March 2020

# Bicycle and Pedestrian Mobility Plan for Southeast Michigan - Appendix

**SEMCOG** | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

**SEMCOG**... *Developing Regional Solutions*

## Mission

SEMCOG, the Southeast Michigan Council of Governments, is the only organization in Southeast Michigan that brings together all governments to develop regional solutions for both now and in the future. SEMCOG:

- Promotes informed decision making to improve Southeast Michigan and its local governments by providing insightful data analysis and direct assistance to member governments;

- Promotes the efficient use of tax dollars for infrastructure investment and governmental effectiveness;

- Develops regional solutions that go beyond the boundaries of individual local governments; and

- Advocates on behalf of Southeast Michigan in Lansing and Washington.

# Bicycle and Pedestrian Mobility Plan for Southeast Michigan – Appendix

## A Plan for SEMCOG and MDOT's Southeast Michigan Regions

The implementation of this regional plan is a multi-jurisdictional, multi-agency effort, based on each agency's role and capacity. In some cases, the action items in this plan are feasible at the local or regional levels while others are better implemented as a part of a county or state-initiated effort. In some instances, action items may be best implemented by advocacy organizations rather than state, county, or local governments. Furthermore, individual projects or program elements may require approval by county, state, or federal agencies. In some instances, changes in policy may be required. While specific agencies may be limited in their capacity to help implement certain action items, together as a region we will be able to better promote bicycle and pedestrian mobility.

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## Abstract

The *Bicycle and Pedestrian Mobility Plan for Southeast Michigan* ensures that the region's nonmotorized system meets the transportation, quality of life, health, and accessibility needs of its residents and visitors, as well as the economic development priorities and goals of the region and local communities. Seven appendices complement the plan.

El *Plan de movilidad de bicicletas y peatones para el sudeste de Michigan* garantiza que el sistema no motorizado de la región satisfaga las necesidades de transporte, calidad de vida, salud y accesibilidad de sus residentes y visitantes, así como las prioridades y objetivos de desarrollo económico de la región y las comunidades locales.

تضمن خطة تنقل الدراجات الهوائية والمشاة لجنوب شرق ميشيغان أن نظام النقل غير المزود بالمحركات في المنطقة يلبي إحتياجات النقل و جودة الحياة والصحة وسهولة إمكانية الوصول لسكانها وزوارها، فضلاً عن أولويات التنمية الإقتصادية وأهداف المنطقة والمجتمعات المحلية

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## Livingston County

### Planning Context

Livingston County consists of 16 townships, two villages, and two cities. The county is home to three state recreation areas, two Huron-Clinton Metroparks, two county parks, and the Mike Levine Lakelands Trail State Park. In total, the county has 24,313 acres of parks, or 134 acres per 1,000 residents – more than any other county in the region.

With a population of 186,946, the county has four percent of the region's total population. There are 85,073 jobs in the county with 56 percent of residents commuting outside the county for employment. The average commute time is 30 minutes, which is the longest in the region. The county's advantageous location between three major job markets – Ann Arbor, Detroit, and Lansing – has made it an ideal location for commuters.

Between 2010 and 2019, Livingston County's population increased by six percent. SEMCOG forecasts that the county's population will increase by another 29 percent by 2045. This is the largest forecasted increase of the region's seven counties. Approximately 45 percent of the Livingston County's land is agricultural, open space, or recreational. An additional 34 percent is single-family residential.

### Local Highlight: Trail Network Plan

In 2019, Livingston County kicked-off development of a countywide trail network plan that will:

- Identify and map existing trials in Livingston County;
- Analyze conditions of existing trails and capacity of multimodal, nonmotorized use;
- Identify gaps in the trail network; and
- Create a prioritized strategy for future trail linkages, including cost estimates.

A major component to this plan is identifying secondary local trail links to the major regional and state trails in the county – most notably the Mike Levine Lakelands Trail State Park, which is Route #1 of Michigan's Great Lake to Lake Trail.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in Livingston County. See highlights in Table 1.

Table 1
### Local Plans that Influence Bicycling and Walking in Livingston County

| Plan Title | Highlights |
|---|---|
| **Livingston County Master Plan (2018)** | Highlights the benefits of having complete street components in local community master plans, and how the county intends to provide assistance to communities in pursuing these components. The Master Plan also points out the linkage between Complete Streets and parks and recreation planning, since they both focus on the importance of connectivity. |
| **Green Oak Charter Township Master Plan (2014)** | Includes the township's nonmotorized pathways and complete streets policies, such as:<br>• Maintaining and expanding the existing trails and pathway system.<br>• Connecting residential areas to recreation, schools, community facilities, and shopping areas.<br>• Creating zoning ordinances that require new developments to provide nonmotorized connections between the development and other uses. |
| **Howell Township Master Plan (2016)** | The nonmotorized section identifies potential corridors for nonmotorized connections. These corridors are intended to connect concentrations of existing and planned residential and commercial developments. The plan recommends that township roadways be designed considering Complete Streets design standards. |
| **Village of Pinckney Master Plan (2015)** | Includes community transportation and circulation goals and objectives that support:<br>• Development of a safe nonmotorized network, connecting residential, shopping, and offices, to parks, schools, and activity centers.<br>• Coordination efforts between different entities in development of a circulation plan for the Central Business District. |
| **Genoa Charter Township Master Plan (2013)** | Identifies locations for pathways within the township and provides design and recommended pathway types. It also has a detailed map for existing and future pathways. |
| **Huron-Clinton Metroparks Master Plans** | In Livingston County, the Huron Meadows Metropark Master plan (2018) includes accessibility analysis of the park trails which allows for prioritization of accessibility improvements. |

## Walking and Bicycling in Livingston County
### Existing Facilities

The Mike Levine Lakelands Trail State Park runs through the southern portion of Livingston County, from Unadilla Township to Green Oak Township, providing links for residents to walk, bike, and horseback ride along a scenic and natural trail. Ongoing pedestrian and bicycle pathways are being connected in the county, especially in Green Oak and Genoa Townships. Both of these townships have recently completed multiple shared-use paths connecting to parks and other core services. The cities of Howell and Brighton, and villages of Pinckney and Fowlerville each have foundational and growing pedestrian networks. The county has 347 miles of sidewalks and 133 miles of bikeways.

Figure 1
**Livingston County Sidewalk Mileage**
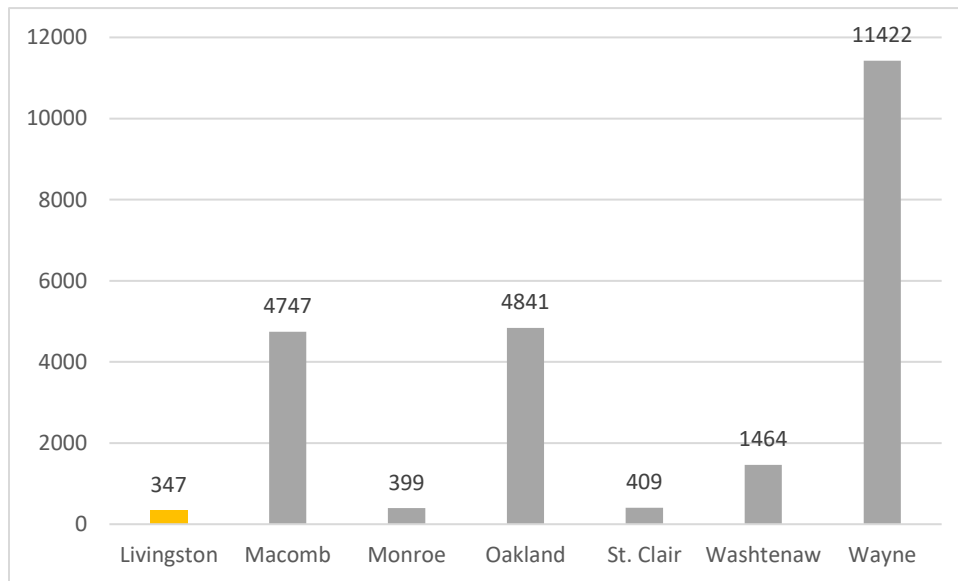


Figure 2
**Livingston County Bicycle Network by Type (Miles)**
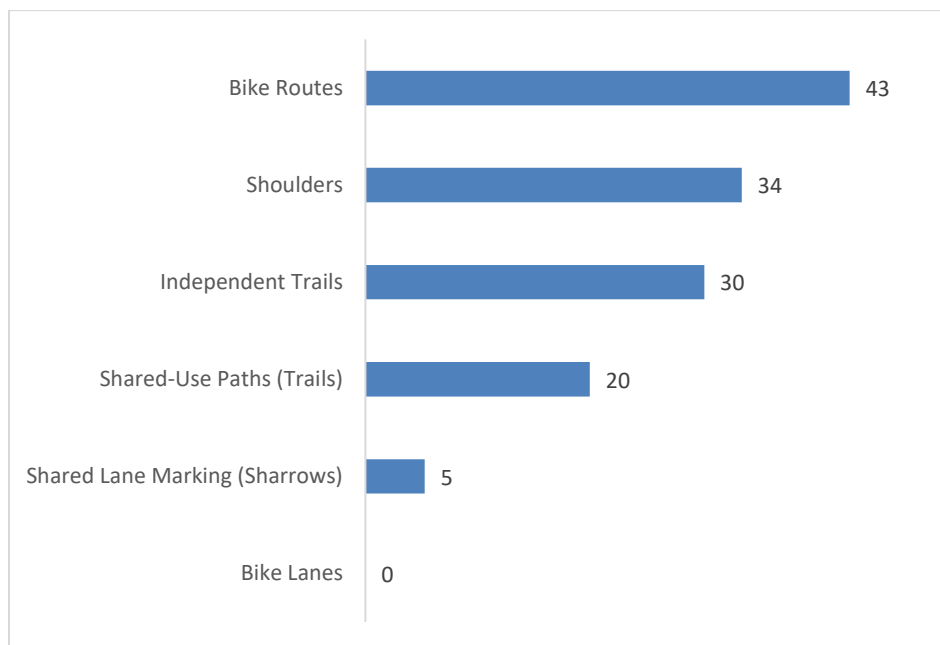
Figure 3
**Livingston County Bicycle Network Mileage**
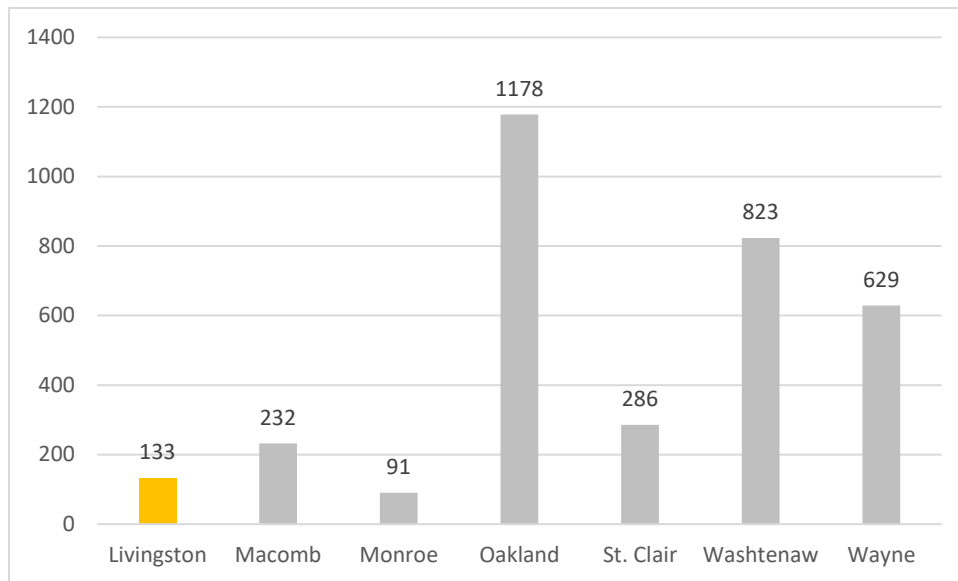


## Activity Level

Walking and bicycling currently accounts for 3.5 percent of trips in Livingston County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 30 minutes, and has reduced by 1.5 minutes between 2010 and 2015. Additionally, more than half of workers who live in Livingston County are employed in another county (56 percent), limiting the potential for walking and bicycling as a commute option.

Figure 4
**Livingston County Trips by Mode**
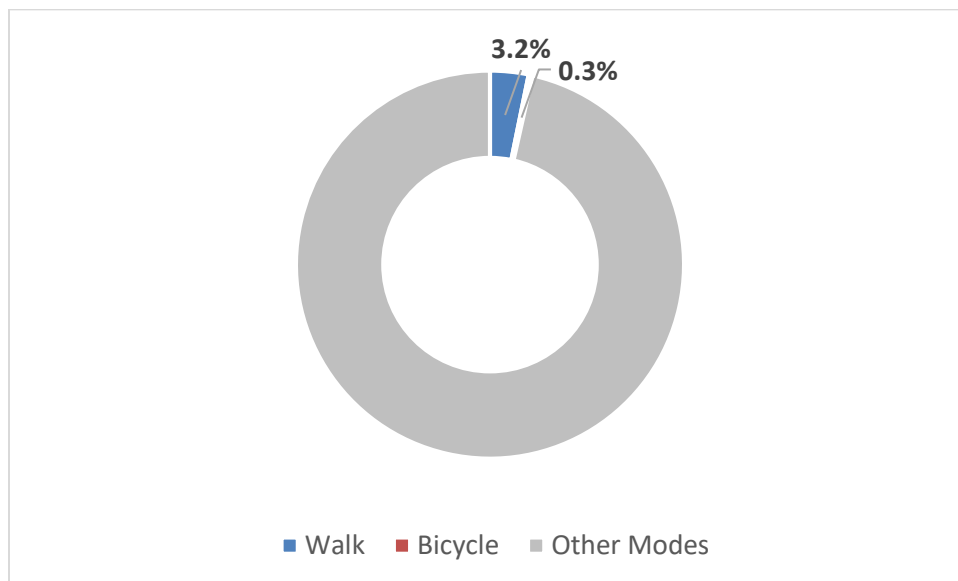
**Crash Data**

There were 129 pedestrian and bicycle crashes in Livingston County from 2014-2018; this includes 10 people killed in crashes involving a pedestrian, and two people killed in crashes involving a bicyclist. There were also 18 bicycle and/or pedestrian crashes that resulted in serious injuries in the county.

Even though pedestrian and bicycle crashes account for only 0.5 percent of total crashes in Livingston County, they account for 13 percent of fatalities and five percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the vast majority of bicycle and pedestrian crashes in Livingston County, take place on County and State roads (83%).

Figure 5
**Livingston County Fatalities by Mode, 2014-2018**



11.2%

2.2%

86.5%

■ Pedestrian   ■ Bicyclist   ■ Vehicle Occupants
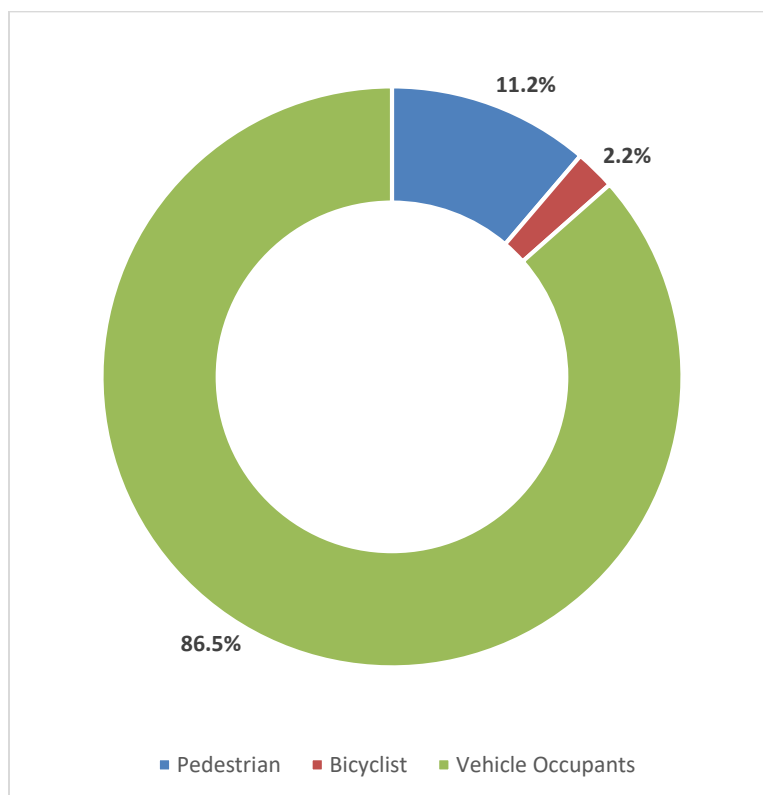
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**Livingston County Serious Injuries by Mode, 2014-2018**
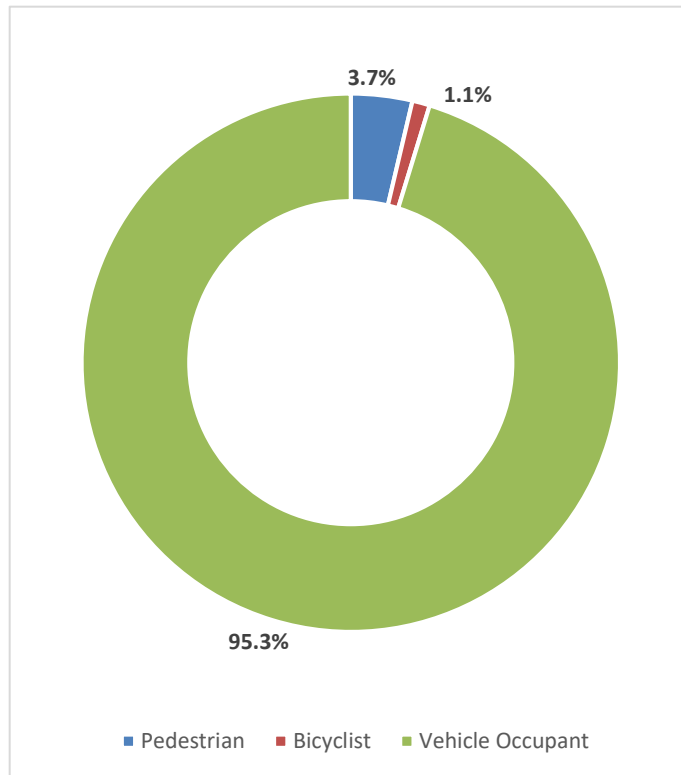


Figure 7
**Livingston County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**
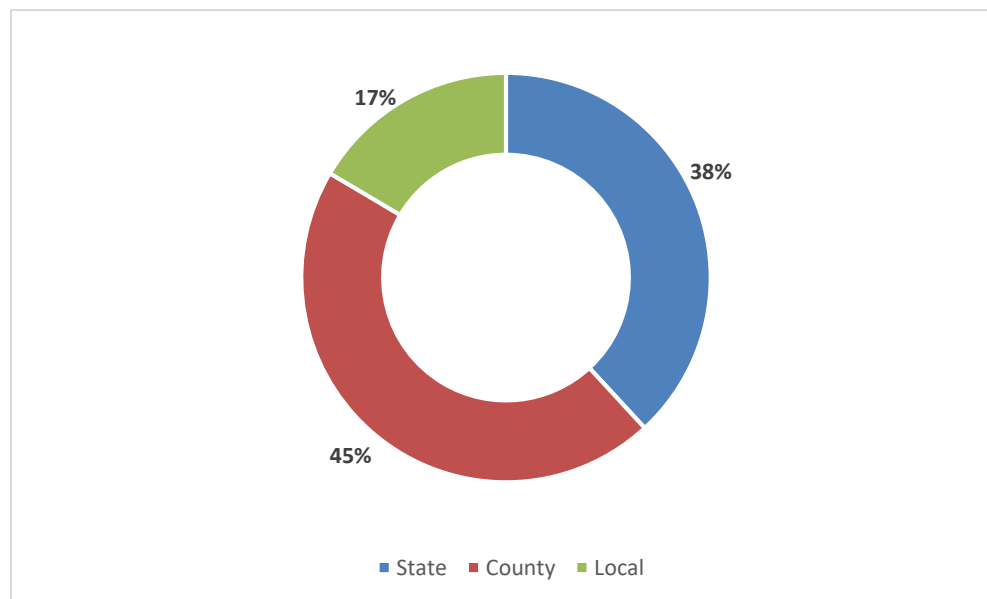
Figure 8
**Livingston County Bicycle Network**



**Legend:**
- Shared-Use Path
- Bike Lane
- Other Bikeway
  *(Including shared-lane markings, wide-paved shoulders, and bike routes)*
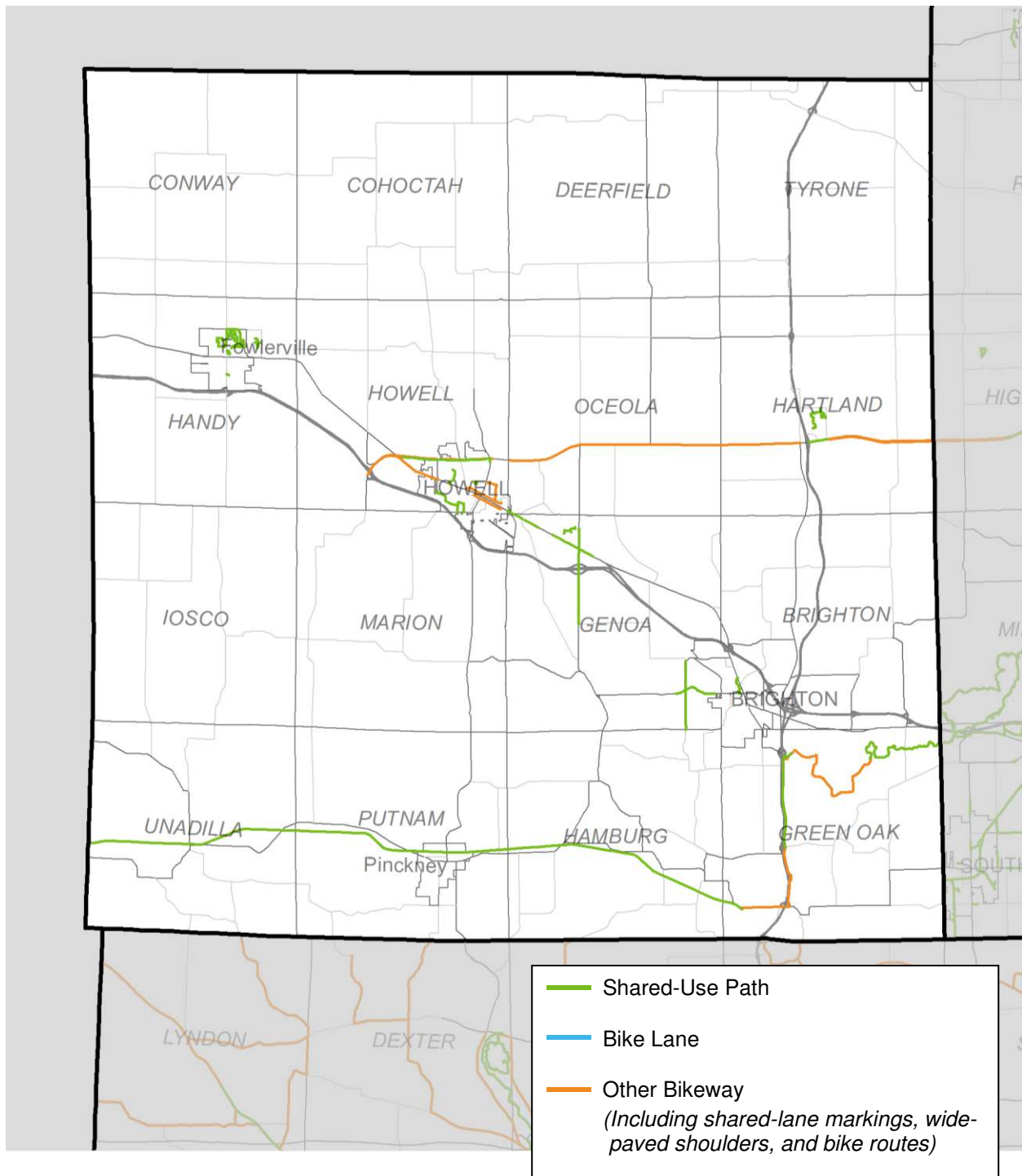
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**Livingston County Pedestrian Infrastructure**
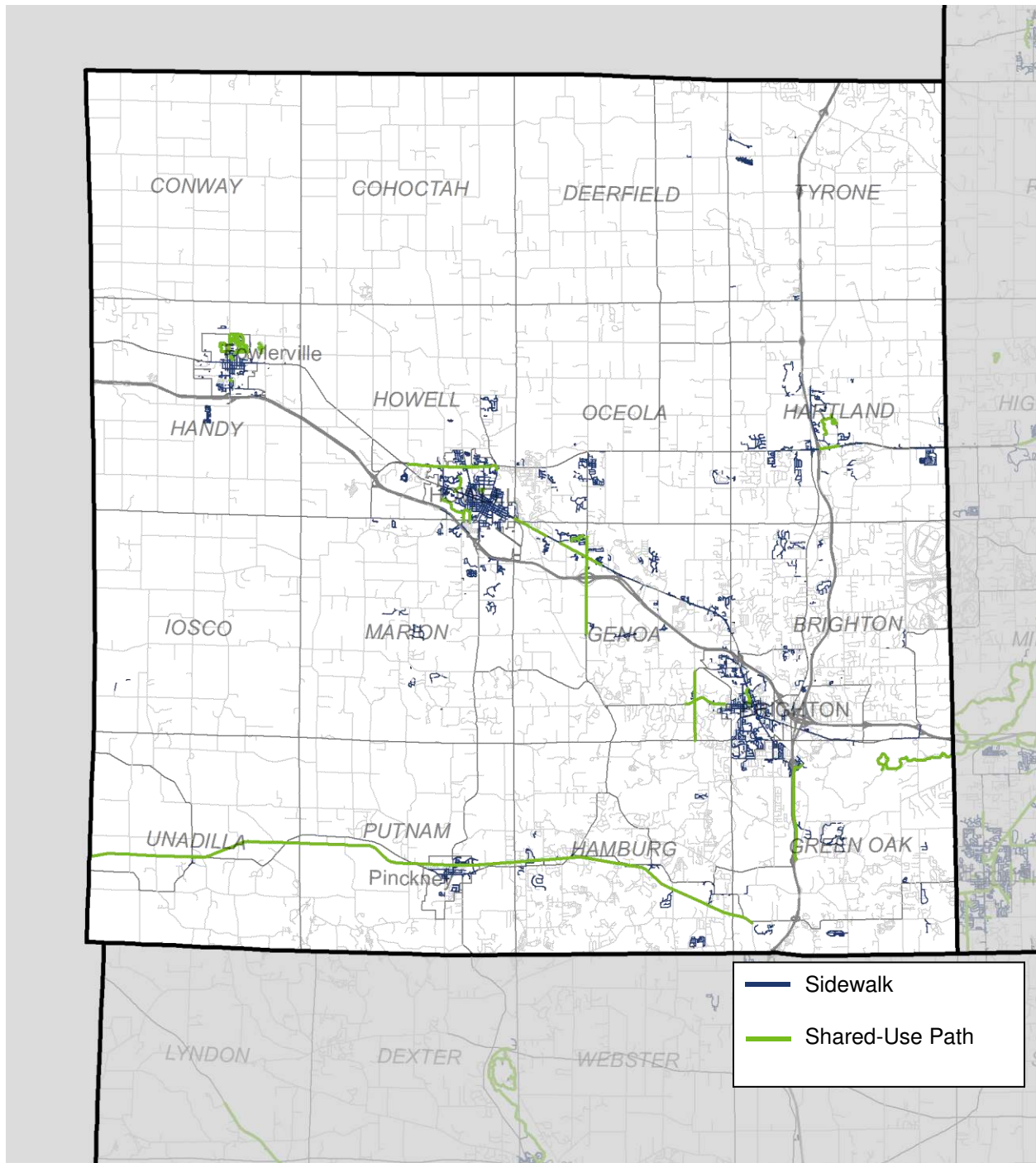
Figure 10
**Livingston County Bicycle and Pedestrian Demand Areas**



Legend:
- High Demand Area
- Moderate Demand Area
- Potential Demand Area
- Park
- Lake
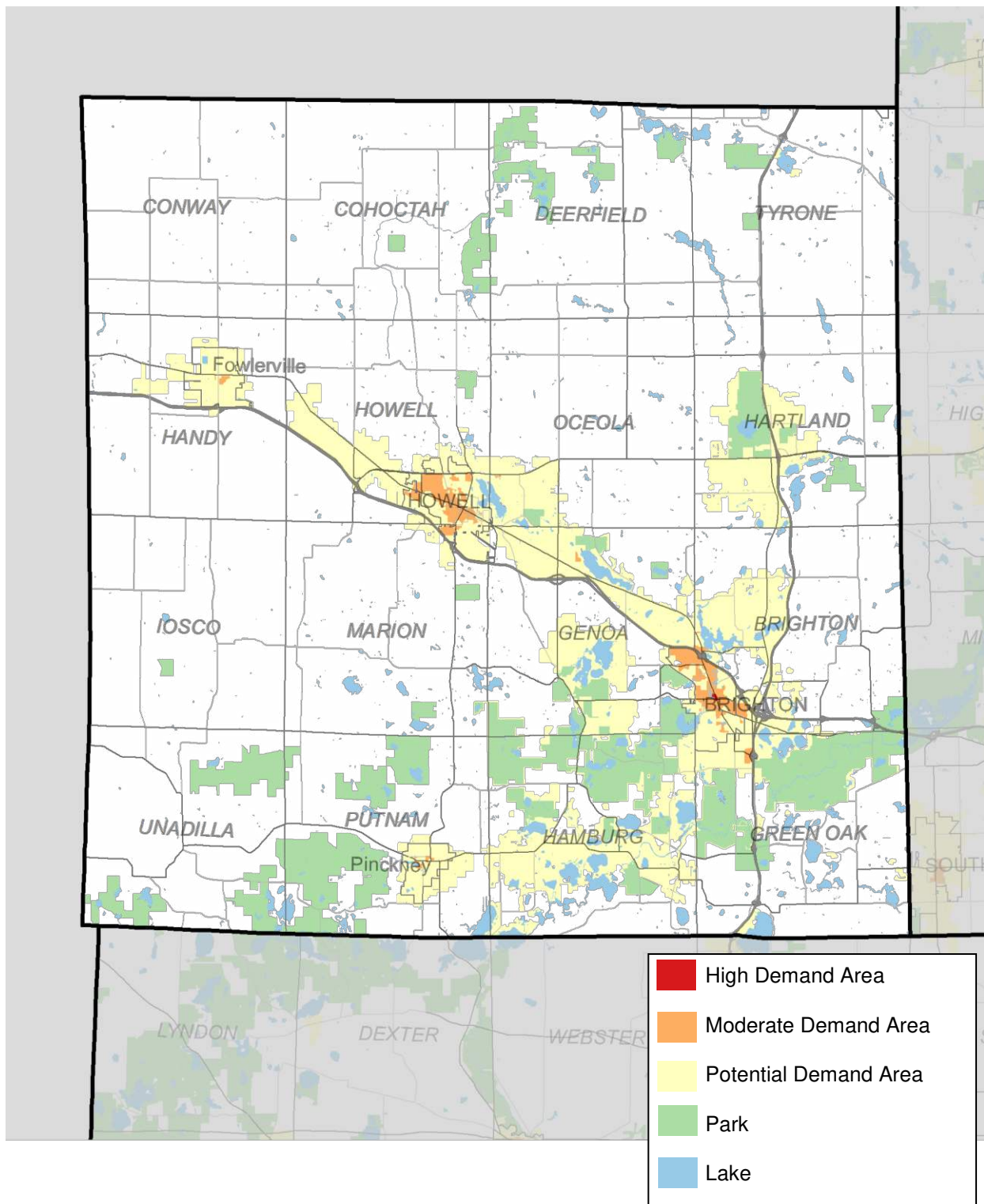
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**Livingston County Gaps in Pedestrian Infrastructure Access by Demand Area**
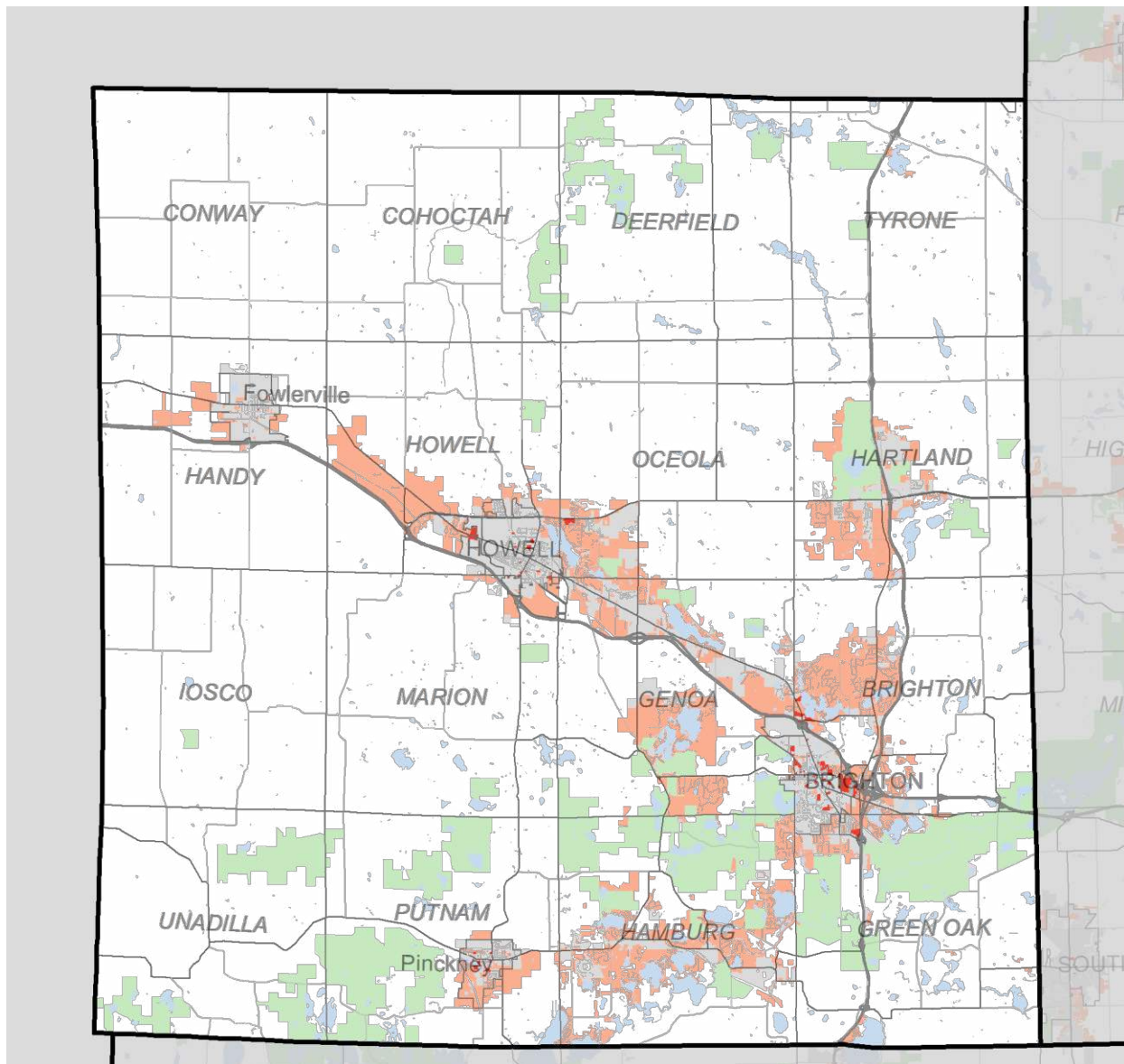


| | |
|---|---|
| 🟥 | Moderate Demand Areas without access to pedestrian infrastructure |
| 🟧 | Potential Demand Areas without access to pedestrian infrastructure |
| 🟩 | Park |
| 🟦 | Lake |

Figure 12
**Livingston County Gaps in Bicycle Infrastructure Access by Demand Area**



Moderate Demand Areas without bicycle infrastructure within one-half mile

Potential Demand Areas without bicycle infrastructure within one-half mile

Park

Lake
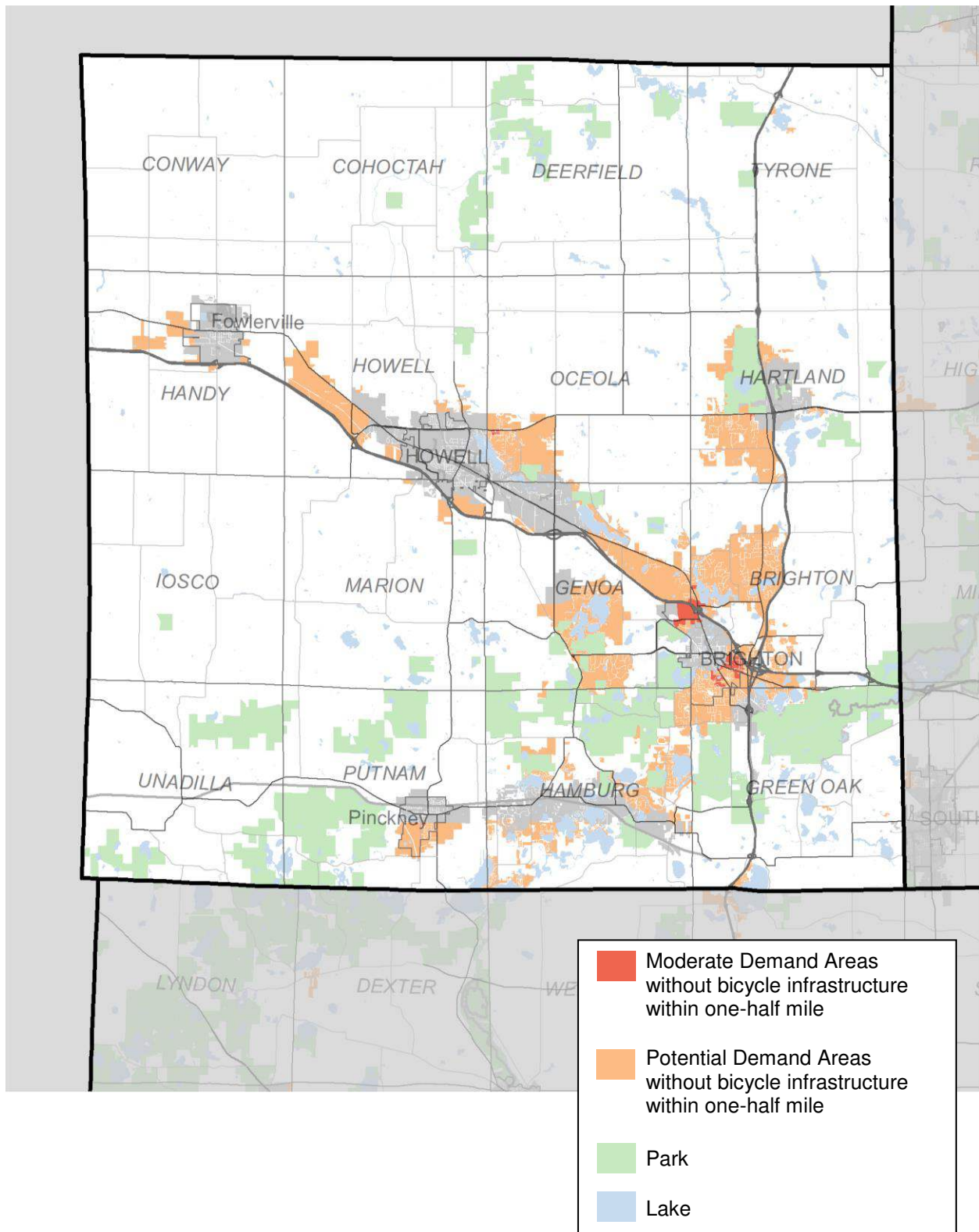
Figure 13
**Livingston County Bicycle and Pedestrian Crashes, 2014-2018**



Legend:
- Crash resulting in fatality
- Crash resulting in serious injury
- Crash resulting in minor injury
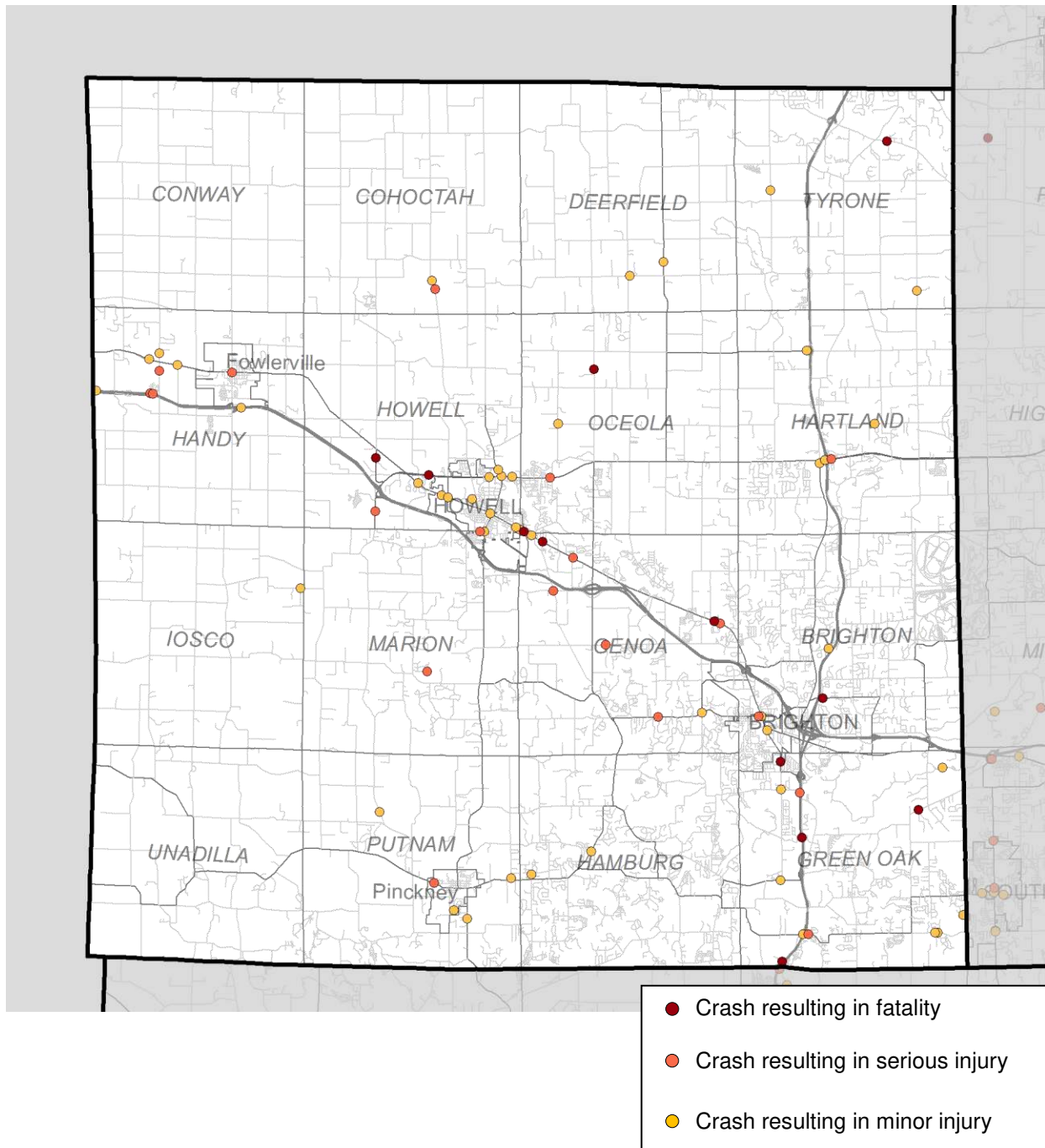
# Macomb County

## Planning Context

Macomb County consists of 13 cities, 11 townships, and three villages. The county is home to three Huron-Clinton Metroparks, one state recreation area, one county park, and several regional trails, including the Macomb Orchard Trail, Freedom Trail, and completed portions of the Iron Belle Trail in Sterling Heights, Utica, and Shelby Township. In total, the county has 19,070 acres of parks, or 23 acres per 1,000 residents.

