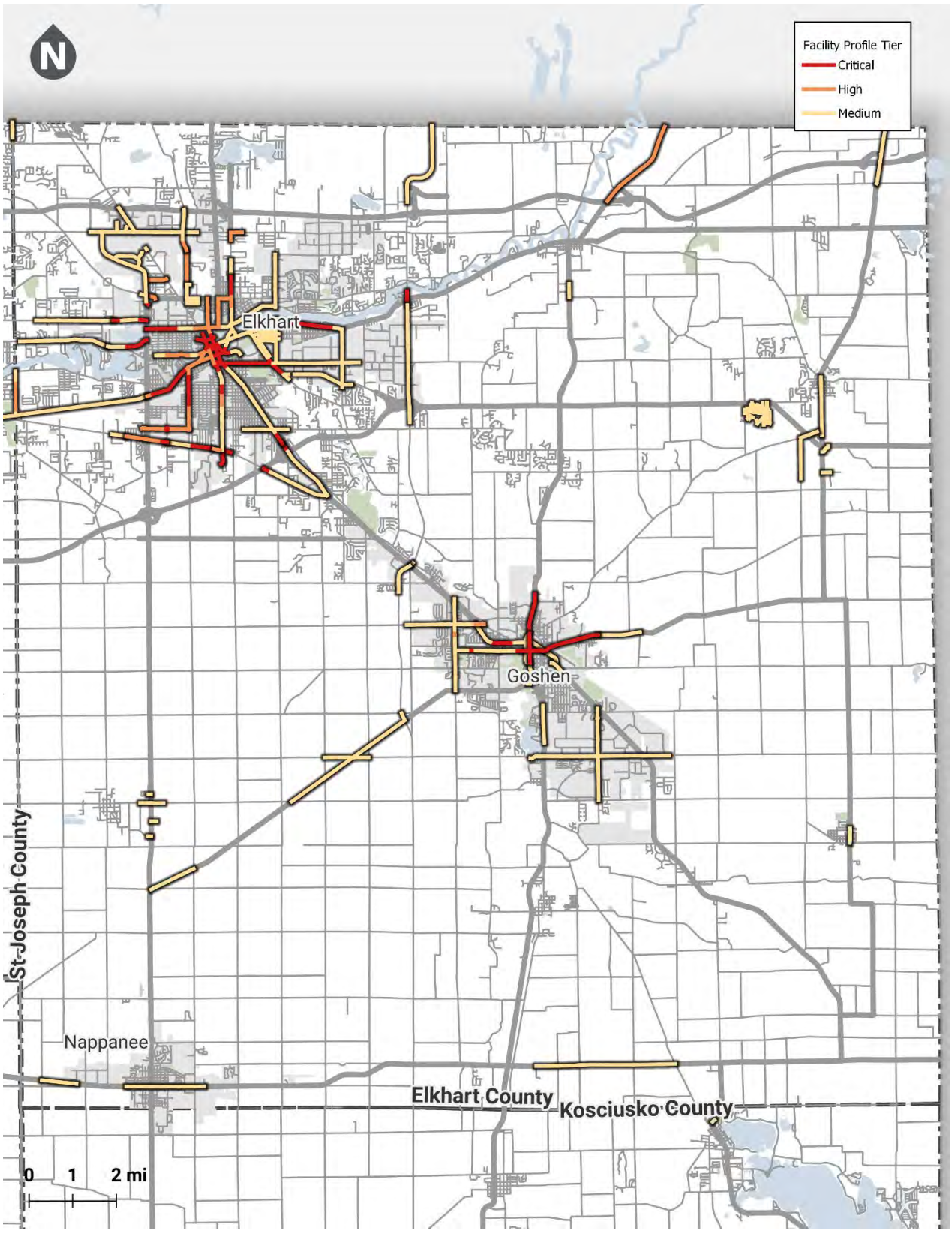


Figure 11 VRU High Risk Network Map, Elkhart County

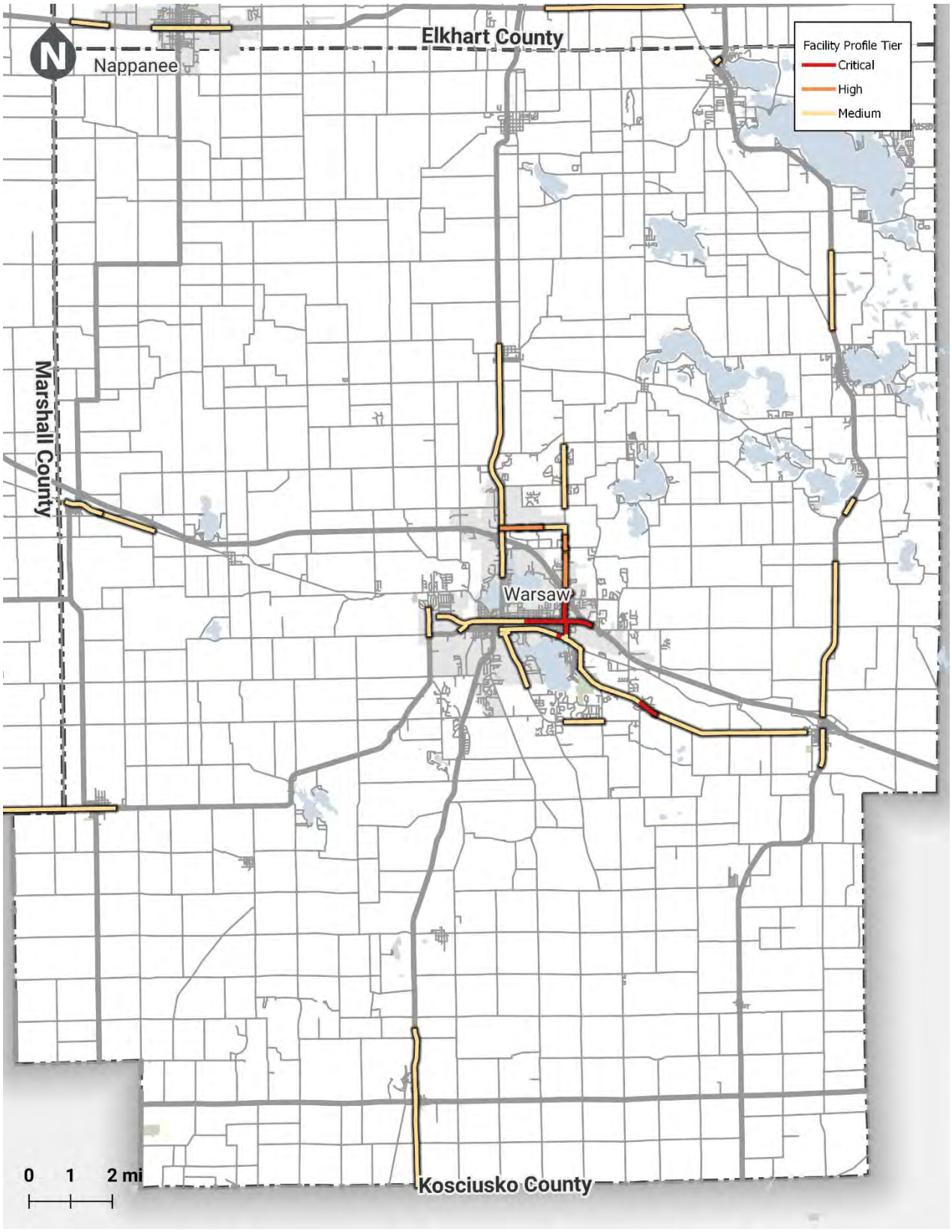


Figure 12 VRU High Risk Network Map, Kosciusko County

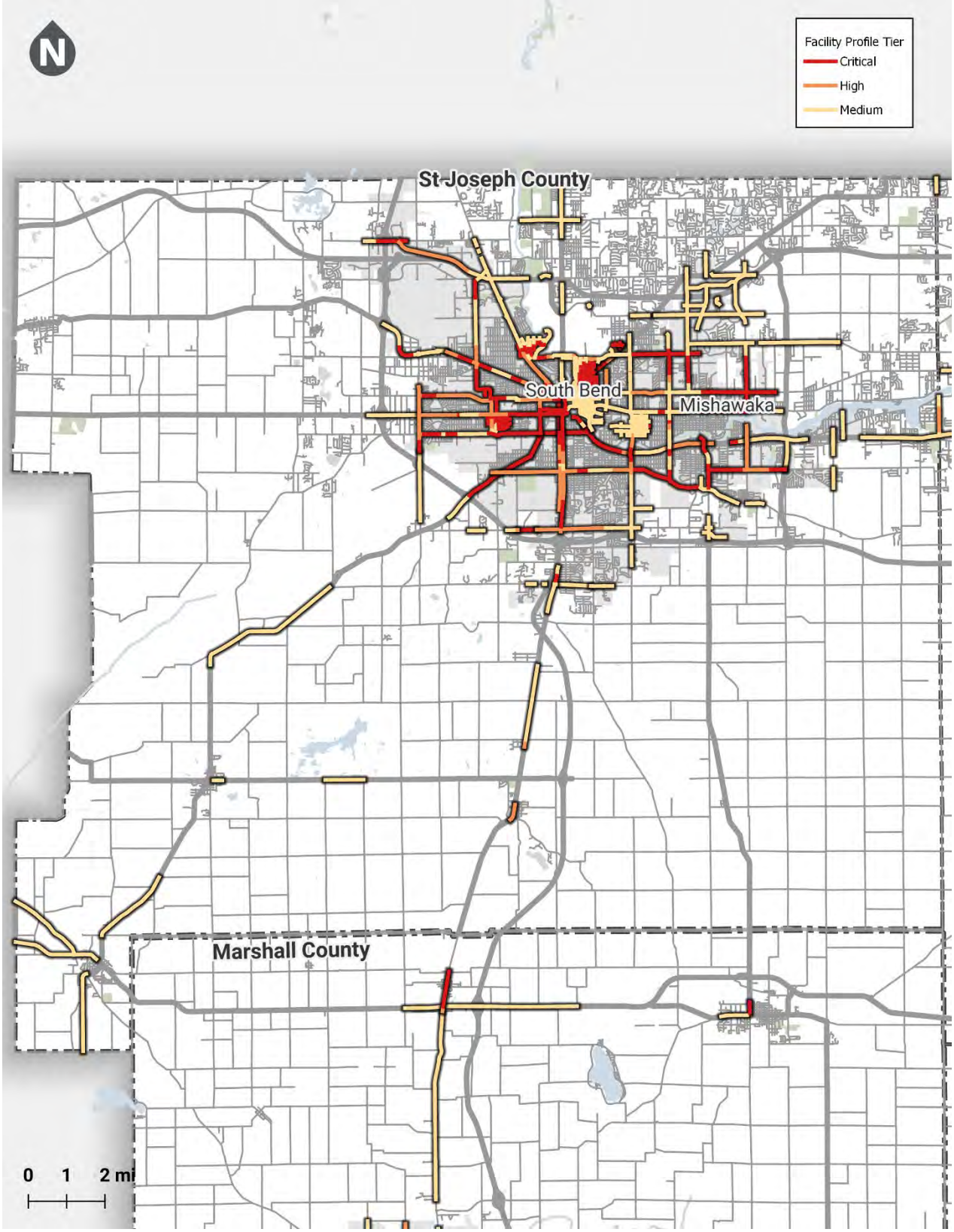


Figure 13 VRU High Risk Network Map, St. Joseph County

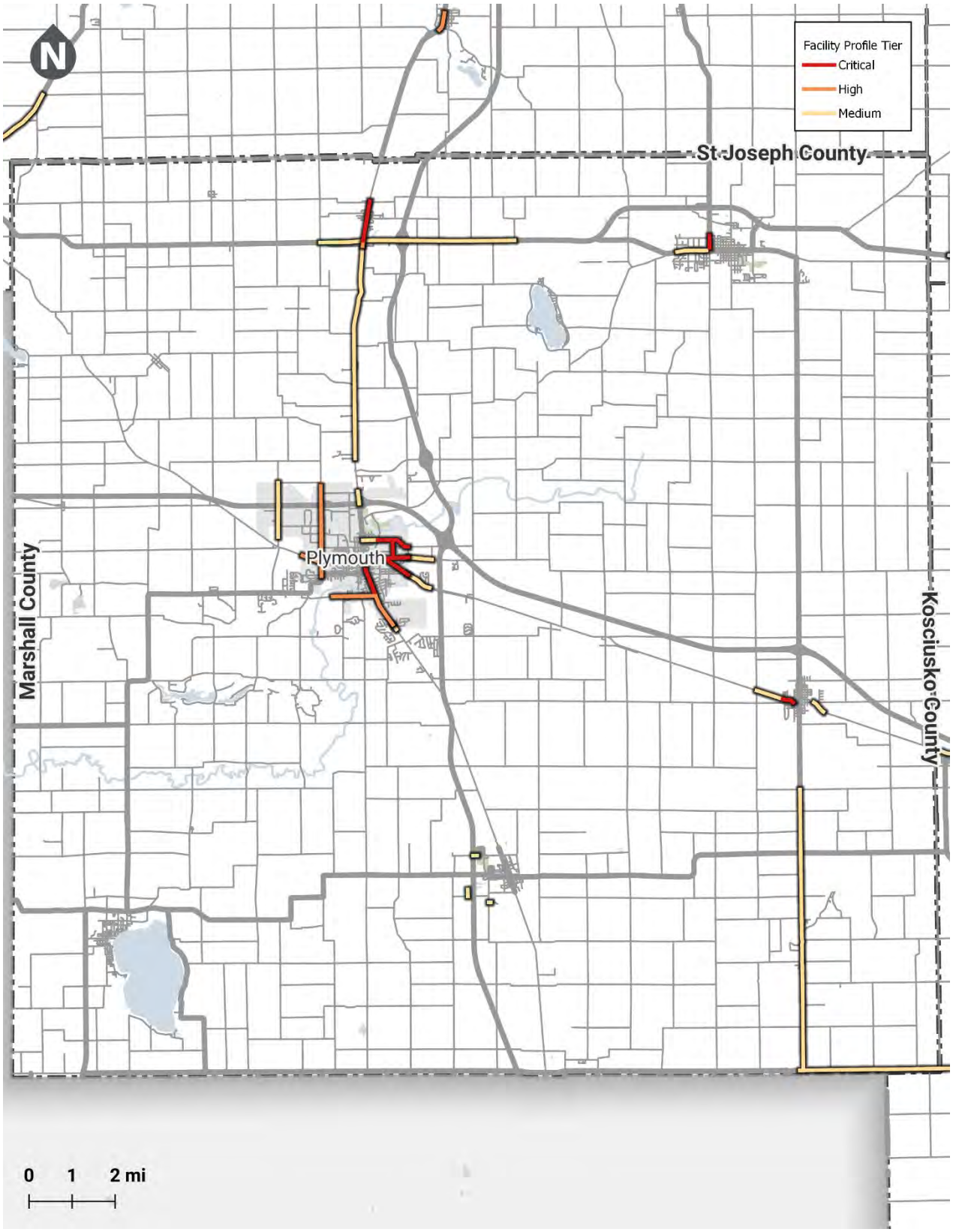


Figure 14 VRU High Risk Network Map, Marshall County

PRIORITIZATION METHODOLOGY

October 10, 2024

To: Caitlin Stevens
Organization: Michiana Area Council of Governments (MACOG)
From: Catherine Girves, Ayden Cohen, and Theja Putta
Project: MACOG Regional Safety Action Plan

Re: Project Prioritization Methodology

The purpose of this memorandum is to summarize the methodology used for prioritizing candidate safety improvement locations. Prioritizing candidate locations is an effective means of guiding the implementation strategy. This process was done in four parallel groups. In one output, the entire region is compared to itself. The other three outputs, all displayed on one map, compare like regions only to themselves: 1) large metro areas (South Bend, Mishawaka, Elkhart, and Goshen), 2) small metro areas (Plymouth, Warsaw, and Nappanee), and 3) rural areas. The first map allows decision makers to see where highest regional priorities exist. The second map shows priorities by type of land use to help identify important local locations more effectively.

Candidate Locations

Candidate locations for were identified through two sources, the High Injury Network and the High Risk Network. For the unit of analysis, each location was sliced into 0.1-mile segments. This prevents any issues with variability in length of segment and any normalizations applied.

Prioritization Categories and Variables

The task of assigning a 'low', 'medium', 'high', or 'critical' priority to a location was based on a set of three prioritization categories:

- Roadway Characteristics
- Land Use and Context
- Equity

Each category includes a series of variables which represent different priorities that align with the goals of the plan. The locations are assigned scores based on how they relate with different variables. The final output is the result of locations ranked or tiered by prioritization scores.

Roadway Characteristics

The variables in this category include:

- **Systemic Analysis Results:** Scoring is based on the location overlapping with a 'High' or 'Critical' tier as identified in the systematic analysis; and

- **High Injury Network Results:** Scoring is based on the location overlapping or intersecting with a location in the High Injury Network.

Table 1: Scoring of Variables, 'Roadway Characteristics' Category

	Process	Regionwide	Large Metro	Small Metro	Rural
Systemic Tier	Location overlaps with a high or critical tier as identified in systemic analysis	5 points – critical tier 3 points – high tier	5 points – critical tier 3 points – high tier	5 points – critical tier 3 points – high tier	5 points – critical tier 3 points – high tier
Part of High Injury Network	Overlaps with or intersects with part of the High Injury Network	3 points – location overlaps with HIN 1 point – location intersects with the High Injury Network	3 points – location overlaps with HIN 1 point – location intersects with the High Injury Network	3 points – location overlaps with HIN 1 point – location intersects with the High Injury Network	3 points – location overlaps with HIN 1 point – location intersects with the High Injury Network

Land Use and Context

The variables in this category include:

- **Destinations:** Location scoring consists of the presence of destination types within 0.25 miles. This includes schools, parks, employment centers, and other activity areas within 0.25 miles;
- **Population Density:** Location scoring is based on the population density within 0.25 miles of a segment;
- **Transit Stops:** Consists of a simple 'yes' or 'no' score based on the proximity of a segment location to a major transit stop;

Table 2: Scoring of Variables, 'Land Use and Context' Category

	Regionwide	Large Metro	Small Metro	Rural
Destinations	Schools, parks, healthcare, shopping, employment centers	Schools, parks, healthcare, shopping, employment centers	Schools, parks, healthcare, shopping, employment centers	Schools, parks, healthcare, shopping, employment centers
Population Density	4 – 5th quintile 3 – 4th quintile 2 – 3rd quintile	4 – 5th quintile 3 – 4th quintile 2 – 3rd quintile	4 – 5th quintile 3 – 4th quintile 2 – 3rd quintile	4 – 5th quintile 3 – 4th quintile 2 – 3rd quintile

	1 – 2nd quintile 0 – 1st quintile	1 – 2nd quintile 0 – 1st quintile	1 – 2nd quintile 0 – 1st quintile	1 – 2nd quintile 0 – 1st quintile
Transit Stops	N/A	3 pts – Yes 0 pts - No	N/A	N/A

Equity

The variables in this category are the same variables used in the equity analysis. Location scoring is based on the number of standard deviations from the mean:

- 4 – Well Above Average
- 3 – Above Average
- 2 – Average
- 1 – Below Average
- 0 – Well Below Average

Table 3 lists each variable and its corresponding weight.

Table 3: Scoring of Variables, 'Equity' Category

Variable	Regionwide	Large Metro	Small Metro	Rural
Racial Minority	2	3	2	1
Hispanic Population	2	3	3	2
Unemployment	2	2	2	2
Young Population	2	3	2	3
Old Population	2	1	2	3
Disability	2	2	2	2
Poverty	2	3	3	3
Language (LEP)	2	2	2	2
Zero Vehicle HH	2	3	2	3
Population with no High School Degree	2	2	2	3

Overall Prioritization Score

Table 4 calculates both the weighted sum and maximum score for each of the categories described above. The equity category score is calculated as the weighted average.

Table 4: Overall Prioritization Score

	Regionwide		Large Metro		Small Metro		Rural	
	Weight	Max Score	Weight	Max Score	Weight	Max Score	Weight	Max Score
Roadway Characteristics	2	8	2	8	2	8	3	8
Land Use and Context	1	10	1	13	1	10	1	10
Equity	5	4	5	4	5	4	4	4
Maximum Total Score	**46** (16+10+20)		**49** (16+13+20)		**46** (16+10+20)		**50** (24+10+16)	

Sincerely,



Catherine Girves | Project Manager

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POLICY REVIEW MEMO

November 13, 2024

To: Caitlin Stevens
Organization: Michiana Area Council of Governments (MACOG)
From: Nasir Meatchem, Tobi Otulana, Catherine Girves
Project: MACOG Regional Safety Action Plan

Re: Policy Review Memo

Introduction

The following memo is a review and summary of relevant plans, policies, and documents that will inform the Michiana Area Council of Governments (MACOG) Regional Safety Action Plan (SAP). Included in this memo is an assessment of those documents that have contributed to transportation policy, street design, or management of the transportation system within the Michiana area. The memo includes a discussion of key takeaways including existing barriers and opportunities for implementing a Safe System Approach framework to MACOG's transportation decision-making within the region. The findings from this memo are intended to document work being done within the Michiana region, identify themes and actions to discuss with stakeholders throughout the planning process, and inform recommendations within the final SAP.

Documents Reviewed

Table 1 presents a list of all the documents reviewed by the project team.

Table 1. Documents Reviewed

Jurisdiction	Document Title	County	Year published
Town of Bristol	Bristol Comprehensive Plan	Elkhart County	2021
City of Elkhart	City of Elkhart Americans with Disabilities Act Transition Plan: Programs and Services, and Facilities	Elkhart County	2012
City of Elkhart	City of Elkhart Comprehensive Plan	Elkhart County	2015
City of Elkhart	City of Elkhart Zoning Ordinance	Elkhart County	2019
Elkhart County	Elkhart County Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Elkhart County	2012
Elkhart County	Elkhart County Comprehensive Plan	Elkhart County	2006
Elkhart County	Elkhart County Roads Guidelines and Standards for Design and Public Improvement "Street Standards"	Elkhart County	2017
Elkhart County	Elkhart County Zoning Ordinance	Elkhart County	2015
City of Elkhart and City of Goshen	Elkhart Goshen Bicycle and Pedestrian Plan	Elkhart County	2017
City of Goshen	Goshen Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Elkhart County	2012
City of Goshen	Goshen Zoning Ordinance	Elkhart County	1984
Town of Middlebury	Middlebury Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Elkhart County	2012

Town of Middlebury	Middlebury Comprehensive Plan	Elkhart County	2020
Town of Millersburg	Millersburg Comprehensive Plan	Elkhart County	2021
City of Nappanee	Nappanee Unified Zoning and Subdivision Control Ordinance	Elkhart County	1998
Town of Middlebury	Town of Middlebury Standard Specifications and Development Guide	Elkhart County	2007
City of Goshen	Uncommonly Great Goshen Comprehensive Plan	Elkhart County	Updated 2018
Town of Wakarusa	Wakarusa ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Elkhart County	2020
Town of Wakarusa	Wakarusa Comprehensive Plan	Elkhart County	2021
City of Nappanee	Nappanee Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Elkhart/Kosciusko County	2011
Kosciusko County	Kosciusko County Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Kosciusko County	2012
Kosciusko County	Kosciusko County Comprehensive Plan	Kosciusko County	2022
Kosciusko County	Kosciusko County Subdivision Control Ordinance	Kosciusko County	1975
Kosciusko County	Kosciusko County Zoning Ordinance	Kosciusko County	2023
Town of Leesburg	Leesburg Land Use and Street Construction Ordinances	Kosciusko County	2023
Town of Milford	Milford ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Kosciusko County	2024
Town of Silver Lake	Silver Lake ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Kosciusko County	2024
Town of Silver Lake	Silver Lake Zoning and Subdivision Control Ordinance	Kosciusko County	2024
Town of Syracuse	Syracuse Subdivision Control Ordinance	Kosciusko County	2023
Kosciusko County	US 30 INDOT PROPEL Project	Kosciusko County	2024
City of Warsaw	Warsaw Comprehensive Plan	Kosciusko County	2015
City of Warsaw	Warsaw Construction Standards	Kosciusko County	2019
City of Warsaw	Warsaw Zoning Ordinance	Kosciusko County	1974, As Amended
Town of Winona Lake	Winona Lake ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Kosciusko County	2021
Town of Winona Lake	Winona Lake Zoning and Subdivision Control Ordinance	Kosciusko County	2021
Winona Lake	Winona Lake Zoning Ordinance	Kosciusko County	2019
MACOG	2024 Michiana on the Move Transportation Plan	MACOG	2014
MACOG	MACOG Active Transportation Plan	MACOG	2016
MACOG	MACOG Complete Streets Policy	MACOG	2021
MACOG	MACOG Transportation Improvement Program	MACOG	2023
MACOG	MACOG Truck Route Inventory Report	MACOG	2007
Argos	Argos Comprehensive Plan	Marshall County	2010
Argos	Argos Zoning Ordinance	Marshall County	2021
Bourbon	Bourbon Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Marshall County	2013
Bourbon	Bourbon Zoning Ordinance	Marshall County	2015

Bremen	Bremen Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Marshall County	2012
Bremen	Bremen Standard Specification and Development Standard	Marshall County	2018
Bourbon	Constructing/Excavating Projects in Town Right-of-Ways	Marshall County	2021
Culver	Culver Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Marshall County	2012
Culver	Culver Zoning Ordinance	Marshall County	1990
Marshall County	INDOT Bridge Assessment	Marshall County	2020
Marshall County	Marshall County Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Marshall County	2012
Marshall County	Marshall County Comprehensive Plan	Marshall County	2004
Marshall County	Marshall County Subdivision Control Ordinance	Marshall County	2007
Marshall County	Marshall County Trails Master Plan	Marshall County	2020
Marshall County	Marshall County Zoning Ordinance	Marshall County	2023
Plymouth	Plymouth Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	Marshall County	2012
Plymouth	Plymouth Complete Streets Policy	Marshall County	2013
Plymouth	Plymouth Forward 2040 Comprehensive Plan	Marshall County	2013
Plymouth	Plymouth Subdivision Control Ordinance	Marshall County	2024
Plymouth	Plymouth Zoning Ordinance	Marshall County	2024
INDOT	US 31 Corridor Study: Existing Conditions Report	Marshall County	2017
St. Joseph County	Basic Criteria for Design	St. Joseph County	1995
City of Mishawaka	Capital Avenue Land Use Plan	St. Joseph County	2003
City of Mishawaka	Engineering Standards: Specifications and Drawings	St. Joseph County	2022
Lakeville	Lakeville Americans with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	St. Joseph County	2013
Lakeville	Lakeville Comprehensive Plan	St. Joseph County	2011
Lakeville	Lakeville Subdivision Control Ordinance	St. Joseph County	2017
Lakeville	Lakeville Zoning Ordinance	St. Joseph County	2019
City of South Bend	Miami Street Commercial Corridor Revitalization Action Plan	St. Joseph County	2000
City of Mishawaka	Mishawaka ADA Public Right-of-Way Self-Evaluation and Transition Plan	St. Joseph County	2023
City of South Bend	Mishawaka Avenue Streetscape Beautification Plan	St. Joseph County	2008
City of Mishawaka	Mishawaka Comprehensive Plan	St. Joseph County	1992
City of Mishawaka	Mishawaka Subdivision Control Ordinance	St. Joseph County	1985
City of Mishawaka	Mishawaka Zoning Ordinance	St. Joseph County	1985
New Carlisle	New Carlisle Comprehensive Plan	St. Joseph County	2007
New Carlisle	New Carlisle Zoning Ordinance	St. Joseph County	2017
North Liberty	North Liberty Comprehensive Plan	St. Joseph County	2022
North Liberty	North Liberty Zoning Ordinance	St. Joseph County	2019