With a population of 864,019, the county has 18 percent of the region's total population. There are 421,450 jobs in the county with 57 percent of residents commuting within the county for their place of employment. While the majority of workers work within the county, 40 percent work in either Oakland or Wayne Counties. The average commute time is 27 minutes. The county is served by multiple freeways and major corridors including I-94, I-696, M-53, M-59, and M-3, and is home to multiple job centers in Clinton Township, Mount Clemens, Sterling Heights, and Warren.

Between 2010 and 2019, Macomb County's population increased by four percent. SEMCOG forecasts that population will continue to increase by another seven percent by 2045. Approximately 32 percent of the county's land is agricultural, open space, or recreational. An additional 31 percent is single-family residential.

### Local Highlight: Connecting the Iron Belle Trail

Macomb County, in partnership with the cities of Center Line, Sterling Heights, and Warren, developed a comprehensive routing and feasibility study to address a critical gap in the Iron Belle Trail. Beginning at the southern border of Warren at 8 Mile Road, and stretching north to Dodge Park in Sterling Heights, the study comprises seven segment analyses, each with cost estimates, alternatives, and most suitable grant opportunities. To determine these priorities, the county held multiple public engagement sessions, including an interactive website with the complete plan and maps. The study was completed in 2019, and the county expects to begin funding identification and implementation in 2020.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in Macomb County. See highlights in Table 2.

Table 2
### Local Plans that Influence Bicycling and Walking in Macomb County

| Plan Title | Highlights |
|---|---|
| **Mobilize Macomb Non-motorized Plan (2017)** | Developed seven types of network gaps and priority links; identifies a set of regional goals and action items to promote and achieve implementation. |
| **Complete Streets Design Plan: Charter Township of Harrison Downtown Development Authority (2017)** | Highlights the various benefits of Complete Streets in different areas including, safety, economic development, public health, environment, accessibility, access to funding, and agency coordination. It provides goals, objectives, an action plan, design recommendations, and funding sources for creating Complete Streets. |
| **Romeo-Washington-Bruce 2017-2021 Parks and Recreation Master Plan (2017)** | The Romeo-Washington-Bruce Recreation Commission was formed to promote, plan, coordinate, and operate a system of parks and recreation for all residents. Plan identifies bicycle and pedestrian facility developments and improvements as items in the five-year Capital Improvement Projects, and includes cooperative agreements for the maintaining recreational facilities. |
| **Shelby Township 2017 Master Plan (2017)** | The Land Use and Transportation section focuses on Complete Streets implementation; maps and strategies to make the township more walkable and bikeable. It also includes design guidelines for the township's major corridors. |
| **City of Sterling Heights Parks, Recreation and Nonmotorized Master Plan (2016)** | Includes an assessment of nonmotorized existing conditions, actions steps, and recommendations to improve and expand walking and biking facilities. Provides details of several planning initiatives, including the city's sidewalk removal/replacement and gap programs. |
| **Huron-Clinton Metroparks Master Plans** | In Macomb County, the Wolcott Mill Metropark Master Plan (2016) includes an accessibility analysis of the park's nature trails and recommends actions to enhance the access for trail users. |

## Walking and Bicycling in Macomb County
### Existing Facilities

The southern communities of Macomb County (south of M-59) have a foundational network of pedestrian facilities, and a growing network of bicycle facilities. The communities adjacent to and north of M-59 are adding more and more facilities for both biking and walking. Shelby, Macomb, and Chesterfield Townships continue to add sidewalks and make connections between neighborhoods and core services. The county's northern cities and villages have established sidewalk networks, as do clusters of neighborhoods in Washington Township. The northern portions of the county are served by the Macomb Orchard Trail, stretching east to west from

Richmond to Shelby Township, and connecting to the Clinton River Trail in Oakland County. The Freedom Trail begins at Lake St Clair Metropark in Harrison Township, links to trails and pathways in Sterling Heights along the Clinton River, and heads north through Dodge Park, downtown Utica, and Riverbends Park in Shelby Township. The county has 4,747 miles of sidewalks and 232 miles of bikeways.

Figure 14
**Macomb County Sidewalk Mileage**
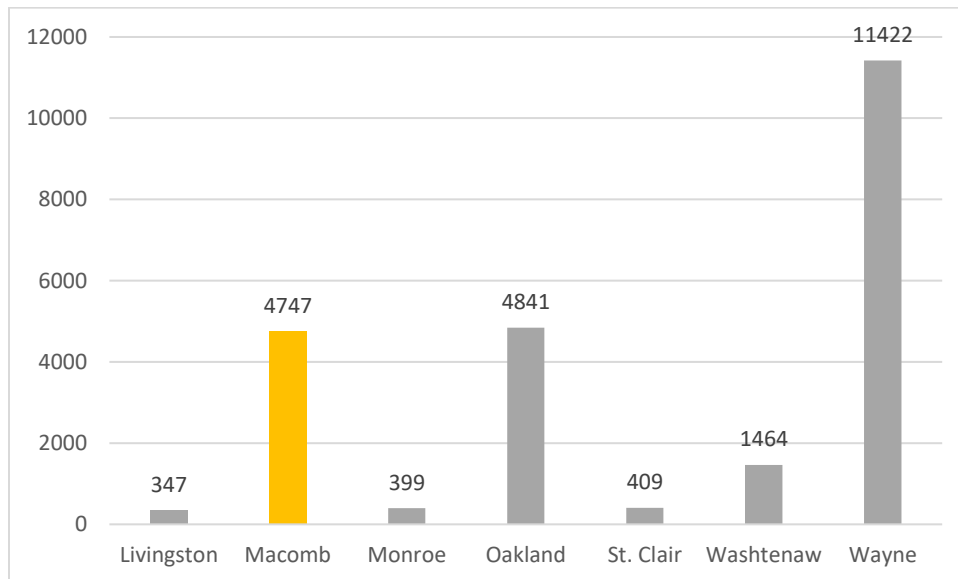


Figure 15
**Macomb County Bike Network by Type (Miles)**
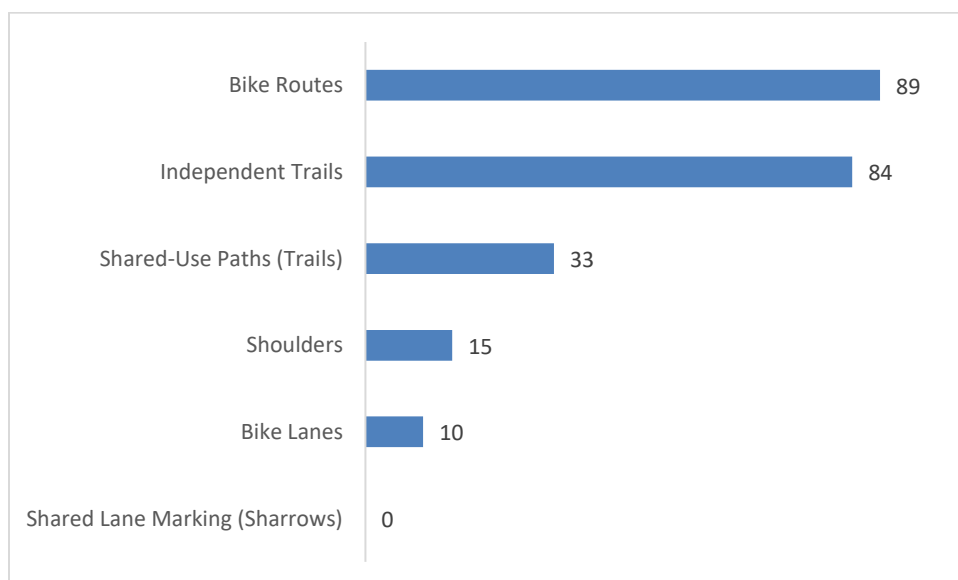
Figure 16
**Macomb County Bicycle Network Mileage**
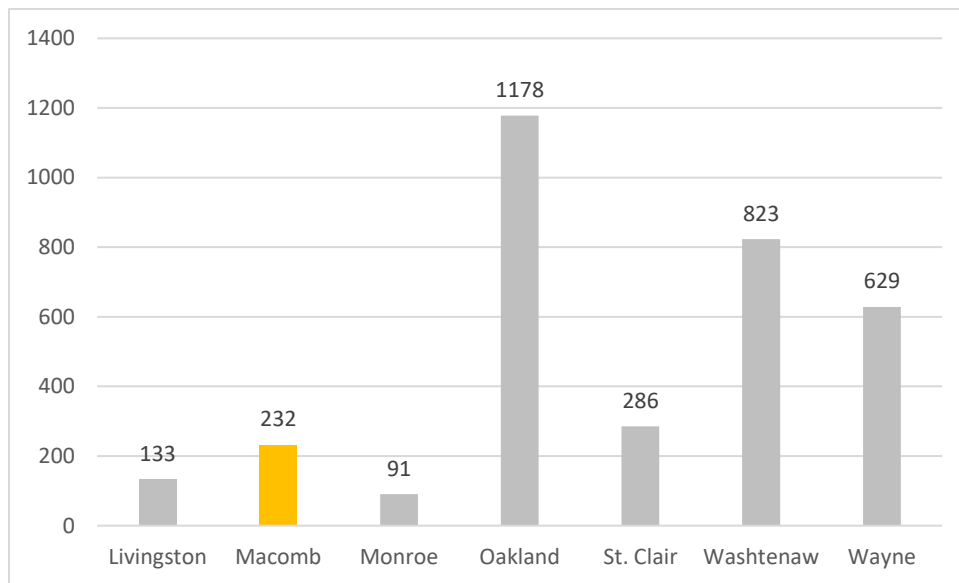


**Activity Level**

Walking and bicycling currently account for five percent of trips in Macomb County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 27 minutes, and has reduced by about 0.5 minute between 2010 and 2015. Additionally, four out of 10 workers who live in Macomb County are employed in another county (43 percent), limiting the potential for walking and bicycling as a commute option.

Figure 17
**Macomb County Trips by Mode**
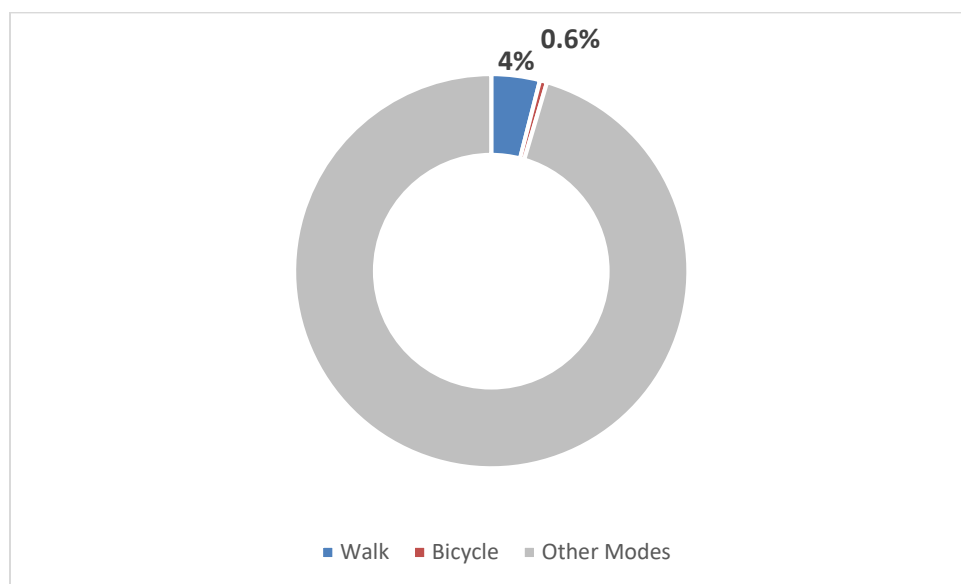
**Crash Data**

There were 1,699 pedestrian and bicycle crashes in Macomb County from 2014-2018; this includes 69 people killed in crashes involving a pedestrian, and 10 people killed in crashes involving a bicycle. There were also 183 serious injuries from bicycle and/or pedestrian crashes in the county. Macomb County had 16 percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only one percent of total crashes in Macomb County, they are responsible for 30 percent of fatalities and 11 percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the largest shared of bicycle and pedestrian crashes take place on the County roads (42%).

Figure 18
**Macomb County Fatalities by Mode, 2014-2018**
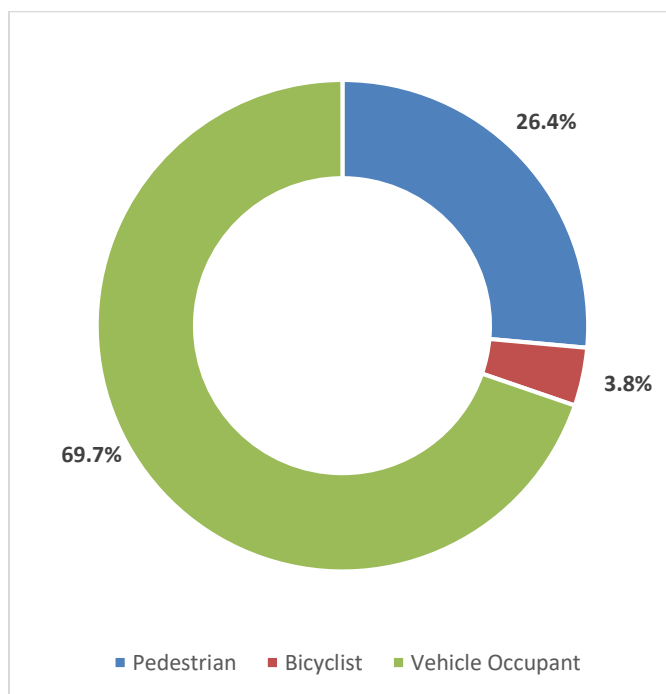
Figure 19
**Macomb County Serious Injuries by Mode, 2014-2018**



8.2%
2.6%
89.2%

■ Pedestrian  ■ Bicyclist  ■ Vehicle Occupant
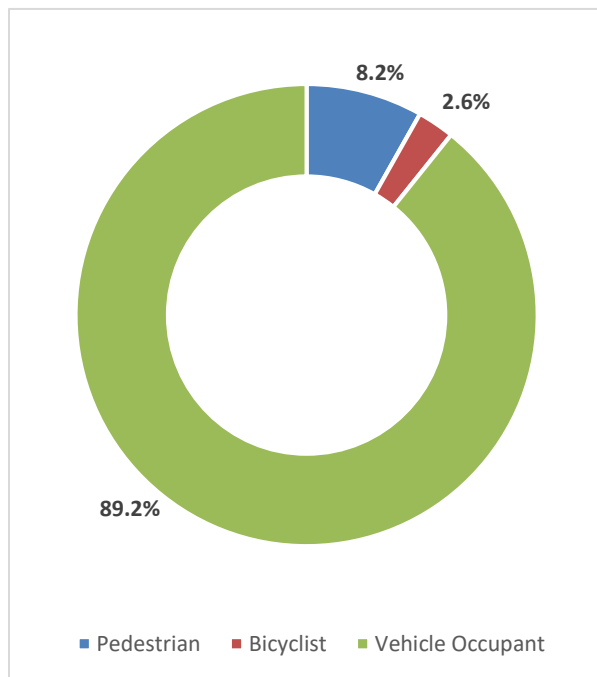
Figure 20
**Macomb County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**



26%
32%
42%

■ State  ■ County  ■ Local
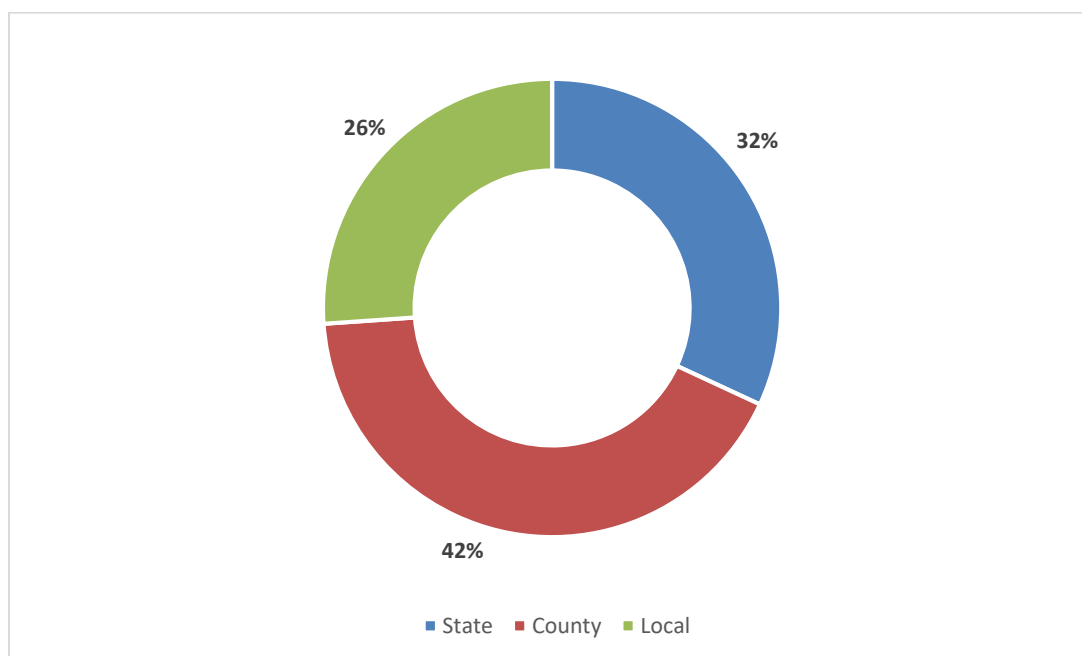
Figure 21
**Macomb County Bicycle Network**



Legend:
- Shared-Use Path
- Bike Lane
- Other Bikeway
  (Including shared-lane markings, wide-paved shoulders, and bike routes)
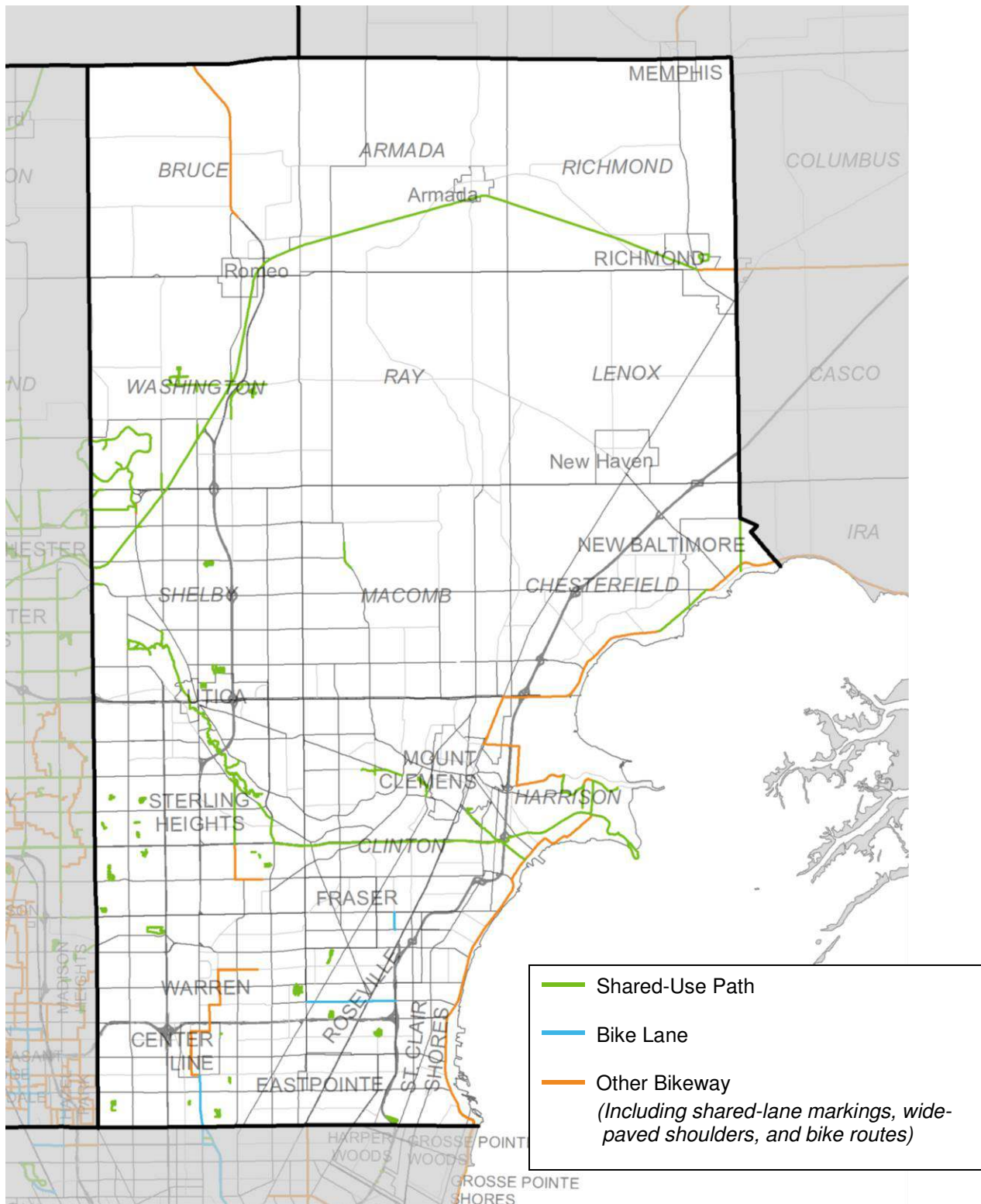
Figure 22
**Macomb County Pedestrian Infrastructure**



Legend:
- Sidewalk
- Shared-Use Path
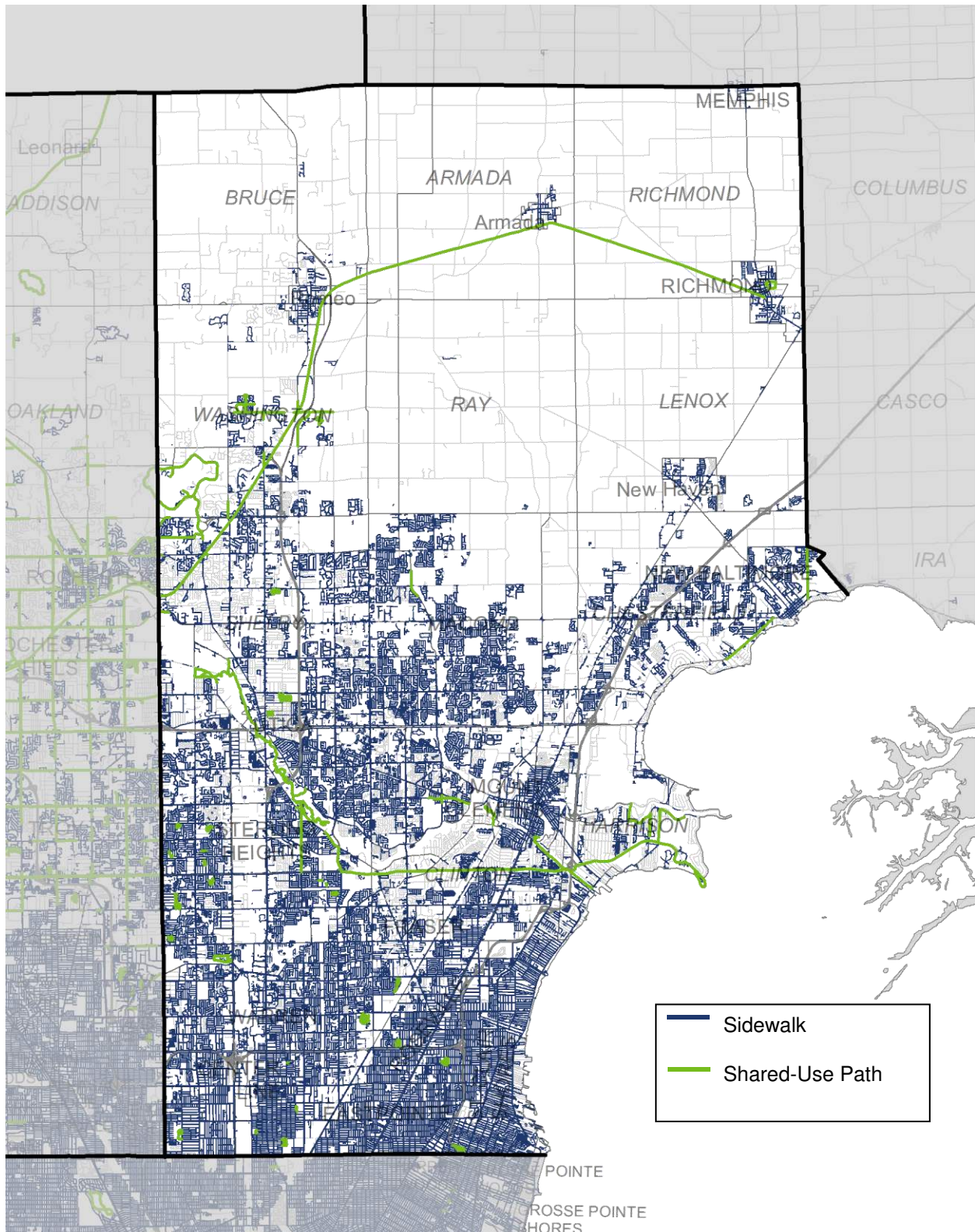
Figure 23
**Macomb County Bicycle and Pedestrian Demand Areas**



Legend:
- High Demand Area
- Moderate Demand Area
- Potential Demand Area
- Park
- Lake
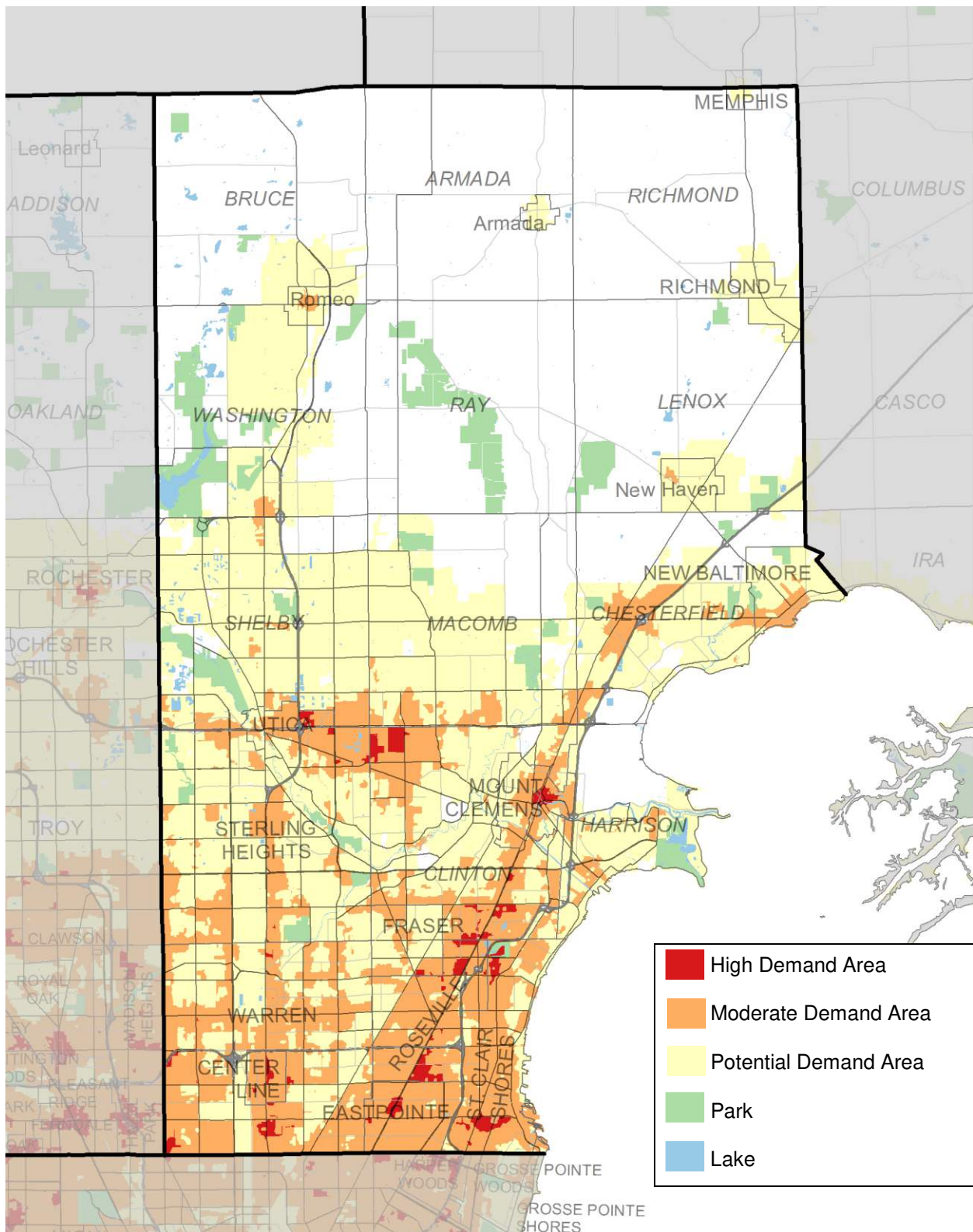
Figure 24
**Macomb County Gaps in Pedestrian Access by Demand Area**



High Demand Areas
without access to pedestrian
infrastructure

Moderate Demand Areas
without access to pedestrian
infrastructure

Potential Demand Areas
without access to pedestrian
infrastructure

Park

Lake
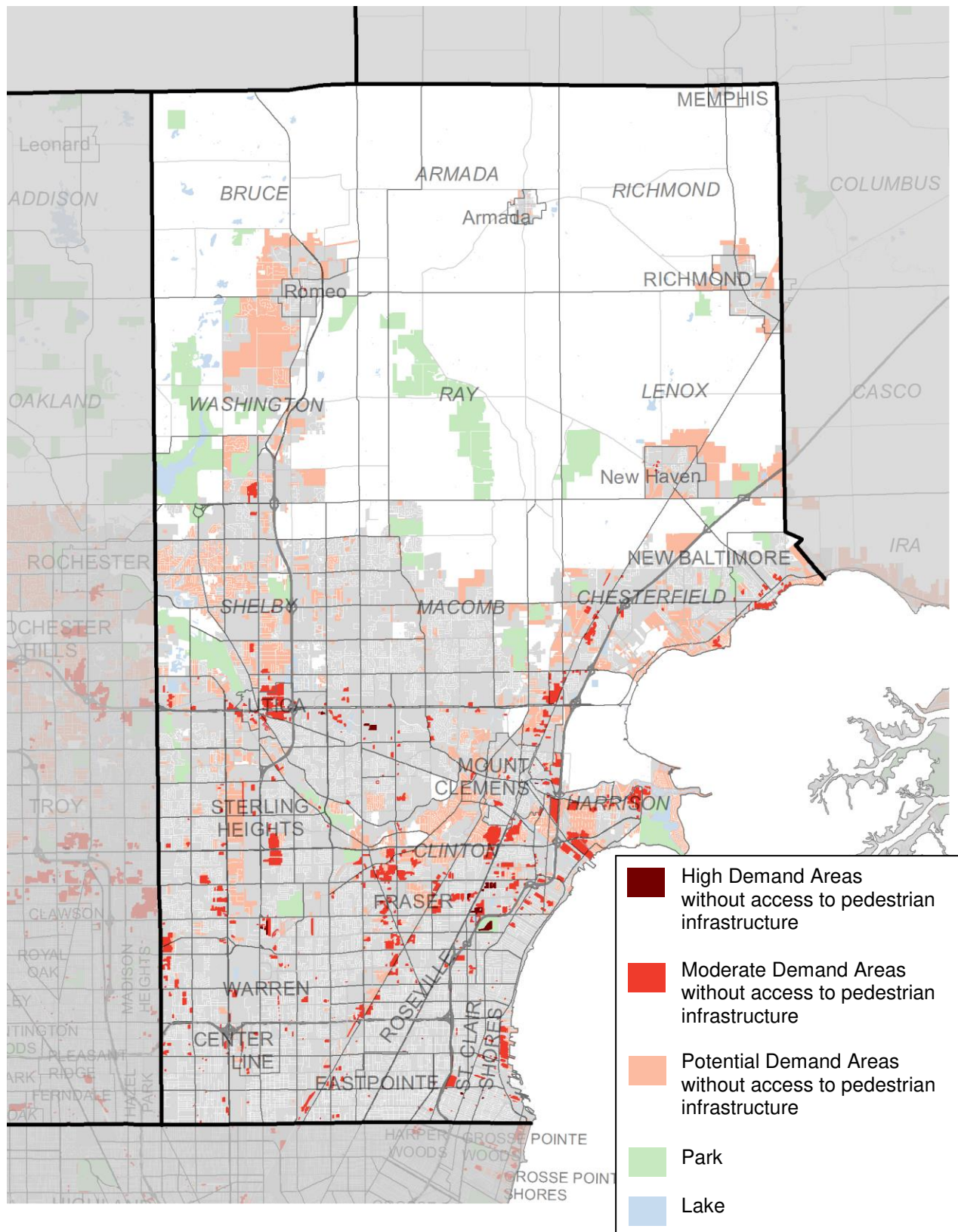
Figure 25
**Macomb County Gaps in Bicycle Infrastructure Access by Demand Area**