Osceola	Osceola ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	St. Joseph County	2013
Osceola	Osceola Comprehensive Plan	St. Joseph County	1992
Osceola	Osceola Zoning Ordinance	St. Joseph County	2019
City of South Bend	Portage Avenue Commercial Corridor Revitalization Action Plan	St. Joseph County	1999
City of South Bend	Rebuilding Our Streets: 10-year Improvement Plan	St. Joseph County	2021
Roseland	Roseland Comprehensive Plan	St. Joseph County	2005
Roseland	Roseland Zoning Ordinance	St. Joseph County	2019
City of South Bend	South Bend ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	St. Joseph County	2018
City of South Bend	South Bend Bicycle Master Plan Goals & Action Plan	St. Joseph County	2018
City of South Bend	South Bend Comprehensive Plan	St. Joseph County	Amended 2022
City of South Bend	South Bend Construction Standards and Specifications	St. Joseph County	2020
City of South Bend	South Bend Municipal Code	St. Joseph County	2020
City of South Bend	South Bend Zoning Ordinance	St. Joseph County	2021
City of South Bend	South Gateway Commercial Corridor Action Plan	St. Joseph County	1998
St. Joseph County	Basic Design Criteria	St. Joseph County	1995
St. Joseph County	St. Joseph County American with Disabilities Act Transition Plan: Pedestrian Facilities in the Public Right-of-Way	St. Joseph County	2012
St. Joseph County	St. Joseph County Comprehensive Plan	St. Joseph County	Draft-2024
St. Joseph County	St. Joseph County Multi-Hazard Mitigation Plan	St. Joseph County	2017
St. Joseph County	St. Joseph County Planning and Zoning Ordinance	St. Joseph County	2023
St. Joseph County	St. Joseph County Reasonable Accommodations Policies and Procedures in Zoning and Land Use Decisions	St. Joseph County	2022
St. Joseph County	St. Joseph County Subdivision Ordinance Design Standards	St. Joseph County	2020
St. Joseph County	St. Joseph County Traffic Control Ordinance	St. Joseph County	1978
St. Joseph County	State Road 993 / Dixie Highway Corridor Study	St. Joseph County	2019
Town of Walkerton	Walkerton ADA Transition Plan: Pedestrian Facilities in the Public Right-of-Way	St. Joseph County	2013
Town of Walkerton	Walkerton Code of Ordinances	St. Joseph County	2022
City of South Bend	West Side Main Streets Revitalization Plan	St. Joseph County	2014

Analysis and Key Takeaways

This section provides a high-level assessment of strengths, weaknesses, and opportunities of the documents reviewed through the lens of the Safe Systems Approach principles and elements (see Figure 1). Considerations for the strengths, weaknesses, and opportunities were also identified based on the best practices for land use and local programs identified in the MACOG SAP Literature Review.

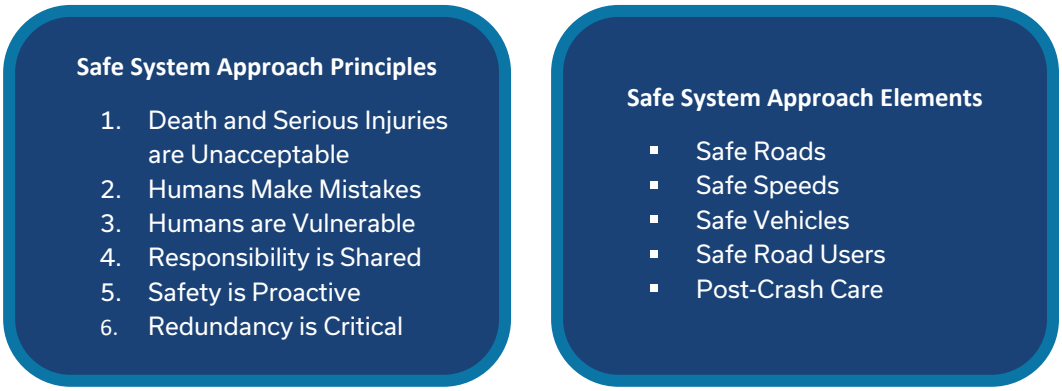


Figure 1. Safe System Approach Principles and Elements

Strengths

Currently, there are no jurisdictions within the MACOG region that have an existing Safety Action Plan or Vision Zero Plan. However, there are several planning documents and adopted policies that exemplify principles and elements that align with a Safe System Approach and/or best practices in land use coordination. These include Complete Streets policies, bicycle and pedestrian plans, a multijurisdictional corridor-specific study, and comprehensive plans.

The following comprehensive planning documents are examples that include strong language and recommendations that promote Safe Systems Approach principles or elements and provide the respective jurisdictions with the foundation needed to implement recommendations from the MACOG SAP that are explicitly rooted in the Safe Systems Approach.

- **The Kosciusko County Comprehensive Plan (2022)** includes a core objective/priority of developing complete, multimodal transportation systems. The objective explicitly calls out how roadways "designed to discourage vehicular speeding…can be comfortably used by pedestrians and bicyclists alike," and notes that "a multimodal approach must be used in developing roadways to include bike and pedestrian facilities alongside vehicle corridors."
  The strong language in the objectives/priorities section is the foundation for the individual town future infrastructure plans and future connectivity plans that will guide Kosciusko County's capital investments in roadway infrastructure for motorists, bicyclists, and pedestrians. In line with best practices, both the future infrastructure plans and future connectivity plans are presented as a companion to the local future land use maps in the comprehensive plan. The document highlights the specific context of the County, noting that in many of the local towns, high-capacity vehicular arterials "serve as the front door to downtown districts...[that] accommodate a high degree of foot traffic due to the local restaurants, shops and offices."
  Additionally, the comprehensive plan recommends that each individual town in the County adopt a Complete Streets policy to encourage coordinating bicycle and pedestrian infrastructure with planned roadway projects. The incorporation of local context, identification of pedestrian zones informed by future land use plans, Complete

Streets policy recommendations, and stated priority of reducing vehicular speeds are strengths that will support future implementation of MACOG SAP recommendations.

- **The Lakeville Comprehensive Plan (2011)** identifies goals, policies, and implementation strategies based on Smart Growth Principles that align with many of the elements of the Safe Systems Approach. The Smart Growth tenets listed in the comprehensive plan that are most relevant to this policy review are:
    - *Create walkable neighborhoods,*
    - *Encourage community and stakeholder collaboration.*
    - *Mix land uses.*
    - *Provide a variety of transportation choices.*
    - *Take advantage of compact development design*[1]

  Specific recommendations for Lakeville that align with the Safe System Approach and equity principles include: implementing a Complete Streets policy; developing an Access Management Plan that reflects the communities needs; developing and updating the Capital Improvement Plan to guide investment decision-making; completing a Sidewalk Master Plan that inventories existing sidewalk and cost estimates the cost of proposed connections; creating, updating, and enforcing Development Standards and Subdivision Ordinances; and coordinating with relevant agencies to explore the development of a paratransit system so that older adults and people with disabilities can maintain independence. These recommendations set up the Town of Lakeville to improve transportation decision-making processes, better coordinate transportation and land use planning, and implement the Safe Systems Approach recommendations that will be in the MACOG SAP.

  Lastly, an additional strength of this comprehensive plan is intentional coordination with MACOG's planning efforts, specifically the MACOG Regional Bicycle Facilities Map.

- The transportation and utilities section of the **North Liberty Comprehensive Plan (2022)** includes four action steps that are consistent with Safe Streets Approach principles and elements. These recommendations are based on safety-based issues documented in the plan including the need for "strategies that address traffic management and needed road infrastructure improvements…to provide a safe transportation network,"; balancing high traffic volumes that support businesses but also "create issues for pedestrian safety and ease of crossing,"; and "key conflict points between the vehicular and active transportation systems," particularly at the Five Points intersection (intersection of Center Street, Main Street, and State Street).
  The first action step recommends developing a master sidewalk and trails plan that includes process and funding strategies for completing and replacing the town's sidewalk network. The second recommendation is to integrate Complete Streets principles into the town's streetscape activities specifically to increase safety for pedestrians and bicyclists. Next is a recommendation to coordinate with INDOT for improvements to the complex Five Points intersection to address safety challenges; and lastly is the recommendation to adopt an alley maintenance policy to guide maintenance, enforcement, and improvements to the town's network of alleyways.

  As with the Lakeville Comprehensive Plan, the action steps provided in the North Liberty Comprehensive Plan will improve transportation decision-making, encourage coordinated land use and transportation planning in the downtown area, and lay the foundation for future implementation of specific recommendations from the MACOG SAP.
- The **Middlebury Comprehensive Plan (2020)** highlights specific transportation needs relevant to systemic safety such as addressing unsafe pedestrian crossings along Main Street (SR 13) and the need for specific facilities for

[1] Smart Growth America. *What is Smart Growth?* https://smartgrowthamerica.org/what-is-smart-growth/

Amish buggy and bicycle travel. Within the Town Center section, there are several recommendations for SR 13 that align with the Safe Systems Approach principles and elements including recommendations to add more pedestrian crossings, eliminate sidewalk gaps, promote 6 foot wide sidewalk construction, install accommodations for Amish buggies and bicyclists, conduct traffic analyses and/or corridor studies to manage intersection issues, and conduct a feasibility study to assess if re-routing truck traffic away from the Town Cetner is feasible for addressing the safety of all roadway users.

Another strength of this comprehensive plan is that considerations for multimodal safety are integrated into goals and recommended strategies throughout the document, not just within a transportation section. For example, within the "Residential" sub-section of the plan, there is a recommendation to "enhance the safety and efficiency of streets for all users," by coordinating with the Indiana Department of Transportation (INDOT) to implement a program to improve crossings on local streets between schools and neighborhoods. In the "Transitional Mixed-Use Corridors" section, the goal for coordinating infrastructure improvements with future development recommends the strategy of maximizing already planned improvements to SR 13 by incorporating traffic calming elements and street redesign to align with the recommendations in the comprehensive plan. This approach indicates a strong understanding of the relationship between land use, transportation, and multimodal safety.

Within the MACOG region there are two jurisdictions with Complete Streets policies that incorporate elements that align with the Safe System Approach.

- The **City of Plymouth Complete Streets Policy** was adopted in 2018. The policy aligns with best practices in Complete Streets development, incorporating many of the 10 elements (see Figure 2) including establishing a



Figure 2. 10 Elements of a Complete Streets Policy

commitment and vision, clearly stating exceptions, specifying best practices for design standards, establishing performance metrics, and detailing the policy implementation process. This policy lays the groundwork for coordinated land use and transportation decision-making within Plymouth, and as the vision states, promotes

"safe access for all users of all ages and abilities including, but not limited to, pedestrians, bike riders, motorists, people with disabilities, buggy riders, freight and commercial providers, and emergency responders."

- The **MACOG Complete Streets Policy** was adopted in 2019 and similarly features many of the best practices elements. The policy is applicable to all projects that received MACOG attributable funds, meaning that nearly all regionally significant transportation projects within the region must comply. The policy includes a vision that highlights the need for equity, outlines a detailed exemption review processes, identifies performance measures, and promotes interagency coordination. MACOG's Complete Streets policy supports the regional vision for an interconnected, safe, and accessible transportation network.

In addition to the comprehensive plans and Complete Streets policies overviewed above, there are other types of planning documents within the MACOG region that exemplify principles and elements from the Safe System Approach.

- The **933 Dixie Highway Corridor Plan (2019)** provides an assessment of existing conditions for multimodal users along this important gateway corridor that runs through St. Joseph County. The plan also outlines a recommended strategy for improving multimodal safety and spurring economic revitalization along the corridor through infrastructure, marketing, and strategic incentives. The plan begins with strong language that acknowledges the corridor's challenges that are rooted in auto-oriented transportation and land use development.

  > *"…the SR 933 Corridor is challenged by a history of auto-oriented development which occurred without a consistent set of development guidelines, lack of a unifying identity, periods of disinvestment, lack of maintenance, and sporadic availability of infrastructure to support new development. Recommendations included in this Study prioritize coordinated planning efforts by all of the jurisdiction with authority in the Corridor to develop and implement guidelines that reinforce placemaking principles, [and] enhance safety of Corridor users…"*

  Specific recommendations for SR 933 that align with Safe Systems Approach principles and elements include:
  - Incorporating multimodal transportation principles to increase safety and accessibility for roadway users. The plan recommends educating the Communications Committee on the importance of multimodal transportation principles to help build local support.
  - Developing a strategy to reduce conflicts between pedestrians and vehicles, including improvements to the existing sidewalk and reducing vehicle speeding.
  - Coordinate with MACOG/INDOT to study and implement pedestrian protections and lighting improvements along SR 933.