Legend:
- **High Demand Areas** without bicycle infrastructure within one-half mile
- **Moderate Demand Areas** without bicycle infrastructure within one-half mile
- **Potential Demand Areas** without bicycle infrastructure within one-half mile
- **Park**
- **Lake**
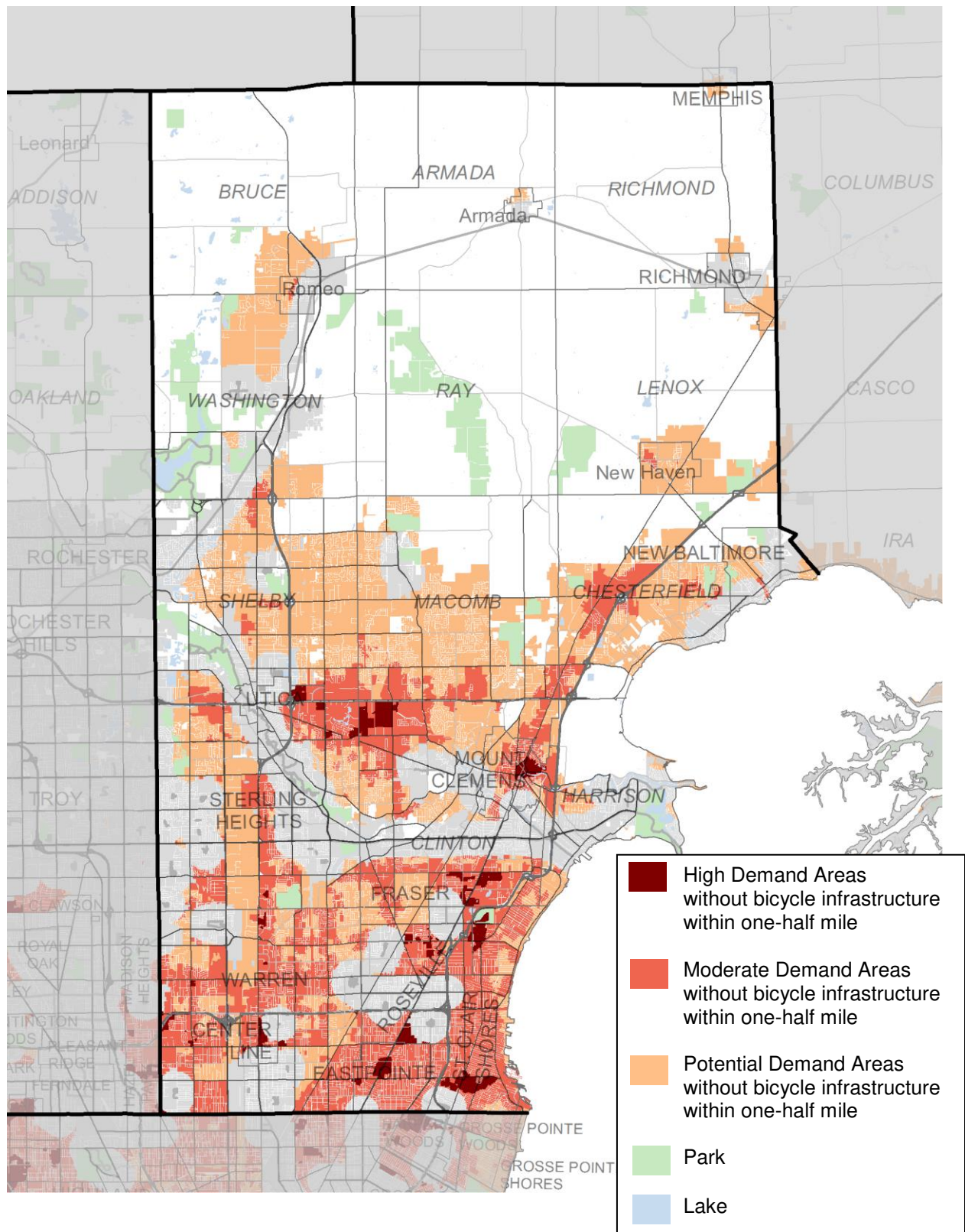
Figure 26
**Macomb County Bicycle and Pedestrian Crashes, 2014-2018**



Legend:
- Crash resulting in fatality
- Crash resulting in serious injury
- Crash resulting in minor injury
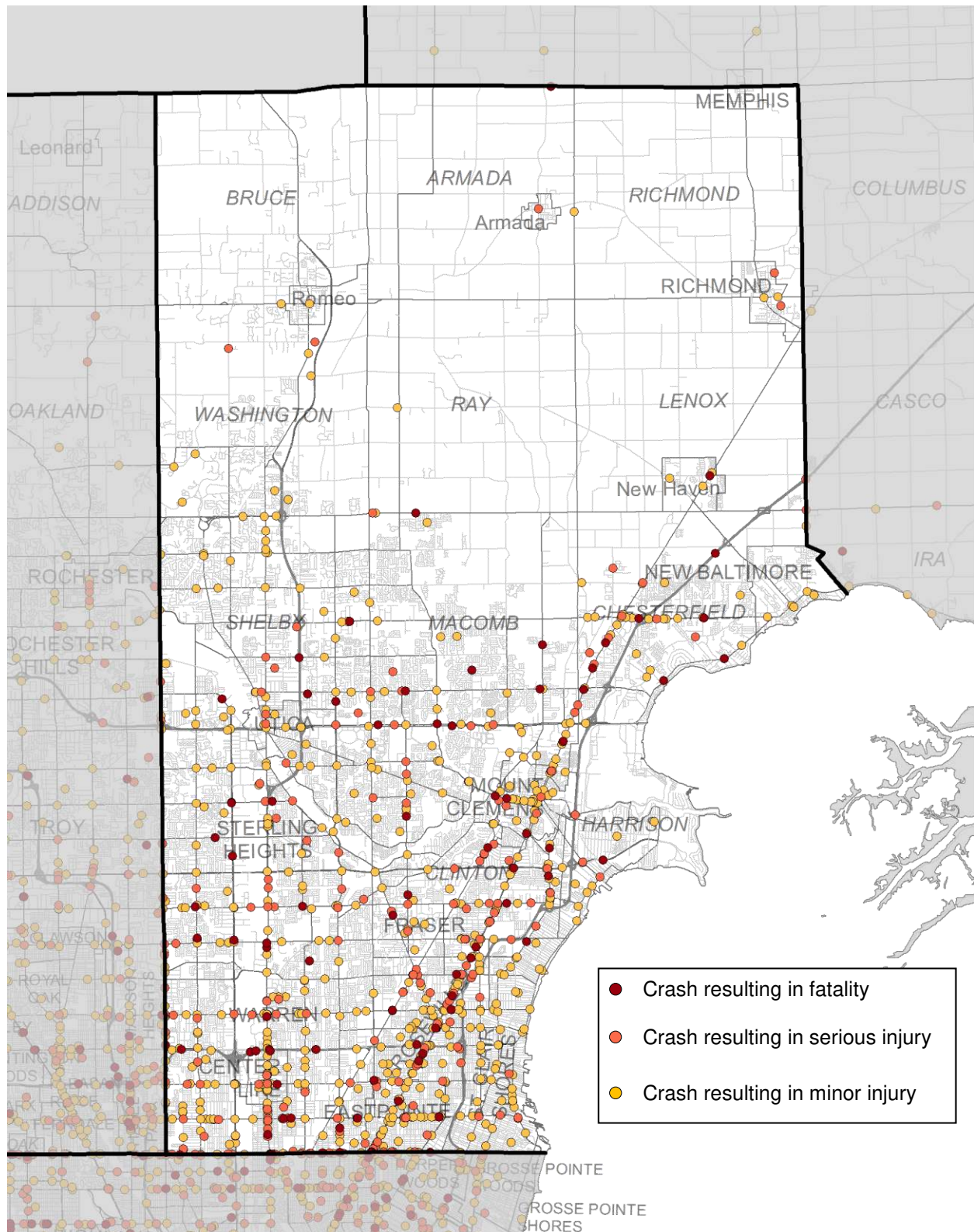
# Monroe County

## Planning Context

Monroe County consists of 15 townships, five villages, and four cities. The county is home to the region's only national park – the River Raisin National Battlefield Park – one state park, five county parks, and the River Raisin Heritage trail, which connects Sterling State Park to Munson Park in the City of Monroe. In total, the county has 10,297 acres of parks, or 68 acres per 1,000 residents.

With a population of 149,619, the county has three percent of the region's total population. There are 58,452 jobs in the county, with 51 percent of residents commuting outside of the county for employment. Outside of the county, the two largest locations where residents work is north in Wayne County and south in Lucas County, Ohio. The average commute time for the county is 24 minutes, the second shortest in the region. The county is located between the major job centers in Ann Arbor, Detroit, and Toledo, and is served by the north-south corridors of I-75 and M-23.

Between 2010 and 2019, Monroe County's population decreased by 0.5 percent. SEMCOG forecasts that the population will increase by five percent between 2019 and 2045. Approximately 66 percent of the county's land is agricultural, open space, or recreational. An additional 18 percent is single-family residential.

## Local Highlight: River Raisin Heritage Trail System

The River Raisin Heritage Trail in Monroe is a unique destination in the region, connecting visitors to the rich history of the area, highlighting the natural beauty of historic Monroe, the River Raisin, and Lake Erie. The seven miles of the Heritage Trail showcase both the history and cultural significance of the area during the War of 1812. The crown jewel of the trail is the River Raisin National Battlefield Park, which provides trail users an opportunity to step back in time and experience the marshes and wetlands that the early French settlers first explored, hunted, and called home. In 2020, Monroe County, in partnership with the City of Monroe, Frenchtown Township, and Monroe Township, will conduct a feasibility study to extend the trail and make important bicycle and pedestrian connections to local core services.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in Monroe County. See highlights in Table 3.

Table 3
## Local Plans that Influence Bicycling and Walking in Monroe County

| Plan Title | Highlights |
|---|---|
| **Erie Township Master Plan (2018)** | Includes a concept plan for nonmotorized transportation in Erie Township with the intention of linking community features, population centers, and water trails. Emphasizes the importance of working with the County Road Commission and regional planning organizations to explore funding opportunities that expand the nonmotorized network. |
| **Frenchtown Township Master Plan (2017)** | The Transportation Action section of this plan has recommendations to update the Zoning Ordinance to require developments along several corridors to include sidewalks and bike paths, where appropriate. It also identifies abandoned railroad corridors for nonmotorized trails. |
| **Resilient Monroe: Master Plan (2017)** | Recommends integrating Complete Streets philosophy into street design and construction, plus linking existing nonmotorized routes to Lake Erie Transit access points in the City of Monroe. |
| **City of Monroe Parks and Recreation Master Plan (2019)** | Recommends developing a city-wide nonmotorized plan containing a network of trails and facilities connecting city parks to community facilities. This plan also recommends supporting adoption of Complete Streets policy for the city. |
| **River Raisin Heritage Corridor-East Master Plan (2013)** | Proposes an interconnected network of nonmotorized transportation options, connecting the River Raisin National Battlefield Park with ecological and historic sites and several City waterfront parks. |
| **Monroe County Parks, Trail & Recreation Master Plan (2018)** | Recommends developing a concept for a county-wide interconnected network of water and land trails which by connecting parks, community facilities, and points of interest would promote active lifestyles, and enhance the well-being of residents. Identifies priority corridors for nonmotorized connections. |

## Walking and Bicycling in Monroe County
### Existing Facilities

The City of Monroe has the county's most extensive pedestrian and bicycle facilities with an established sidewalk network and the majority of the River Raisin Heritage Trail extending from Sterling State Park west through the city. Frenchtown, Monroe, and Bedford Townships each have growing pedestrian networks and continue to add more miles of sidewalk to connect neighborhoods to core services. The county's cities and villages each have pedestrian facilities, especially near their historic downtowns. The Village of Dundee and City of Milan each have a solid foundation of sidewalks in neighborhoods and core business areas. The county has 399 miles of sidewalks and 91 miles of bicycle infrastructure & bikeways.

Figure 27
**Monroe County Sidewalk Mileage**
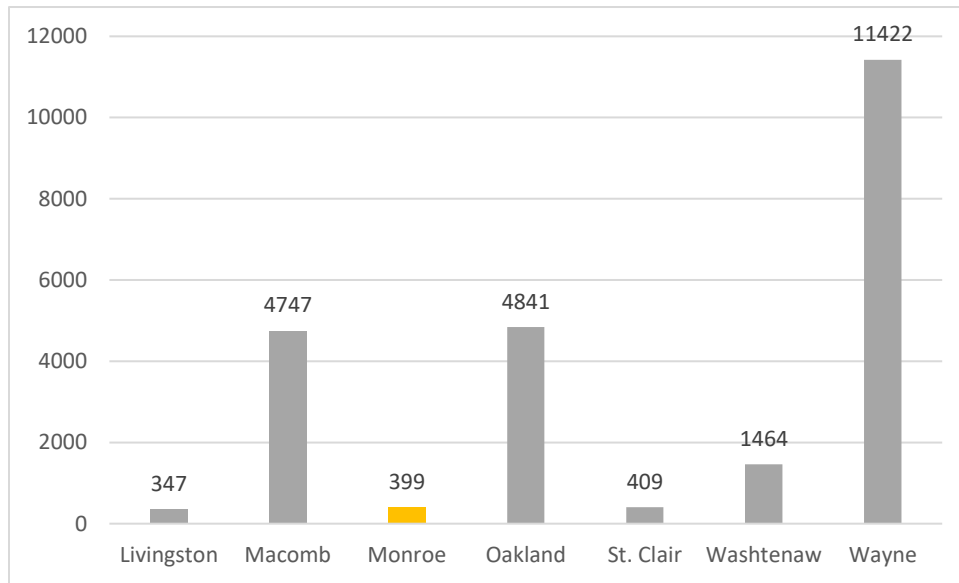


Figure 28
**Monroe County Bicycle Network by Type (Miles)**
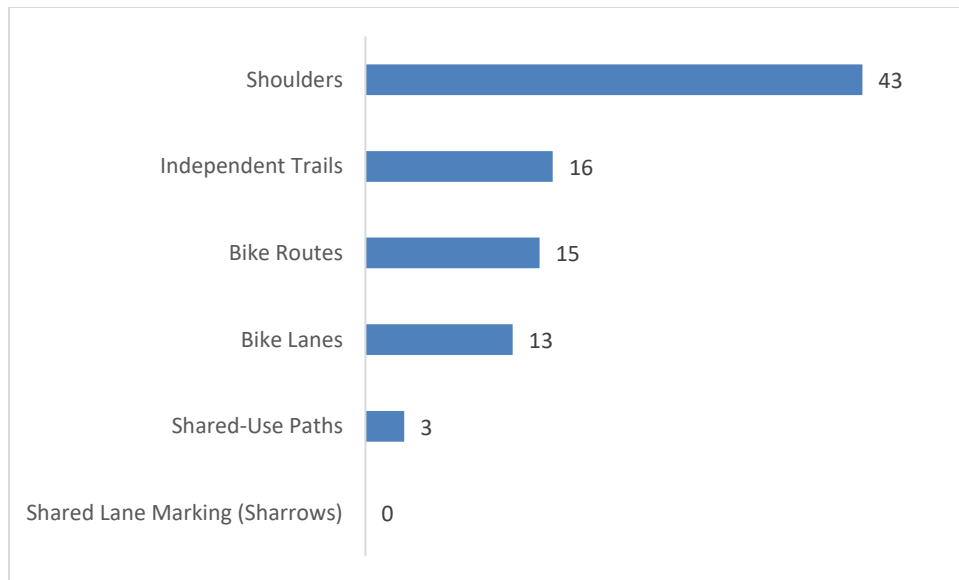
Figure 29
**Monroe County Bicycle Network Mileage**
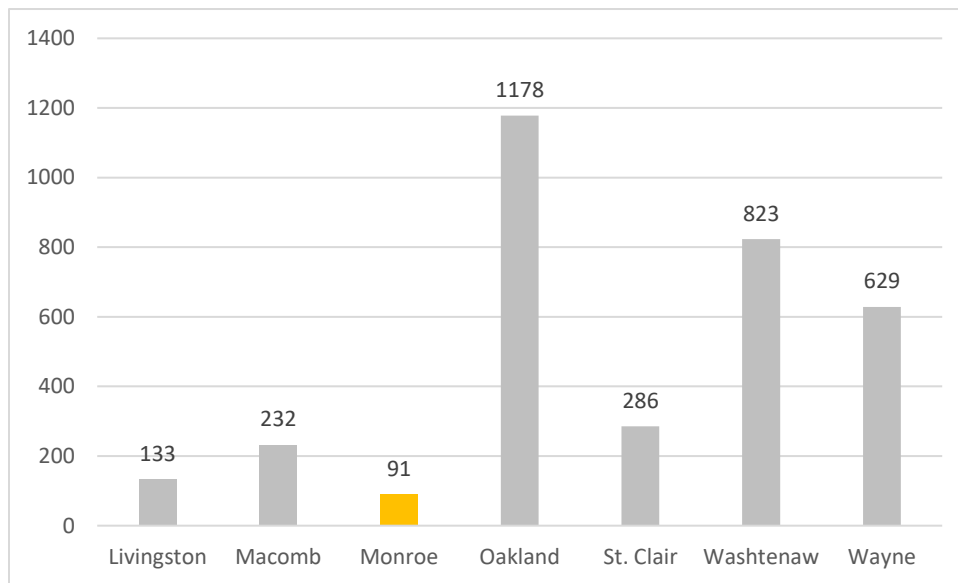


## Activity Level
Walking and bicycling currently accounts for four percent of trips in Monroe County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 24 minutes. Additionally, half of workers who live in Monroe County work in another county (51 percent), limiting the potential for walking and bicycling as a commute option for many workers.

Figure 30
**Monroe County Trips by Mode**
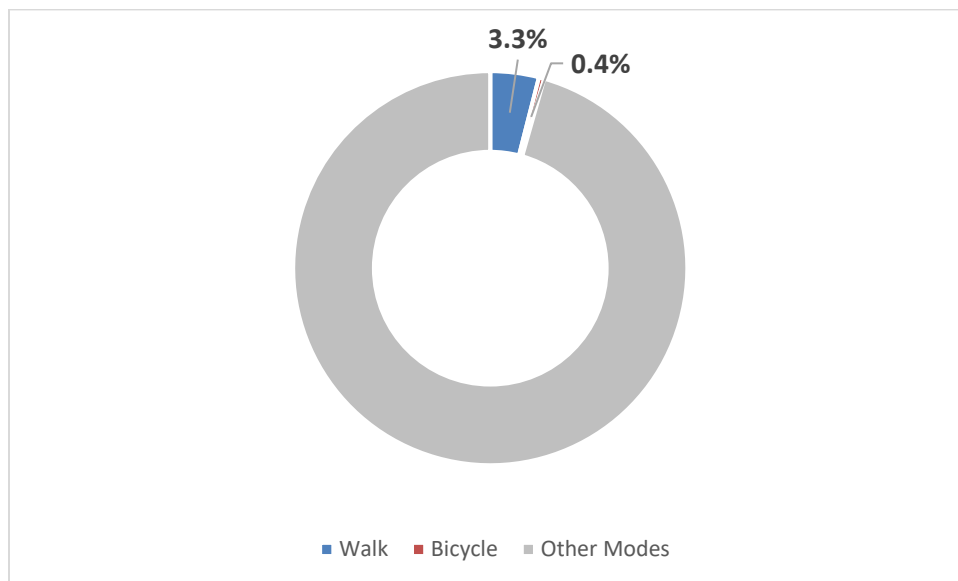
**Crash Data**

Monroe County experienced two percent of the region's pedestrian and bicycle crashes; 222 pedestrian and bicycle crashes occurred there from 2014-2018. Thirteen people were killed in crashes involving a pedestrian, and two were killed in crashes involving a bicycle. There were 31 serious injuries from bicycle and/or pedestrian crashes in the county during the same period.

Even though pedestrian and bicycle crashes account for only one percent of total crashes in Monroe County, they are responsible for 14 percent of fatalities and eight percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the vast majority of bicycle and pedestrian crashes in Monroe County, take place on the State and County roads (74%).

Figure 31
**Monroe County Fatalities by Mode, 2014-2018**
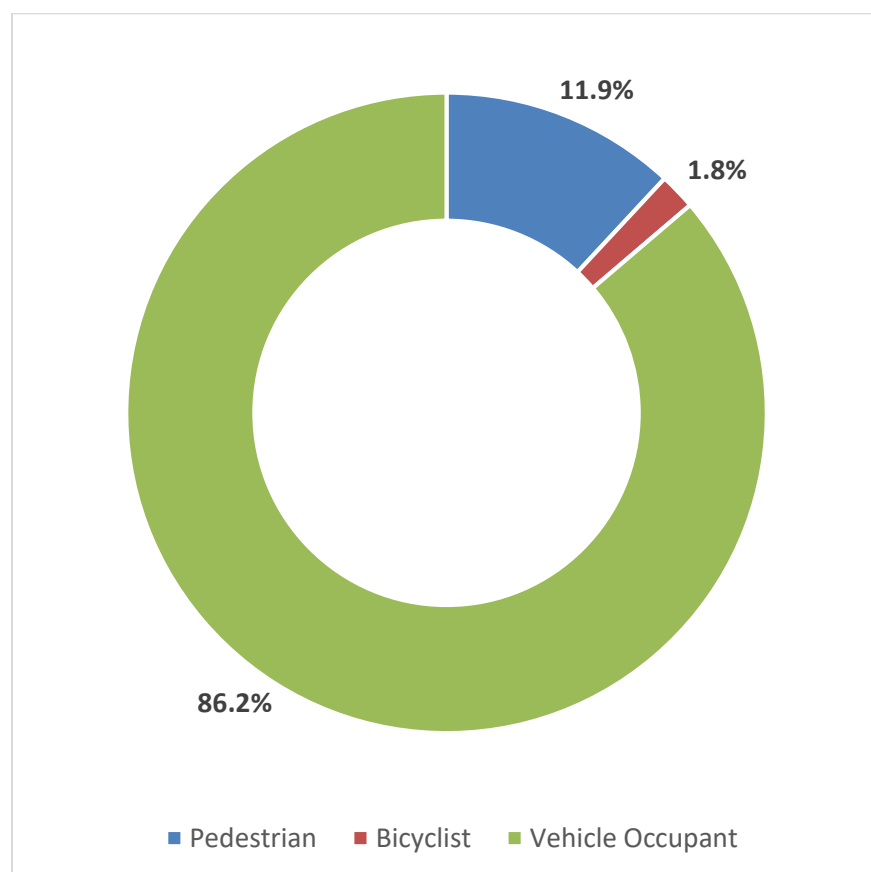
Figure 32
**Monroe County Serious Injuries by Mode, 2014-2018**



5.1%
2.8%
92.2%

■ Pedestrian  ■ Bicyclist  ■ Vehicle Occupant
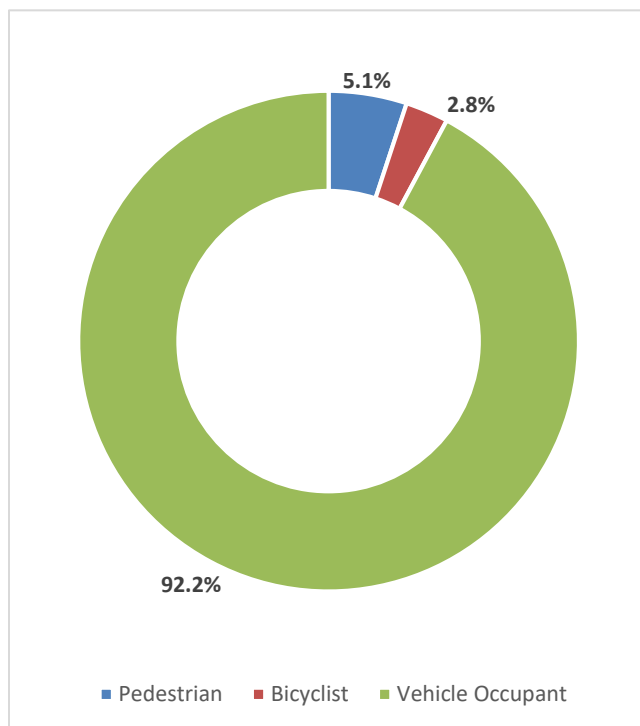
Figure 33
**Monroe County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**



26%
40%
34%

■ State  ■ County  ■ Local
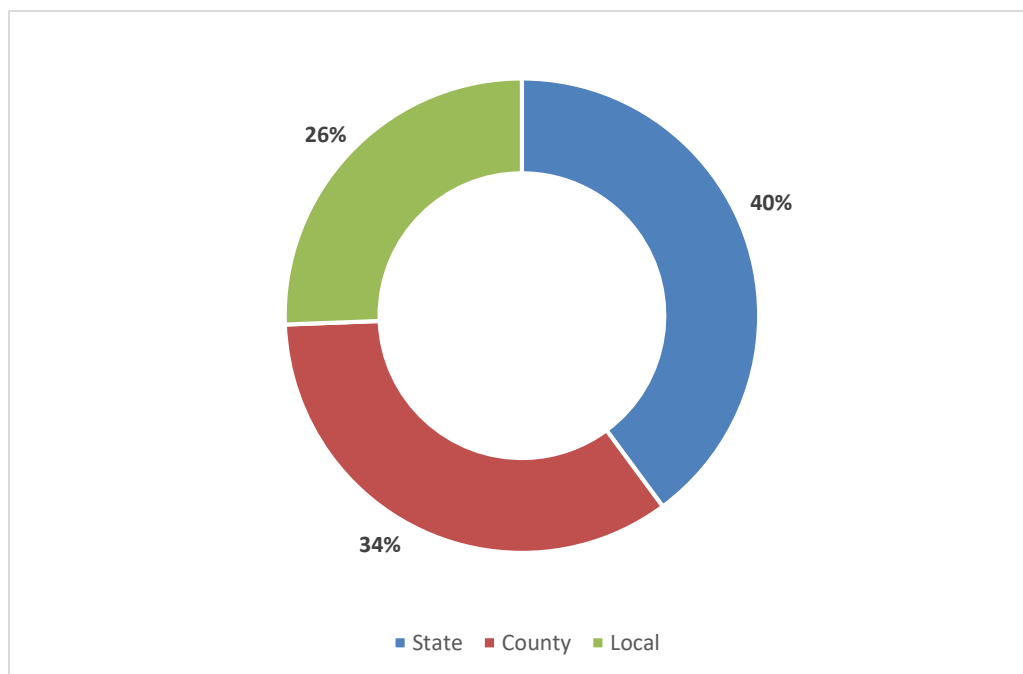
Figure 34
**Monroe County Bicycle Network**



Legend:
- Shared-Use Path
- Bike Lane
- Other Bikeway
  (Including shared-lane markings, wide-paved shoulders, and bike routes)
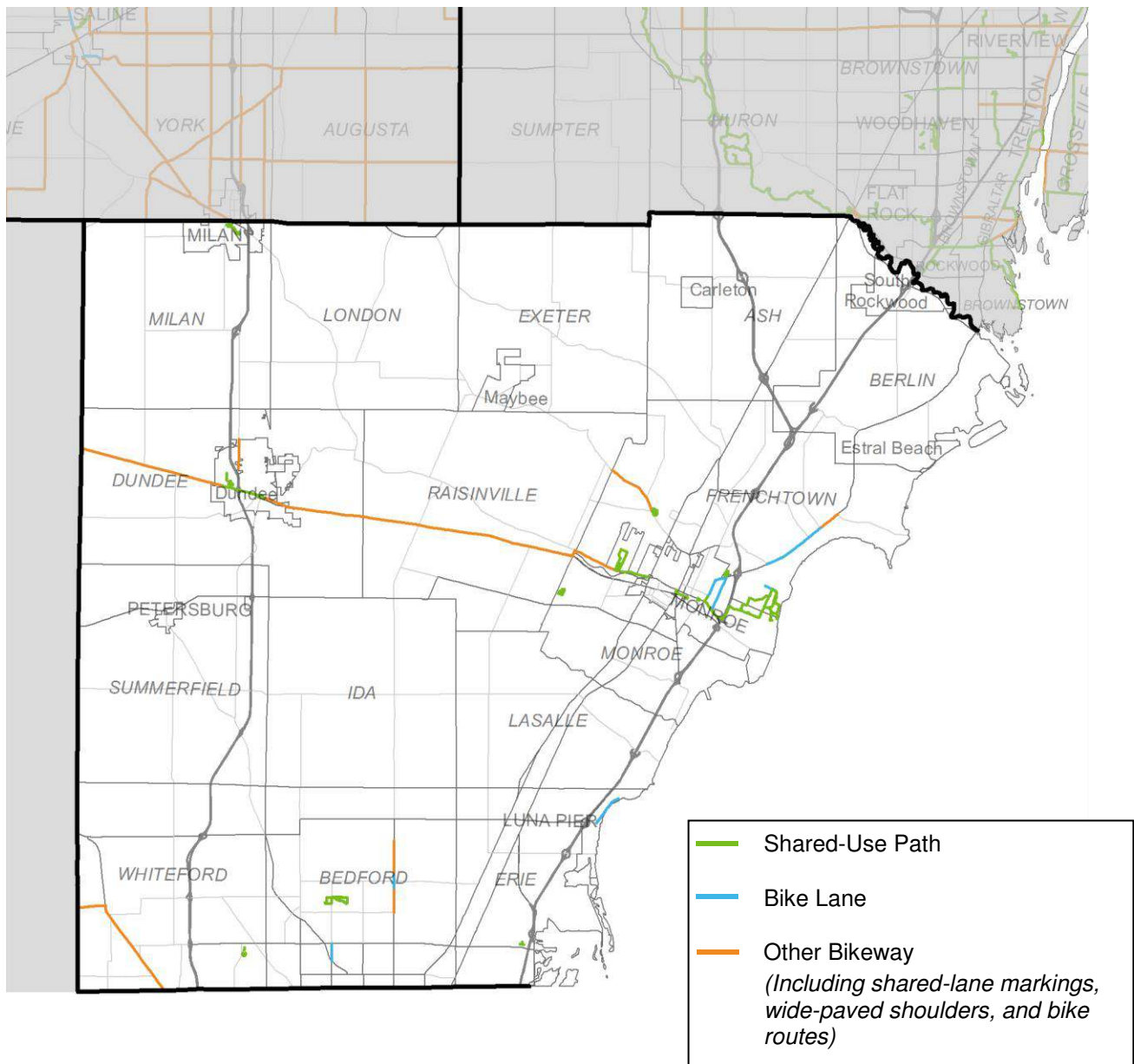
Figure 35
**Monroe County Pedestrian Infrastructure**
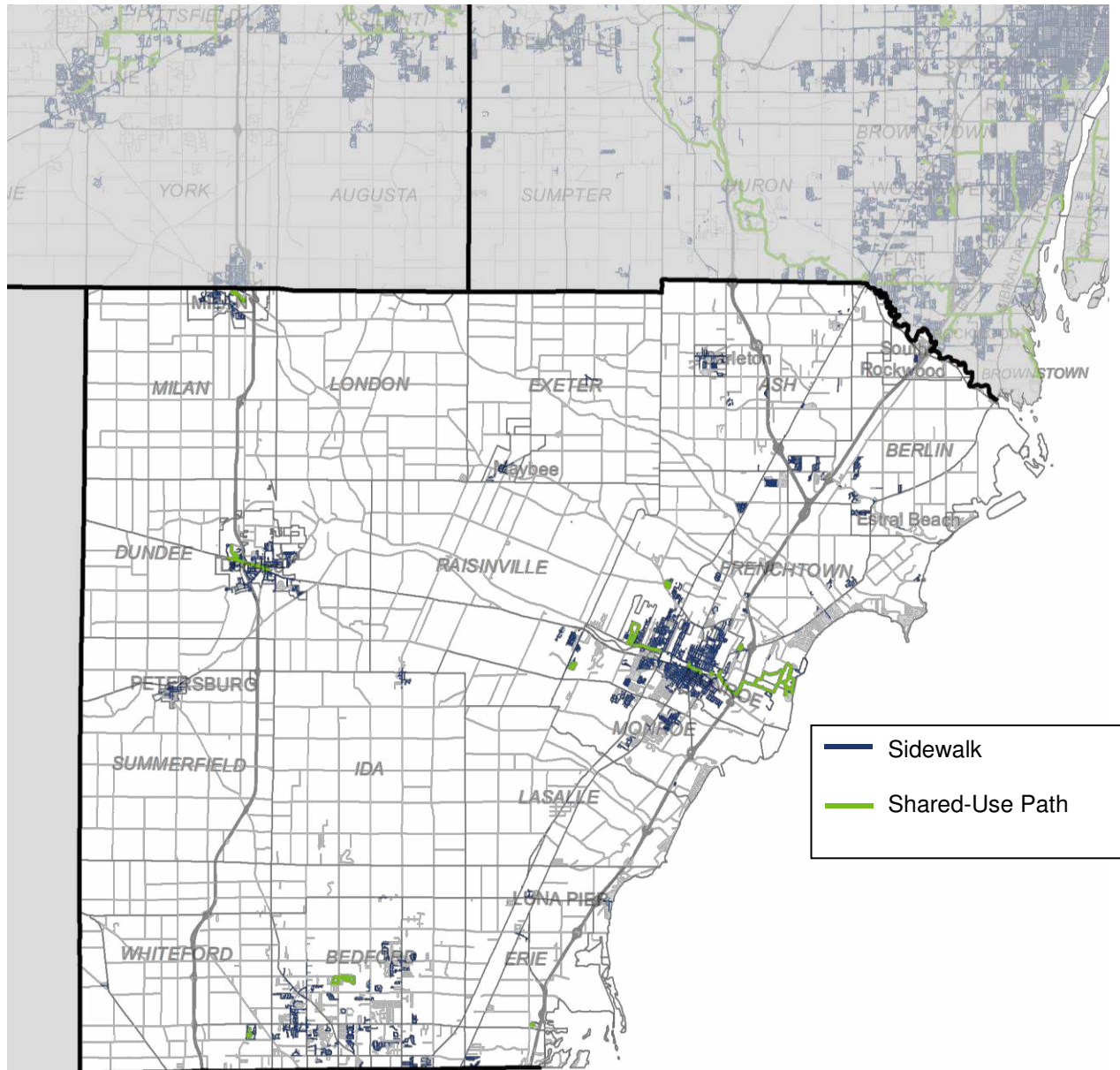
Figure 36
**Monroe County Bicycle and Pedestrian Demand Areas**



Legend:
- High Demand Area
- Moderate Demand Area
- Potential Demand Area
- Park
- Lake
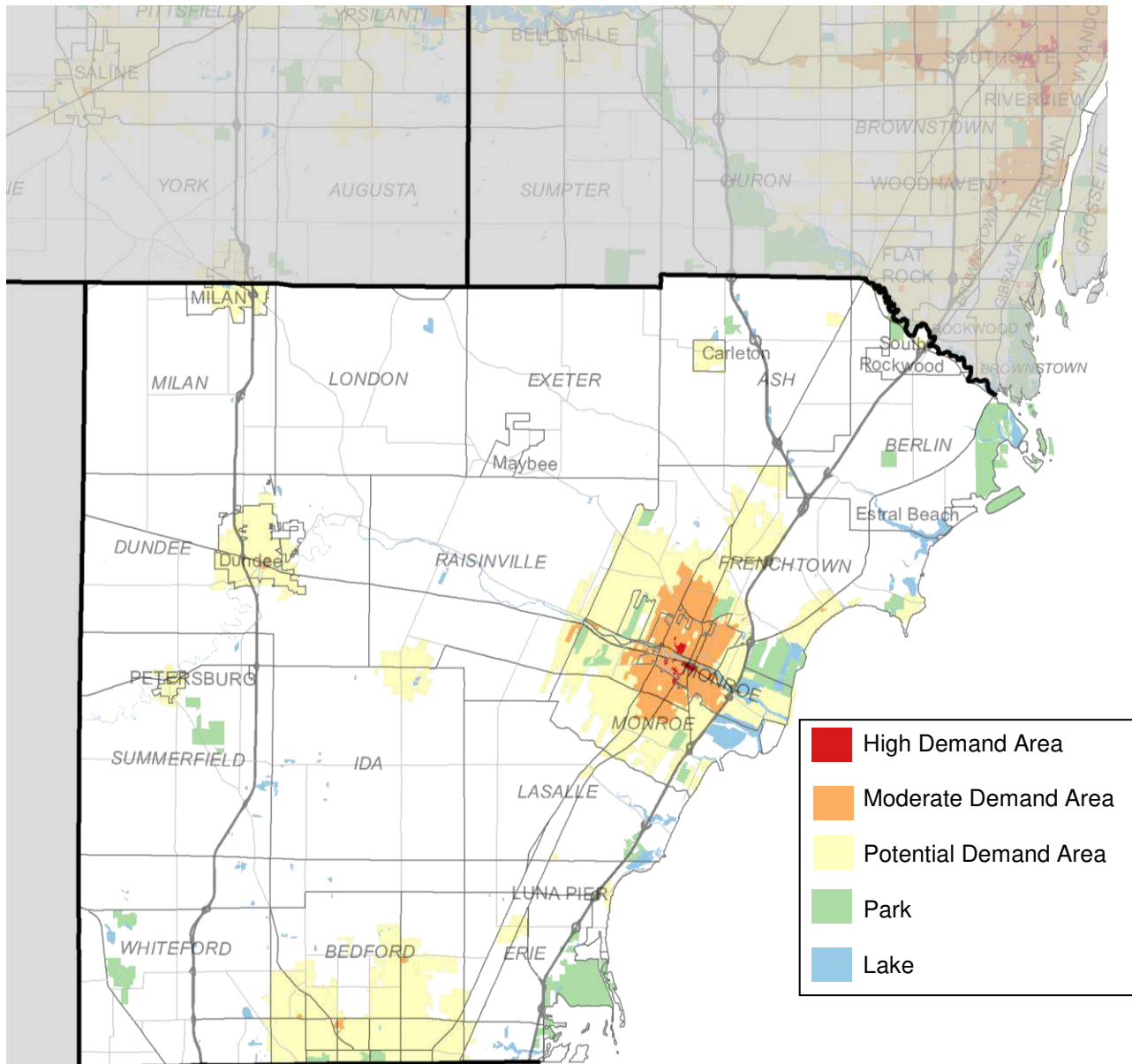
Figure 37
**Monroe County Gaps in Pedestrian Infrastructure Access by Demand Area**



Legend:
- Moderate Demand Areas without access to pedestrian infrastructure
- Potential Demand Areas without access to pedestrian infrastructure
- Park
- Lake
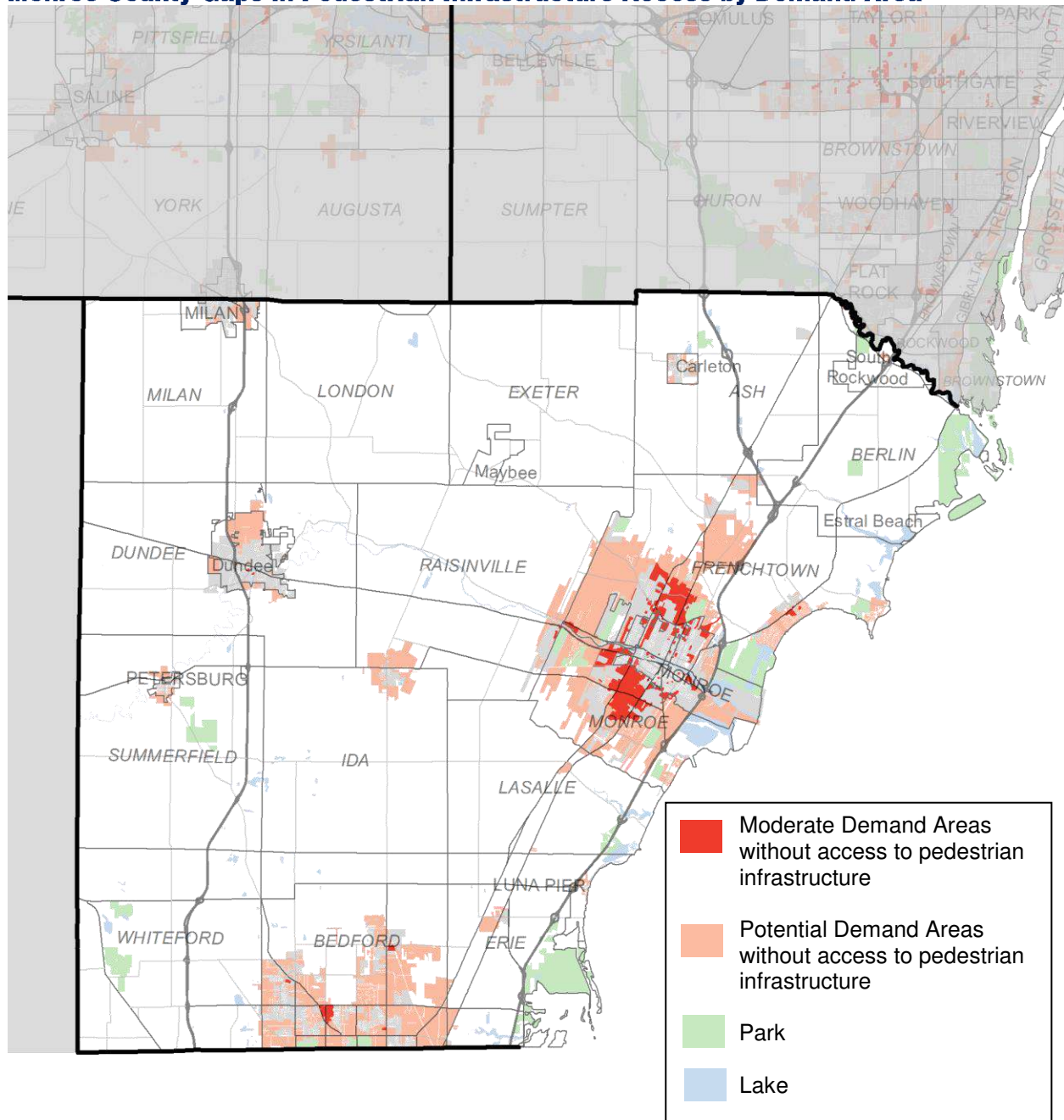
Figure 38
**Monroe County Gaps in Bicycle Infrastructure Access by Demand Area**