  This plan is a good example of a comprehensive corridor planning effort that balances land use, economic development, and mobility goals while still incorporating safety as a key consideration in the assessment of existing conditions and in the recommendations provided.
- **MACOG's Active Transportation Plan (2016)** includes safety as a key goal, and it is adequately incorporated throughout the document's objectives and implementation action steps. The plan establishes a vision for "an interconnected, safe, and accessible active transportation network where all residents and visitors can travel from place to place without use of a personal motorized vehicle." Plan elements that align with best practices for systemic safety include objectives about integrating transportation and land use policies to encourage multimodal transportation and utilizing best practices in facility design and maintenance.

  The plan proposes over 550 miles of bicycle and pedestrian facilities across the 4-county region, including several regionally significant projects that will likely entail funding and coordination from MACOG to achieve.

In addition to identifying over 550 miles of proposed bicycle and pedestrian facilities across the 4-county region, the plan includes implementation steps that can support future implementation of the MACOG SAP recommendations. This includes adopting a Complete Streets policy that influences the design of attributable-funded projects, establishing baseline counts and measurements that can be used to inform systemic-safety countermeasures, and creating an active transportation design guideline to support local governments in implementing high-quality, multimodal facilities.

Barriers

Although the Safe Systems Approach and considerations for systemic safety are now considered a best practice, traditional transportation planning and engineering standards did not incorporate these principles. Like many regions across the country, MACOG and its local jurisdictions will need to methodically review and update plans and policies that conflict or present barriers to implementing strategies that are rooted in the Safe Systems Approach. Additionally, many traditional engineering standards are now known to be detrimental to safety and must be updated to prioritize safety first. Based on the project team's review of the documents listed in Table 1, there were common themes within the documents that could present a barrier to implementing the Safe Systems Approach:

- Design guidance that is primarily auto oriented with minimal or no considerations for facility design and/or safety of other (and more vulnerable) roadway users like pedestrians, cyclists, and buggy riders. For example, the guidance provided in the **Elkhart County Streets Standards (2017)** is focused on vehicle accommodations. There are minimal guidelines for sidewalks and no guidelines provided for bikeways or accommodations for buggies.
- Design guidance that is not in line with best practices or is not right sized to the context of the jurisdiction, therefore preventing implementation that addresses the specific safety needs and concerns of the community and/or roadway conditions. An example of this is in the **Warsaw Comprehensive Plan (2015)**. The plan includes strong language about fostering effective and safe transportation for multiple modes of travel and there are many relevant recommendations (e.g., develop a Complete Streets policy). However, the thoroughfare plan included in the document includes street features for the various roadway functional classes that are not in line with the context of Warsaw or best practice design for bicycle and pedestrian facilities. For example, the typical cross-section shown for major arterials depicts a 120-foot right-of-way with 5-foot unprotected bike lanes alongside 4 to 5 lanes of vehicle traffic, shown in Figure 3. Wide cross sections like these are centered around peak hour design methods which lead to wider than necessary roads that encourage speed and lead to poor safety outcomes. Cross sections such these are almost always flagged as high injury or high-risk roadway types.

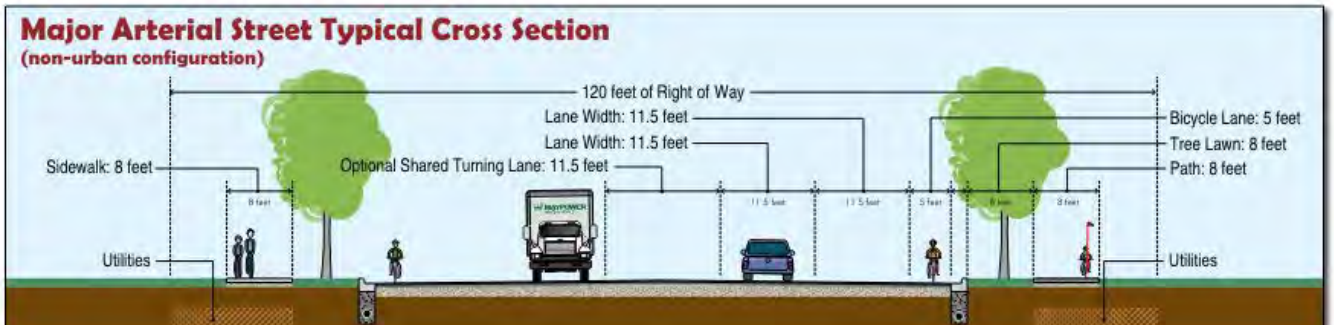


Figure 3. Major Arterial Street Typical Cross-Section, Warsaw Comprehensive Plan (2015)

- Weak language as it relates to active transportation – specifically language that mentions active transportation in the context of recreation, economic development, or aesthetic improvements with minimal or no mention of the

importance of active transportation safety or active transportation as a valid mode of transportation. For example, the **Town of Osceola Comprehensive Plan (1992)** does include some discussion of public transportation within the assessment of existing transportation conditions, but there is no mention of accommodations for walking, bicycling, or other modes of transportation within the recommended transportation improvements.

- Design speeds are based on roadway classification instead of presence of context and safety. For example, **South Bend's Construction Standards & Specifications (2020)** list that where posted speeds are not provided, the design speeds for residential and collector streets are 30 MPH and 40MPH for arterial streets. The likelihood of a crash and the crash severity increases rapidly with even small increases in speeds. In addition, designing roadways for higher than posted speeds has been a historical practices "because the relationship between design dimensions and future performance was poorly understood." However, "Recent research has improved our knowledge of the relationship between geometric design features and traffic operations for all modes of transportation and has developed new knowledge about the relationship of geometric design features to crash frequency and severity." Today, we know that drivers will drive what feels comfortable which aligns with the design speed or higher. **Saint Joseph County's Basic Design Criteria (1995)** for Design includes language that states design speeds should be 10MPH over the operating speeds, which based on a new understanding of design speeds influence on roadways, will more likely lead to an increase in crashes and severity than improved safety as previously though.
- Peak hour and traffic analysis models that prioritize low delays inherently prioritize speed over safety. In addition, traffic "forecasting" is based on the premise that everyone will use a private automobile to move about and that these trips will only increase in the future. Both of these underlying assumptions of traffic planning have led wide, unsafe, and inequitable transportation networks. For example, **Elkhart County's Street Standards (2017)** assume a 2% growth rate, use auto centered trip generation, and focus on peak hour volumes, a common approach, but one that must be updated in order to achieve a Safe System that accommodate citizens that move about in a variety of ways and modes.

In addition to these barriers, the lack of general design guidance at the state and local for the design and incorporation of safe walking, bicycle and buggies facilities including crossings for high-speed roadways will continue to imped the implementation and quality of implementation when it is considered.

Opportunities

There are several ways the MACOG and local jurisdictions within the region can better incorporate Safe System Approach principle and elements into the plans, policies, design standards, and documents that guide transportation decision-making, funding, and outcomes. These include high-level actions such as:

- Include multimodal transportation safety as a foundational goal of the document
- Explicitly call out and incorporate Safe Systems Approach principles and elements into the document
- Utilize the MACOG SAP vision and goals to inform the vision, goals, priorities, and objectives identified within the document
- Incorporate the specific recommendations and strategies that will be identified in the MACOG SAP into the document
- Incorporate best practices in multimodal design and FHWA proven safety countermeasures into documents that include design guidance or design standards
- Utilize data-based analyses from the MACOG SAP – such as the crash analysis, equity analysis, or systemic safety analysis – to identify recommendations or action steps within the document

- Utilize community-engagement findings from the MACOG SAP to inform recommendations or action steps within the document

Ideally, any plans or policies that are developed within the MACOG region will include an explicit reference to the MACOG SAP and either feature or overview recommendations from the SAP that are relevant to the document being developed.

In addition to the comprehensive plans listed in the previous section, there are several jurisdictions in MACOG that have comprehensive plans that include language about multimodal connections, however the language in the plans is high-level, nonspecific to the context of the jurisdiction, or framed primarily as a tool for economic development or aesthetic improvement rather than as essential for safety. Many of the comprehensive plans with weaker language around multimodal safety are 14+ years old, presenting an opportunity for strengthened language and the incorporation of specific recommendations from the MACOG SAP when the comprehensive plan is updated in the future. For communities like South Bend and St. Joseph County that are currently in the midst of comprehensive planning, there is still opportunity to incorporate Safe Systems Approach principles and elements into the planning process and final document.

Many of the comprehensive plans reviewed include recommendations for developing modal specific plans (e.g., Active Transportation Plan) or adopting a Complete Streets policy. For local jurisdictions that have not yet implemented these recommendations, there is opportunity to incorporate Safe Systems Approach principles and elements into their plans and/or policies. Examples of how this has been done in other communities is shown in Figure 4.

The Lakewood, Ohio Active Transportation Plan incorporated the Safe System Approach by conducting an analysis using the Safer Streets Priority Finder (SSPF) to identify corridors that present a high risk to people walking and biking based on existing crash data and statistical modeling that uses information about roadway characteristics to identify systemic trends. The results from the analysis were used to inform where and what type of active transportation facilities were recommended.

Section 3 Purpose of the Mid-Ohio Regional Planning Commission (MORPC) Complete Streets Policy notes that Complete Streets "are key to creating a Safe System, and specifically incorporate the six principles of the Safe System Approach." It also includes FHWA guidance on the Safe System Approach for active transportation in Section 5 Design Guides.[1]

1. Mid-Ohio Regional Planning Commission. Complete Streets Policy May 2024. https://www.morpc.org/2023/wp-content/uploads/2024/04/MORPC-Complete-Streets-Policy-May-2024-1.pdf

Figure 4. Examples of Incorporating the Safe Systems Approach into modal plans and Complete Streets policies.

LITERATURE REVIEW AND BEST PRACTICES

May 31, 2024

To: Caitlin Stevens
Organization: Michiana Area Council of Governments (MACOG)
From: Ayden Cohen and Catherine Girves
Project: MACOG Regional Safety Action Plan

Re: Literature Review and Best Practices

Overview

The Michiana region shares a goal with agencies across the world – reducing and eliminating fatal and serious injury crashes on their roadways. This memo will outline national roadway safety guidance and best practices, state guidance, and highlight model agencies to inform the Michiana Area Council of Governments (MACOG) Regional Safety Action Plan. The resources referenced that are red, italicized, and underlined are links that can provide further information. This memo is meant to provide the guidance and framework for the initial outline of the Safety Action Plan.

The Safe System Approach

The Safe System Approach takes a **comprehensive** and **holistic** approach to eliminate fatalities and serious injuries for all road users.[1] Zero roadway deaths and serious injuries is our goal, and the Safe System Approach is how we get there. Rather than taking a primarily reactive approach, the Safe System Approach uses a **proactive** approach, creating one transportation system that is safe. A successful implementation of the Safe System Approach balances reacting to historical crash patterns and proactively addressing risks despite historical crash patterns. This must be done in a way that, should a crash occur, it cannot result in fatal and serious injury to all road users. It recognizes that **humans make mistakes** and that **responsibility must be shared** among stakeholders to prevent death and serious injuries on our roadways.[2] The Safe System Approach will be the guiding framework for the MACOG Regional Safety Action Plan, so it is important to ground the planning process in understanding its principles and elements.



The Safe System Approach wheel that shows the principles and elements. Source: FHWA

[1] Principles of the Safe System Approach, 2022. https://www.transportation.gov/NRSS/SafeSystem
[2] Zero Deaths and Safe System, 2023. https://highways.dot.gov/safety/zero-deaths

Principles

The Safe System Approach is based on six principles:

- ***Death and Serious Injuries are Unacceptable –*** Prioritize the elimination of crashes that result in death and serious injuries.
- ***Humans Make Mistakes*** – The transportation system should be designed and operated to accommodate certain types and levels of inevitable human mistakes to avoid death and serious injuries when a crash occurs.
- ***Humans are Vulnerable*** – The transportation system should be human-centric and designed and operated to accommodate the human body's vulnerabilities and limits for tolerating crashes.
- ***Responsibility is Shared*** – All stakeholders – including government at all levels, industry, non- profit/advocacy, researchers, and the general public – are vital to preventing fatalities and serious injuries on our roadways.
- ***Safety is Proactive*** – Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterward.
- ***Redundancy is Critical*** – Reducing risks requires strengthening all parts of the transportation system so that if one part fails, the other parts still protect people.

Elements

Strategies to address risk through the Safe System Approach should address as many of the five elements as possible to create a systemic approach to safety:

- ***Safe Roads*** – Design roadway environments to mitigate human mistakes and account for injury tolerance, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.
- ***Safe Speeds*** – Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, appropriate speed-limit setting, targeted education, outreach campaigns, and enforcement.
- ***Safe Vehicles*** – Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact on both occupants and non-occupants.
- ***Safe Road Users*** – Encourage safe, responsible driving and behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed.
- ***Post-Crash Care*** – Enhance the survivability of crashes through expedient access to emergency medical care, while creating a safe working environment for vital first responders and preventing secondary crashes through robust traffic incident management practices.