Legend:
- **High Demand Areas** without bicycle infrastructure within one-half mile
- **Moderate Demand Areas** without bicycle infrastructure within one-half mile
- **Potential Demand Areas** without bicycle infrastructure within one-half mile
- Park
- Lake
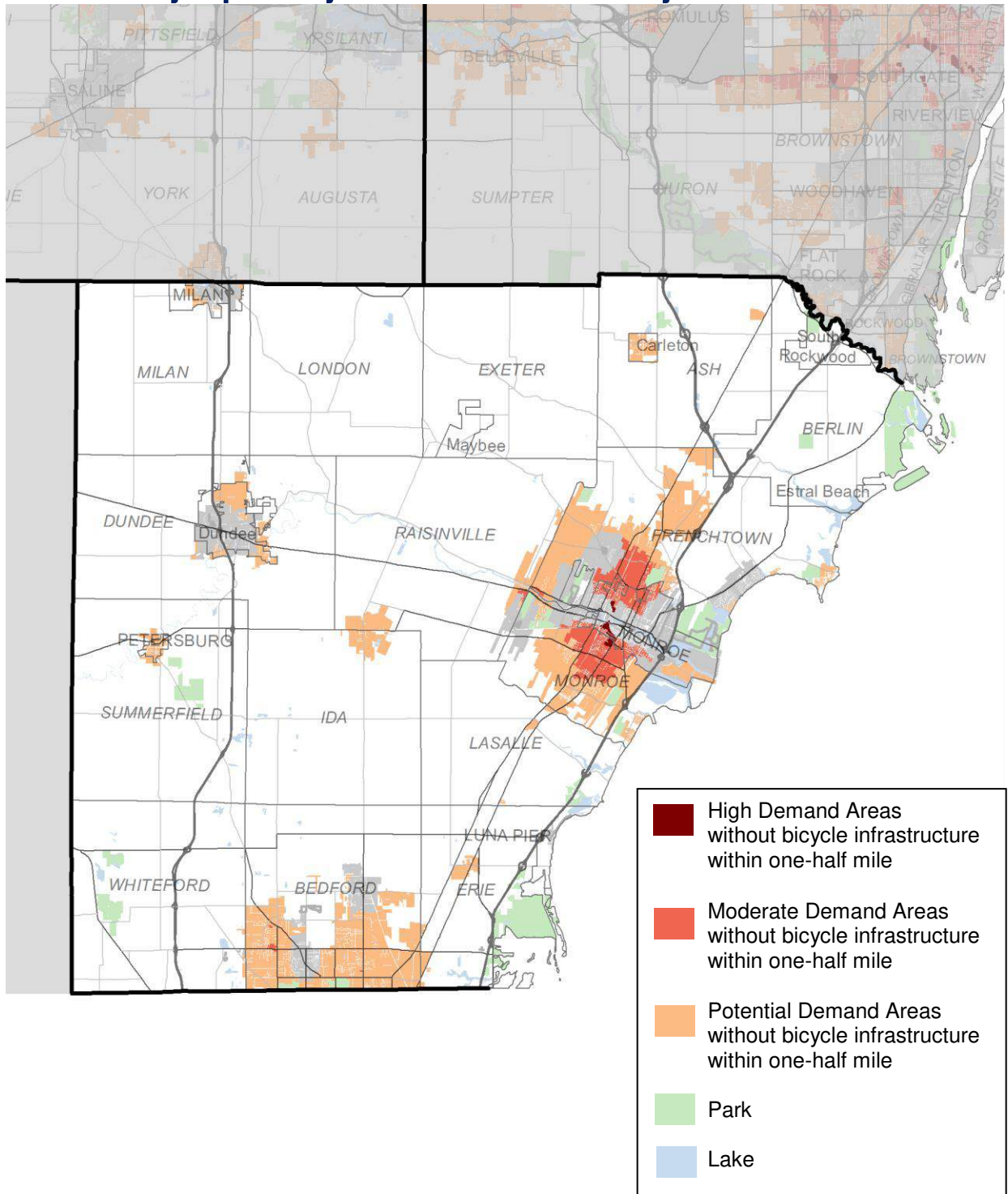
Figure 39
**Monroe County Bicycle and Pedestrian Crashes, 2014-2018**



Crash resulting in fatality

Crash resulting in serious injury

Crash resulting in minor injury
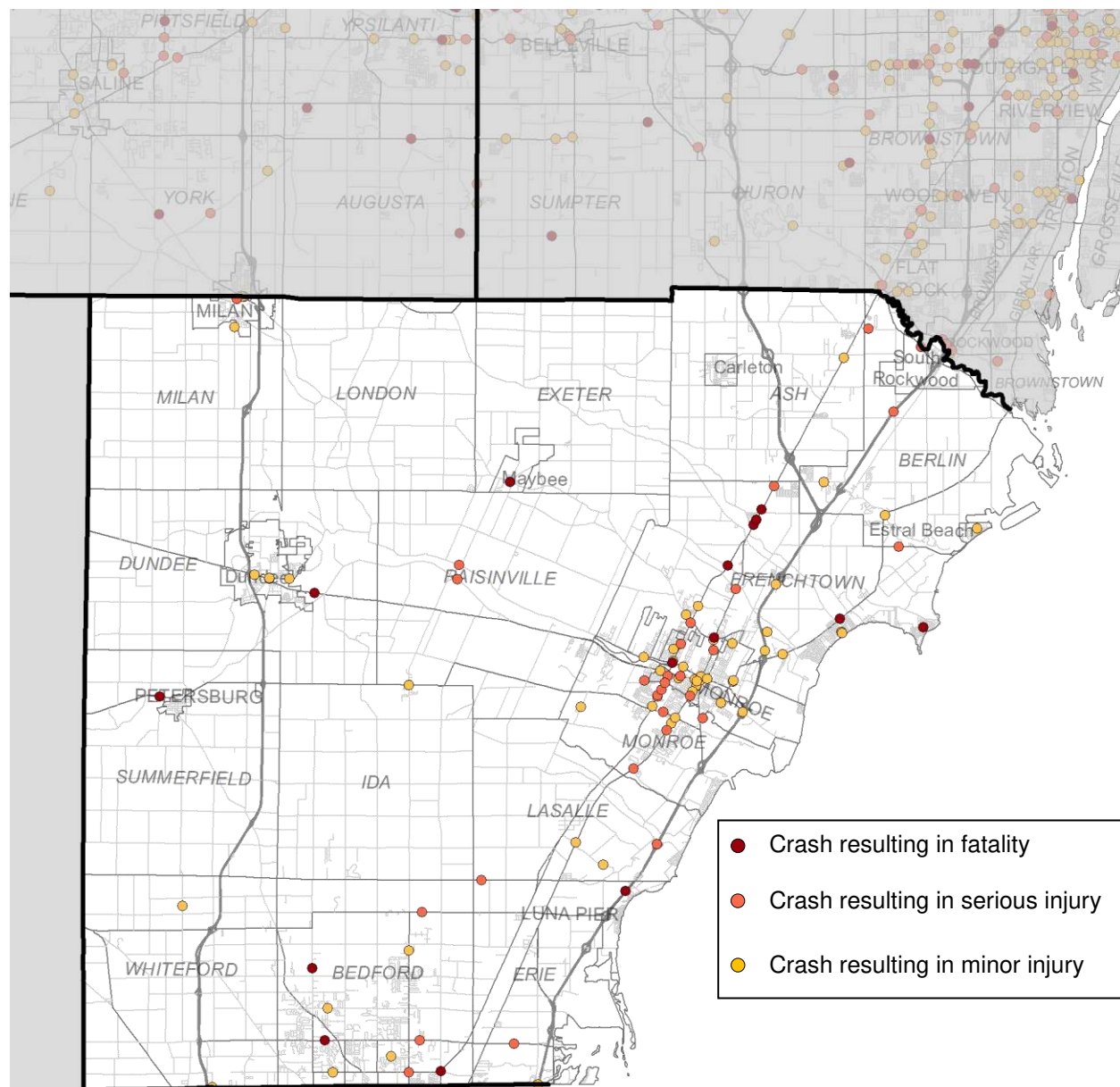
# Oakland County

## Planning Context

Oakland County consists of 31 cities, 21 townships, and 10 villages. The county has 14 county parks, eight state recreation areas, three Huron-Clinton Metroparks, and several regional trails, including the Clinton River Trail, Huron Valley Trail, Milford Trail, Paint Creek Trail, Polly Ann Trail, West Bloomfield Trail, and I-275 Metro Trail. Together, these trails make up large segments of both the Iron Belle Trail and Great Lake to Lake Trails. In total, the county has the region's greatest amount of parkland, with 66,754 acres, or 56 acres per 1,000 residents.

With a population of 1,241,860, the county is home to 26 percent of the region's total population. There are 960,562 jobs in the county, which is the most of any county in the region. The vast majority of workers – 69 percent – work in the county. Wayne County is the largest commuting destination with 18 percent of workers. The average commute time is 25 minutes. The county is served by multiple freeways and major corridors including I-75, I-696, I-275, Woodward Avenue, M-59, M-10, and Telegraph Road, and is home to multiple job centers.

Between 2010 and 2019, Oakland County's population increased by five percent. SEMCOG forecasts that the county's population will continue to increase by another six percent by 2045. Approximately 23 percent of the county's land is agricultural, open space, or recreational. An additional 37 percent is single-family residential.

### Local Highlight: The Michigan Airline Trail

In 2019, the Michigan Airline Trail officially opened, filling a seven-mile gap in the Great Lake to Lake Trail through the communities of Wixom, Walled Lake, and Commerce Township in southwest Oakland County. The trail also connects three major regional trails – the West Bloomfield Trail, Huron Valley Trail, and M-5 Metro Trail. The next phase of the trail is to connect to downtown Wixom and extend the trail further west along the rail corridor north of Pontiac Trail Road.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in Oakland County. Highlights from plans in Oakland County shown in Table 4.

Table 4
**Local Plans that influence Bicycling and Walking in Oakland County**

| Plan Title | Highlights |
|---|---|
| **City of Birmingham Multi-Modal Transportation Plan (2013)** | Includes an ADA Transition Plan, which outlines existing conditions, and identifies barriers that limit accessibility and proactive and reactive strategies. Outlines a framework for addressing and improving accessibility. |
| **Charter Township of Commerce Parks, Recreation + Trails Master Plan (2019)** | Recommends supporting and encouraging accessibility to and within parks, as well as development of the local and regional nonmotorized systems to increase the connectivity. Identifies seven nonmotorized priorities and projects to be implemented over the next five years. |

| | |
|---|---|
| **Ferndale Moves! On-Line Transportation Dialogue and Resource Center (2014)** | Provides a vision for the city to promote and implement multi-modal transportation projects. Includes detailed maps of completed and planned projects and FAQs on new infrastructure and ongoing studies. |
| **City of Novi Non-Motorized Master Plan (2011)** | A sidewalk quality rating system and a road-crossing-difficulty assessment system were designed to help identify a pedestrian's level of comfort. Includes a map for roadside pathway conflicts and an on-road bicycling quality assessment. |
| **City of Oak Park Complete Streets Plan (2018)** | Guidelines and ideas on how to address nonmotorized transportation and Complete Streets issues through policies, programs, and design guidelines. Four priority corridors were identified for nonmotorized transportation improvements and for developing a regional bike share program. |
| **Complete Streets Pontiac (2017)** | Includes several policy recommendations including developing a sidewalk gap prioritization methodology, enhancing and promoting issue reporting tools, and a local direct road funding mechanism. Recommends partnering with Oakland University on tasks such as before and after pedestrian and bicycle counts, permanent counts, and yearly crash analysis. |
| **City of Troy 5 year Parks & Recreation Plan (2015)** | Identifies developing a comprehensive trail pathway system throughout the city. Establishes a framework for organizing, planning, designing, funding, and constructing a system of recreational trails. Recommends adoption of a Complete Streets approach to transportation planning. |
| **Huron-Clinton Metroparks Master Plans** | Kensington Metropark Master Plan (2017) includes accessibility analysis of the park's hike-bike trail. |

## Walking and Bicycling in Oakland County
**Existing Facilities**
The communities of Southeast Oakland County have a comprehensive network of pedestrian facilities. Over the last few years, communities along the Woodward Avenue corridor have been working together to substantially expand the bicycling network. MoGo bike share is expected to launch in Spring 2020, which will use this expanding bicycle network by adding 31 stations and 140 bikes in Berkley, Ferndale, Huntington Woods, Oak Park, and Royal Oak. Most of the county's cities and villages have established networks of sidewalks, especially in the central business and historic downtowns of Birmingham, Rochester, Farmington, Milford, and South Lyon. Additionally, the cities of Auburn Hills, Novi, Rochester Hills, and Troy, and Orion and West Bloomfield Townships each have eight-foot-wide safety paths (shared-use) along their major roadways, in addition to a growing number of neighborhoods with sidewalks. Oakland County has the region's most miles of shared-use paths and independent trails, with several of the region's most popular trails. The county has 4,840 miles of sidewalks and 1,178 miles of bikeways – the most of any county in the region.

Figure 40
**Oakland County Sidewalk Mileage**
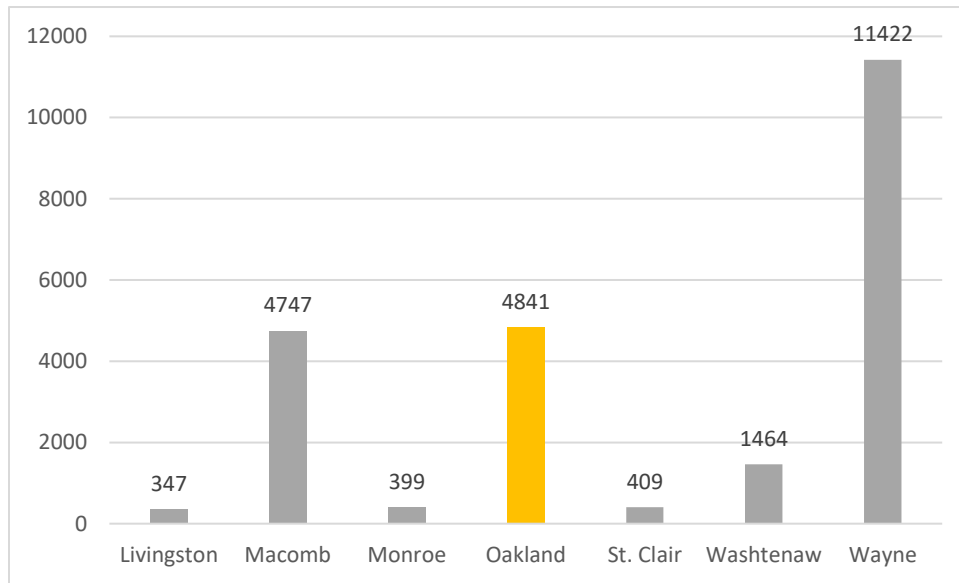


Figure 41
**Oakland County Bicycle Network by Type (Miles)**
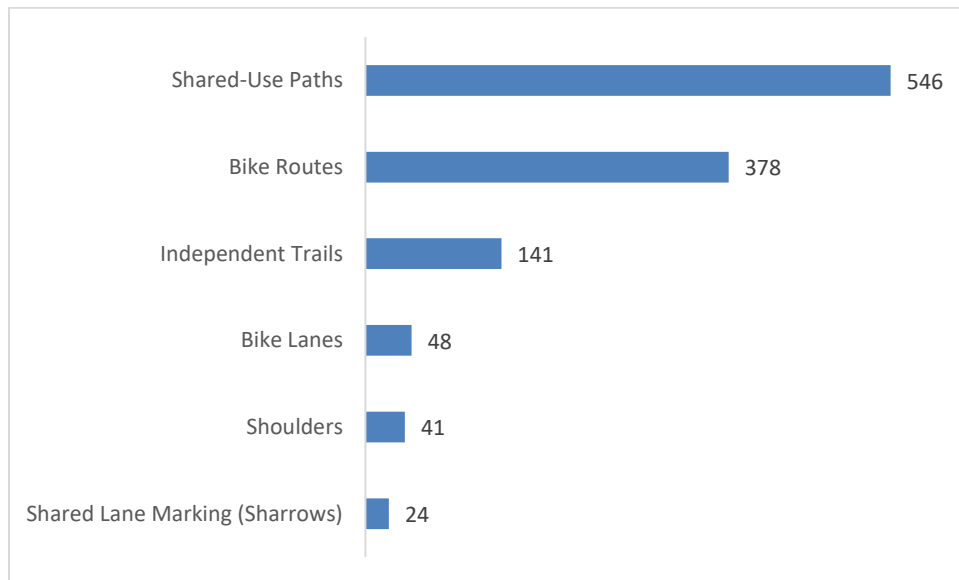
Figure 42
**Oakland County Bicycle Network Mileage**
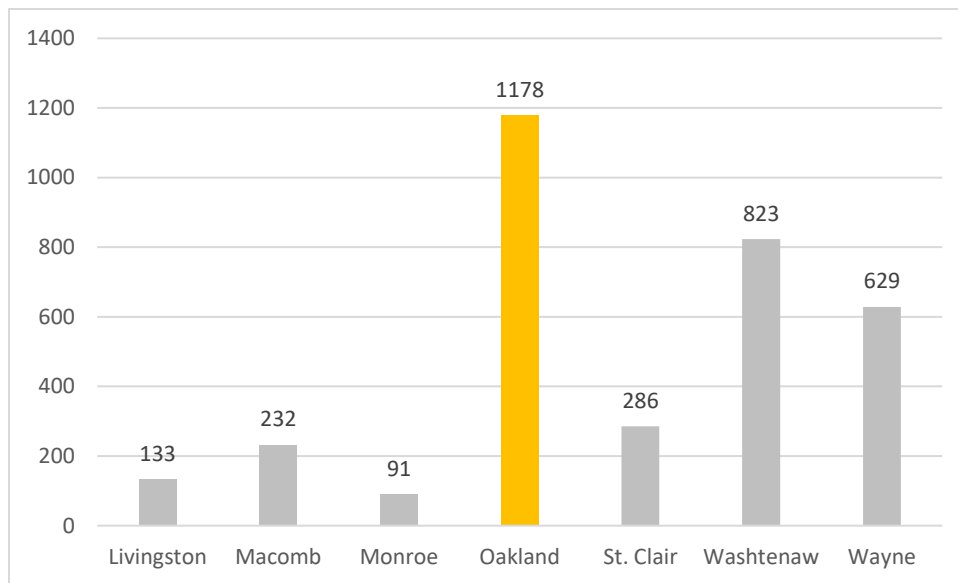


## Activity Level

Walking and bicycling currently accounts for five percent of trips in Oakland County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 25 minutes. Additionally, 30 percent of workers who live in Oakland County are employed in another county (31 percent), indicating the potential for walking and bicycling as a commute option for some workers.

Figure 43
**Oakland County Trips by Mode**
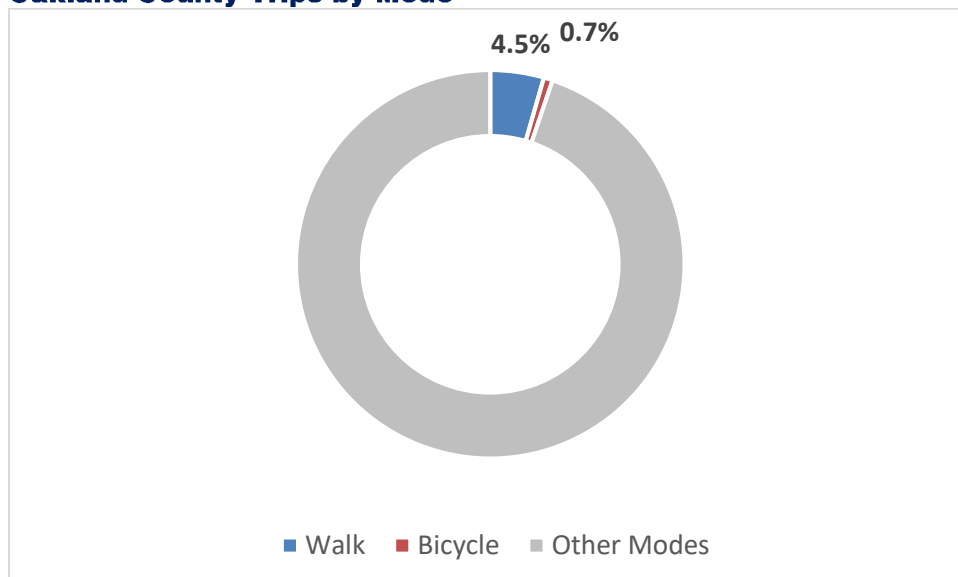
**Crash Data**

There were 1,990 pedestrian and bicycle crashes in Oakland County from 2014-2018; 81 people were killed in crashes involving a pedestrian and 11 people were killed in crashes involving a bicycle. There were 265 serious injuries from bicycle and/or pedestrian crashes.

Even though pedestrian and bicycle crashes account for less than one percent of total crashes in Oakland County, they are responsible for 28 percent of fatalities and 12 percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the largest share of bicycle and pedestrian crashes in Oakland County, take place on the local roads (39%), followed by County roads (37%).

Figure 44
**Oakland County Fatalities by Mode, 2014-2018**



24.3%  
3.3%  
72.4%  

■ Pedestrian  ■ Bicyclist  ■ Vehicle Occupant
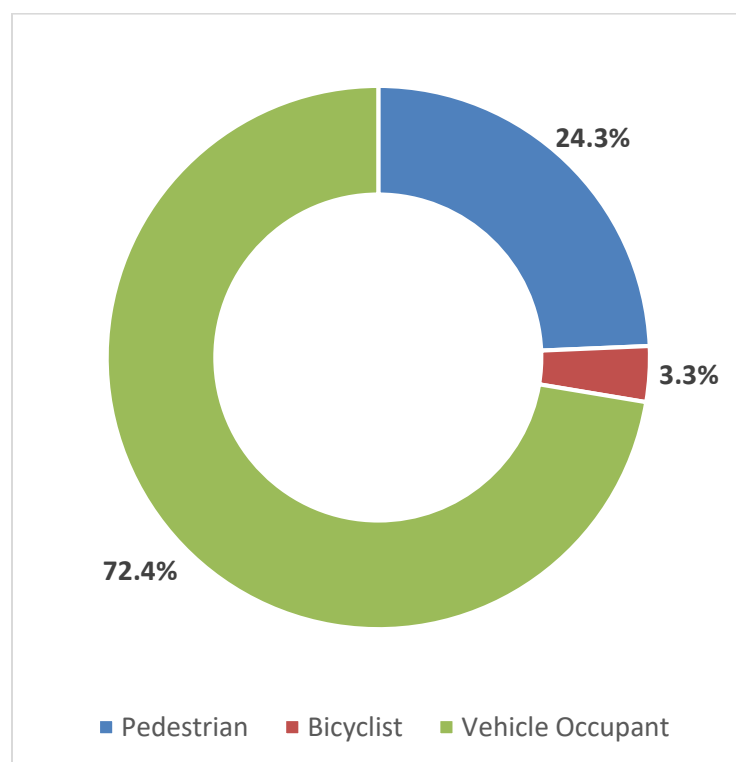
Figure 45
**Oakland County Serious Injuries by Mode, 2014-2018**
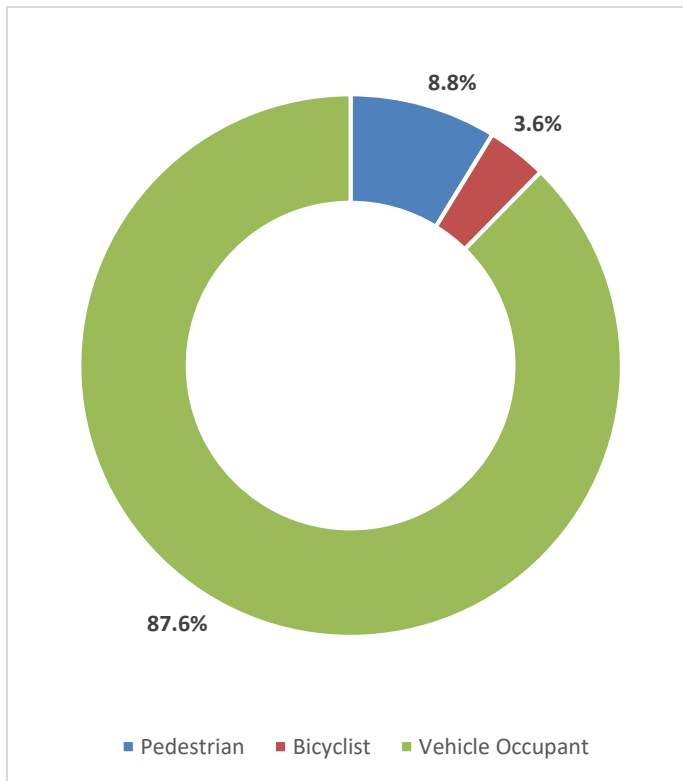


Figure 46
**Oakland County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**
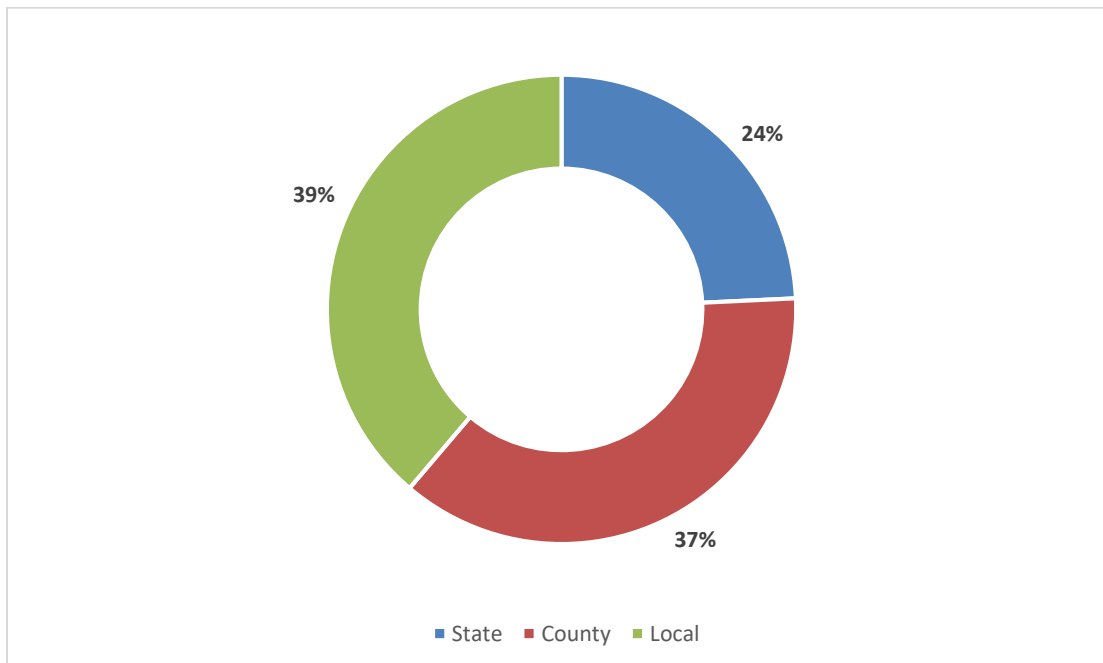
Figure 47
**Oakland County Bicycle Network**

Figure 47
**Oakland County Bicycle Network**

Legend:
- Shared-Use Path
- Bike Lane
- Other Bikeway
  *(Including shared-lane markings, wide-paved shoulders, and bike routes)*
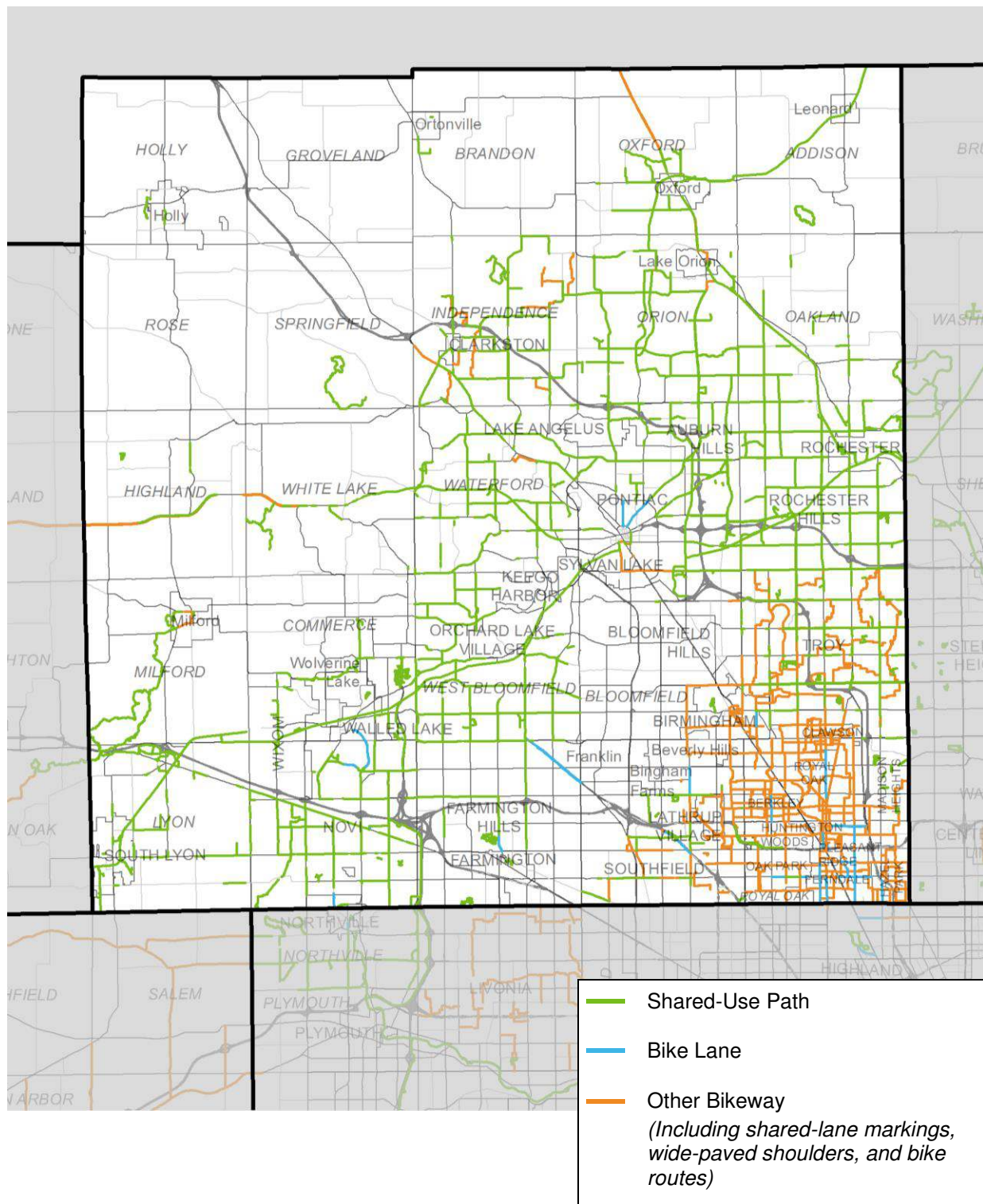
Figure 48
**Oakland County Pedestrian Infrastructure**



Legend:
- Sidewalk
- Shared-Use Path
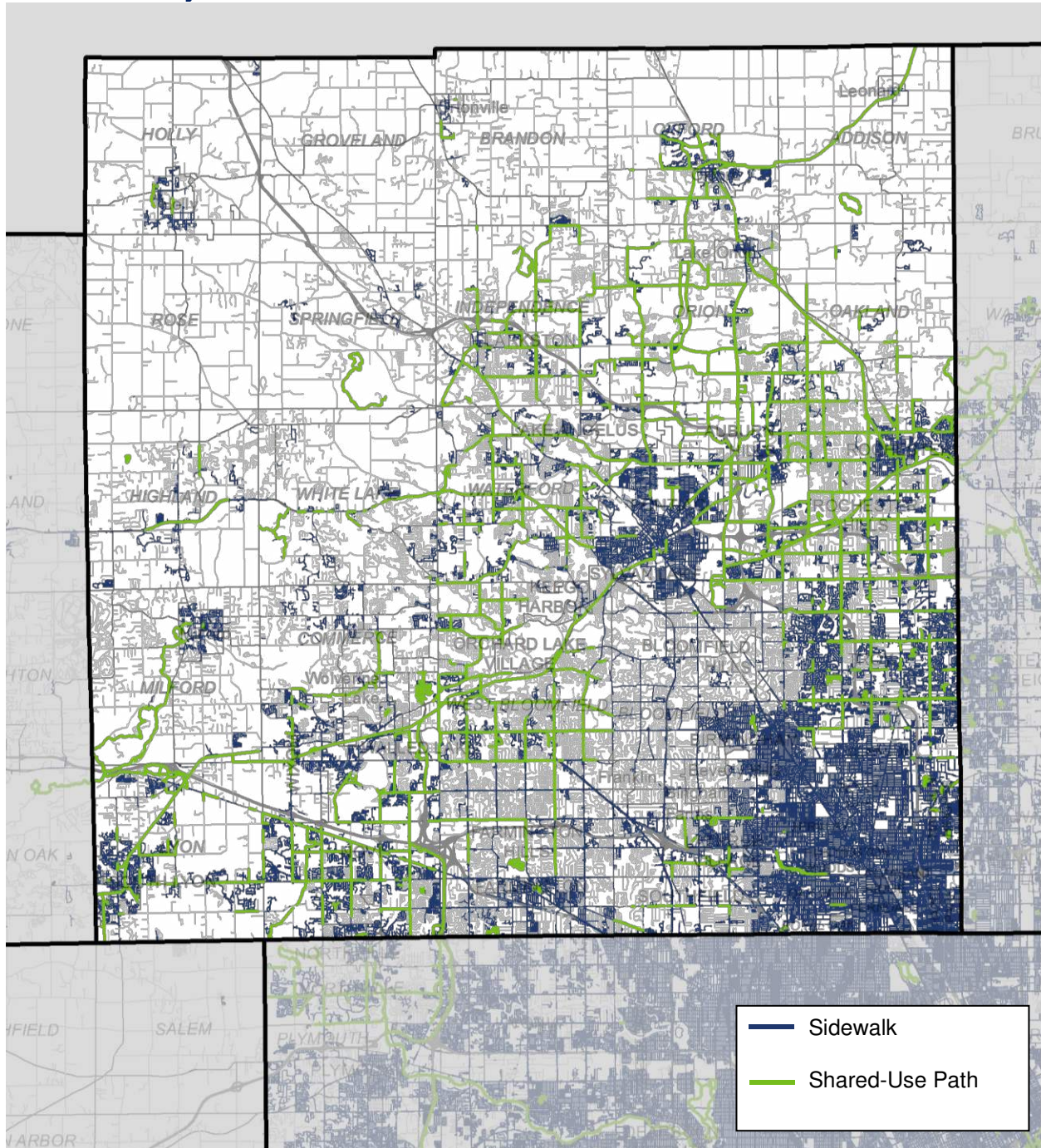
Figure 49
**Oakland County Bicycle and Pedestrian Demand Areas**



High Demand Area

Moderate Demand Area

Potential Demand Area

Park

Lake
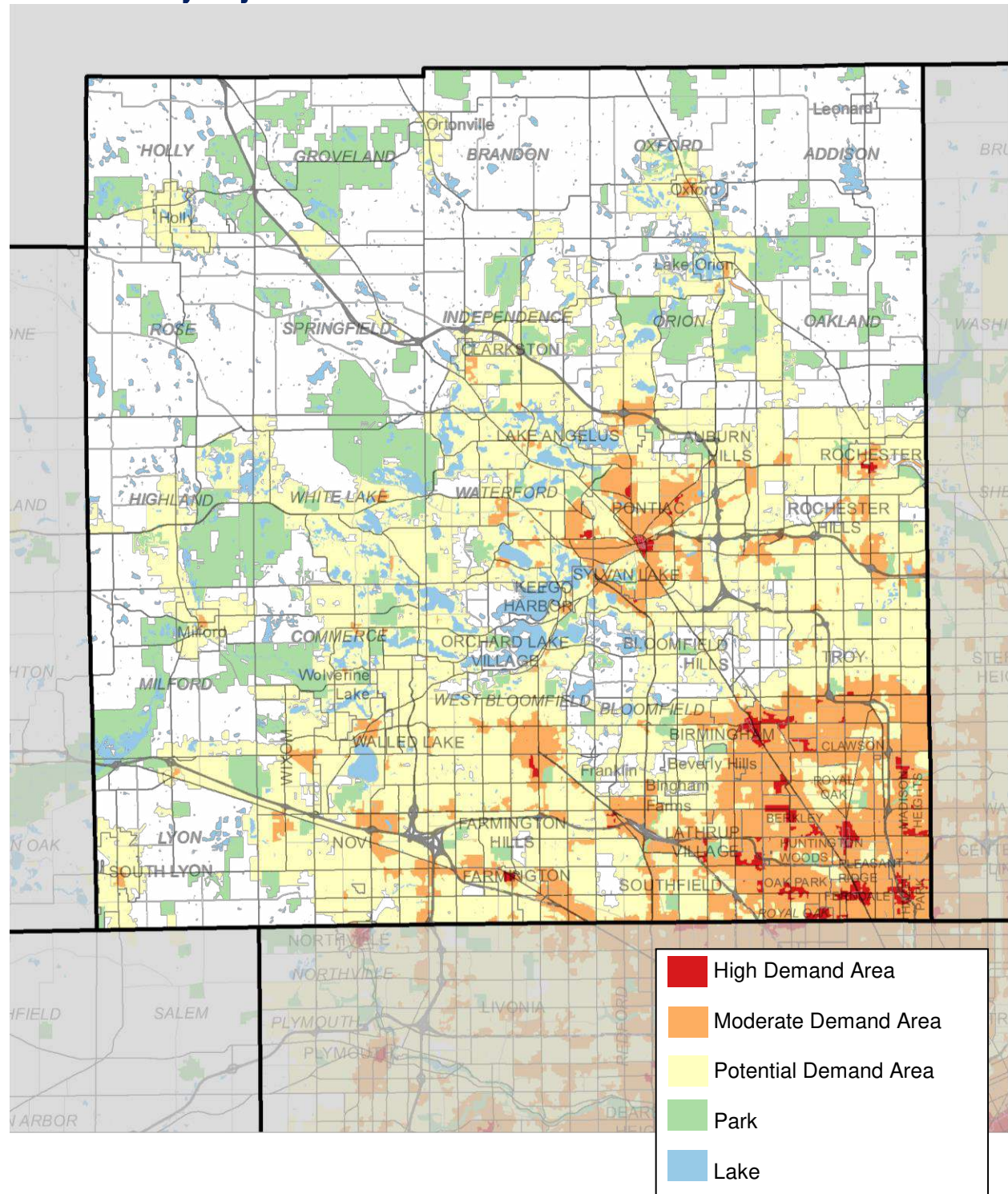
Figure 50
**Oakland County Gaps in Pedestrian Infrastructure Access by Demand Area**



Legend:
- High Demand Areas without access to pedestrian infrastructure
- Moderate Demand Areas without access to pedestrian infrastructure
- Potential Demand Areas without access to pedestrian infrastructure
- Park
- Lake
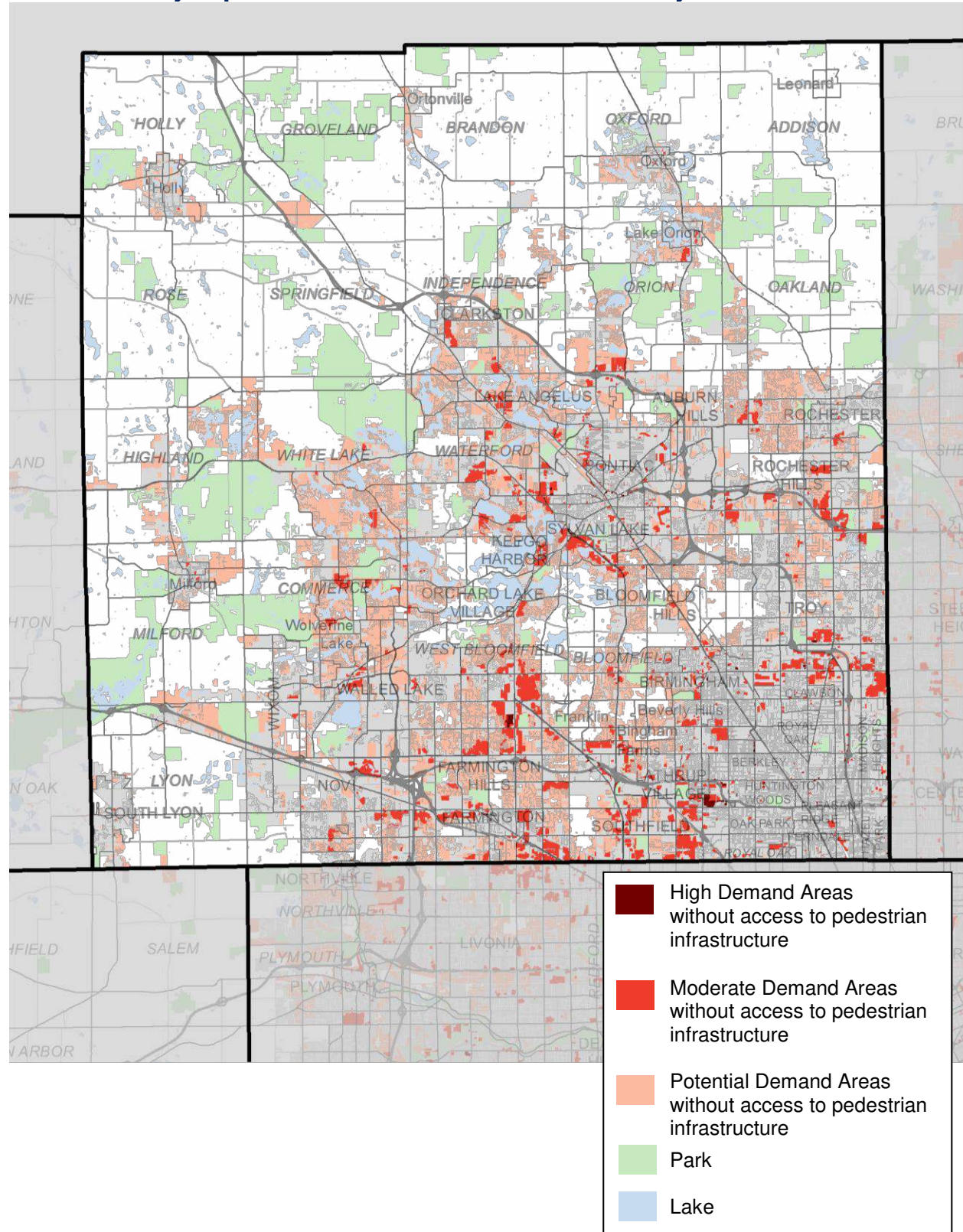
Figure 51
**Oakland County Gaps in Bicycle Infrastructure Access by Demand Area**



**High Demand Areas** without bicycle infrastructure within one-half mile

**Moderate Demand Areas** without bicycle infrastructure within one-half mile

**Potential Demand Areas** without bicycle infrastructure within one-half mile

Park

Lake
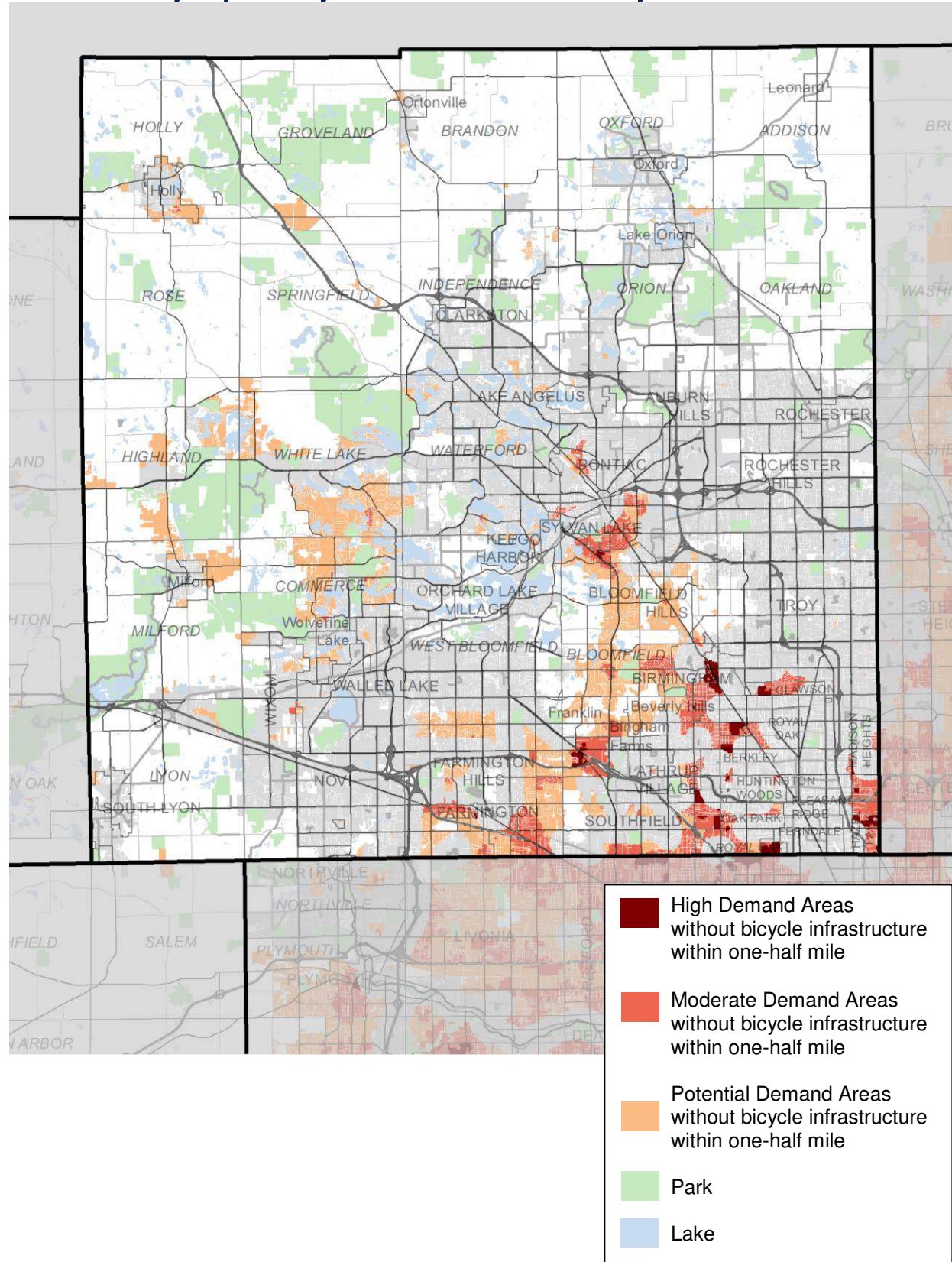
Figure 52
**Oakland County Bicycle and Pedestrian Crashes, 2014-2018**



Legend:
- Crash resulting in fatality
- Crash resulting in serious injury
- Crash resulting in minor injury
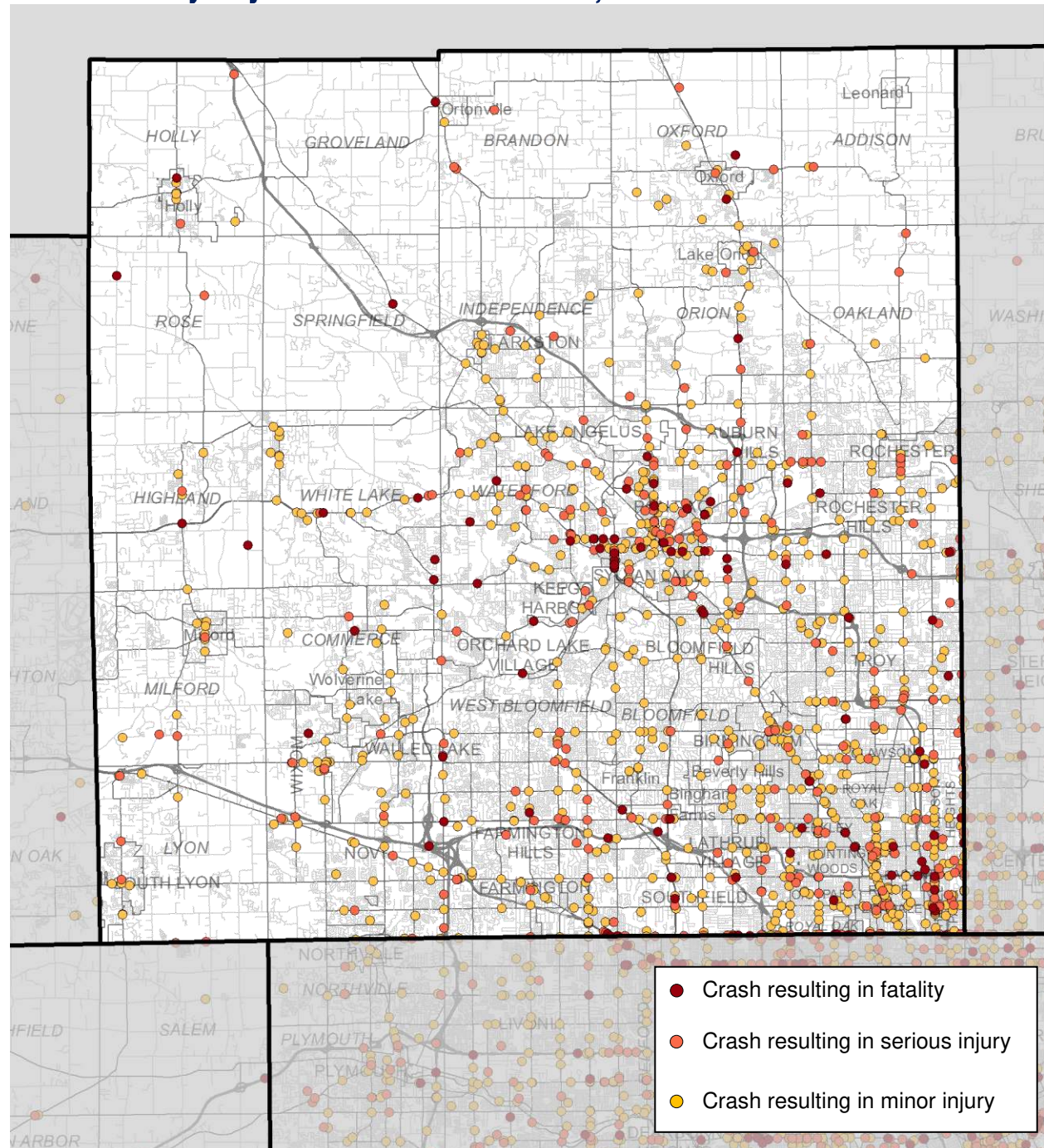
# St. Clair County

## Planning Context

St. Clair County consists of eight cities, 23 townships, and two villages. The county has five county parks, two state parks, three state game and recreation areas, and several regional trails, including the Wadhams to Avoca Trail, Blue Water River Walk, and Bridge to Bay Trail. Known as the Blue Water Area because its eastern and southern boundaries are formed by the waters of Lake Huron, the St. Clair River, and Lake St. Clair, the county has 140 miles of shoreline and 16 designated water trails. In total, the county has 16,312 acres of parks, or 100 acres per 1,000 residents.

With a population of 159,761, the county has three percent of the region's total population. There are 64,236 jobs in the county. The majority of workers – 63 percent – work in the county. Macomb County is the largest commuting destination with 24 percent of workers. The average commute time is 28 minutes, the second longest in the region. The county is served by multiple freeways and major corridors including I-94, I-69, M-25, and Gratiot Avenue Road, and has job centers and cultural destinations in communities along the shoreline, such as Fort Gratiot Township, Marysville, Port Huron, and St. Clair.

Between 2010 and 2019, St. Clair County's population decreased by two percent. SEMCOG forecasts the county's population will increase by four percent between 2019 and 2045. Approximately 68 percent of the county's land is agricultural, open space, or recreational. An additional 18 percent is single-family residential.

## Local Highlight: Blue Water River Walk

Through coordination of multiple stakeholders, including St. Clair County, City of Port Huron, and Community Foundation of St. Clair, more than one mile of shoreline along the St. Clair River was redeveloped into the Blue Water River Walk. This unique regional destination consists of:

- A multi-use trail with historic and educational interpretive signage and kiosks, public art, and placemaking amenities;
- Restored and rehabilitated shoreline, featuring a shallow-water habitat, off-shore reefs, and native plants and wildlife habitat;
- A restored 1900s railroad ferry dock; and
- A three-acre county wetland park, with habitat for reptiles, amphibians, and migrating waterfowl.

The Blue Water River Walk is part of the county's Bridge to Bay Trail which, when complete, will be a 54-mile paved trail from Lakeport State Park to New Baltimore.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in St Clair County. Highlights are shown in Table 5.

Table 5
### Local Plans that Influence Bicycling and Walking in St. Clair County

| Plan Title | Plan Idea |
|---|---|
| **St. Clair County: Economic Impact of Trail Development (2019)** | Highlights the importance of establishing a group of trail-oriented organizations which guide aspects of trail development. Recommends focusing on forming consensus strategies and robust engagement that provide a strong foundation to both developing and sustaining a trail system. |
| **St. Clair County Trails Plan (2019)** | A trail framework identifies feasible and actionable trail projects that support plan goals:<br><br>• Creating a connected regional trail network<br>• Driving economic development and reinvestment<br>• Encouraging collaborations and partnerships<br>• Enhancing public health, safety, and green infrastructure<br><br>The framework is built through a three-step process of gap identification, gap alternatives, and project prioritization. |
| **Parks and Recreation Master Plan for Fort Gratiot Township (2018)** | Identifies a strategic action item to use public right-of-way along streets, roads, abandoned railroads, or along drain easement for a nonmotorized path network. |
| **2018-2022 City of Port Huron Master Plan** | Recommends providing design guidelines that include areas for rideshare programs, public transportation, nonmotorized transportation, autonomous vehicles or future technologies in commercial districts. It sets transportation goals and objectives for transportation designs and functions that integrate with Complete Streets concepts. |

## Walking and Bicycling in St. Clair County
### Existing Facilities

St. Clair County has two major existing regional trails, the Wadhams to Avoca Trail and the Bridge to Bay Trail. There are plans to fill gaps and enhance both of these trails, in addition to connecting Port Huron to the Macomb Orchard Trail in Macomb County as part of the Great Lake to Lake Trail. The county's cities, especially those along the St. Clair River – Algonac, Marine City, Marysville, Port Huron, and St. Clair – all have significant pedestrian networks and growing bicycle facilities. The county has 409 miles of sidewalks and 286 miles of bikeways.

Figure 53
**St. Clair County Sidewalk Mileage**
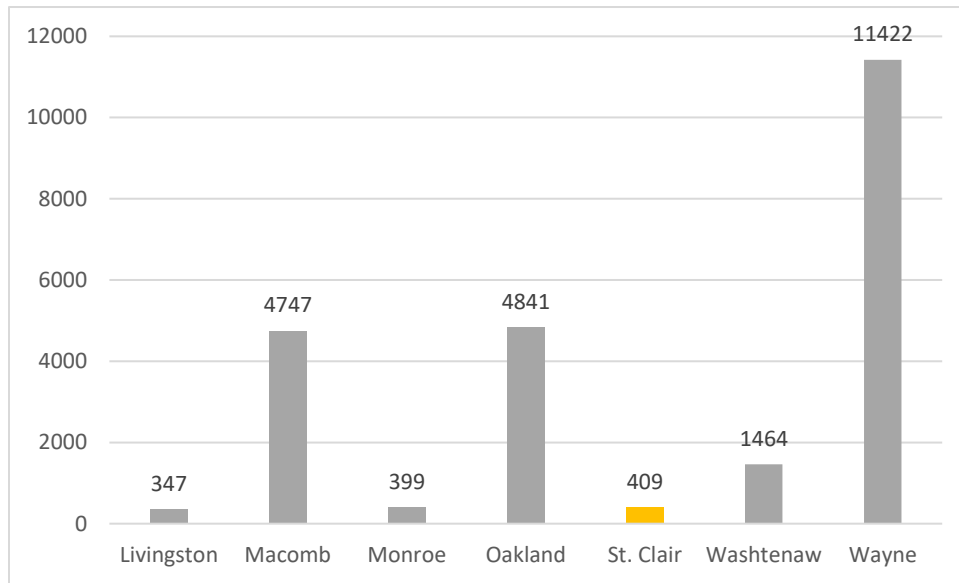


Figure 54
**St. Clair County Bicycle Network by Type (Miles)**

Figure 55
## St. Clair County Bicycle Network Mileage



**Activity Level**

Walking and bicycling currently accounts for four percent of trips in St. Clair County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 28 minutes. Additionally, 37 percent of workers who live in St. Clair County are employed in another county, leaving the potential for walking and bicycling as a commute option for many workers.

Figure 56
**St. Clair County Trips by Mode**
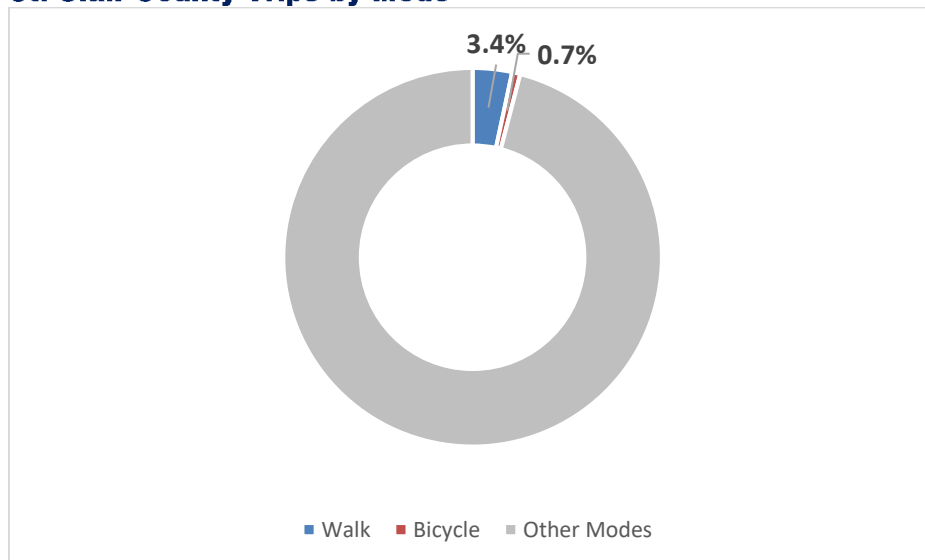


**Crash Data**

There were 244 pedestrian and bicycle crashes in St. Clair County from 2014-2018; eight people were killed in crashes involving a pedestrian, and three people killed in crashes involving a bicycle. There were 40 serious injuries from bicycle and/or pedestrian crashes in the county during the same period. St. Clair County has two percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only one percent of total crashes in St. Clair County, they are responsible for 12 percent of fatalities and 10 percent of serious injuries. Excluding crashes where the road jurisdiction is not known, the majority of bicycle and pedestrian crashes in St. Clair County, take place on the local roads (38%).

Figure 57
**St. Clair County Fatalities by Mode, 2014-2018**

Figure 58
**St. Clair County Serious Injuries by Mode, 2014-2018**
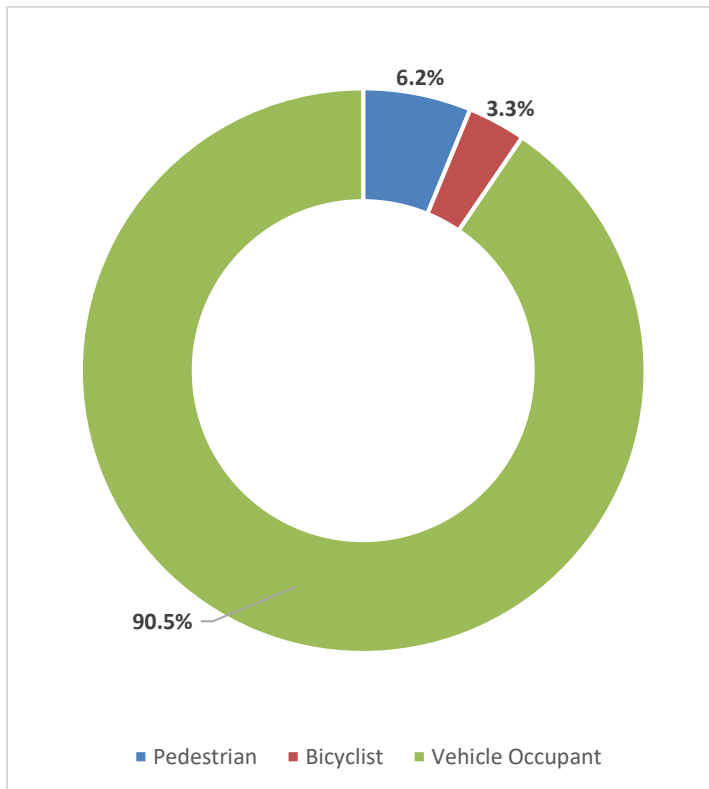


Figure 59
**St. Clair County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**
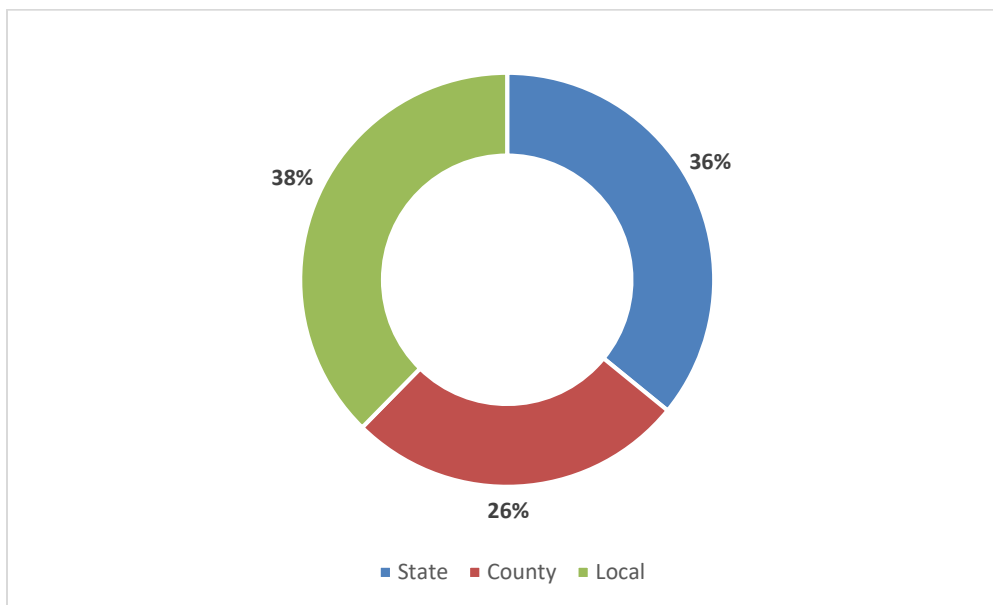
Figure 60
**St. Clair County Bicycle Network**



Legend:
- Shared-Use Path
- Bike Lane
- Other Bikeway
  *(Including shared-lane markings, wide-paved shoulders, and bike routes)*
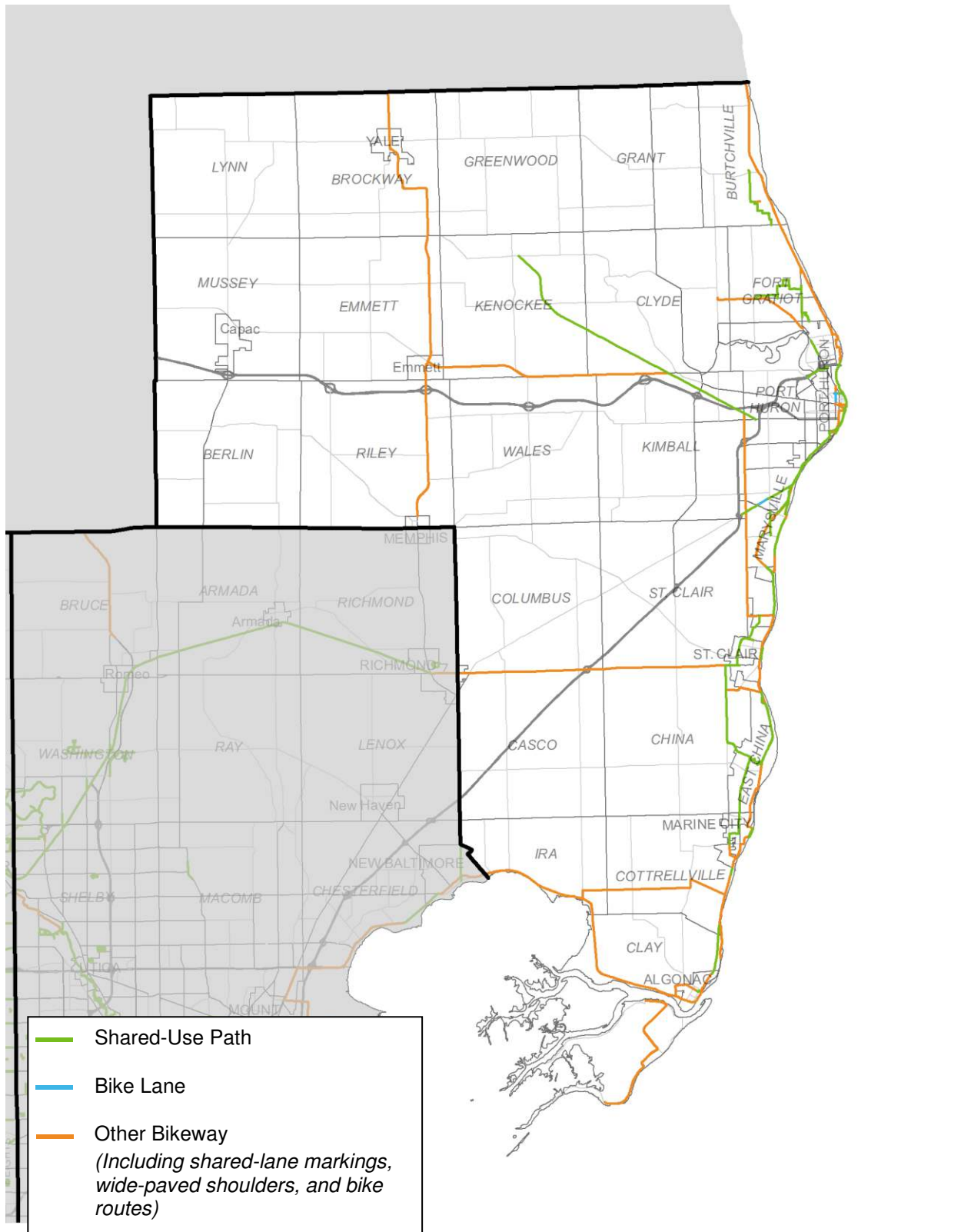
Figure 61
**St. Clair County Pedestrian Infrastructure**



Legend:
— Sidewalk
— Shared-Use Path
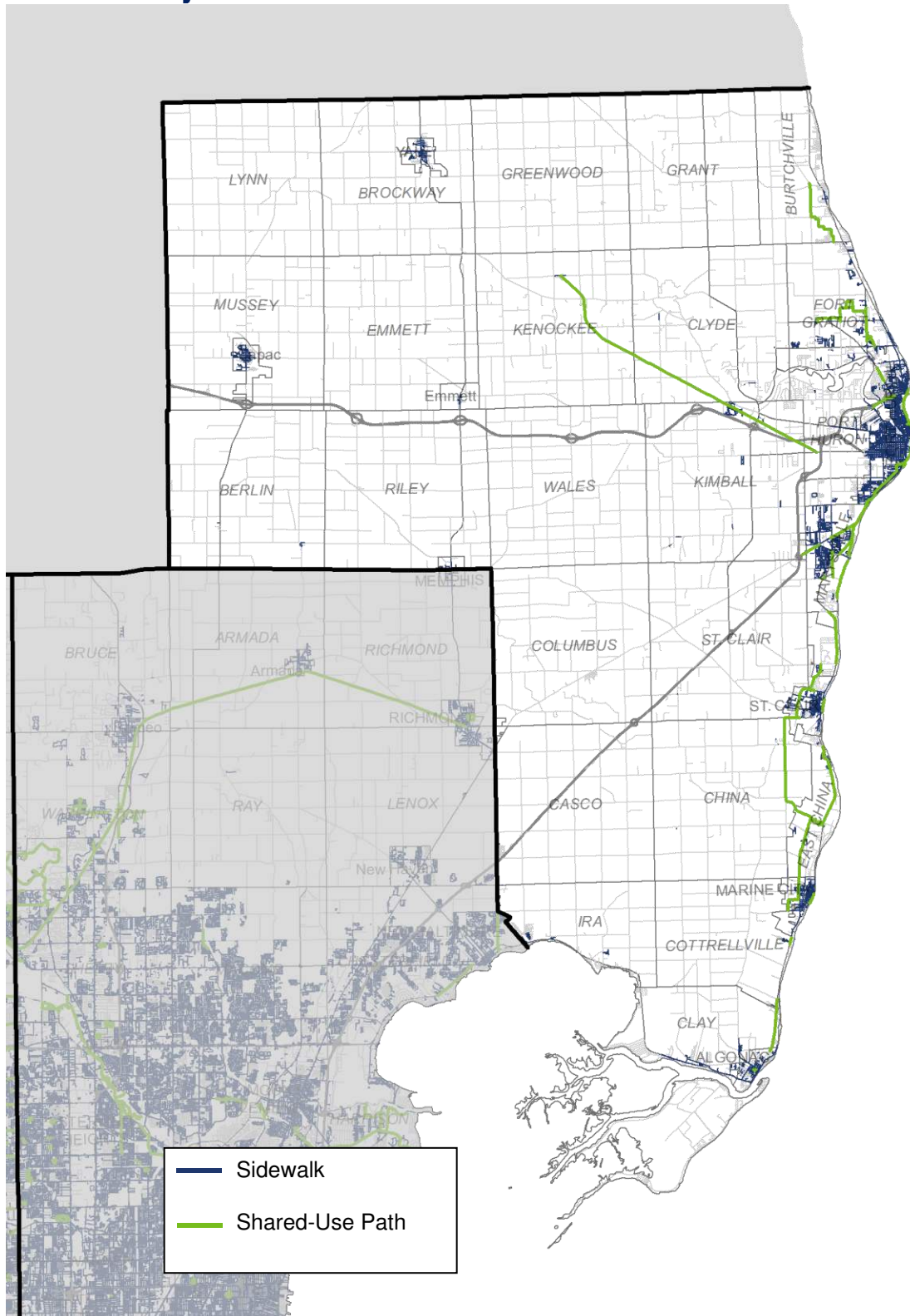
Figure 62
**St. Clair County Bicycle and Pedestrian Demand Areas**



Legend:
- High Demand Area
- Moderate Demand Area
- Potential Demand Area
- Park
- Lake
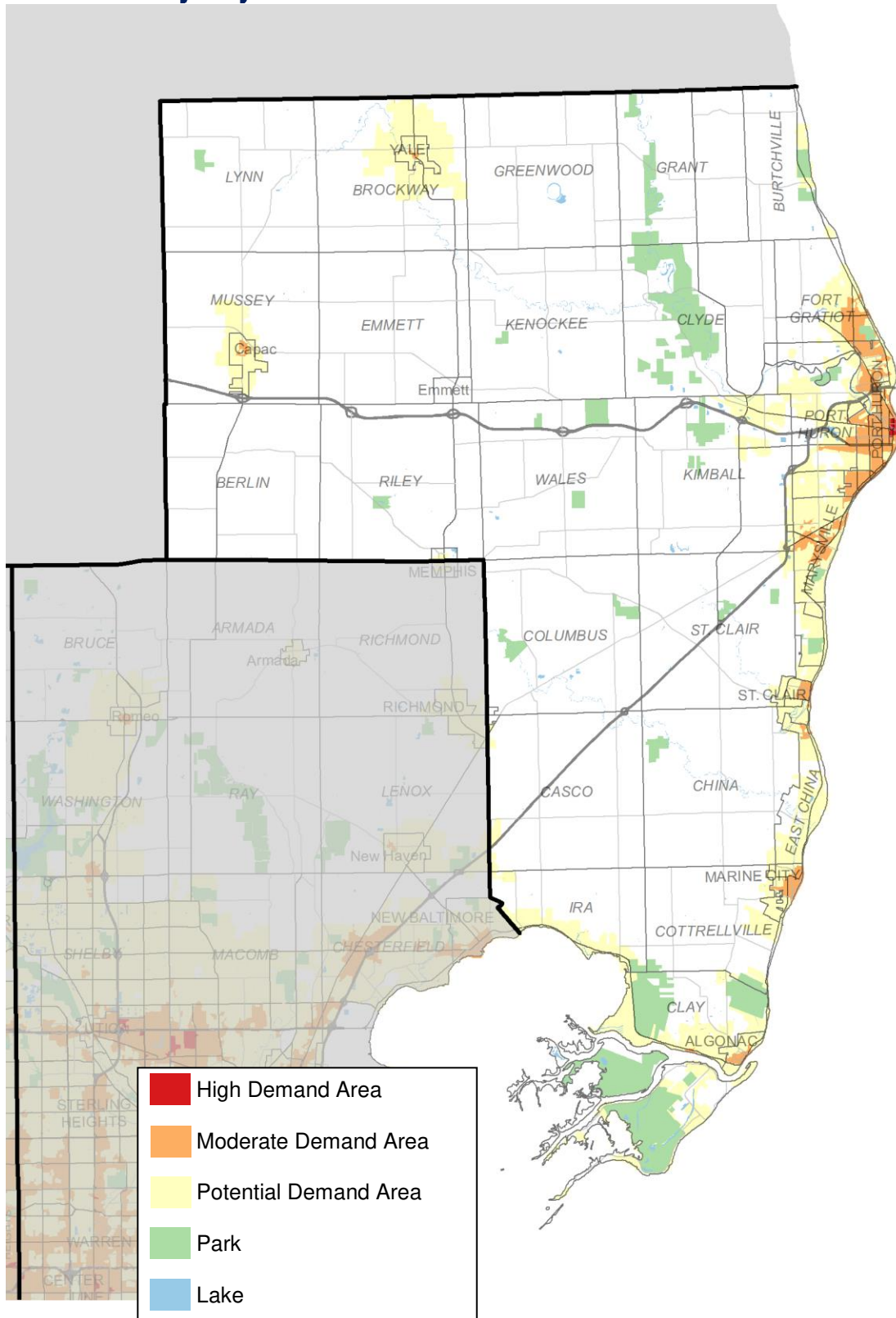
Figure 63
**St. Clair County Gaps in Pedestrian Infrastructure Access by Demand Area**

Figure 64
**St. Clair County Gaps in Bicycle Infrastructure Access by Demand Area**



Legend:
- Moderate Demand Areas without bicycle infrastructure within one-half mile
- Potential Demand Areas without bicycle infrastructure within one-half mile
- Park
- Lake
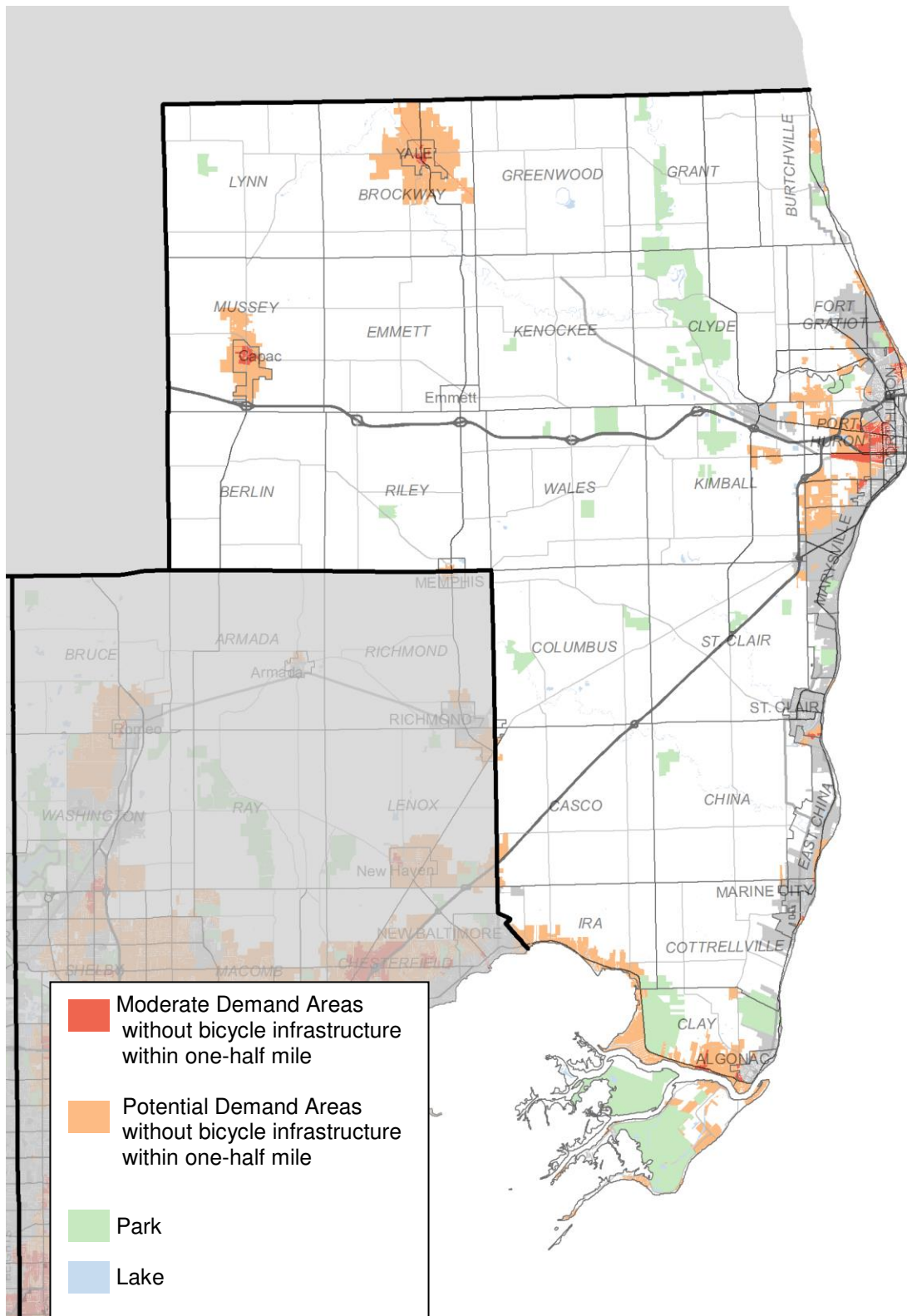
Figure 65
**St. Clair County Bicycle and Pedestrian Crashes, 2014-2018**



Legend:
- Crash resulting in fatality
- Crash resulting in serious injury
- Crash resulting in minor injury

![SEMCOG logo] | SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS
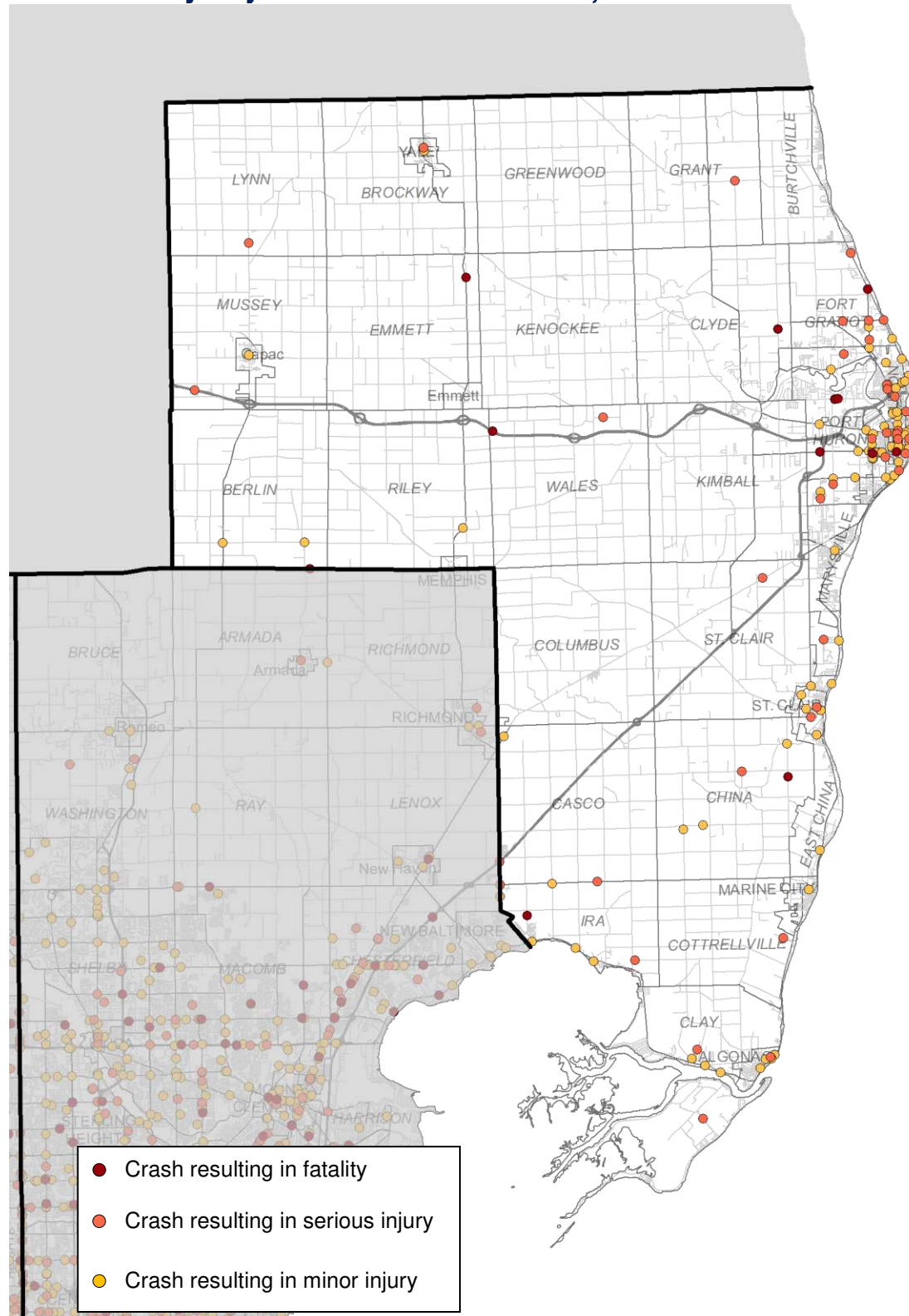
# Washtenaw County

## Planning Context

Washtenaw County consists of six cities, 20 townships, and two villages. The county is home to 11 county parks, eight state parks, three Huron-Clinton Metroparks, and the Border to Border Trail/Iron Belle Trail. When complete, this county-wide trail will connect to 70 percent of the county's population and includes multiple major "spurs," such as the Matthaei Botanical Gardens Trail. The county is also bisected by the Huron River, which provides an array of water recreation opportunities, especially at Argo Canoe Livery and Cascades and Gallup Park. In total, the county has the region's second greatest amount of parks, with 38,695 acres, or 112 acres per 1,000 residents.