Framework

The Safe System Approach Framework is the lens through which all transportation decisions should be made as we work to eliminate roadway deaths and serious injuries.[3] In every policy and practice decision, the Framework should be used to ensure that policies are adopted, and streets are designed to ensure the safety of all road users. Additionally, the Safe System Approach highlights the importance of redundancy in the system to prevent fatalities and injuries resulting from

[3] Safe Systems Framework, 2019. https://www.ite.org/pub/?id=C8B1C6F9-DCB5-C4F3-4332-4BBE1F58BA0D

crashes that do occur. For example, if you cannot reduce speeds down to a level that is safe for all road users, you must separate them in space at a level that protects the most vulnerable road user at risk in a crash.

Other Safety Terms and Their Connection to the Safe System Approach

There are many other forms of safety terminology that are utilized to frame and strategize ways to reduce risk on roads. Although these terms are not necessarily a part of the Safe System Approach, these terms all share the same underlying mission – preventing fatal and serious injury crashes. Utilizing the Safe System Approach and incorporating all these elements in the MACOG Regional Safety Action Plan will lead the region to meeting the goals of the plan. Common terms in this work include:

- **Vision Zero** – Vision Zero is the goal to eliminate all traffic fatalities and serious injuries while increasing safety, health, and equitable mobility for all.[4] The goal is Vision Zero, and the Safe System Approach is the framework to achieve that goal.
- **Toward Zero Deaths (TZD)** – *Toward Zero Deaths* is a national strategy on highway safety with the goal of creating a highway system free of fatalities through a sustained and even accelerated decline in transportation-related deaths and injuries.[5] TZD focuses on uniting safety stakeholders nationwide and spearheading a cultural change in highway safety.
- **Creating a Positive Safety Culture** – Traffic Safety Culture is made up of the values, beliefs, and attitudes that influence the behaviors of road users and stakeholder actions.[6] With the Safe System Approach being built on a set of values and beliefs, it is crucial to create a shared culture that encourages and supports the coordination and integration of safety actions across all involved parties.

Safe Streets and Roads For All Comprehensive Safety Action Plan Components and Eligibility Worksheet

The *Safe Streets and Roads for All (SS4A) guidance* and *eligibility* worksheet provides descriptions of key components a plan should feature in order to be eligible for Safe Streets and Roads for All implementation grant program funds. The Safe Streets and Roads for All program was established under the Bipartisan Infrastructure Law, with up to $1 billion available to support creating safer routes for all. The following components are key to a successful comprehensive safety action plan:

- **Leadership Commitment and Goal Setting:** An official public commitment by a high-ranking official and/or governing body to an eventual goal of zero roadway fatalities and serious injuries. The commitment must include a goal and timeline for eliminating roadway fatalities and serious injuries.
- **Planning Structure:** A committee, task force, implementation group, or similar body charged wi **Safety Analysis:** An analysis of locations where there are crashes and the severity of the crashes, as well as contributing factors and

[4] What is Vision Zero? https://visionzeronetwork.org/about/what-is-vision-zero/
[5] Towards Zero Deaths: A National Strategy on Highway Safety, 2014. https://www.towardzerodeaths.org/wp-content/uploads/2019/12/TZD_National_Strategy.pdf
[6] How are Vision Zero, Safe System, and Traffic Safety Culture related? https://chsculture.org/how-are-vision-zero-safe-system-and-traffic- safety-culture-related/

crash types by relevant road users (motorists, people walking, transit users, etc.). Analysis of systemic and specific safety needs is also performed, as needed.

- **Engagement and Collaboration:** Robust engagement with the public and relevant stakeholders, including the private sector and community groups, that allows for both community representation and feedback.
- **Equity Considerations:** Analysis of both population characteristics and initial equity impact of the proposed projects and strategies.
- **Policy and Process Changes:** Assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize transportation safety. The Action Plan discusses implementation.
- **Strategy and Project Selections:** Identification of a comprehensive set of projects and strategies, shaped by data, the best available evidence and noteworthy practices, as well as stakeholder input and equity considerations, that will address the safety problems described in the Action Plan.
- **Progress and Transparency:** Method to measure progress over time after an Action Plan is developed or updated, including outcome data.

The Self-Certification Eligibility Worksheet is a companion tool to quantitatively determine whether the project application is aligned with the critical components listed above. The Worksheet will serve as a key reference point throughout the entire project life cycle, as it is critical for the final Regional Safety Action Plan to align with these criteria.

S|S 4|A Safe Streets and Roads for All Self-Certification Eligibility Worksheet

All applicants should follow the instructions in the NOFO to correctly apply for a grant. See the SS4A website for more information.

Table 1 of the SS4A NOFO describes eight components of an Action Plan, which correspond to the questions in this worksheet. Applicants should use this worksheet to determine whether their existing plan(s) contains the required components to be considered an eligible Action Plan for SS4A.

This worksheet is required for all SS4A **Implementation Grant** applications and any **Planning and Demonstration Grant applications to conduct Supplemental Planning/Demonstration Activities only**. Please complete the form in its entirety, do not adjust the formatting or headings of the worksheet, and upload the completed PDF with your application.

Eligibility

An Action Plan is considered eligible for an SS4A application for an Implementation Grant or a Planning and Demonstration Grant to conduct Supplemental Planning/Demonstration Activities if the following two conditions are met:

- You can answer "YES" to Questions **3, 7,** and **9** in this worksheet; *and*
- You can answer "YES" to **at least four of the six remaining** Questions, **1, 2, 4, 5, 6**, and **8.**

If both conditions are not met, an applicant is still eligible to apply for a Planning and Demonstration Grant to fund the creation of a new Action Plan or updates to an existing Action Plan to meet SS4A requirements.

Applicant Information

Lead Applicant: _____ **UEI:** _____

Action Plan Documents

In the table below, list the relevant Action Plan and any additional plans or documents that you reference in this form. Please provide a hyperlink to any documents available online or indicate that the Action Plan or other documents will be uploaded in Valid Eval as part of your application. Note that, to be considered an eligible Action Plan for SS4A, the plan(s) coverage must be broader than just a corridor, neighborhood, or specific location.

Document Title	Link	Date of Most Recent Update

Action Plan Components

For each question below, answer "YES" or "NO." If "YES," list the relevant plan(s) or supporting documentation that address the condition and the specific page number(s) in each document that corroborates your response. This form provides space to reference multiple plans, but please list only the most relevant document(s).

1. Leadership Commitment and Goal Setting

Are **BOTH** of the following true?

- A high-ranking official and/or governing body in the jurisdiction publicly committed to an eventual goal of zero roadway fatalities and serious injuries; and
- The commitment includes either setting a target date to reach zero OR setting one or more targets to achieve significant declines in roadway fatalities and serious injuries by a specific date.

☐ **YES**
☐ **NO**

Note: This may include a resolution, policy, ordinance, executive order, or other official announcement from a high-ranking official and the official adoption of a plan that includes the commitment by a legislative body.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

2. Planning Structure

To develop the Action Plan, was a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and monitoring?

☐ **YES**
☐ **NO**

Note: This should include a description of the membership of the group and what role they play in the development, implementation, and monitoring of the Action Plan.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

3. Safety Analysis

Does the Action Plan include **ALL** of the following?

- Analysis of existing conditions and historical trends to provide a baseline level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region;
- Analysis of the location where there are crashes, the severity, as well as contributing factors and crash types;
- Analysis of systemic and specific safety needs, as needed (e.g., high-risk road features or specific safety needs of relevant road users); and,
- A geospatial identification (geographic or locational data using maps) of higher risk locations.

☐ **YES**
☐ **NO**

Note: Availability and level of detail of safety data may vary greatly by location. The Fatality and Injury Reporting System Tool (FIRST) provides county- and city-level data. When available, local data should be used to supplement nationally available data sets.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

4. Engagement and Collaboration

Did the Action Plan development include **ALL** of the following activities?

- Engagement with the public and relevant stakeholders, including the private sector and community groups;
- Incorporation of information received from the engagement and collaboration into the plan; and
- Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.

☐ **YES**
☐ **NO**

Note: This should be a description of public meetings, participation in public and private events, and proactive meetings with stakeholders.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

3. Safety Analysis

Does the Action Plan include **ALL** of the following?

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- Analysis of systemic and specific safety needs, as needed (e.g., high-risk road features or specific safety needs of relevant road users); and,
- A geospatial identification (geographic or locational data using maps) of higher risk locations.

☐ **YES**
☐ **NO**

Note: Availability and level of detail of safety data may vary greatly by location. The Fatality and Injury Reporting System Tool (FIRST) provides county- and city-level data. When available, local data should be used to supplement nationally available data sets.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

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Did the Action Plan development include **ALL** of the following activities?

- Engagement with the public and relevant stakeholders, including the private sector and community groups;
- Incorporation of information received from the engagement and collaboration into the plan; and
- Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.

☐ **YES**
☐ **NO**

Note: This should be a description of public meetings, participation in public and private events, and proactive meetings with stakeholders.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

5. Equity Considerations

Did the Action Plan development include **ALL** of the following?

- Considerations of equity using inclusive and representative processes;
- The identification of underserved communities through data; and
- Equity analysis developed in collaboration with appropriate partners, including population characteristics and initial equity impact assessments of proposed projects and strategies.

☐ **YES**
☐ **NO**

Note: This should include data that identifies underserved communities and/or reflects the impact of crashes on underserved communities, prioritization criteria that consider equity, or a description of meaningful engagement and collaboration with appropriate stakeholders.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

6. Policy and Process Changes

Are **BOTH** of the following true?

- The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and
- The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.

☐ **YES**
☐ **NO**

Note: This may include existing and/or recommended Complete Streets policy, guidelines for community engagement and collaboration, policy for prioritizing areas of greatest need, local laws (e.g., speed limit), design guidelines, and other policies and processes that prioritize safety.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

7. Strategy and Project Selections

Does the plan identify a comprehensive set of projects and strategies to address the safety problems in the Action Plan, with information about time ranges when projects and strategies will be deployed, and an explanation of project prioritization criteria?

☐ YES
☐ NO

Note: This should include one or more lists of community-wide multi-modal and multi-disciplinary projects that respond to safety problems and reflect community input and a description of how your community will prioritize projects in the future.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

8. Progress and Transparency

Does the plan include **BOTH** of the following?

- A description of how progress will be measured over time that includes, at a minimum, outcome data.
- The plan is posted publicly online.

☐ YES
☐ NO

Note: This should include a progress reporting structure and list of proposed metrics.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

9. Action Plan Date

Was at least one of your plans finalized and/or last updated between 2019 and April 30, 2024?

☐ YES
☐ NO

Note: Updates may include major revisions, updates to the data used for analysis, status updates, or the addition of supplemental planning documents, including but not limited to an Equity Plan, one or more Road Safety Audits conducted in high-crash locations, or a Vulnerable Road User Plan.

If "YES," please list your most recent document(s), date of finalization, and page number(s) that corroborate your response.

Document Title	Date of Most Recent Update	Page Number(s)

Best Practices in Roadway Safety

National Resources

National Safety Council Safe System Approach Clearinghouse

The National Safety Council (NSC) is a leading safety advocate nonprofit in the United States. Its Safe System Working Group webpage provides information that policymakers, practitioners, and the public can use to increase the prioritization of safety programs by growing a strong safety culture and adopting the Safe System Approach.

The NSC and Road to Zero Coalition acknowledge the socioeconomic disparities that exist in street safety. NSC provides sources in its Safe, Equitable Mobility Systems section that covers why the Safe System approach must be implemented equitably, explaining disparities in the street safety and work that can be done to reverse these disparities. These resources will be referred to throughout the planning process.

Core Elements for Vision Zero Communities (Vision Zero Network)

The goal of the Core Elements document is to shift the method of safety planning and analysis away from traditional approaches and toward the Safe System Approach. Vision Zero acknowledges the fact that traffic deaths and severe injuries are preventable.[7] The Safe System Approach builds upon the reality that people make mistakes, and focuses on influencing policy at the system level, resulting in designs, practices, and policies that lessen the severity of crashes.

The MACOG Regional Safety Action Plan should include the following National Vision Zero Core Elements:

- **Leadership and Commitment**
  - Public, High Level, and Ongoing Commitment
  - Authentic Engagement
  - Strategic Planning
  - Project Delivery
- **Safe Roads and Safe Speeds**
  - Complete Streets for All
  - Context-Appropriate Speeds
- **Data-Driven Approach, Transparency, and Accountability**
  - Equity-Focused Analysis and Programs
  - Proactive, Systemic Planning
  - Responsible, Hot Spot Planning
  - Comprehensive Evaluation and Adjustments

[7] https://visionzeronetwork.org/wp-content/uploads/2018/11/VZN_CoreElements_FINAL.pdf



CORE ELEMENTS
FOR VISION ZERO COMMUNITIES

Leadership and Commitment

1. Public, High-Level, and Ongoing Commitment. The Mayor and key elected officials and leaders within public agencies, including transportation, public health, and police, commit to a goal of eliminating traffic fatalities and serious injuries within a specific timeframe. Leadership across these agencies consistently engages in prioritizing safety via a collaborative working group and other resource-sharing efforts.

2. Authentic Engagement. Meaningful and accessible community engagement toward Vision Zero strategy and implementation is employed, with a focus on equity.

3. Strategic Planning. A Vision Zero Action Plan is developed, approved, and used to guide work. The Plan includes explicit goals and measurable strategies with clear timelines, and it identifies responsible stakeholders.