With a population of 361,509 the county is home to eight percent of the region's total population. There are 256,651 jobs in the county. The vast majority of workers – 78 percent – work in the county. Wayne and Oakland Counties are the largest commuting destinations with 16 percent of workers. The average commute time is 22 minutes, which is the shortest for any county in the region. The county is served by multiple freeways and major corridors including I-94, US-14, M-23, and M-12. Ann Arbor and the University of Michigan are the county's largest job centers, but significant employment can also be found in the surrounding communities of Pittsfield Township, Ypsilanti, and Ypsilanti Township. Between 2010 and 2019, Washtenaw County's population increased by eight percent. SEMCOG forecasts the county's population will continue to increase by another 27 percent by 2045. This is the second largest forecasted population increase for any county in the region. Approximately 58 percent of the county's land is agricultural, open space, or recreational. An additional 21 percent is single-family residential.

### Local Highlight: Border-to-Border Trail (B2B)

The Border-to-Border Trail is a nonmotorized pathway connecting cities, parks, and destinations throughout Washtenaw County. Currently, more than 40 miles of trail exist, with 70 more miles planned. Through coordination and partnership with the Huron Waterloo Pathway Initiative, an additional 29-mile paved, shared-use path connecting Dexter, Chelsea, Stockbridge, the Lakelands Trail, and Pinckney is underway. A major goal of B2B is to route the trail away from roads to create a safe and fun experience for as wide a range of users as possible.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in Washtenaw County. Highlights are shown in Table 6.

Table 6
**Local Plans that Influence Bicycling and Walking in Washtenaw County**

| Plan Title | Highlights |
|---|---|
| **City of Ann Arbor Non-Motorized Transportation Plan (2013)** | Highlights importance of incorporating nonmotorized best practices into all relevant policies, and all aspects and stages of planning. Recommends increasing awareness of nonmotorized transportation opportunities and benefits, and also provides information to all users on safe ways to integrate all transportation modes. Provides policies and programs addressing bicycle and pedestrian travel, including road-crossing guidelines. |

| | |
|---|---|
| **City of Chelsea Master Plan (2019)** | Nonmotorized section identifies nonmotorized connections for active transportation between various areas of the city and opportunities to connect the city's pathways and biking system with regional paths. |
| **Pittsfield Township Sustainable Vision for Parks and Recreation (2017)** | Sets a goal of participating in establishing a township-wide nonmotorized transportation system. Action item identifies expansion of nonmotorized sidewalks, bike lanes, greenways/pathways amenities. |
| **City of Saline Non-Motorized Transportation Plan (2017)** | Map of proposed nonmotorized transportation routes for the city was developed to serve as a guide for future nonmotorized funding, design, and implementation. Also includes proposed safe pedestrian crossings locations throughout the city. |
| **City of Ypsilanti Non-Motorized Transportation Master Plan (2010)** | Emphasizes linkage between land use and zoning to nonmotorized transportation planning. Recommends that any future zoning amendments do not reduce vital transportation options; and policies to determine how appropriate infill development, neighborhood-scaled businesses, and other land-use options can support nonmotorized transportation. |
| **Non-Motorized Transportation Plan Washtenaw Area Transportation Study (2018)** | Highlights the importance of adopting context sensitive solutions in improving or maintaining safety, mobility, and infrastructure conditions. Includes creative funding sources necessary to implement the plan's vision. Emphasizes the importance of adopting a set of performance measures and targets to measure plan progress. |
| **Huron-Clinton Metroparks Master Plans** | The Hudson Mills Metropark Master Plan (2017) highlights the importance of B2B and Iron Bell Trail connections to county and state leaders; identifies development of Border-to-Border (B2B) hike-bike trail extension to Lakelands Trail and Livingston County as key projects. The Dexter-Huron & Delhi Metroparks Master Plan (2018) includes supporting the extension of Border to Border in both parks as action items. |

## Walking and Bicycling in Washtenaw County

### Existing Facilities

Washtenaw County has an extensive network of pedestrian and bicycling facilities. With the largest number of miles of bicycle routes and wide-paved shoulders in the region, the county provides significant access between the more rural townships and villages and cities. The county's cities and villages have significant pedestrian networks, especially in and near the historic downtowns and business districts. The City of Ann Arbor provides a wealth of facilities for both walkers and bicyclists, and continues to grow annually. Pittsfield and Ypsilanti Townships are planning for facilities for both pedestrians and bicyclists, along with enhancements that connect both to the county's Border-to-Border Trail. In the northwest part of the county, the Huron Waterloo Pathways are making significant progress to connect the Border-to-Border Trail west to Chelsea and north through Lyndon Township. The county has 1,464 miles of sidewalks and 823 miles of bikeways.

Figure 66
**Washtenaw County Sidewalk Mileage**



Figure 67
**Washtenaw County Bicycle Network by Type (Miles)**
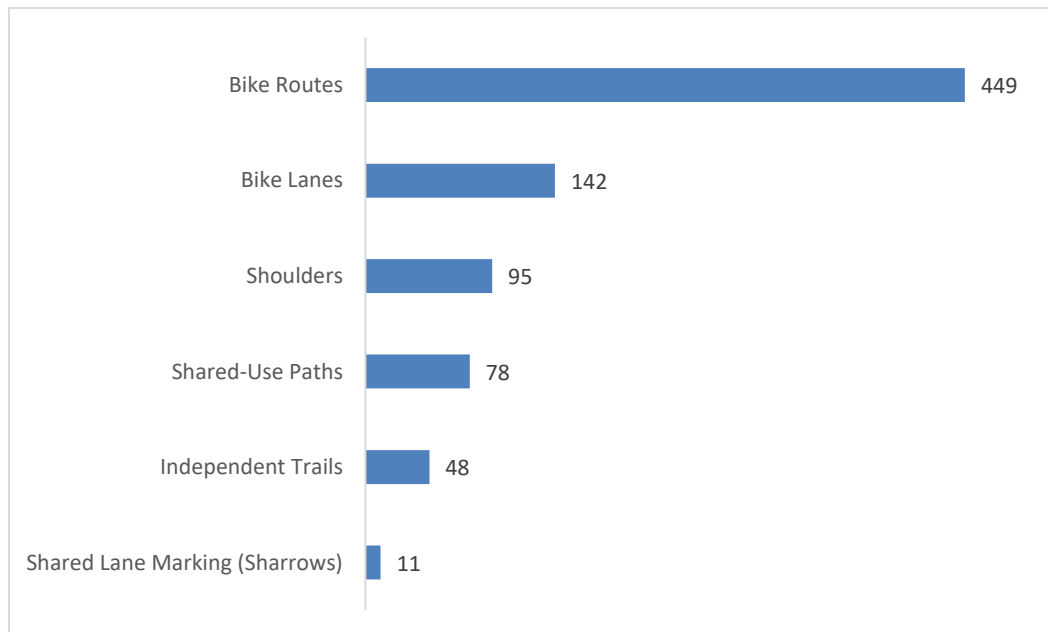
Figure 68
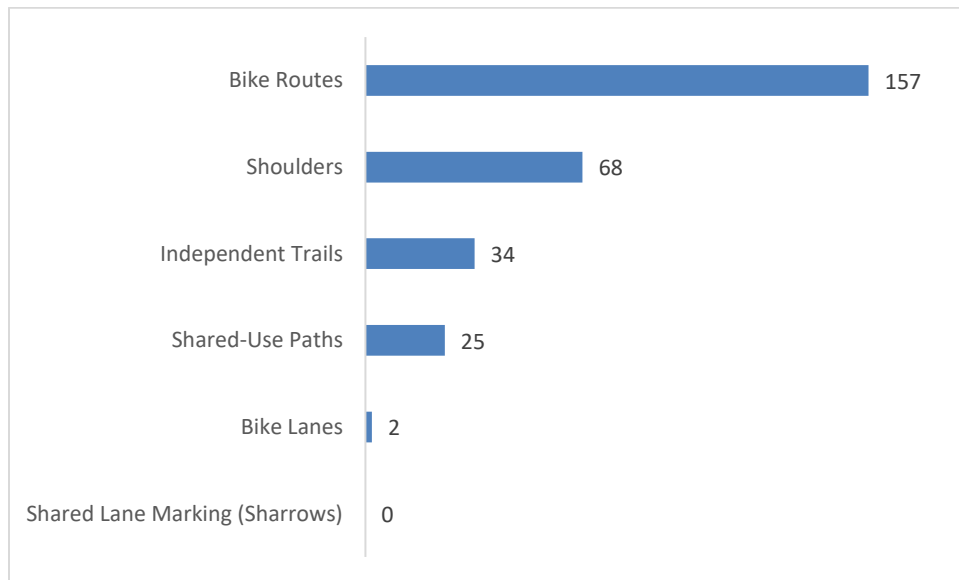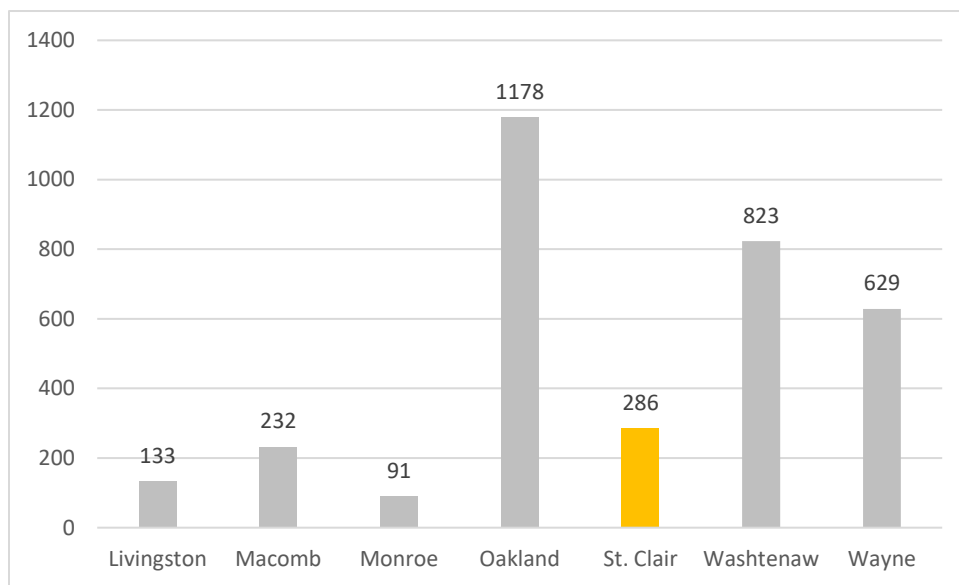**Washtenaw County Bicycle Network Mileage**
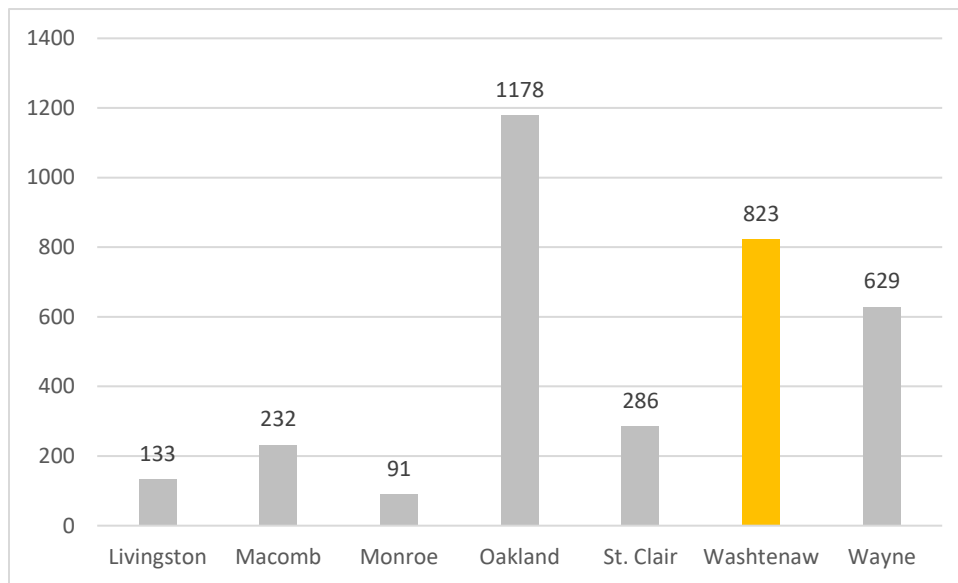


## Activity Level

Walking and bicycling currently accounts for 11 percent of trips in Washtenaw County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 22 minutes. Additionally, the majority of workers who live in Washtenaw County are also employed in Washtenaw County as well (78 percent), creating the potential for walking and bicycling as a commute option for many workers.

Figure 69
**Washtenaw County Trips by Mode**
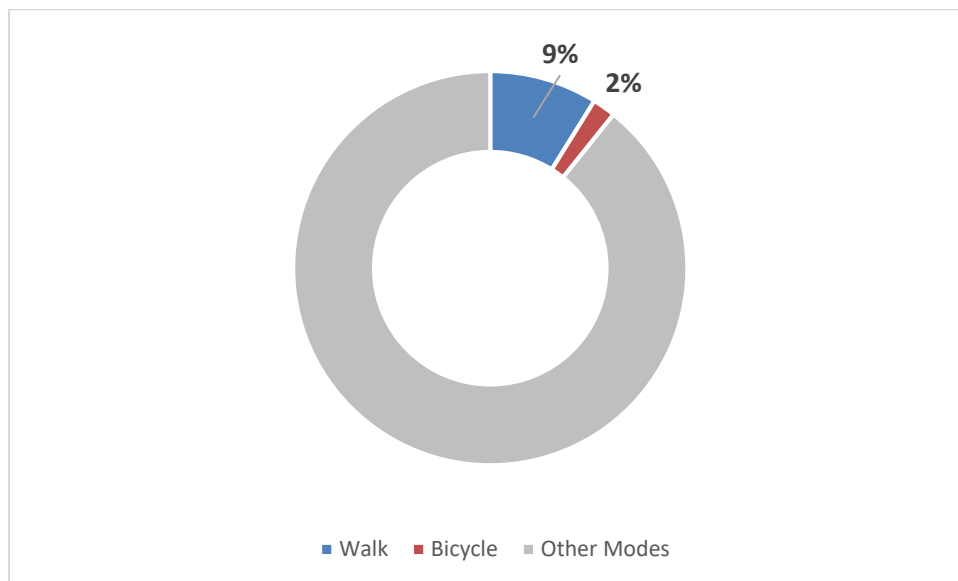
**Crash Data**

There were 995 pedestrian and bicycle crashes in Washtenaw County from 2014-2018; 23 people were killed in crashes involving a pedestrian, and 10 people were killed in crashes involving a bicycle. There were 118 serious injuries from bicycle and/or pedestrian crashes in the county during the same period. Washtenaw County had nine percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only two percent of total crashes in Washtenaw County, they account for about of 22 percent of fatalities and 16 percent of serious injuries. Excluding crashes where the jurisdiction is not known, more than 50 percent of bicycle and pedestrian crashes in Washtenaw County, take place on local roads.

Figure 70
**Washtenaw County Fatalities by Mode, 2014-2018**



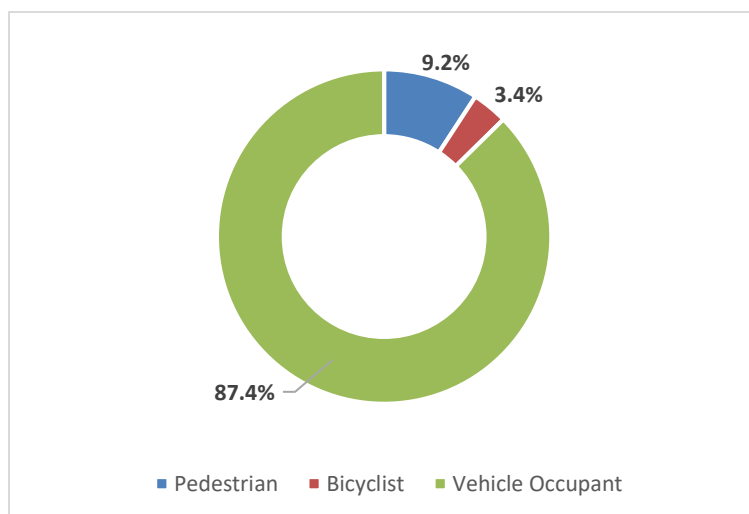■ Pedestrian ■ Bicyclist ■ Vehicle Occupant
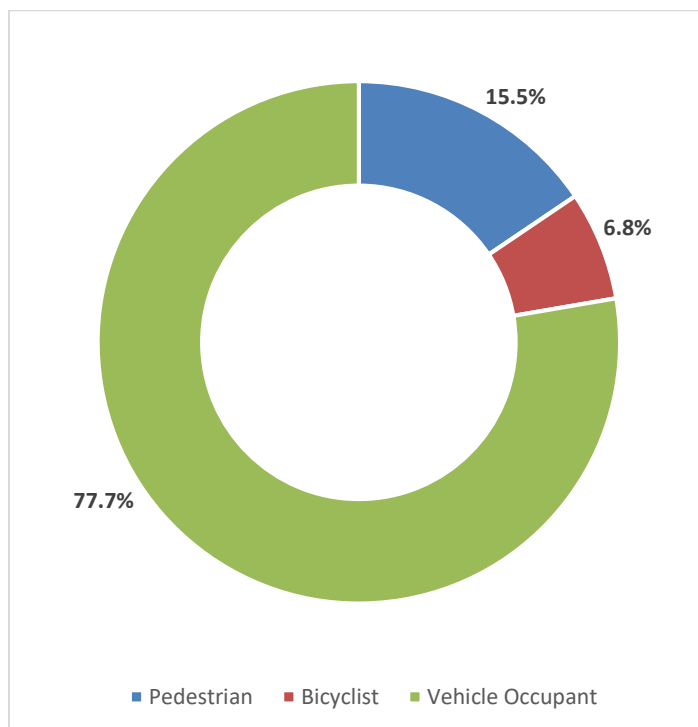
Figure 71
**Washtenaw County Serious Injuries by Mode, 2014-2018**
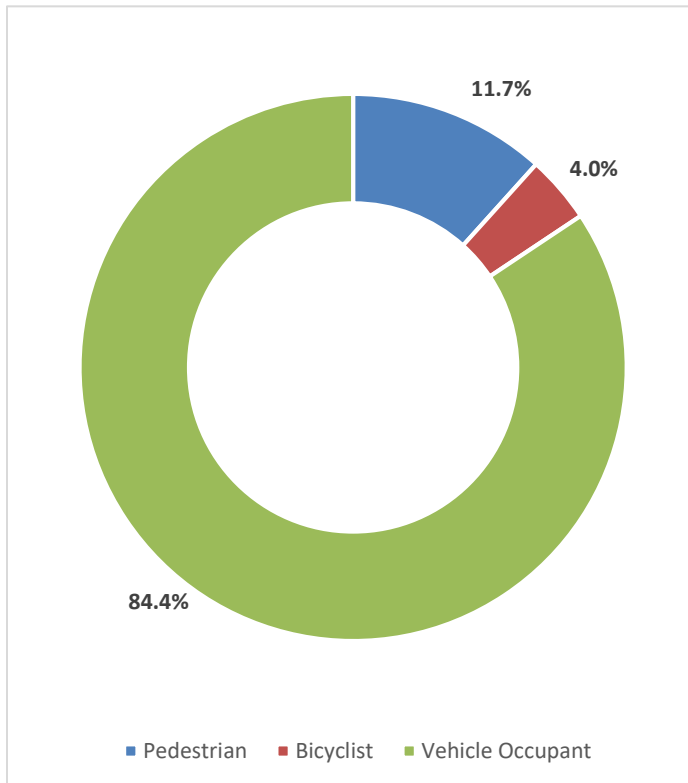


Figure 72
**Washtenaw County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**
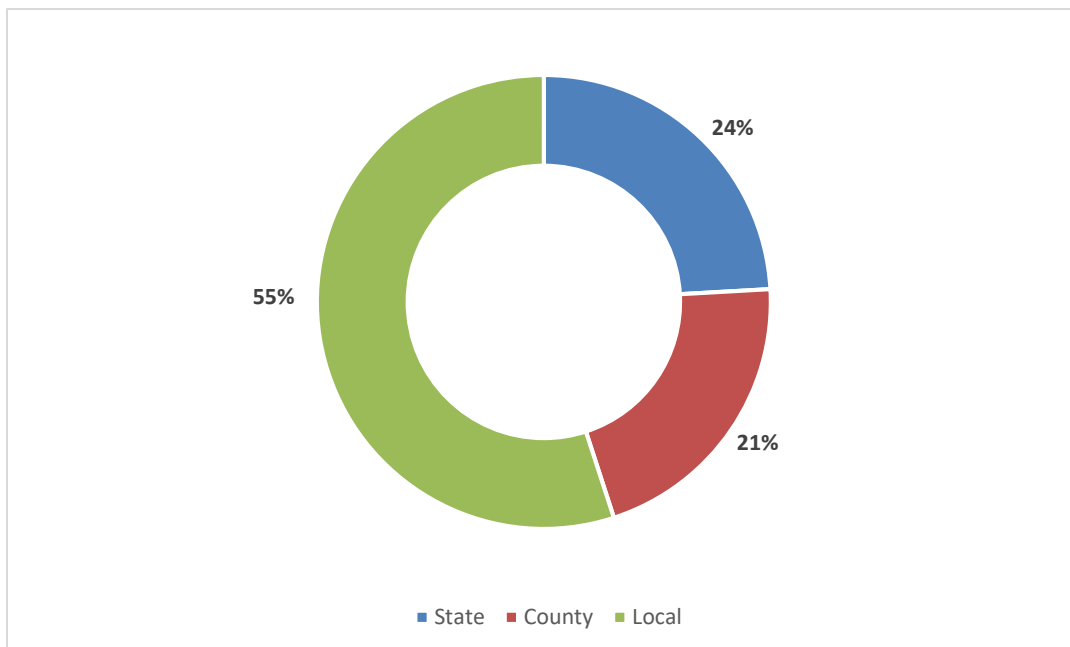
Figure 73
## Washtenaw County Bicycle Network



Legend:
- Shared-Use Path (green)
- Bike Lane (blue)
- Other Bikeway (orange)
  *(Including shared-lane markings, wide-paved shoulders, and bike routes)*
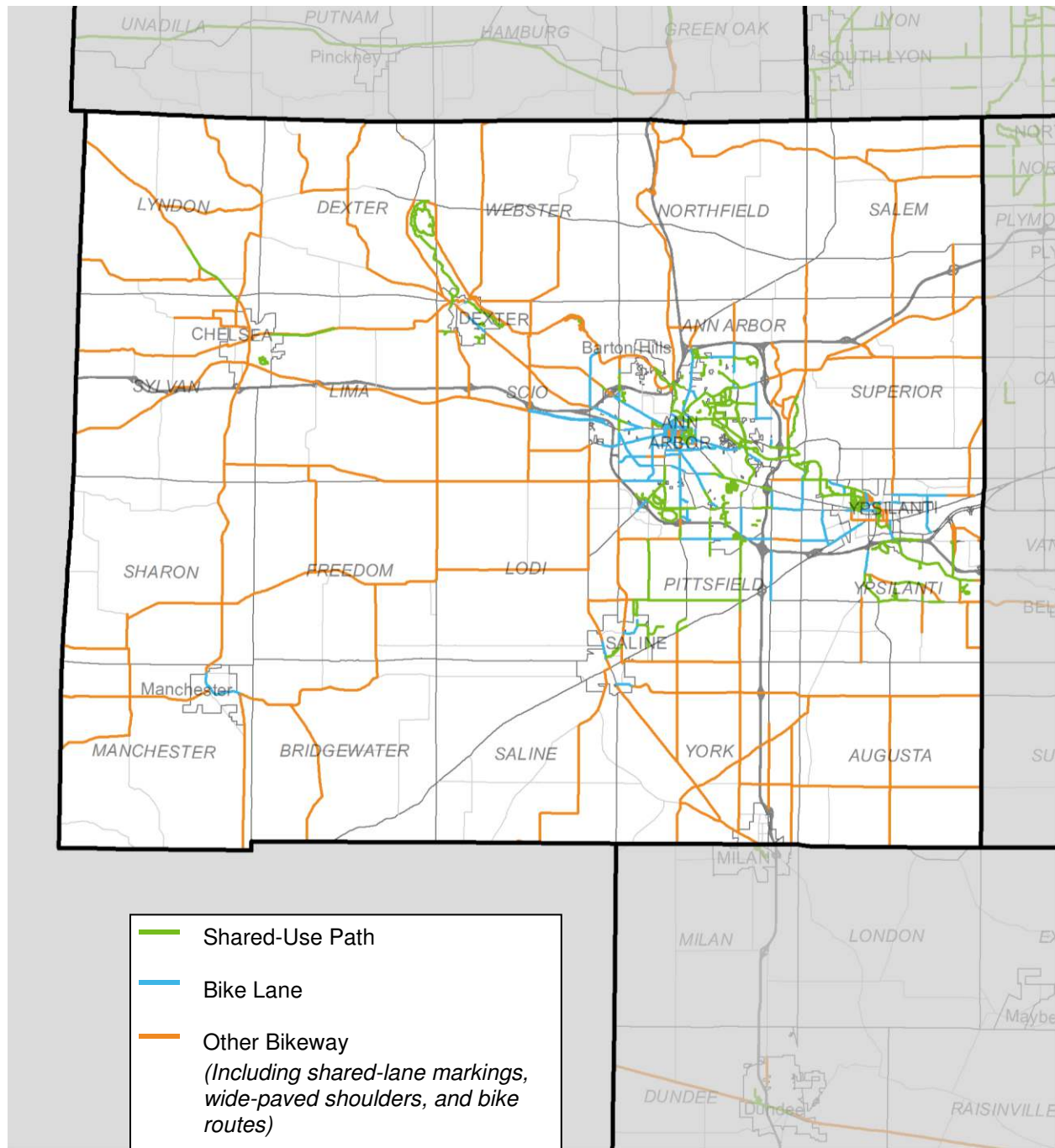
Figure 74
**Washtenaw County Pedestrian Infrastructure**



Legend:
- Sidewalk
- Shared-Use Path
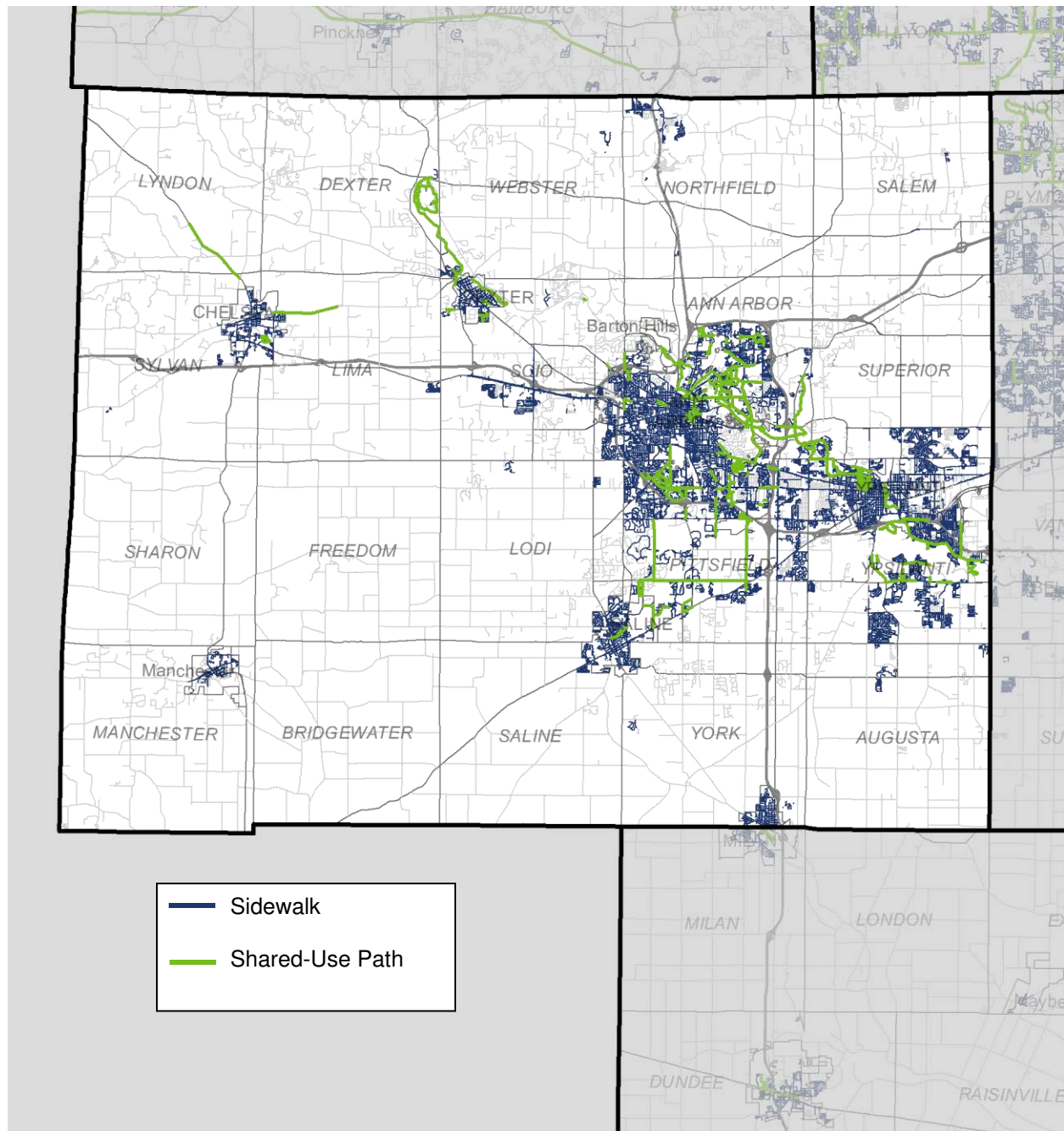
Figure 75
**Washtenaw County Bicycle and Pedestrian Demand Areas**



High Demand Area

Moderate Demand Area

Potential Demand Area

Park

Lake
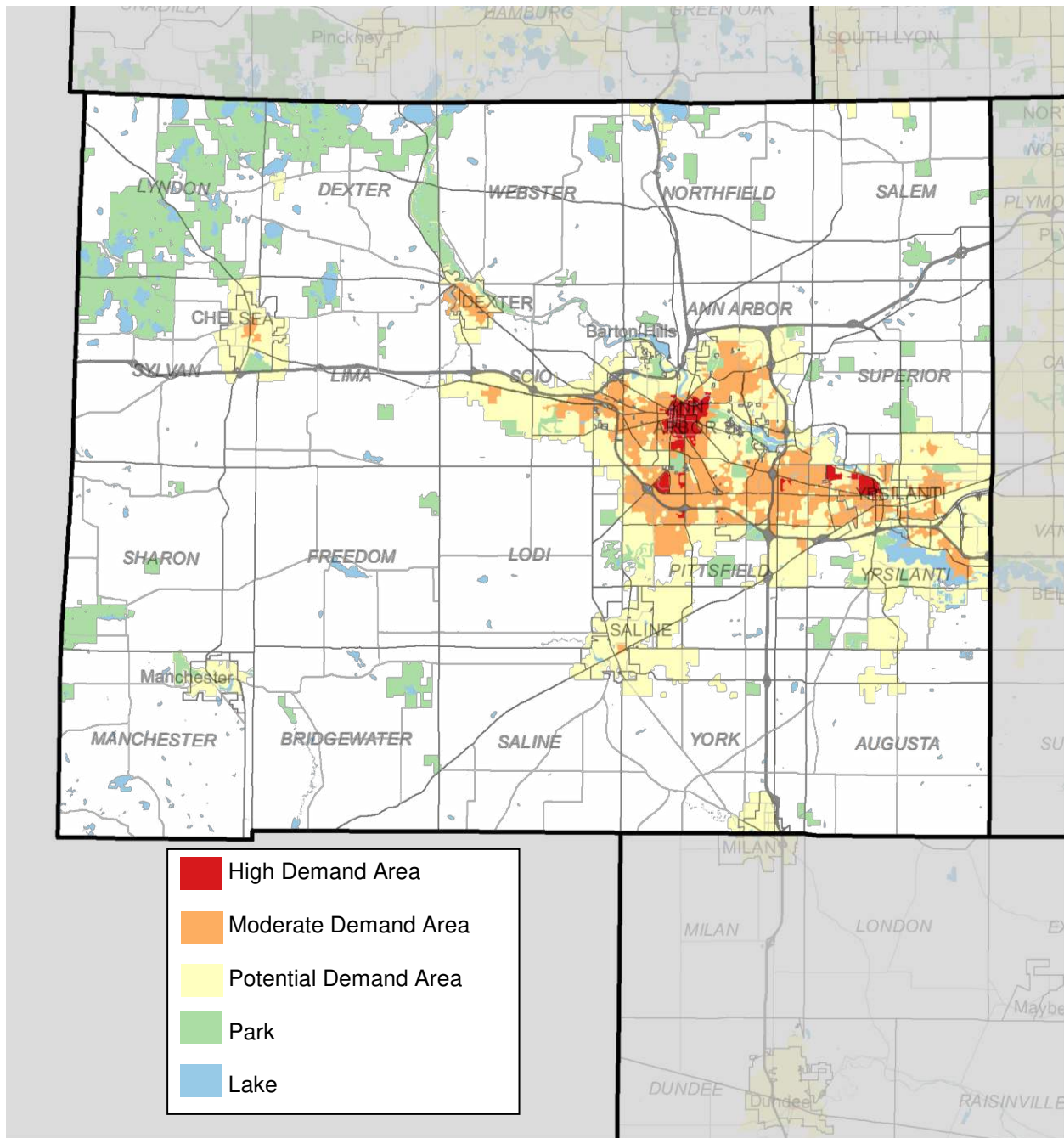
Figure 76
**Washtenaw County Gaps in Pedestrian Infrastructure Access by Demand Area**