4. Project Delivery. Decision-makers and system designers advance projects and policies for safe, equitable multi-modal travel by securing funding and implementing projects, prioritizing roadways with the most pressing safety issues.

Equity and Engagement

Elevating equity and meaningful community engagement, particularly in low-income communities and communities of color, should be a priority in all stages of Vision Zero work.

Safe Roadways and Safe Speeds

5. Complete Streets for All. Complete Streets concepts are integrated into communitywide plans and implemented through projects to encourage a safe, well-connected transportation network for people using all modes of transportation. This prioritizes safe travel of people over expeditious travel of motor vehicles.

6. Context-Appropriate Speeds. Travel speeds are set and managed to achieve safe conditions for the specific roadway context and to protect all roadway users, particularly those most at risk in crashes. Proven speed management policies and practices are prioritized to reach this goal.

Data-driven Approach, Transparency, and Accountability

7. Equity-Focused Analysis and Programs. Commitment is made to an equitable approach and outcomes, including prioritizing engagement and investments in traditionally under-served communities and adopting equitable traffic enforcement practices.

8. Proactive, Systemic Planning. A proactive, systems-based approach to safety is used to identify and address top risk factors and mitigate potential crashes and crash severity.

9. Responsive, Hot Spot Planning. A map of the community's fatal and serious injury crash locations is developed, regularly updated, and used to guide priority actions and funding.

10. Comprehensive Evaluation and Adjustments. Routine evaluation of the performance of all safety interventions is made public and shared with decision makers to inform priorities, budgets, and updates to the Vision Zero Action Plan.

To learn more about the Vision Zero Core Elements, see the Vision Zero Network's full Vision Zero Core Elements document, which includes further details and links to examples and related resources. In addition, the Vision Zero Network website and ITE Safety Resources Toolbox offer useful information on Vision Zero principles, recommended practices, and analysis strategies.

Core Elements for Vision Zero Communities

Proven Safety Countermeasures (FHWA)

FHWA's Proven Safety Countermeasures initiative (PSCi) is a collection of countermeasures and strategies effective in reducing roadway fatalities and serious injuries on our Nation's roadways. Transportation agencies are strongly encouraged to consider widespread implementation of Proven Safety Countermeasures to make roadways safer. Factors such as crash and roadway type are used to determine the "best fit" Proven Safety Countermeasure for the unique conditions.

The Proven Safety Countermeasures initiative tools linked on the webpage include:

Speed Management

- Speed Safety Cameras
- Variable Speed Limits
- Appropriate Speed Limits for All Road Users

Roadway Departure

- Wider Edge Lines
- Enhanced Delineation for Horizontal Curves
- Longitudinal Rumble Strips and Stripes
- SafetyEdge
- Roadside Design Improvements at Curves
- Median Barriers

Intersections

- Backplates with Reflective Borders
- Corridor Access Management
- Left and Right Turn Lanes at Two Way Stop Controlled Intersection
- Reduced Left-Turn Conflict Intersections
- Roundabouts
- Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections
- Yellow Change Intervals

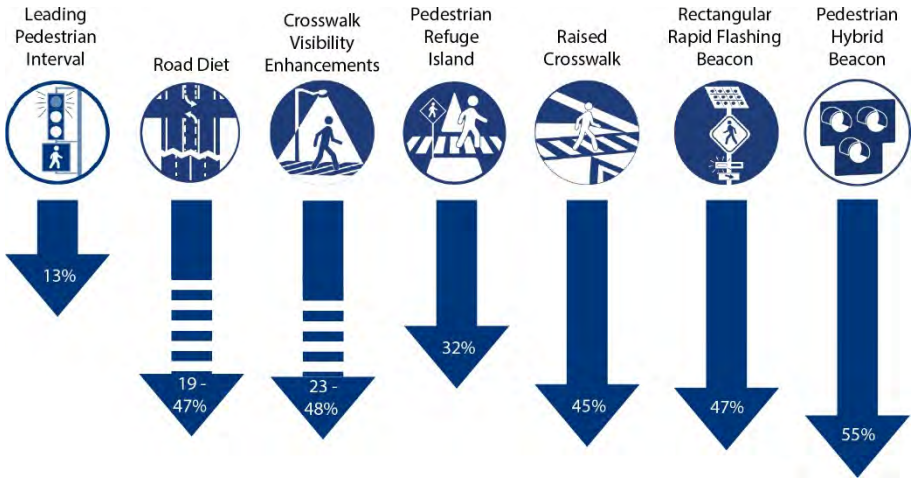
Pedestrian/Bicyclist

- Leading Pedestrian Interval
- Road Diets (Roadway Reconfiguration)
- Crosswalk Visibility Enhancement
- Pedestrian Refuge Island
- Bicycle Lanes
- Rectangular Rapid Flashing Beacons (RRFB)
- Pedestrian Hybrid Beacons
- Walkways

Crosscutting

- Pavement Friction Management
- Lighting
- Local Road Safety Plans

- Road Safety Audits



Crash reduction factors for the pedestrian safety countermeasures promoted by the Proven Safety Countermeasures.

A Highway Safety Countermeasure Guide for State Highway Safety Offices (NHTSA)

NHTSA's Highway Safety Countermeasure Guide is a resource for State Highway Safety Offices (SHSO) in selective effective, science-based traffic safety engineering countermeasures for major highway safety problems. The guidebook accomplishes the following:

- Describes major strategies and countermeasures relevant to SHSO.
- Summarizes the countermeasures uses, effectiveness, costs, and implementation timelines.
- References most important research summaries and individual studies.

The guide breaks down potential countermeasures and strategies into ten different **problem areas**, including:

1. Alcohol/Drug Impaired driving
2. Seat belts and child restraints
3. Speeding and speed management
4. Distracted driving
5. Motorcycle safety
6. Young drivers
7. Older drivers
8. Pedestrian safety
9. Bicycle safety
10. Drowsy driving

Although this guide is not meant to be a comprehensive list of countermeasures or expectations for SHSO implementation, it does highlight problems to be identified through systematic data collection and analysis. It is an excellent starting point for readers who would like to become familiar with behavioral safety strategies and countermeasures.

Traffic Safety Culture (Towards Zero Deaths)

The Towards Zero Deaths national strategy applies safety culture to decision-making at all levels. This resource provides links to national case studies for building traffic safety culture within organizations and within communities.

Toward Zero Deaths acknowledges that safety culture is more than a public information campaign. Safety must be a factor in every transportation decision. The Toward Zero Deaths National Strategy applies safety culture to decision-making at all levels. It involves safety as a valued factor in every transportation decision, whether personal or organizational, it outlines the safety culture development process through a five-step process to learn, plan, engage, implement, and evaluate strategies. This resource will be helpful for meeting goals related to education and increasing awareness.

Safe System Approach for Speed Management (FHWA)

This report, produced by FHWA serves as a resource for understanding the impacts of speed on traffic safety, while exploring the link between speed management and the Safe System Approach. The report establishes a five-stage framework on the Safe System Approach for Speed Management, which are as follows:

- Establishing a vision and building consensus for speed management
- Collecting and analyzing speed and safety data
- Prioritizing locations for speed management proactively
- Selecting speed management countermeasures
- Conducting ongoing monitoring, evaluation, and adjustment

The report presents case studies and examples that MACOG region jurisdictions can refer through not only throughout this planning process, but down the road through implementation. There are successful examples of lowering speed limits, redesigning roadways, collecting data, and more.

Creating a Positive Safety Culture (Towards Zero Deaths)

The traffic safety culture resource webpage provides a definition of traffic safety culture and explains its influences on street user behavior. Safety culture is built on the value that traffic deaths and serious injuries are preventable through changes in behavior at all levels of the transportation system.

Internal shifts in government structure and resources to ensure transportation safety is part of every decision such as:

- Community leaders can advocate for and pass appropriate laws that reduce risky driving behaviors, and make sure programs are used with those who violate laws so that it doesn't happen again.
- Professionals from local, state, tribal, and federal traffic safety agencies can take the lead to promote growing positive safety culture. Examples include:
    - Form effective coalitions and partnerships to support the Vision Zero goals.
    - Can provide tools resources to communities, workplaces, and families to help create a positive safety culture.
    - Can invest in developing innovative strategies.

External impacts to change behaviors on our streets to the safest possible including:

- Always wearing seat belts
- Eliminate distracted driving
- Obeying speed limits
- Families discuss driver safety and create family rules to ensure safe behaviors.
- Schools promote traffic safety in health classes.

- Workplaces establish policies and provide training to prevent crashes.
- Healthcare providers talk to patients about the importance of wearing a seatbelt, and how different medication can affect one's ability to operate a motor vehicle.

A downloadable primer document is available to create shared language and understanding on what positive traffic safety culture means. The webpage also includes a presentation that can be used to introduce the basic ideas and spark conversations about new strategies to achieve Vision Zero.

Safety Data Case Studies (FHWA)

FHWA has an ongoing series of safety data case studies around roadway safety data collection, management, and analysis issues. The case studies identify agency challenges and the implemented solutions. The case studies take place in locations across the US, including those like communities within the MACOG region. These case studies will be utilized to inform the project selection process as they provide data-informed background context.

Crash Modification Factors Clearinghouse

The Crash Modification Factors (CMF) Clearinghouse is a resource funded by FHWA that offers a regularly updated repository of CMFs. CMFs are estimate used to quantify the change in crashes expected after the implementation of a countermeasure. The website also includes a variety of detail surrounding countermeasure selection, comparison of alternative treatments, cost-benefit analysis, and more. This resource will be utilized throughout the project life cycle in a variety of capacities and can also be used as a resource beyond the project.

Safe System Roadway Design Hierarchy

In January 2024, FHWA released the Safe System Roadway Design Hierarchy, a resource for transportation professionals to characterize engineering and infrastructure-based countermeasures and strategies and their alignment to the Safe System Approach. The tool includes four tiers that range from most to least aligned with the principles of the Safe System Approach. Tiers one through three include countermeasures to remove potential conflicts and separate vulnerable road users from motor vehicles, with the goal of reducing kinetic energy in a potential crash. Tier four countermeasures and strategies provide critical information to the road user so they can take appropriate action. Further details on the tiers can be found in the linked document, but a basic overview is provided below.

- **Tier 1: Remove Severe Conflicts –** This could involve separate road users moving at different speeds or directions in space. This typically includes strategies that remove conflicts such as intersection crossing conflicts, removing fixed objects along the road, eliminating railway-highway crossings, or providing separation between motorized and non-motorized users.
- **Tier 2: Reduce Vehicle Speeds –** This typically covers the implementation of speed management strategies to reduce vehicle speeds, leading to the reduction of kinetic energy involved in a crash if one were to occur.
- **Tier 3: Manage Conflicts in Time –** The assumption of tier three is that road users will need to occupy the same physical space on the roadway but increases safety by separating users in time using traffic control devices such as traffic signals or hybrid beacons.
- **Tier 4: Increase Attentiveness and Awareness –** This typically involves crossing visibility enhancements, retroreflective signal backplates, and rumble strips.

It's important to note that in the Safe System Roadway Design Hierarchy, infrastructure changes are more effective than changes that rely on behavioral changes. This tool will serve as a resource in design decision making throughout the planning process and will also serve as an excellent resource to MACOG in the implementation of the plan and future efforts.

Best Practices in Land Use Through the Lens of Roadway Safety

When discussing best practices in applying the Safe System Approach to reduce and eliminate fatal and serious injuries, the focal components are typically related to behavioral and engineering elements. However, it is important to recognize that land use policies have a strong impact on the way that road users interact with their environment. Zoning and land use can influence the number of trips road users take, the mode they choose, as well as engineering practices.

Federal Practice

To further investigate the role of land use in roadway safety, FHWA's study, *Improving Pedestrian Safety on Urban Arterials: Learning from Australasia* investigates the approaches and innovations used in other countries to eliminate and reduce fatal and serious injuries on arterial roadways. Although the study is focused on pedestrian-involved crashes, there are many takeaways that can be applied to all modes. The most important thing to note is that of the three factors to reduce risk for fatal and serious injury crashes, **design layout** must be considered. The report finds that roads must be designed to suit their desired context, consider future land use, as well as economic, climate, public health, and equity goals.

Local Practice

Completed in 2019 in St. Joseph County, the SR 933/Dixie Highway Corridor Study focuses on revitalization of the corridor. Clear connections between economic development and transportation safety are made in the study, as well as the role of placemaking to achieve both these ends. This includes an identification of the role that land use plays in accomplishing these interconnected goals. One of the key takeaways from the study was that the implementation of study recommendations surrounding placemaking will reinforce development opportunities and increase residential and mixed-use development. Land use and development recommendations made in this corridor study should be evaluated to other parts of the MACOG region.

State and Local Practices and Plans Influencing Roadway Safety

To ensure that regionally applicable recommendations are made as a result of the planning process, a thorough review of existing statewide, as well as local jurisdiction, policies and plans was completed. The policy analysis will go into further detail on these existing policies, but the goal of the best practices review exercise is to identify current safety efforts and best practices at the state level, as well as throughout the MACOG region.

Indiana Department of Transportation (INDOT) Vulnerable Road User Assessment

Per the requirements of the Bipartisan Infrastructure Law (BIL), the State of Indiana, through the Indiana Department of Transportation (INDOT), developed its first ever Vulnerable Road User (VRU) Assessment in late 2023. The assessment follows a data driven process to provide the state with guidance towards reducing fatal and serious injuries among vulnerable road users. This assessment sets an excellent precedent for applying the Safe System Approach at a larger scale, while also showcasing INDOT's support of the goal of reducing and eliminating fatal and serious injury crashes through the Safe System Approach.

The VRU Assessment identified many key strategies and action items as a result of trends identified through the data analysis. Strategies and actions identified in the VRU Assessment that should inform the MACOG Regional Safety Action Plan include the following:

- Reduction of vehicle speeds through road diets, roundabouts, speed bumps, and other traffic calming measures.
- Implementation of proven safety countermeasures to remove VRU conflict points.
- Separate VRUs from adjacent motor-vehicle traffic.

- Conduct VRU safety studies.
- Complete public outreach and education focused on the benefits of and how to navigate enhanced or new intersection designs and safety treatments.

St. Joseph County

2043 St. Joseph Comprehensive Plan

St. Joseph County is in the final stages of drafting an updated comprehensive plan for the County, it's first update since the early 2000's. The plan contains a transportation pillar, which has a focus on safer infrastructure for all road users, but especially active transportation users. It will be important to ensure that recommendations made in the MACOG Regional Safety Action Plan align with the goals of the comprehensive plan.

SR 933/Dixie Highway Corridor Study

The Dixie Highway Corridor Study identifies ways in which safety can be enhanced for all roadway users. The Corridor Study identifies safety improvements for all road users in it's "Mobility and Infrastructure" section, many of which align with the Safe System Approach principles and elements. This includes the separation of users in space and time, as well as traffic calming efforts. Recommendations from the study should be reviewed and incorporated into the MACOG Regional Safety Action Plan, particular for similar roadways across the region.

South Bend Bicycle Master Plan 2018-2020 Goals and Action Plan

The 2018-2020 South Bend Bicycle Master Plan Goals and Action Plan identified a series of goals and actions to improve the safety and connectivity for bicyclists in the City. Although these goals were set with the intention of being implemented between 2018 and 2020, this sets a precedent for South Bend, and other urban areas in the MACOG region, for goals to be incorporated in the MACOG Regional Safety Action Plan to improve bicyclist safety. Some of these include:

- Continue adding protected bicycle routes;
- Continue pursuing traffic calming measures;
- Launch pilot media campaign;
- Seek and support training opportunities for public safety personnel; and
- Conduct Bike safety audits.

Kosciusko County

Warsaw Comprehensive Plan

The City of Warsaw completed its last update of its comprehensive plan in December 2014. The plan identified a variety of goal areas for a community. In the transportation goal area, there were many goals set, including the goal of fostering an effective and safe transportation system. Many of the action items underneath this goal will set the precedent for similar communities in the MACOG region. This includes:

- Adopt a "Complete Streets: ordinance to promote full and safe utilization of street rights-of-way for all users and their needs
- Commitment of funding each year for sidewalk, bike lanes, and trail systems expansions.

Equity Practices in Roadway Safety

Equity is defined in different ways depending on the context. We can define equitable transportation as:

- Accounting for past inequality;
- Providing for current needs and addressing current disadvantage;
- Producing an overall improvement in the system; and
- Ensuring everyone has transportation access and options that allow them to participate fully in society.

This requires determining which communities currently experience the most adverse effects of the existing transportation system as well as how positive outcomes of investments are distributed. Communities that have experienced historical marginalization, disenfranchisement, and disinvestment are more likely to shoulder the burdens of the transportation system or have benefits of the system withheld due to the ongoing effects of past policies and investment patterns. The communities that are historically marginalized and/or transportation disadvantaged include:

- Native Americans
- Black/African Americans
- Latino/Hispanic Americans
- Asian Americans
- Individuals whose first language is not English
- People with disabilities
- Youth and older adults
- People experiencing poverty

An equity analysis can be used to determine how people with sociodemographic vulnerability (due to systemic discrimination and marginalization) are impacted differently. It can identify communities that have disproportionate impacts related to safety, access, or other transportation system outcomes.

Equity is critical for a safe roadway network. People of color are more likely to be killed while walking than any other race or ethnic group, despite making up a smaller proportion of the population. Between 2016 and 2020, American Indian and Alaska Natives were killed on roadways nationwide at a rate of 4.8 deaths per 100,000 and African Americans suffered 3 deaths per 100,000. Additionally, pedestrian in lower-income communities are killed at a much higher rate than their higher income counterparts. Nationwide, Census tracts with a median household income of $90,000-$250,000 had a rate of about 1 pedestrian fatality per 100,000 people. However, in tracts with a median household income of $2,500-$43,000 there were more than three times that rate, coming in at 3.3 fatalities per 100,000 people.[8] Investing in communities and areas that experience the greatest safety burden can result in the greatest impact.

This review includes resources that will be referenced throughout the development of the MACOG Regional Safety Action Plan and examples from agencies across the country who have excelled at integrating equity in their planning process and decision making. Additionally, the different forms of work that need to be done to truly affect equity are discussed and highlighted.

[8] Dangerous by Design 2022, 2022. https://smartgrowthamerica.org/wp-content/uploads/2022/07/Dangerous-By-Design-2022-v3.pdf

National Resources

Equity in Roadway Safety Webinar Series (FHWA)

Equity ensures that the unique needs of underserved communities are considered and addressed appropriately. In the journey to reaching zero deaths and serious injuries, the Safe System Approach should be applied equitably to address the disparities of people who are disproportionately impacted by crash fatalities and serious injuries.

In their commitment to roadway safety, FHWA has begun the *Equity in Roadway Safety Webinar Series.* This webinar series serves as a resource for communities applying equity in roadway safety. The topics covered include the following.

- Roadway Safety for People Experiencing Homelessness
- Tools and Strategies for Equitable Design
- Elevating Equity and Safety in Project Prioritization
- Strategies for Meaningful Public Involvement in Roadway Safety Planning
- Tools to Conduct Equitable Safety Data Analysis
- Equity in Safety Leadership Panel

The webinars listed above are available for pre-recorded viewing and serve as a resource in applying equity to the MACOG Regional Safety Action Plan and understanding how FHWA would like to see equity applied to projects.

Inclusive Transportation: A Manifesto for Repairing Divided Communities (Veronica O. Davis)

Inclusive Transportation by Veronica O. Davis creates a vision for applying equity in transportation. Davis recognizes the role that transportation planners, engineers, policymakers, and others play in righting the wrongs of previous transportation decisions and building an equitable transportation for all people. The book provides a thorough explanation as to why centering people in transportation requires a shift in training, communication, data collection and more. Davis utilizes case studies and questions to help readers imagine what equity means in individual transportation projects and transportation systems. The book serves as an excellent resource and provides prompts to guide learning and application of the ideas discussed. This tool will be useful in the development of the MACOG Regional Safety Action Plan, as well as other transportation plans and projects for MACOG, the member communities, and stakeholders.

Vision Zero Equity Strategies for Practitioners (Vision Zero Network)

The Vision Zero Network advocates for safe mobility strategies that do not exacerbate negative, unintended consequences, particularly in communities of color and low-income communities. This report summarizes successful strategies in US Vision Zero cities that integrate equity into their work. Three broad strategies for integrating equity in Vision Zero include:

1. Re-thinking the role of enforcement;
2. Investing where needs are greatest; and
3. Engaging the community.

Most communities find that a relatively small percentage of streets are the sites of a disproportionate number of traffic deaths and serious injuries. These streets are often labeled High Injury Networks (HIN) and should be prioritized for safety improvements. Many communities are overlaying their High Injury Networks with maps highlighting equity seeking populations, sometimes called equity priority areas or Communities of Concern. This allows cities and rural communities to identify funding priorities using an equity lens. It also facilitates communication of priorities to other jurisdictional departments whose decisions influence road safety and to the public.

As an example, the Los Angeles HIN spotlights streets with a high concentration of traffic collisions that result in severe injuries and deaths, and highlights those occurring in traditionally underserved and vulnerable communities. The City of Los

Angeles overlaid the HIN with maps created with data from Healthy Los Angeles' Health and Equity Index, which combines demographic, socio- economic, health conditions, land use, transportation, food environment, crime, and pollution burden data in a single lens.

US DOT Equitable Transportation Community Explorer

The USDOT Equitable Transportation Community Explorer (ETCE) is an equity screening and mapping tool. The tool uses data consistently available throughout the US to highlight communities experiencing higher rates of burdens and disadvantage. The tool offers different map layers that show each of the five burden/vulnerability indices at the census tract level and allows individuals to utilize the data and mapping capabilities to inform their understanding of communities. The tool is intended to help target state and federally funded transportation projects to vulnerable or underserved communities. This version of the tool is experimental as the USDOT tests the service before releasing a final version.

Users can assess data layers on social vulnerability using data from the US Census Bureau's American Community Survey. Additional indicators of health vulnerability, transportation insecurity, and environmental, and climate and disaster burden are available in the tool. This tool provides agencies with the capability to screen their projects for potentially historically underserved communities and determine early ways to avoid or mitigate potential impacts to these populations and prioritize investments and projects in their communities. This tool can be used throughout the project life cycle to inform engagement activities, project identification and prioritization, and more.

EJScreen: Environmental Justice Screening and Mapping Tool (EPA)

EJScreen is the Environmental Protection Agency's (EPA) environmental justice mapping and screening tool. The tool serves as a nationally consistent dataset and approach for combining environmental and demographic socioeconomic indicators. EJScreen contains 13 environmental indicators, 7 socioeconomic indicators, 13 EJ indexes, and 13 supplemental indexes. The tool can be used throughout the project life cycle to identify underrepresented populations throughout the MACOG region to inform engagement efforts and recommendations.

Equity in Local Programs

Lancaster Vision Zero

Lancaster Vision Zero centers equity in the focal point of the plan goals. In the investigation phase of the action plan, the city found that there are higher rates of crashes and more serious crashes in low-income communities, in communities of color, and in communities with low car ownership. The city sought to change that by putting equity at the forefront of their Vision Zero efforts. The Action Plan identifies four major equity action items, with relevant supporting points for each. The action items include:

- Establish a standing Vision Zero Coordinating Committee. This committee includes city staff, partner institutions, members of the community, advocacy groups, state and county leadership, and community- based organizations.
- Develop processes and funding opportunities to support the participation of community-based organizations in the development and implementation of Vision Zero related efforts.
- Develop and implement a community engagement plan for all Vision Zero projects.
- Prioritize Vision Zero investments in low-income communities, communities of color, and low mobility communities.

Another aspect of Lancaster Vision Zero that sets it apart as an example for integrating equity in the plan is the dialogue it has towards enforcement and equity in roadway safety. Although there are recommendations for initiatives in collaboration with the Lancaster Police Department, there are none related to enforcement.

Increasing traffic enforcement, particularly in communities of color, could exacerbate injustices of the past and increase distrust in the communities that the plan is hoping to serve. The goal of Vision Zero is not increased traffic fines, but safer streets for all road users.

Toledo Vision Zero

Toledo's Vision Zero Action Plan establishes taking an equity-centered approach as a core strategy. The plan recognized the importance of equal access to safe streets for all members of Toledo, regardless of their race, age, ability, or income. The plan has a series of four main equity strategies, with a variety of goals that fall underneath each of them. Those strategies include:

- Prioritize Vision Zero investment in Communities of Concern.
- Establish a standing voluntary Vision Zero Coordinating Committee.
- Develop processes to center community participation in the development and implementation of Vision Zero related efforts and strategy updates.
- Report annually to the public the impacts of Vision Zero implementation strategies.

Although all goals in the plan are noteworthy, some of the equity goals underneath these strategies that are especially noteworthy are:

- Include residents from Communities of Concern and people with disabilities on the Vision Zero Coordinating Committee.
- Monitor implementation to ensure no strategies result in racial profiling or otherwise exacerbate racial inequities.
- Attend existing events in Communities of Concern within the High Injury Network.
- Host engagement events in Communities of Concern within the High Injury Network. Provide incentives to community members for participation.
- Hire local community-based organizations and culturally based organizations to shape and share Vision Zero related messages and develop a Street Ambassador program that employs people from Communities of Concern to conduct engagement events.

Equity in Engagement Practices

It is crucial to approach planning for public engagement guided by equity, and to be deliberate in engagement with underrepresented communities. Historically, those who are facing transportation disparities are also the most underrepresented in engagement efforts. When trying to resolve inequities, itis important to hear the voices of those who have been marginalized and are underrepresented. Project teams need to understand how transportation-related barriers negatively impact the day-to-day lives of community members.

The *Equitable Engagement Toolkit and Guidebook* published by the East Central Wisconsin Regional Planning Commission, outlines a step-by-step process to create a community engagement strategy. The six steps include:

1. **Self-Reflection and Research** - Understand your place, role, and power in the project. Although this is the first step, you should continuously reflect on your role throughout the process.
2. **Scope** – Decide the role that public engagement will play in the project and how feedback will impact decisions.
3. **Plan** – Decide what strategies will be used to get the feedback you need and engage all the necessary stakeholders at the table. This is especially important when inviting historically marginalized populations to be involved in the project.
4. **Engage** – Hold events, send out communications, and get feedback. There might be a learning curve, so this will need to be adaptable.

5. **Review** – Look back at the process and identify lessons learned.
6. **Sustain** – Keep the relationships formed going into the future.

Following this structure creates a collaborative environment where historically marginalized stakeholders are valued, respected, and honored for their perspective. This resource will inform the engagement process in the MACOG region beginning with an understanding whose expertise has historically been missed in planning processes, as well as deliberate strategies to remedy that, and investment in equitable practices most likely to effective with prioritized audiences.