Legend:
- High Demand Areas without access to pedestrian infrastructure
- Moderate Demand Areas without access to pedestrian infrastructure
- Potential Demand Areas without access to pedestrian infrastructure
- Park
- Lake
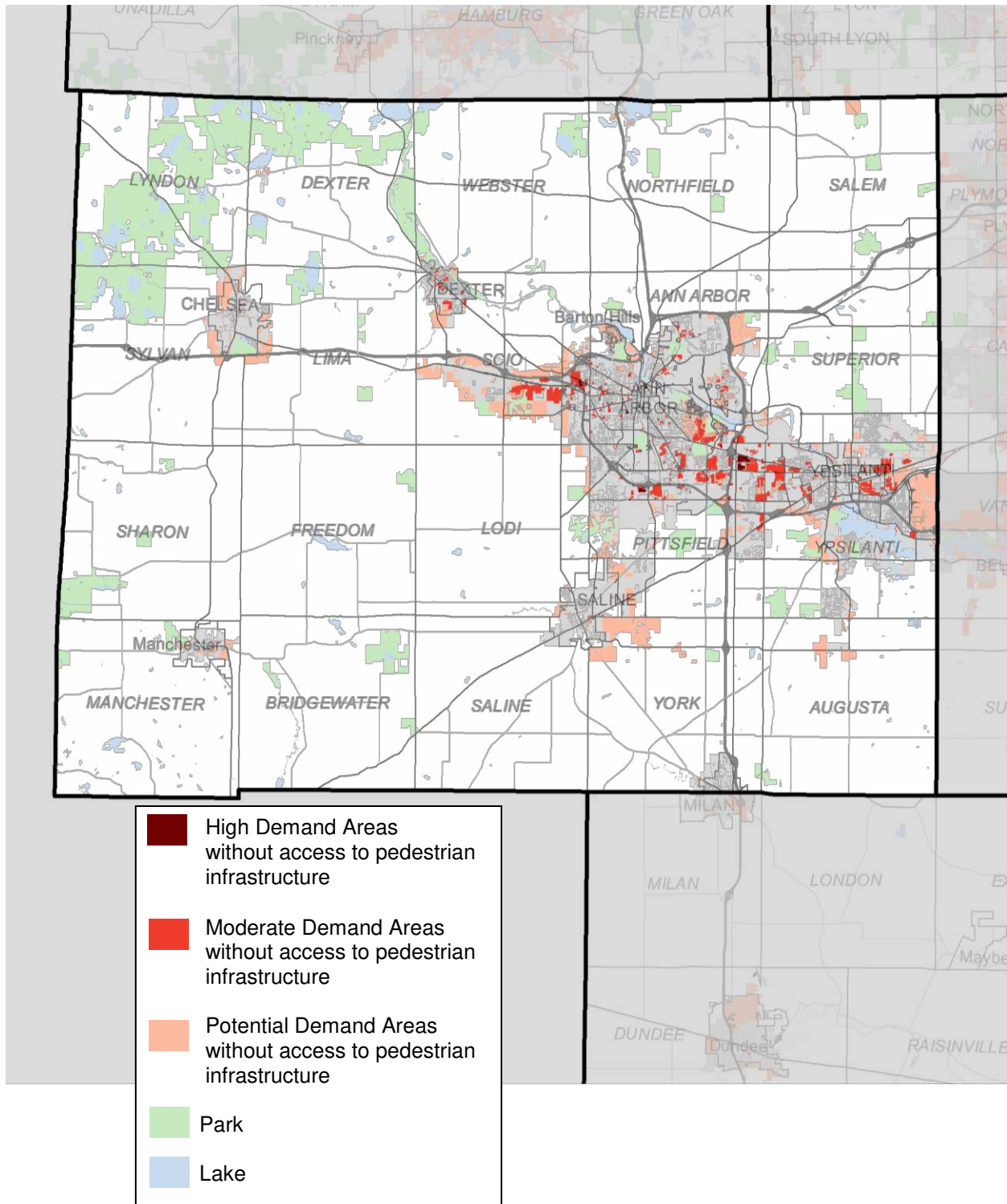
Figure 77
**Washtenaw County Gaps in Bicycle Infrastructure Access by Demand Area**



Legend:
- **Moderate Demand Areas** without bicycle infrastructure within one-half mile
- **Potential Demand Areas** without bicycle infrastructure within one-half mile
- Park
- Lake
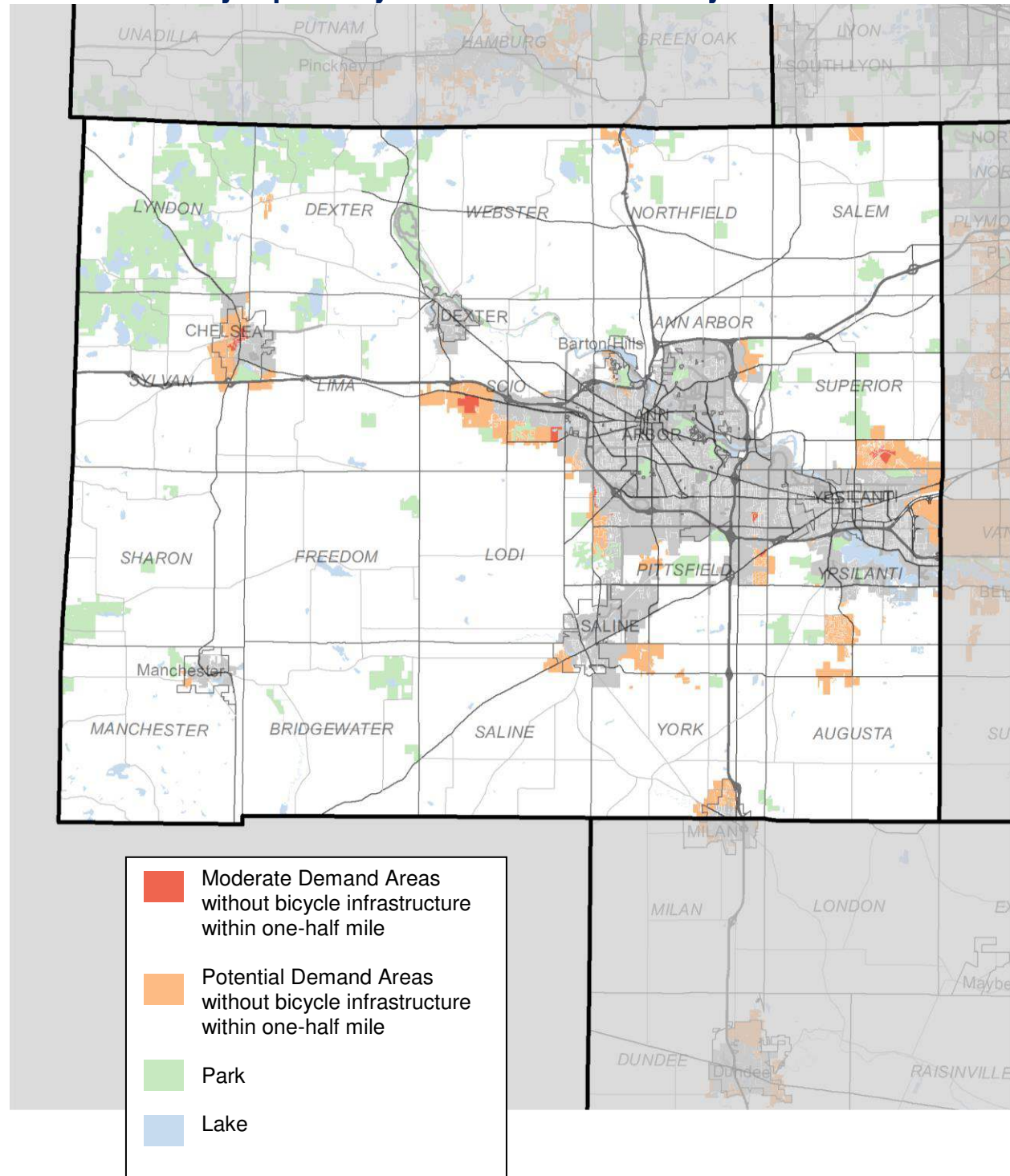
Figure 78
**Washtenaw County Bicycle and Pedestrian Crashes, 2014-2018**



● Crash resulting in fatality

● Crash resulting in serious injury

● Crash resulting in minor injury
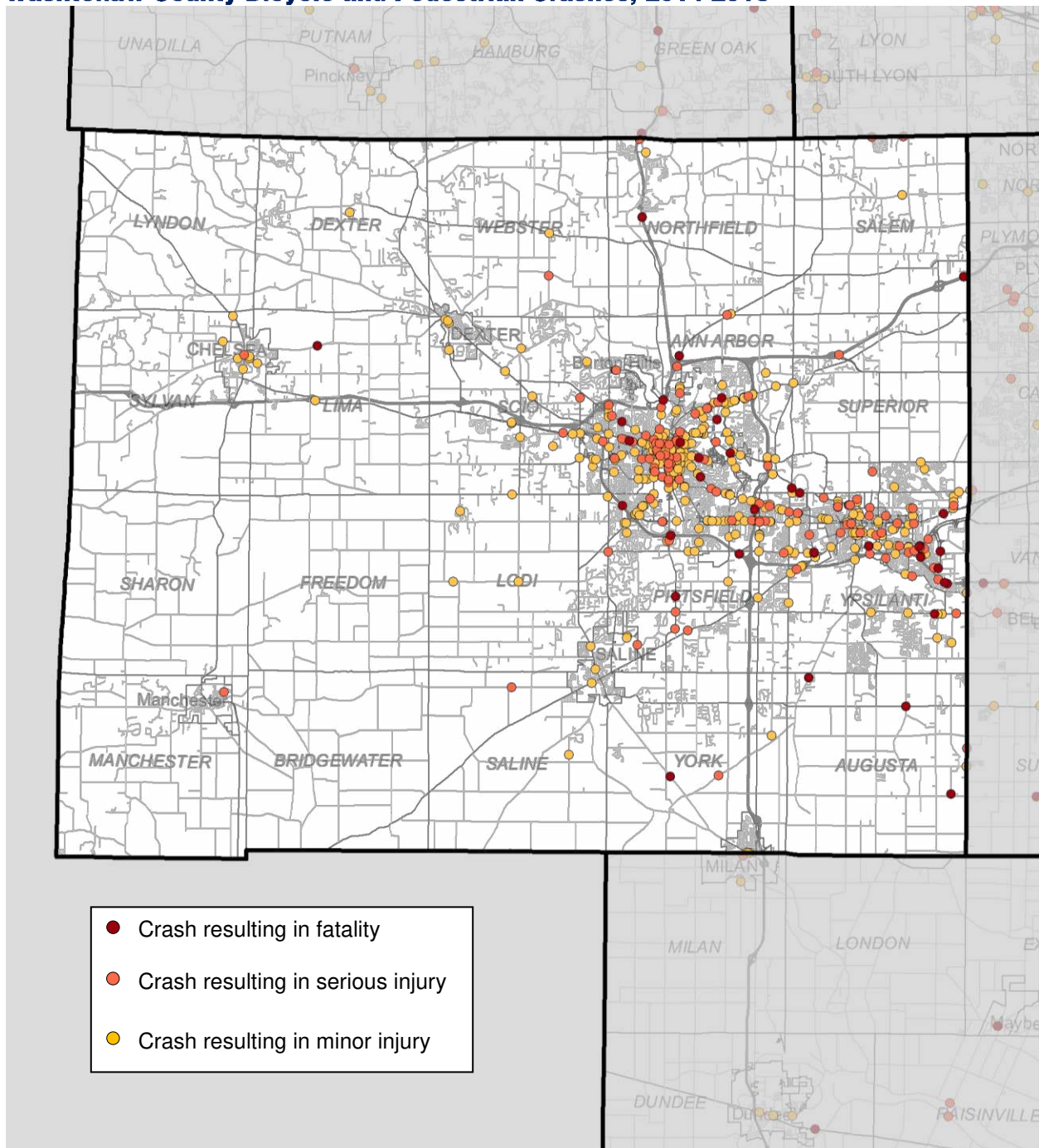
# Wayne County

## Planning Context

Wayne County consists of 33 cities and nine townships. The county is home to three state parks, four Huron-Clinton Metroparks, and eight county parks, including Hines Park which features 24 distinct recreation areas and trails. Wayne County has multiple trails connecting downtowns and cultural destinations, including the Detroit RiverWalk, Dequindre Cut, I-275 Metro Trail, and the Downriver Linked Greenways, which includes trails through each of the four Metroparks in the county – Huron, Lake Erie, Oakwoods, and Willow. In total, the county has 28,962 acres of parks, or 16 acres per 1,000 residents.

With a population of 1,763,822, the county is the most populous in the region, accounting for 37 percent of the region's total. There are 927,801 jobs in the county. The vast majority of workers – 68 percent – work in the county. Oakland and Macomb counties are the largest commuting destinations, with 23 percent of workers. The average commute time for the county is 25 minutes. The county is served by multiple freeways and major corridors that primarily originate or pass through the City of Detroit. Detroit is the county's and region's major job and cultural center, with 336,795 jobs and regional attractions from sporting stadiums, to museums, concert halls, and theaters.

Between 2010 and 2019, Wayne County's population decreased by four percent. SEMCOG forecasts that the county's population will increase by five percent by 2045. As the region's most developed county, the major land uses are Transportation/Communication/Utilities and single-family residential. Combined, these two land uses account for 62 percent of the county's land. The county also has the region's highest population density (persons/acre) at 4.47.

### Local Highlight: Downriver Linked Greenways

Since 1998, the Downriver Linked Greenways has helped to facilitate over 75 miles of trails and pathways through the Downriver region. The goal is to help transform this area into a healthier community for all residents and visitors by creating a network of trails and green spaces. These trails traverse many different types of places, including rural, urban, and over 7,000 acres of parkland.

## Plans and Policies

Several local plans identify needed bicycling and walking improvements in Wayne County. Highlights are shown in Table 7.

Table 7
**Local Plans that Influence Bicycling and Walking in Wayne County**

| Plan Title | Highlights |
|---|---|
| **City of Dearborn Multimodal Plan (2019)** | Includes several innovative and implementable recommendations, including adopting a Complete Streets and vision zero ordinance, establishing a multimodal transportation board, identifying where shared and autonomous vehicles can be parked, developing a multimodal information website, and deploying real-time transit information. |

| | |
|---|---|
| **Livonia Bike Walk (2015)** | Arterial Sidewalk System Gaps were identified, defined as areas recommended for installing either sidewalks or a shared-use path to complete the arterial sidewalk network. Identifies priority crossing improvements within the community, and includes a bikeway preferred facility map. |
| **City of Northville Non-Motorized Plan (2013)** | Six priority routes were proposed for establishing nonmotorized facilities for short- and long-term developments. Includes recommendations to improve awareness of bicycle and pedestrian facilities and opportunities to promote bicycling and walking, and providing funding source options to ensure implementation. |
| **City of Plymouth Master Plan (2018)** | The five sub-area plans provide detailed directions on design principles, and proposed pedestrian amenities. Sets goals for nonmotorized improvements, including creating a comprehensive nonmotorized plan, creating a bicycle network that connects neighborhoods and community destinations, improving pedestrian crossing at seven identified intersections, and exploring funding options for future projects. |
| **City of Woodhaven Parks and Recreation Master Plan (2016)** | Includes the city's pathways plan, which establishes a continuous city-wide walkway system connecting neighborhoods to community destinations and is also tied into the regional greenway system. Includes a project schedule, which outlines the cost estimate and timeframe for proposed projects. |

## Walking and Bicycling in Wayne County

**Existing Facilities**

Wayne County has the region's most extensive network of pedestrian facilities. The majority of cities have sidewalks connecting neighborhoods to core services; most residential streets have sidewalks on both sides of the street. The City of Detroit has the most miles of pedestrian and bicycle facilities in the region. The city also provides some of the region's most-used facilities with the Detroit RiverWalk and Dequindre Cut, and is currently developing the Joe Louis Greenway which, when complete, will be a 32-mile trail connecting the city with Highland Park, Hamtramck, and Dearborn. Multiple trails provide access and connectivity to core services and neighborhoods including the I-275 Metro Trail, Hines Park Trail, and Lower Huron to Lake Erie Trail System. Canton Township has invested significantly in connecting the township's pedestrian network and has used ITC corridors with great success to connect into the Lower Rouge River Trail and I-275 Metro Trail. The county has 11,422 miles of sidewalks (most of any county in the region) and 629 miles of bikeways.
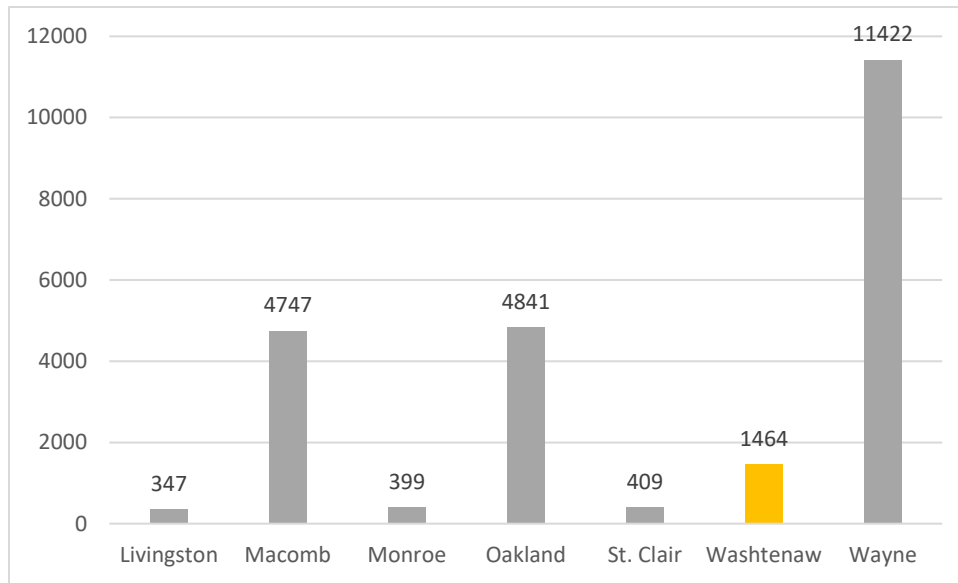
Figure 79
**Wayne County Sidewalk Mileage**
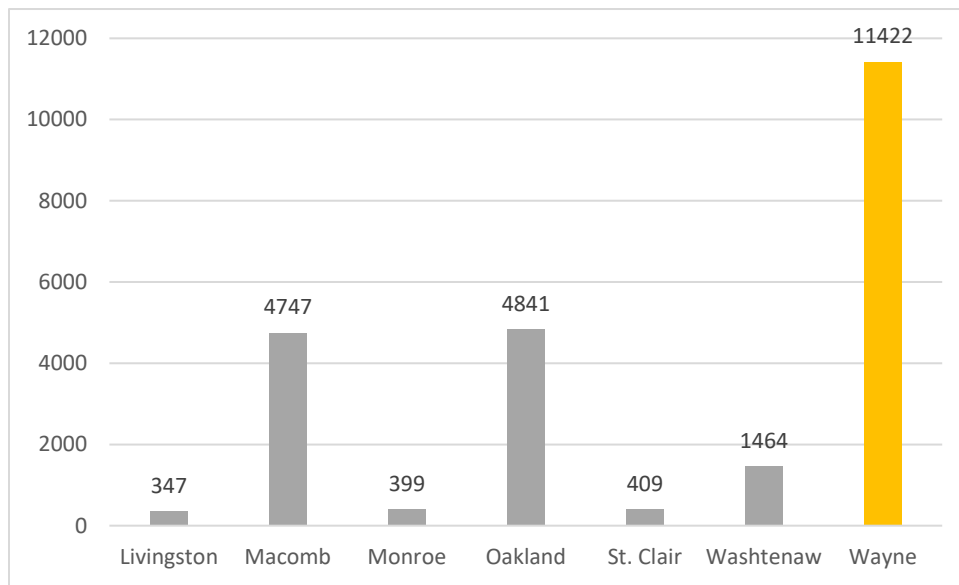


Figure 80
**Wayne County Bicycle Network by Type (Miles)**
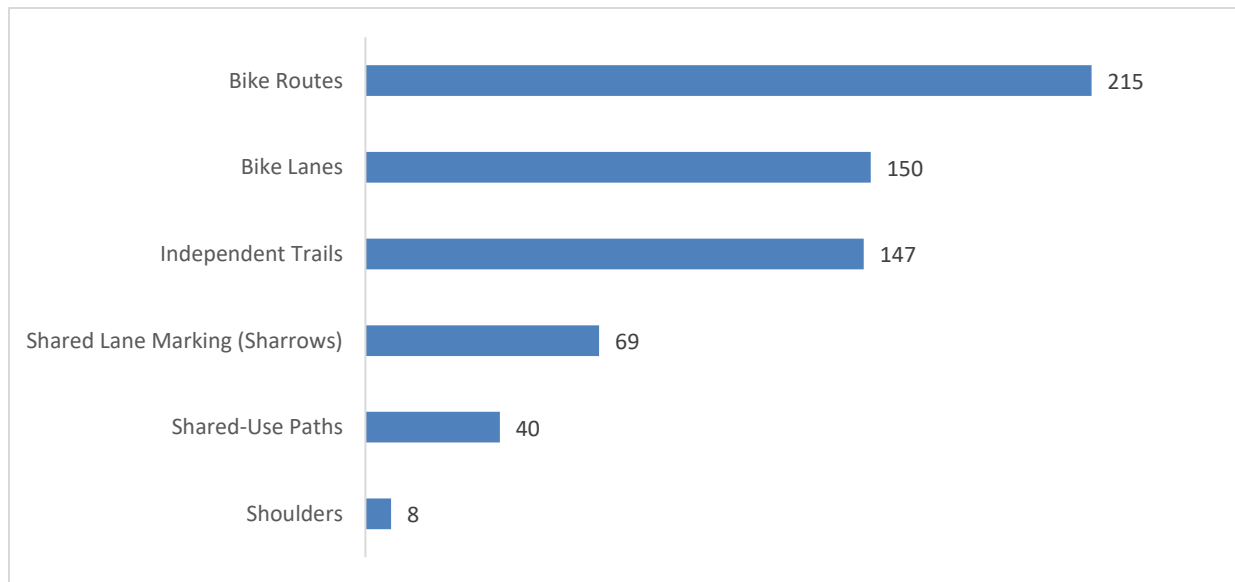
Figure 81
**Wayne County Bicycle Network Mileage**
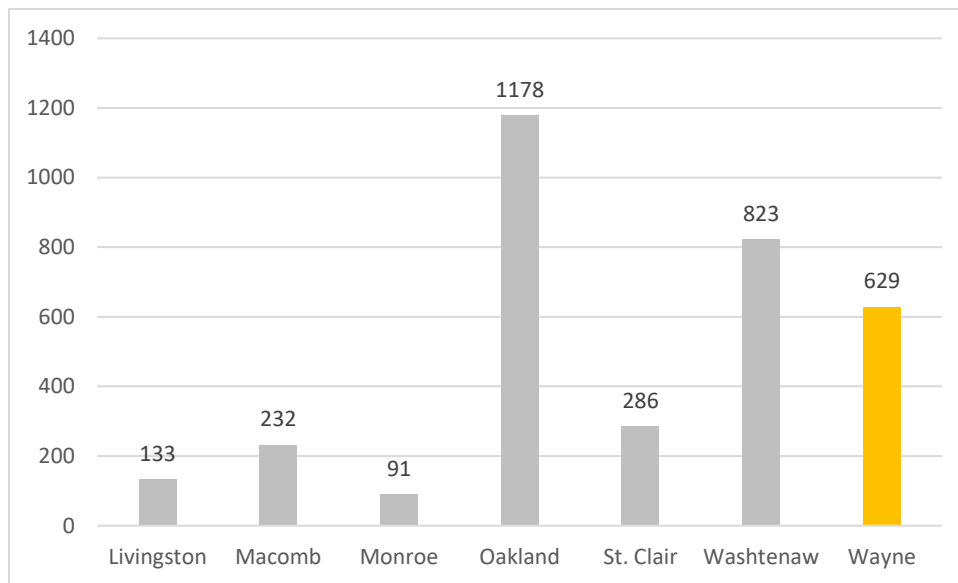


## Activity Level

Walking and bicycling currently accounts for nine percent of trips in Wayne County. The average travel time to work for residents age 16 and over who live in the county and work outside the home is 24 minutes. Additionally, 74 percent of workers who live in Wayne County are employed in the county, creating the potential for walking and bicycling as a commute option for many workers.

Figure 82
**Wayne County Trips by Mode**
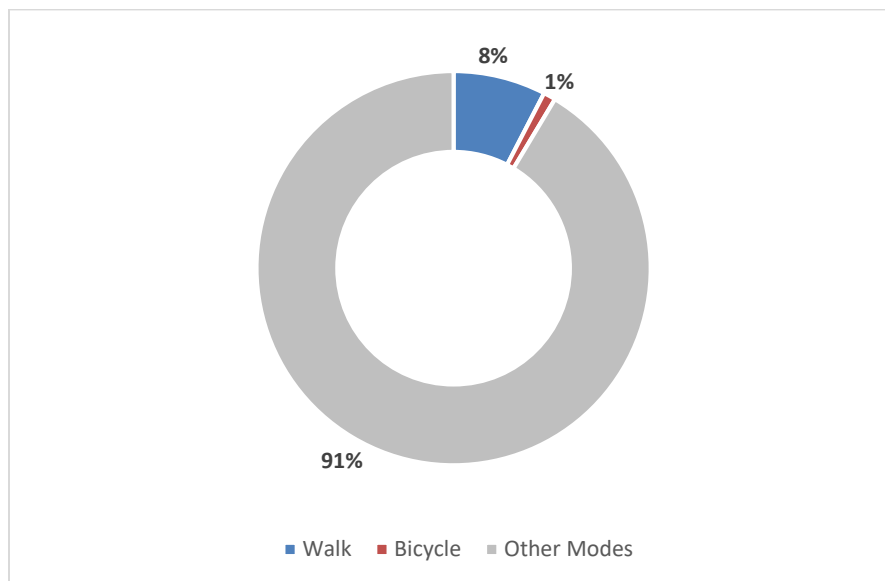
**Crash Data**

There were 5,635 pedestrian and bicycle crashes in Wayne County from 2014-2018; 258 people were killed in crashes involving a pedestrian, and 18 people were killed in crashes involving a bicycle. There were 690 serious injuries from bicycle and/or pedestrian crashes in the county during the same period. Wayne County had 52 percent of the region's pedestrian and bicycle crashes.

Even though pedestrian and bicycle crashes account for only two percent of total crashes in Wayne County, they account for more than 31 percent of fatalities and 15 percent serious injuries. Excluding crashes where the road jurisdiction is not known, the largest share of bicycle and pedestrian crashes in Wayne County, take place on the local roads (43%).

Figure 83
**Wayne County Fatalities, 2014-2018**



29.1%

2.0%

68.8%

■ Pedestrian  ■ Bicyclist  ■ Vehicle Occupant
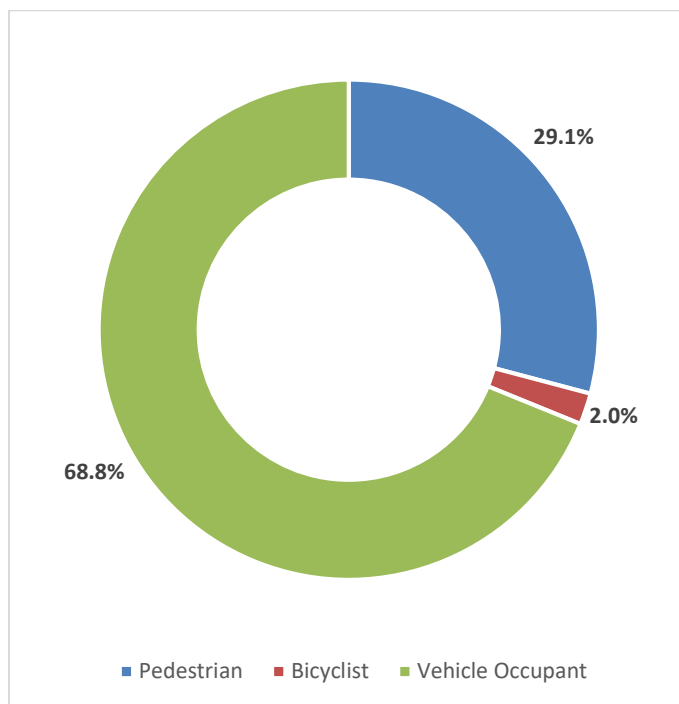
Figure 84
**Wayne County Serious Injuries by Mode, 2014-2018**
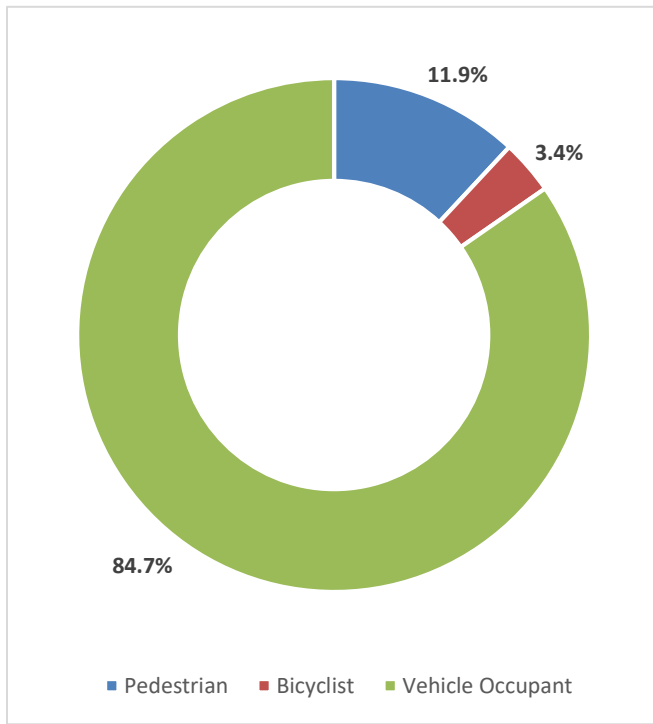


Figure 85
**Wayne County Pedestrian and Bicycle Crashes by Road Jurisdiction, 2014-2018**
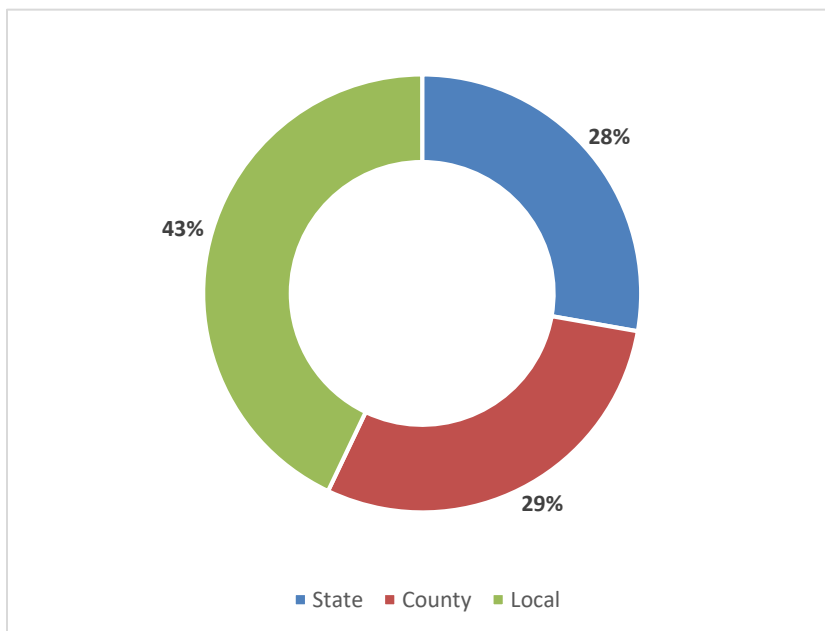
Figure 86
**Wayne County Bicycle Infrastructure & Bikeways**



Shared-Use Path

Bike Lane

Other Bikeway
*(Including shared-lane markings, wide-paved shoulders, and bike routes)*

Figure 87
**Wayne County Pedestrian Infrastructure**



Sidewalk

Shared-Use Path
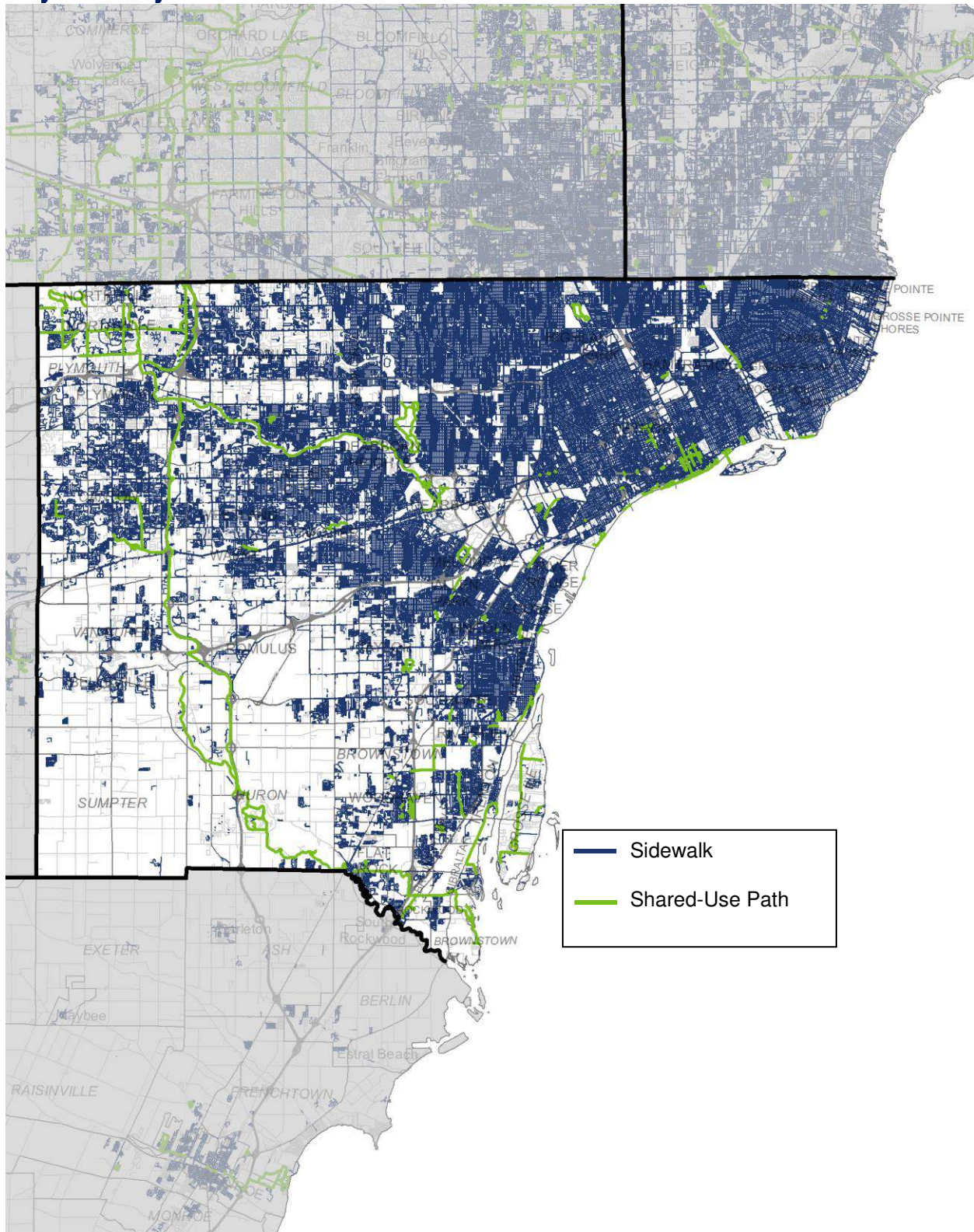
Figure 88
**Wayne County Bicycle and Pedestrian Demand Areas**



High Demand Area

Moderate Demand Area

Potential Demand Area

Park

Lake
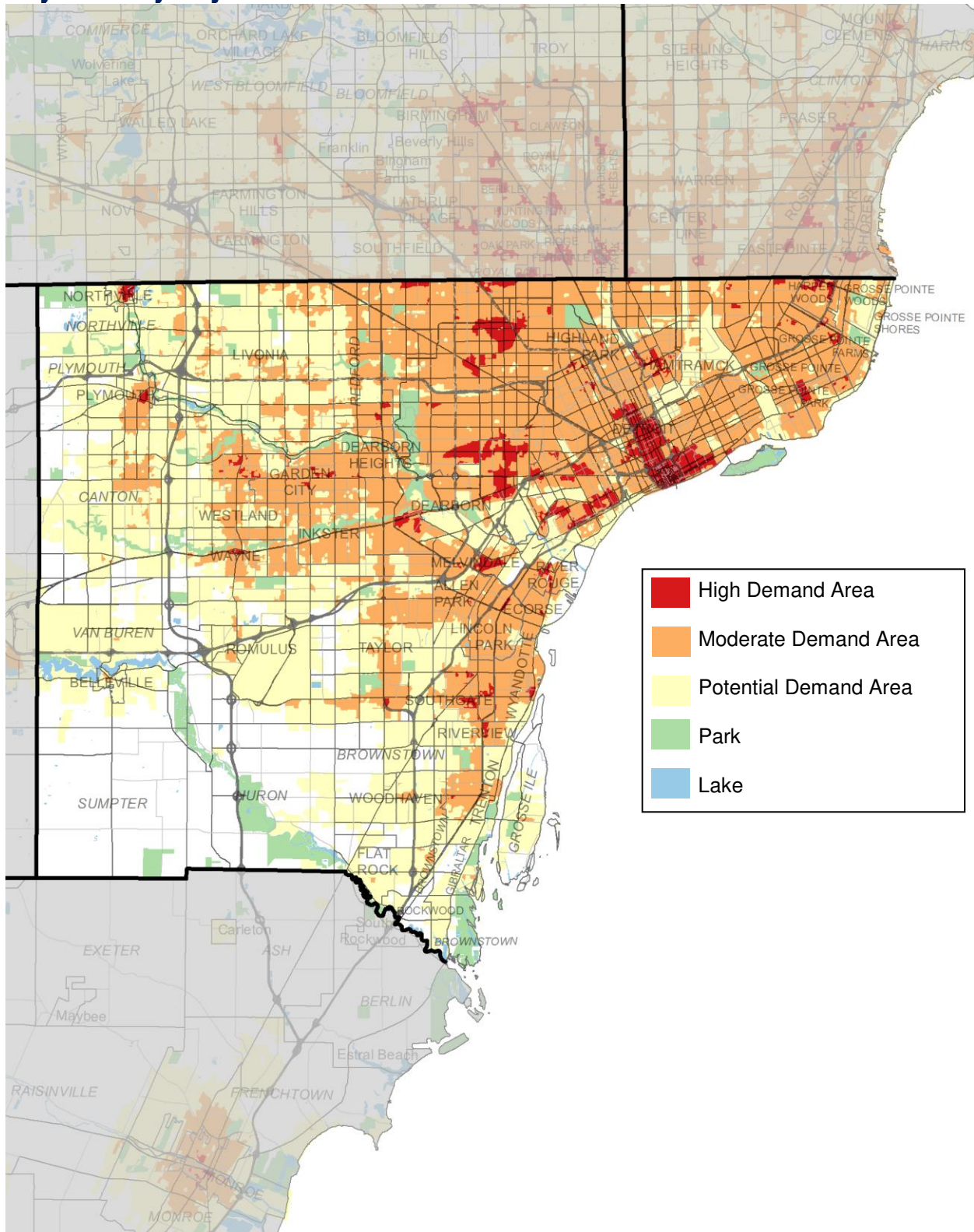
Figure 89
**Wayne County Gaps in Pedestrian Infrastructure Access by Demand Area**