Applying The Safe System Approach

Below are various agencies that we suggest the MACOG region use as models and references in creation of the Regional Safety Action Plan. These agencies are similar to MACOG region jurisdictions in size, context, or have achieved successes in implementation of Vision Zero. Each agency will be highlighted for excelling in utilizing one or more of the Safe System Approach elements. The model agencies include:

- *Northwest Arkansas*
- *Greater Portland, Maine*
- *Denver Regional Council of Governments*
- *Hillsborough County, Florida*
- *Toledo, Ohio*
- *Des Moines, Iowa*
- *Lancaster, Pennsylvania*
- *Minneapolis, Minnesota*
- *Hoboken, New Jersey*
- *Boston, Massachusetts*
- *Madison, Wisconsin*
- *Portland, Oregon*

Safe Roads

Lancaster Vision Zero

Lancaster's Vision Zero Action Plan has an equity centered roadmap to reaching zero fatal and serious injuries on roadways across the city. The Action Plan has four key goal areas identified by the Steering Committee. Those goals are as follows:

- Equity
- Safety and Slow Speeds
- Culture Change
- Data

The Action Plan's key goal area of Safety and Slow Speeds aligns with the Safe System Approach element of Safe Roads through its action items laid out in the Action Plan. The citywide safety improvements recommended in the Action Plan include:

- Establish Vision Zero Design Guidelines through the consolidation of policies and design guidelines from previously adopted plans. These policies will guide Lancaster's street design, traffic, and parking procedures in order to prioritize safety.
- Expand design guidelines to include elements identified in the citywide crash analysis such as intersection treatments, signalization, and crosswalk improvements.

Northwest Arkansas Vision Zero

Northwest Arkansas provides an excellent model for the MACOG region in rural roadway safety. The NW Arkansas region has a very similar demographic and land use breakdown to the MACOG region and will serve as an example in embedding Safe Roads in the Transportation Safety Action Plan.

The NW Arkansas Vision Zero Action Plan prioritizes the separation of users in space in time as one of their main goals, informing the 24 action items that fall underneath the goal of reducing conflict between roadway users. Although all the action items are notable for MACOG, some that should specifically be noted include:

- Install edge and center line treatment with bicycle-friendly rumble strips on roadways with marked shoulders
- Install backplates with retroreflective boards at all signalized intersections and use reflectors on curves and bridges, starting with the HIN
- Daylight intersections (removing obstacles that impair sight lines) in town centers and in high-volume pedestrian areas
- Provide buffers to sidewalks and sidepaths (paint, greenspace, trees, etc.)
- Identify walking zones for schools, recreation centers, and other community identified priorities for connectivity
- Implement road diets along the HIN where applicable

Taking Action on Regional Vision Zero: Safer Streets for Metro Denver (DRCOG)

Representing over 50 local governments, the Denver Regional Council of Governments (DRCOG) is committed to Vision Zero. DRCOG recognizes that roadway fatalities and serious injuries are preventable, and their Vision Zero Action Plan showcases their commitment to eliminating and reducing them through the Safe System Approach. Similar to MACOG, DRCOG oversees a diverse set of communities – urban, suburban, and rural – which allows for their plan to share similar characteristics to what might be seen in the MACOG Regional Safety Action Plan.

Utilizing a data driven approach, DRCOG's plan provides a model for MACOG in safer roads. After identifying high crash corridors, the plan goes further to identify common trends along these corridors. These findings are broken down by urban, suburban, and rural contexts, and the appropriate proven safety countermeasures are applied in each area.

Vision Zero Greater Portland

Greater Portland Council of Governments (GPCOG) began its Vision Zero journey in January 2022 through the direction of the Portland Area Comprehensive Transportation System (PACTS) Policy Board. In collaboration with a large advisory panel of multiple stakeholders, including municipalities, MaineDOT, local and state police, emergency responders, and public health departments, GPCOG finalized the Action Plan for the urban and suburban communities of Greater Portland. GPCOG is currently in the process of drafting the Action Plan for rural and island communities in Greater Portland.

Through the lens of the Safe System Approach, Vision Zero Greater Portland is comprised of a data driven approach to reducing and eliminating fatal and serious injury crashes in the Portland region. One of the key objectives, which has it's aligned action steps, is Safer Roads, which aligns with the Safe System Approach element. Relevant action steps that will inform the development of the MACOG Regional Safety Action Plan are detailed in the list below.

- Explore creating a sustainable, dedicated funding source for quick-build demonstration projects to pilot safety improvements.
- Obtain funding to implement quick-build demonstration projects at high priority locations.
- Identify regional safety-focused quick-build projects.
- Work to align relevant local, regional, and state street design guidelines with Vision Zero and Safe System Approach principles.

Safe Road Users

Hoboken Vision Zero

A key program element of Hoboken's Vision Zero program is their Vision Zero Ambassadors. These ambassadors are community members that care about traffic safety and demonstrate the importance of zero-traffic related injuries and deaths to their peers. Some of the roles that Community Ambassadors play include, but aren't limited to:

- Distributing Vision Zero educational materials at a block party or street fair.
- Hosting a community meeting to discuss VZ projects.
- Speaking the language of Vision Zero, like saying "crash" and not "accident".
- Engaging with Communities of Concern about Vision Zero principles.

Des Moines Vision Zero

Des Moines' Vision Zero Action Plan is split up into different focus areas that have a variety of actions towards implementation. One of the main focus areas is "A Culture of Safe Street Behaviors". The action items in that focus area include strategies consistent with the element of Safe Road Users including, but not limited to:

- Develop standard language regarding Vision Zero and street safety for use by all city departments and partner agencies when interacting with the media and public.
- Implement a multimodal safety education campaign highlighting the prevalence and impact of distracted driving, the benefits of seat belt, car seat, and helmet use, and safe interactions with other road users.
- Couple major infrastructure changes and enforcement activities with messaging to communicate why traffic safety is important.
- Develop branded Vision Zero signage to be installed with Vision Zero infrastructure projects during construction.

Madison Vision Zero

Madison's Vision Zero Action Plan brings a data-driven approach to reaching zero traffic deaths through a systemic lens, while centering equity. The action plan focuses on all road users, including motorists, pedestrian, bicyclists, and transit users. Since the adoption of the Action Plan, the city has made great strides in implementing the Action Plan, particularly in the realm of Safe Road Users. In their recent Progress Report, which highlights their progress over the last two years, the city showcased many steps towards zero. This includes:

- A reduction in vehicle miles traveled (VMT).
- Safe Routes to School education and encouragement campaigns – this consisted of after school bike clubs, community bike rides, and walking school buses.
- The city's "Let's Talk Streets" community engagement campaign to engage the public on design for current and future projects.

Safe Speeds

Boston Vision Zero

Boston's Vision Zero Action Plan is committed to a blend of bicycle and pedestrian friendly infrastructure improvements within their journey to reaching the goal of zero fatalities or serious injury crashes by 2030. Two of the main actions that have taken place since the adoption of their Action Plan include reducing vehicle speeds and introducing neighborhood slow streets.

The neighborhood slow streets programming included a variety of improvements in the designated corridors to slow down drivers and alert them that they are entering a residential roadway. These improvements included:

- Posted gateway signage that identifies the corridor as a slow street.
- Temporary curb extensions to improve pedestrian visibility and slow driver speed.
- Speed humps to slow driver speed in the corridor.

Priority corridors were identified across the city for vehicle speed reduction. Various countermeasures were selected for the implantation of this effort, including:

- Daylighting of intersections to improve visibility of all roadway users.
- Reconfigured number of lanes appropriate for residential streets to construct separated bike lanes to improve safety for all roadway users.
- Programmed leading-pedestrian intervals to give a head start for pedestrians and increase their visibility to right-turning drivers.

Vision Zero Greater Portland

The urban and suburban focused Vision Zero Greater Portland Action Plan identified speeding as one of the leading factors in fatal and serious injury crashes in the region. This led to the development of the plan's third key objective – Safer Speeds – in alignment with the Safe System Approach element. The recommended action steps that may inform the MACOG Regional Safety Action Plan are listed below.

- Explore funding to obtain speed feedback signs for use by municipalities.
- Assist municipalities and examine speed limits and identify locations that would benefit from speed limit reductions.
- Support legislation to allow safety cameras as an enforcement technique, including for red-light running and speeding.
- Monitor and evaluate results of speed limit changes and recommend needed improvements based on results.

Safe Vehicles

Minneapolis Vision Zero

One of the core goal categories and actions in Minneapolis' Vision Zero Action Plan is to regulate and maintain a safe vehicle fleet. The city understands that vehicle safety regulations are a key part of reaching Vision Zero and that there are many requirements for new traffic safety technology being considered. The city has a commitment to support roadway safety through safe vehicles through the following actions:

- Piloting and managing emerging vehicle technologies with the potential to improve safety.
- Evaluating the potential to use smaller vehicles in the public fleet to align with safer street designs.
- Supporting efforts to require prudent additional vehicle safety features with a particular focus on measure that will increase pedestrian and bicycle safety.

Madison Vision Zero

As a follow up to its Vision Zero Action Plan, Madison released the 2020-2022 progress report in early 2024. The progress report identified progress towards reaching performance metrics, as well as identified additional actions that bring the city closer to its goal of reducing and eliminating fatal and serious injury crashes. A Safe System Approach element that the city is excelling in is safe vehicles through its upcoming Safe Speed Pilot Project. The city is aiming to conduct a 90-day pilot of intelligent speed assistance in the city fleet. The pilot will evaluate the effectiveness of the technology installed in ten vehicles based on their mileage and speeding exceptions.

Post-Crash Care

Hoboken Vision Zero

Hoboken's Vision Zero Action Plan continues to demonstrate an effective implementation of the Safe System Approach. The plan recognizes that severe crashes may still occur and that a rapid response by EMS is the final safety net to increase the probability of survival. The action items identified in the plan include:

- Establish an interagency crash response team to review injury and fatal collision locations to identify and implement short term safety enhancements.
- Establish an interagency rapid response team to coordinate with victim families for services and ensure consistent data collection and sharing.
- Develop a communications protocol for describing serious and fatal crashes in a timely way.
- Evaluate current crash response protocol including deployment to scene, reporting and data analysis.
- Update Fire Department EMT requirements to increase speed of post-crash care.

Boston Vision Zero

It is incredibly important to allocate the appropriate time, effort, and funding towards improving post-crash care. Boston's Vision Zero Action Plan sets a great example for agencies in moving the needle with improved post- crash care. Through the task force established in the planning process, a multi-agency Rapid Response Team was formed. The team analyzes and responds to every fatal traffic crash in the city, following the response of EMS responders. The quick response from EMS, along with the rapid implementation of traffic safety improvements will improve results of crash victims, while also preventing further crashes.

Sincerely,



Catherine Girves | Principal Planner

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Move Safe Michiana: Regional Safety Action Plan

Public Comment Period

May 9th- June 9th, 2025

Date	Submitted By	Comment
5/14/2025	Alison Mynsberge, online	The 85% rule is garbage in the absence of speed limit enforcement. There are many areas of South Bend that should be posted 25 mph to support shared roadways with wheelchairs, mopeds, and casual commuting cyclists. The only reason they are now effectively 15 mph intermittently instead of the posted 30 mph is because so many speed humps were installed. The 85th percentile rule doesn't work if the roads are poorly marked, enforcement of speeding is paltry, and hit & run fatalities tend to go unsolved.
5/28/2025	John Goetz, written, Open House	I want some protected bike lanes on Jefferson between Ironwood and Greenlawn. Also, I want the same thing on Greenlawn between Jefferson and the train tracks.
5/28/2025	David Wiegner, written, Open House	1 – Many of these accidents are preventable (pg VIII) 2 – "Safety is Proactive" should be higher priority (pg 3) 3 – Include reporting changes to reporting (pg 8) 4 – What were the circumstances for ped. accidents (pg 9) 5 – Could these maps include schools (p12-19) 6 – Strategies to address driver behaviors, and also improve non-motorized safety considerations is key to provide (pg 26) 7 – Please add speeds to kinetic energy and injury/fatality to humans (pg 29) 8 – It is too bad that projects are currently being completed without these considerations (pg 29) 9 – Switch Roadway to the bottom (pg 43) Good work, looking forward to improvements. Just worried that these will never really be a priority for local agencies. Hoping for it though!
5/29/2025	Wesley Kuric, written, Open House	Maps with safety information are excellent. Swiss cheese layout graphic is very good. Good breakdowns on project costs. This is very comprehensive and well laid out. Great work!!! Very excited to see where this goes. Keep me posted. Maybe add a section on possible barriers to success! Maybe some anecdotal stories about why this is needed.
6/04/2025	Dirk Oyer, online	Lincoln Avenue in Goshen is listed as a Candidate Community Project, and the section from 5th Street to Cottage Avenue is described as having "two through lanes, a center turn lane, on street parking on both sides, and a bicycle lane on the south side until Cottage Avenue." The poor response to these changes is also mentioned. After the poor response, these changes were rolled back and the road has reverted to four lanes with a right turn only lane at the eastbound end and street parking on the south side of the road. The background and project plan should be edited to reflect the current state of the street and the additional work now unfortunately necessary to re-implement the project.
06/04/2025	Amon Yoder, In Person	Connect 700 W, South of US 6 down to 900N in Kosciusko County. This would provide an alternative to SR 19 to get to Nappanee for horse and buggy.