High Demand Areas without access to pedestrian infrastructure

Moderate Demand Areas without access to pedestrian infrastructure

Potential Demand Areas without access to pedestrian infrastructure

Park

Lake
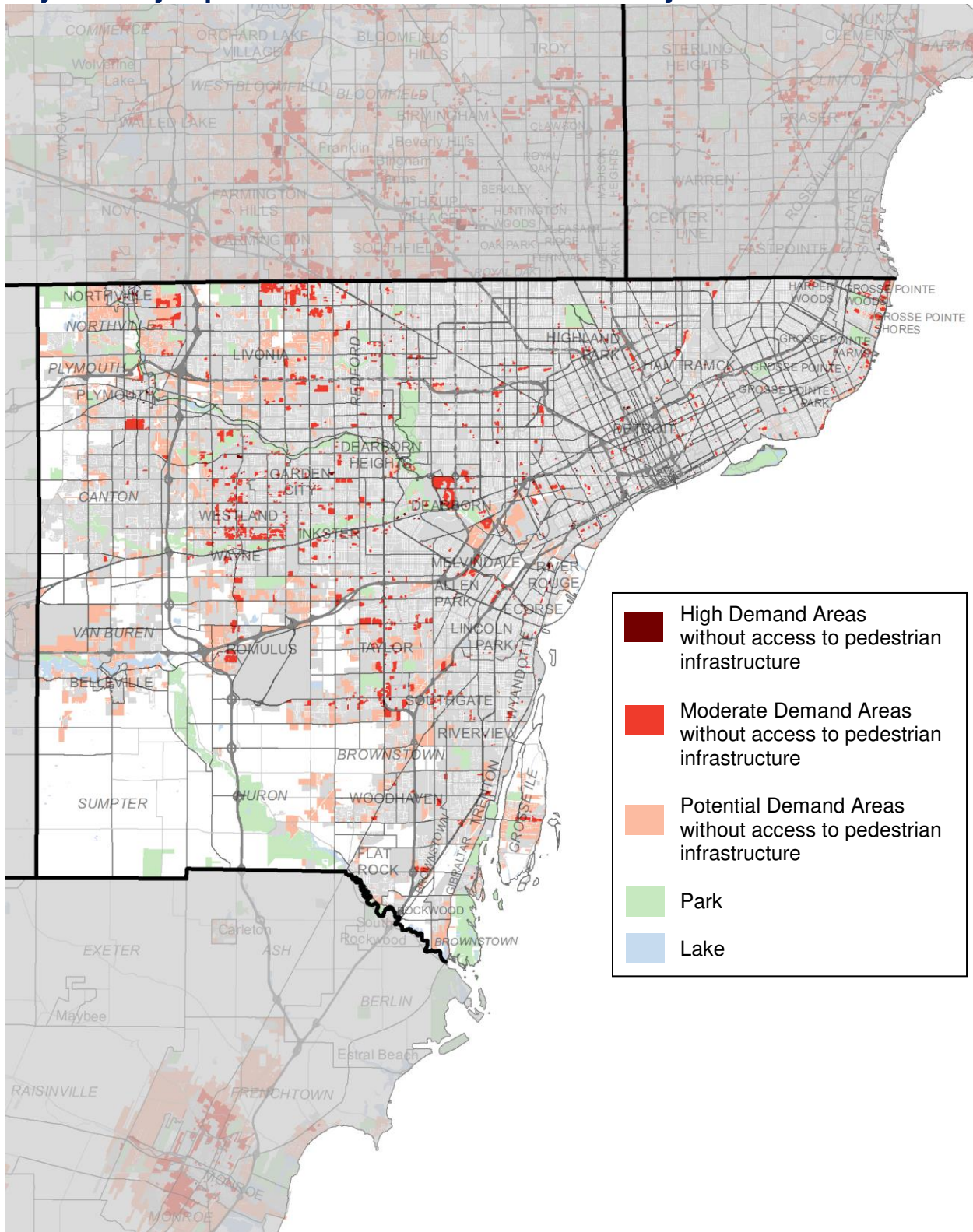
Figure 90
**Wayne County Gaps in Bicycle Infrastructure Access by Demand Area**



Legend:

- **High Demand Areas** without bicycle infrastructure within one-half mile
- **Moderate Demand Areas** without bicycle infrastructure within one-half mile
- **Potential Demand Areas** without bicycle infrastructure within one-half mile
- **Park**
- **Lake**
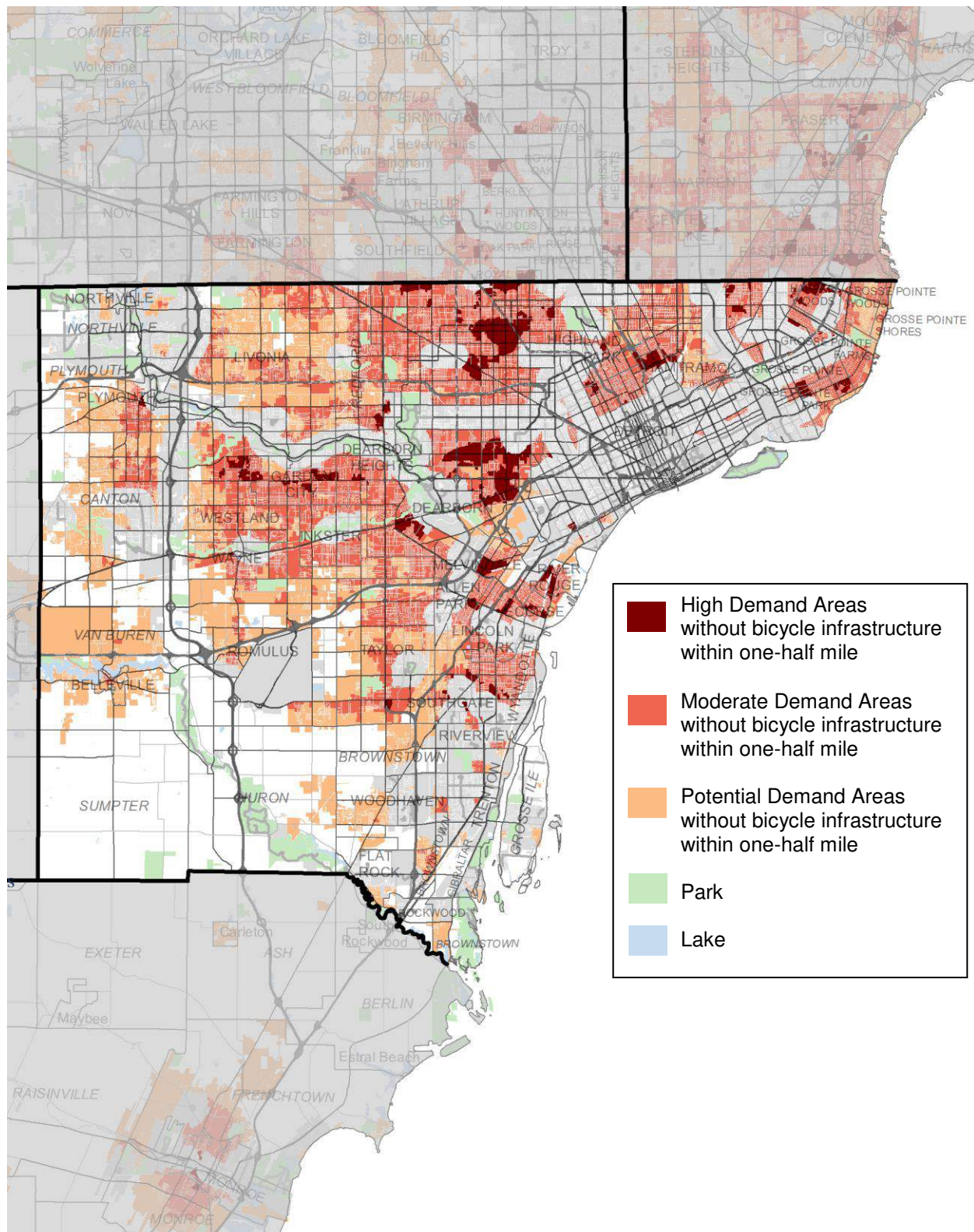
Figure 91
**Wayne County Bicycle and Pedestrian Crashes, 2014-2018**



Crash resulting in fatality

Crash resulting in serious injury

Crash resulting in minor injury
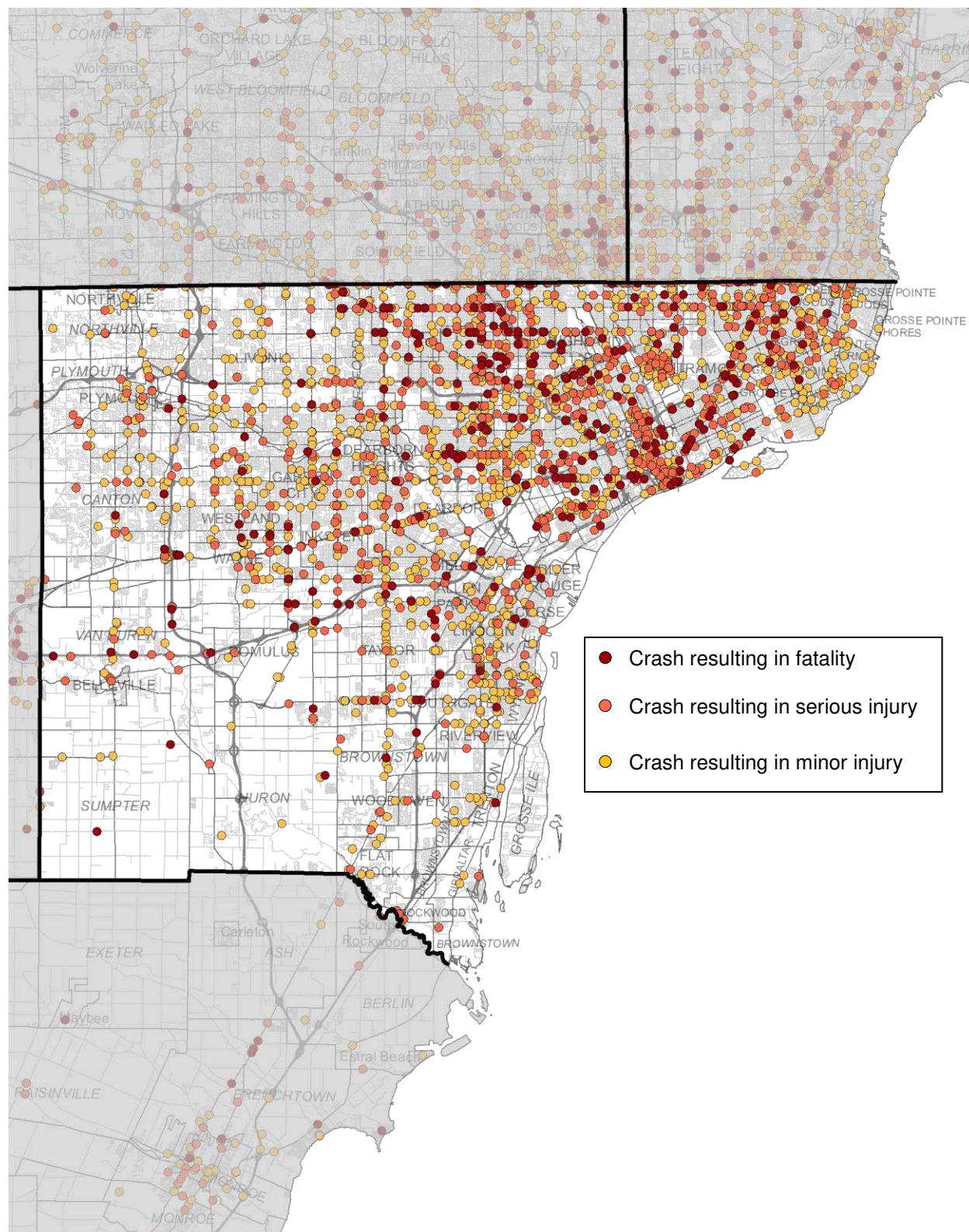
# Appendix B — Regional Bicycle and Pedestrian Corridors

The Bicycle and Pedestrian Mobility Plan identifies 26 Regional Corridors that serve as the main mobility connections and include a range of existing and planned infrastructure types, reflecting components of the regional trail network, state and national bike routes, demand centers and equity emphasis areas, along with other aspects of the system. They are intended to be used to facilitate cross-jurisdictional collaboration toward a common vision for bicycle and pedestrian mobility in Southeast Michigan.

Figure 92 provides a regional map of the corridors that corresponds with each of the identified 26 Regional Corridors. The naming for each corridor is to provide a general guide to where the corridor approximately begins and ends, and in some cases extends beyond the community named. The descriptions provided for each Regional Corridor are primarily to familiarize the reader with the corridor and the general communities, roadways, trails, parks, and amenities it connects.

## 1. Fowlerville to Detroit Corridor
- Connects demand areas in Fowlerville, Howell, Brighton, Lyon Township, Novi, Farmington, and Detroit
- Primarily follows the Grand River Avenue corridor where there are existing and planned sidewalks, shared-use paths, rural wide-paved shoulders and shared lane markings
- Corridor coordinates with MDOT University Region to link Southeast Michigan to Ingham County communities, including Lansing

## 2. Huron Waterloo Pathway Loop Corridor
- Connects demand areas in Chelsea, Dexter, and Pinckney  to Stockbridge in Ingham County
- Utilizes the Mike Levine Lakelands State Park Trail between Pinckney and Stockbridge
- Utilizes existing and planned shared use paths between Chelsea and Waterloo Recreation Area, Chelsea and Dexter, and Dexter to Hudson Mills Metropark
- Part of Washtenaw County's Border-to-Border Trail, Michigan's Iron Belle Trail, and the Great Lake to Lake Trail, Route 1

## 3. Pinckney to St Clair Shores Corridor
- Connects demand areas in Pinckney, South Lyon, Novi, Farmington, Southfield, Oak Park, Ferndale, Hazel Park, Warren, Eastpointe, and St Clair Shores
- Utilizes the Mike Levine Lakelands Trail State Park between Pinckney and Green Oak Township
- Primarily aligns with existing infrastructure and high demand areas along 10 Mile and 9 Mile Roads
- Nine Mile Road has the highest utilized east-west SMART bus route connecting pedestrians and bicyclists in Macomb and Oakland Counties

### 4. Chelsea to Manchester Corridor

- Connects the demand areas of Chelsea and Manchester

- Primarily follows the M-52 corridor and Washtenaw County Bike Route

- Corridor coordinates with MDOT University Region to link Southeast Michigan to Jackson County and the cities of Jackson and Napoleon to the west, and Lenawee County and the cities of Tecumseh and Adrian to the south

### 5. Dexter to Wyandotte Corridor

- Connects demand areas in Dexter, Ann Arbor, Ypsilanti, Belleville, Romulus, Taylor, Southgate, and Wyandotte

- Utilizes Washtenaw County's Border to Border Trail, the Iron Belle Trail, the I-275 Metro Trail, and Underground Railroad Bicycle Route and primarily follows the Eureka Road corridor in Wayne County

### 6. Brighton to Saline Corridor

- Connects demand areas in Brighton, Green Oak Township, Ann Arbor, Pittsfield Township, and Saline

- Utilizes existing pathways and routes along the Whitmore Lake Road and Lohr Road corridors, as well as existing pedestrian and bicycle infrastructure in Ann Arbor and Saline

- Part of the Underground Railroad Bicycle Route

- Corridor coordinates with MDOT University Region to link Southeast Michigan to Lenawee County and the communities of Tecumseh, Adrian and Blissfield

### 7. Ann Arbor to Detroit Corridor

- Connects demand areas in Ann Arbor, Plymouth, Westland, Garden City, Dearborn Heights, Dearborn, and Detroit

- Utilizes the Hines Park Bikeway, and existing pedestrian and bicycle infrastructure, including shared-use paths and routes along the Plymouth Road corridor, and sidewalks and protected bike lanes along Michigan Avenue in Detroit

- Connects to the Gordie Howe Bridge, which when complete links Southeast Michigan to Canada's 14,864 mile "The Great Trail"

### 8. Saline to River Rouge Corridor

- Connects demand areas in Saline, Pittsfield Township, Ypsilanti, Wayne, Inkster, Dearborn, Detroit, and River Rouge

- Primarily follows the Michigan Avenue and Outer Drive corridors that have significant pedestrian infrastructure, but limited bicycle infrastructure

- Michigan Avenue has some of the highest bus ridership within the region and is a planned rapid transit and commuter rail corridor.

- Trail Planning efforts are in place to link communities and parks within the Lower Rouge Corridor

## 9. Ann Arbor to Whiteford Corridor

- Connects demand area in Ann Arbor, Pittsfield Township, Milan, Dundee, and Petersburg

- Primarily follows along Platt Road, Sylvania-St Petersburg Road and Memorial Highway corridors

- Corridor coordinates with TMACOG and Ohio DOT to link Southeast Michigan to Northern Ohio communities including Sylvania and Toledo, and with MDOT University Region linking to Lenawee County to the west

- Part of the Underground Railroad bicycle route

## 10. Dundee to Monroe Corridor

- Connects demand areas in the cities of Dundee and Monroe

- Utilizes existing bicycle and pedestrian infrastructure in Dundee and the River Raisin Heritage Trail in Monroe

- Primarily follows routes and wide paved shoulders along Custer Road and M-50, and connects to River Raisin National Battlefield Park and Sterling State Park

- Corridor coordinates with MDOT University Region to link Southeast Michigan to Lenawee County and the City of Tecumseh

## 11. Bedford to Detroit Corridor

- Connects demand areas in Bedford Township, Monroe Township, Monroe, Frenchtown Township, Gibraltar, Trenton, Riverview, Wyandotte, Ecorse, River Rouge, and Detroit

- Utilizes existing bicycle and pedestrian infrastructure in Bedford Township, following the Telegraph Road and Dixie Highway corridor through Monroe, and pathways and routes along Dixie Highway, Biddle Avenue, and Jefferson Avenue

- Provides connection to Lake Erie Metropark, Detroit River International Wildlife Refuge, Elizabeth Park, Historic Fort Wayne, the Detroit RiverWalk, and to pedestrian connections to Grosse Ile Township

- Corridor coordinates with Ohio DOT plans to become the preferred route for proposed US Bike Route 20, connecting Southeast Michigan to major Ohio cities including Toledo

## 12. Holly to Brighton Corridor

- Connects demand areas in Holly, Highland Township, Milford, and Brighton

- Utilizes the Milford Trail and connects to and through Kensington Metropark, Highland State Recreation Area, and Island Lake State Recreation Area

- Primarily follows the Milford Road and E. Grand River Avenue corridors

## 13. Clarkston to Detroit Corridor

- Connects demand areas in Clarkston, Waterford Township, Pontiac, Bloomfield Hills, Birmingham, Royal Oak, Huntington Woods, Pleasant Ridge, Ferndale, Detroit, and Highland Park

- Primarily follows the Dixie Highway and Woodward Avenue corridors

- Utilizes existing pedestrian and bicycle infrastructure throughout the corridor, with gaps primarily in Bloomfield Hills and north of Clarkston
- Woodward Avenue is one of the most used bus corridors within the region and is a planned RTA Rapid Transit Corridor
- Northern section should align with ongoing Iron Belle Trail planning efforts

## 14. South Lyon to St Clair Corridor
- Connects demand areas in South Lyon, Wixom, Walled Lake, West Bloomfield, Pontiac, Rochester Hills, Rochester, Romeo, Armada, Richmond, and St Clair
- Utilizes several regional trails including the Huron Valley Trail, Michigan Airline Trail, West Bloomfield Trail, Clinton River Trail, Macomb Orchard Trail, and Bridge to Bay Trail
- Is part of the Great to Lake Trail, and follows the proposed connection along Fred Moore Highway between Richmond and St Clair

## 15. Pontiac to Brownstown Corridor
- Connects demand areas in Pontiac, Bloomfield Township, Southfield, Redford Township, Detroit, Dearborn Heights, Dearborn, Taylor, and Brownstown Township
- Primarily follows the Telegraph Avenue corridor - a significant cross-town SMART bus route
- Connects to and through Hines Park Bikeway and Rouge Park Trails

## 16. Walled Lake to Lake Erie Metropark Corridor
- Connects demand areas in Walled Lake, Novi, Northville, Plymouth, Canton Township, Van Buren Township, and Flat Rock
- Utilizes the M-5 Metro Trail, Meadowbrook Pathways, I-275 Metro Trail and Downriver Linked Greenways, including trails through Lower Huron, Willow, and Oakwoods Metroparks, and the HCMA East-West Connector
- Connects to Lake Erie Metropark and is part of the Iron Belle Trail

## 17. Joe Louis Greenway Corridor
- Connects demand areas in Detroit, Highland Park, Hamtramck, and Dearborn
- Utilizes existing and planned bicycle and pedestrian infrastructure, including the Dequindre Cut, Detroit RiverWalk, and the former Conrail Rail Corridor
- Part of the Iron Belle Trail

## 18. Ferndale to River Rouge Corridor
- Connects demand areas in Ferndale, Detroit, and River Rouge
- Utilizes existing and planned bicycle and pedestrian infrastructure along the Livernois Avenue and Fort Street corridors

## 19. Leonard to Detroit Corridor
- Connects demand areas in Oxford, Lake Orion, Orion Township, Rochester, Rochester Hills, Shelby Township, Utica, Sterling Heights, Warren, Center Line, and Detroit

- Utilizes several regional trails including the Polly Ann Trail, Paint Creek Trail, Rochester Riverwalk, River Bends Park trails, and the Clinton River Park Trail

- Part of the Iron Belle Trail

- Corridor coordinates with MDOT Bay Region plan to connect Southeast Michigan with Lenawee County, including the communities of Dryden and Lapeer

## 20. Birmingham to Lake St. Clair Metropark Corridor
- Connects demand areas in Birmingham, Troy, Sterling Heights, Fraser, Clinton Township, and Harrison Township

- Utilizes the Freedom Trail and its connection to Lake St Clair Metropark

- Primarily follows the Big Beaver/16 Mile/Metropolitan Parkway corridor, connecting to several commercial, residential, and employment centers

## 21. Rochester to Marine City Corridor
- Connects demand areas in Rochester, Shelby Township, Macomb Township, Chesterfield Township, New Baltimore, and Marine City

- Primarily follows the 23 Mile Corridor through Macomb County and portions of the Underground Railroad Bicycle Route and Bridge to Bay Trail in St Clair County

## 22. Detroit to Port Huron Corridor
- Connects demand areas in Detroit, Eastpointe, Roseville, Clinton Township, Mount Clemens, Chesterfield Township, New Haven, Richmond, Marysville, and Port Huron

- Primarily follows the Gratiot Avenue corridor, which is a heavily utilized SMART FAST transit route and an RTA proposed rapid transit corridor.

## 23. Capac to Port Huron Corridor
- Connects demand areas in Capac, Port Huron Township, and Port Huron

- Utilizes US Bike Route 20 along Brandon Road and Lapeer Road, and the southern portions of the Wadhams to Avoca Trail

## 24. Yale to Port Huron Corridor
- Connects demand areas in Yale, Port Huron Township, and Port Huron

- Utilizes the Wadhams to Avoca Trail and existing and planned bicycle and pedestrian infrastructure in Yale, Port Huron Township and Port Huron

- Corridor coordinates with MDOT Bay Region plan to connect Southeast Michigan with Sanilac and Lapeer Counties

## 25. Yale to New Baltimore Corridor
- Connects demand areas in Yale, Memphis, Richmond, and New Baltimore

- Primarily follows the M-19 corridor utilizing existing and planned infrastructure in Yale, Memphis, Richmond, and New Baltimore

- Includes signed US Bike Route 20, which stretches across the entire state to Ludington

- Both Macomb County and St Clair County plan for enhanced infrastructure along County Line Road

## 26. Fort Gratiot to Detroit Corridor

- Connects demand areas in Fort Gratiot Township, Port Huron, Marysville, St Clair, Marine City, Algonac, New Baltimore, Harrison Township, St Clair Shores, Grosse Pointe communities, and Detroit

- Primarily follows the Jefferson Avenue corridor, utilizing the Bridge to Bay Trail in St Clair County

- Corridor coordinates with MDOT Bay Region plan to connect Southeast Michigan with Sanilac Communities, including Lexington and Port Sanilac

Figure 92
**Regional Bicycle and Pedestrian Corridors**



Regional Bicycle and Pedestrian Corridor

Existing infrastructure for both walking and biking
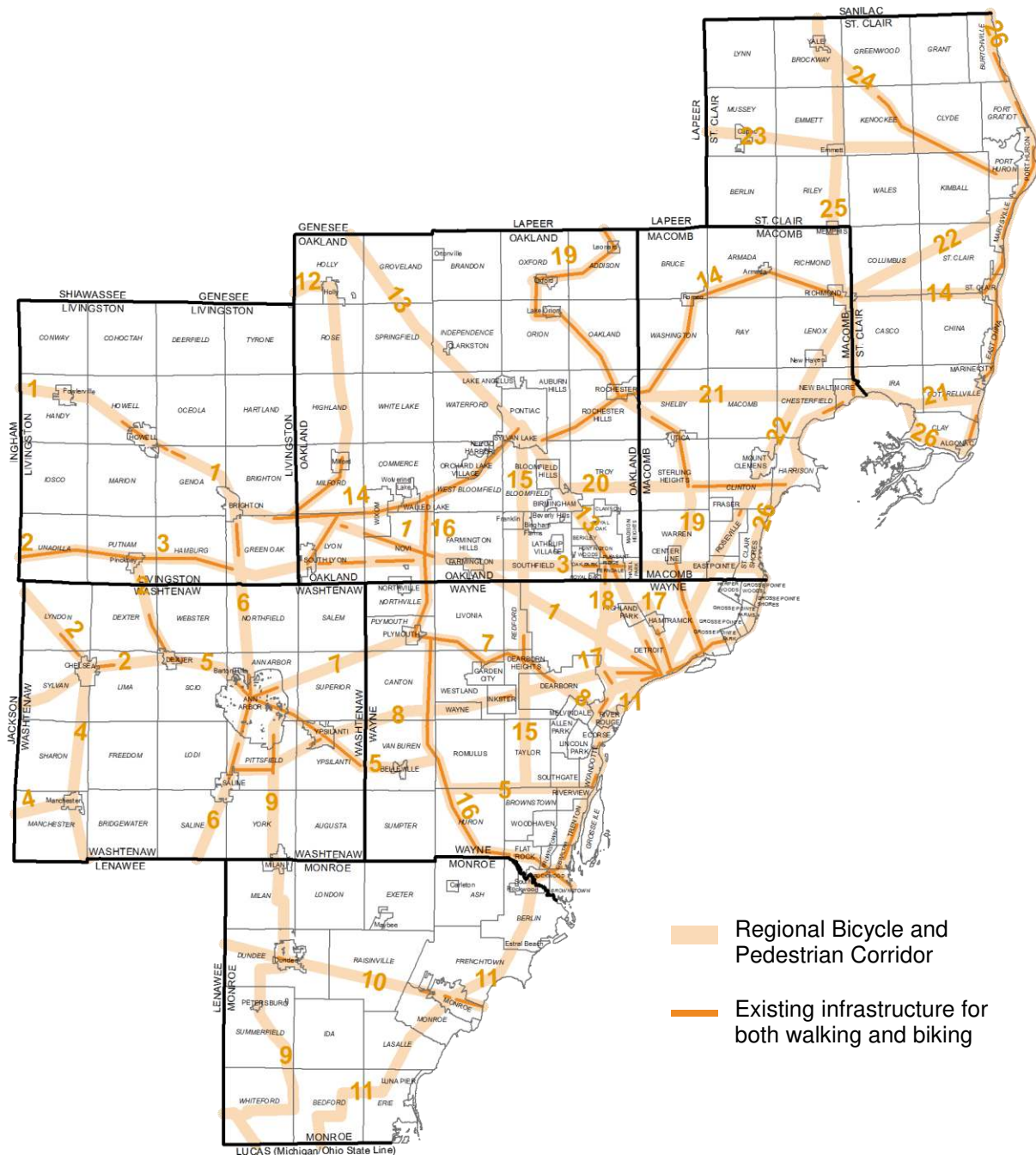
Table 8
**Regional Bicycle and Pedestrian Corridors by County**

| | | Livingston County | Macomb County | Monroe County | Oakland County | St. Clair County | Washtenaw County | Wayne County |
|---|---|---|---|---|---|---|---|---|
| 1 | Fowlerville to Detroit | X | | | X | | | X |
| 2 | Huron Waterloo Pathway Loop | X | | | | | X | |
| 3 | Pinckney to St. Clair Shores | X | X | | X | | | |
| 4 | Chelsea to Manchester | | | | | | X | |
| 5 | Dexter to Wyandotte | | | | | | X | X |
| 6 | Brighton to Saline | X | | | | | X | |
| 7 | Ann Arbor to Detroit | | | | | | X | X |
| 8 | Saline to River Rouge | | | | | | X | X |
| 9 | Ann Arbor to Whiteford | | | X | | | X | |
| 10 | Dundee to Monroe | | | X | | | | |
| 11 | Bedford to Detroit | | | X | | | | X |
| 12 | Holly to Brighton | X | | | X | | | |
| 13 | Clarkston to Detroit | | | | X | | | X |
| 14 | South Lyon to St. Clair | | X | | | X | | |
| 15 | Pontiac to Brownstown | | | | X | | | X |
| 16 | Walled Lake to Lake Erie Metropark | | | | X | | | X |
| 17 | Joe Louis Greenway | | | | | | | X |
| 18 | Ferndale to River Rouge | | | | X | | | X |
| 19 | Leonard to Detroit | | X | | X | | | X |
| 20 | Birmingham to Lake St. Clair Metropark | | X | | X | | | |
| 21 | Rochester to Marine City | | X | | | X | | |
| 22 | Detroit to Port Huron | | X | | | X | | X |
| 23 | Capac to Port Huron | | | | | X | | |
| 24 | Yale to Port Huron | | | | | X | | |
| 25 | Yale to New Baltimore | | X | | | X | | |
| 26 | Fort Gratiot to Detroit | | X | | | X | | X |

# Appendix C — Bicycle and Pedestrian Public Survey Results

## Introduction

Public engagement is one of the core elements in regional planning. SEMCOG is committed to providing opportunities for the public to be involved in developing and implementing its planning work. Public engagement results in development of better plans, and most importantly increases the likelihood of implementation.

In developing the Bicycle and Pedestrian Mobility Plan for Southeast Michigan, SEMCOG conducted an interactive public online survey to better understand people's preferences in walking and bicycling in the region, as well as to identify the opportunities, challenges, availability, and quality of infrastructure and facilities.

This interactive public online survey (total participation: 3,073) was conducted during May 2019. Its purpose was to educate and collect data on prevailing experiences and priorities for walking and bicycling in the region. The survey was available to all residents. It was extensively shared among the biking community. Although not part of a scientifically derived sample, the feedback provides an important perspective.

The Bicycle and Pedestrian Public Survey was promoted through several methods including:

- Social media – Including SEMCOG's Facebook, Twitter, Instagram, and LinkedIn.
- SEMCOG's website – www.semcog.org. It was also featured on the Metropolitan Affairs Coalition's website. MAC is SEMCOG's partner organization.
- *Regional Update* – SEMCOG's bi-weekly newsletter sent to regional stakeholders, leaders, local government staff, and the media.
- SEMCOG's internal and external meetings and presentations at the Bicycle and Pedestrian Task Force, SEMCOG Executive Committee, and General Assembly meetings.

### Demographics

Participation in the survey occurred in all seven counties of Southeast Michigan, with the greatest participation in Oakland County, and the least in Monroe County. Additionally, three percent of all survey participants were from outside the region, with the greatest concentrations in the Toledo, Ohio area and Windsor, Canada. Table 9 displays survey participants by county.

Table 9
**Participants by County**

| County | Percentage |
|---|---|
| **Oakland** | 39% |
| **Wayne** | 25% |
| **Washtenaw** | 13% |
| **Macomb** | 8% |
| **Livingston** | 5% |
| **St. Clair** | 5% |
| **Monroe** | 2% |
| **Out of Region** | 3% |

Figure 93 displays the home location of survey participants, by community. While nearly every community in the region had at least one participant, the greatest concentration of participants were from Southeast Oakland County, Detroit, and Ann Arbor.

Figure 93
**Participants by Community**
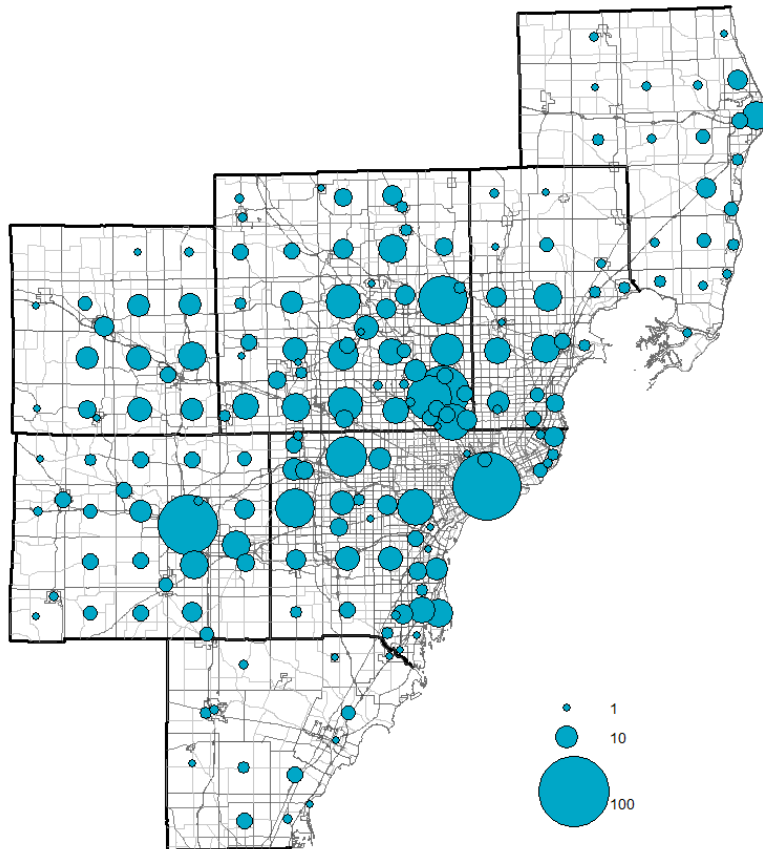


The majority of survey participants were age 35 and older. Those participants under age 35 represented 11 percent of all participants, while nearly half (49 percent) of participants were over age 55. Figure 94 illustrates the survey participants by age.

Figure 94
**Participants by Age**
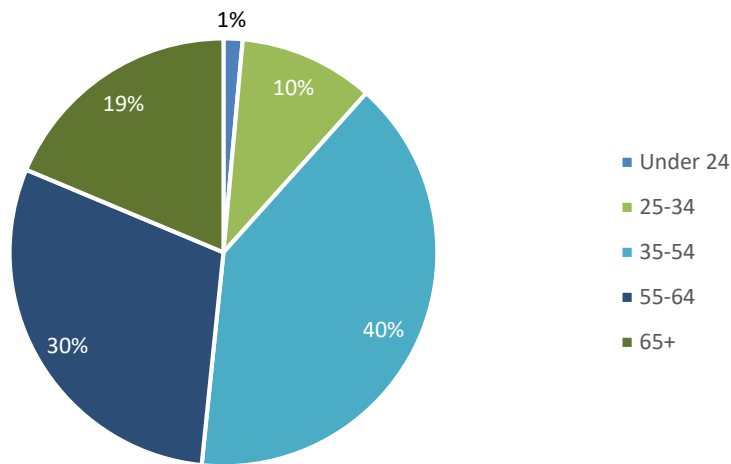


The survey received a nearly equal participation rate of both female and male respondents. Figure 95 illustrates the survey participants by gender.

Figure 95
**Participants by Gender**
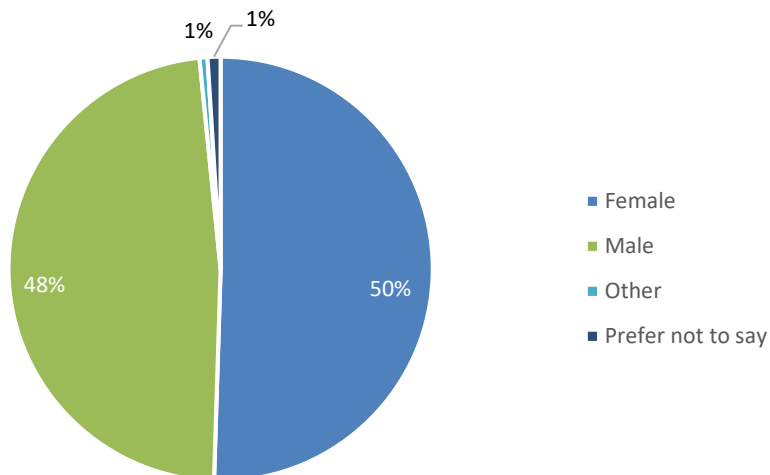
## Methodology/Approach

This public survey featured the following five functions or "screens:"

1. **Welcome & Introduction** – Including how the survey results will be used and educational messages about the purpose of the survey.
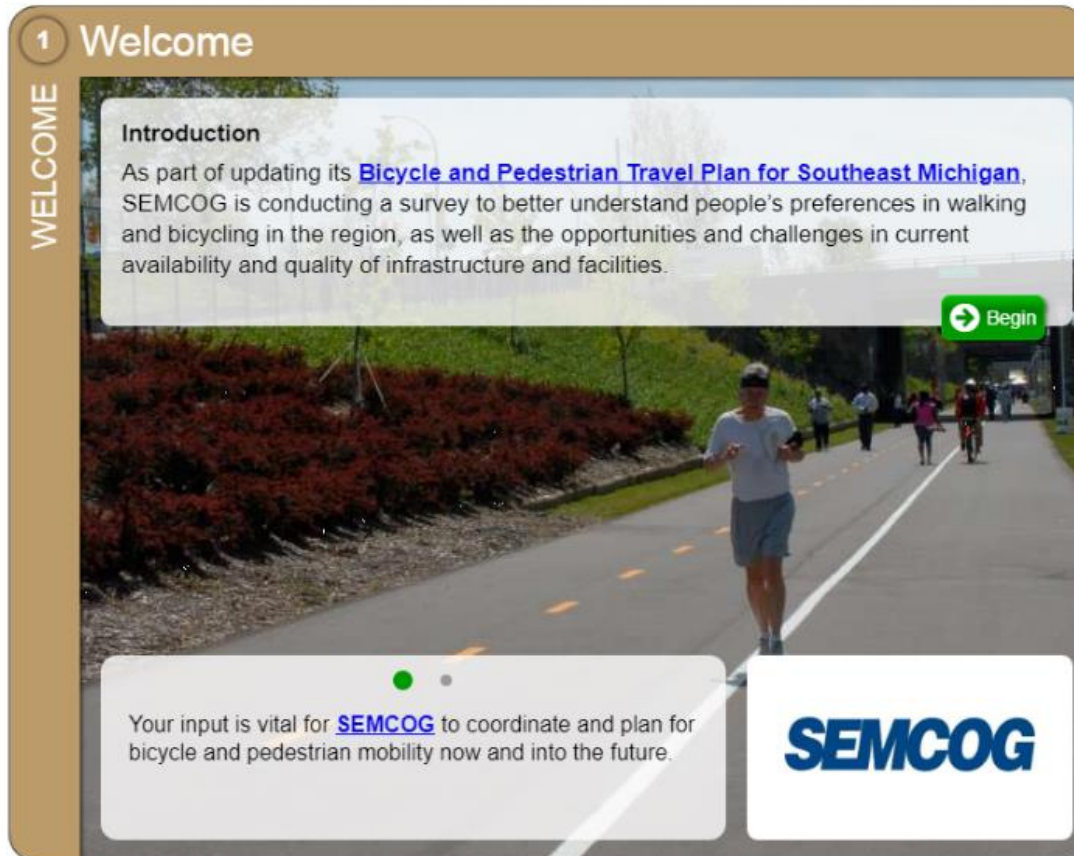
2. **Survey Questions: Help Us Plan** – This screen was divided into five topics: "Travel Modes," "Travel Behavior," "Walking Frequency," "Biking Frequency," and "Impediments to Walking and Biking." For each topic, multiple questions were asked.

3. **Mapping**: **Where Do You Want to Walk/Bike** – Using a "map marker tool," the survey allowed participants to drag and drop markers to areas of interest or concern across the region, as well as providing space to add comments for each marker. This interactive map included a set of optional map markers: "Home," "School/Work," "Shop/Dine/Fun," "Park/Recreation," "Transit/Other," and "Impediment."
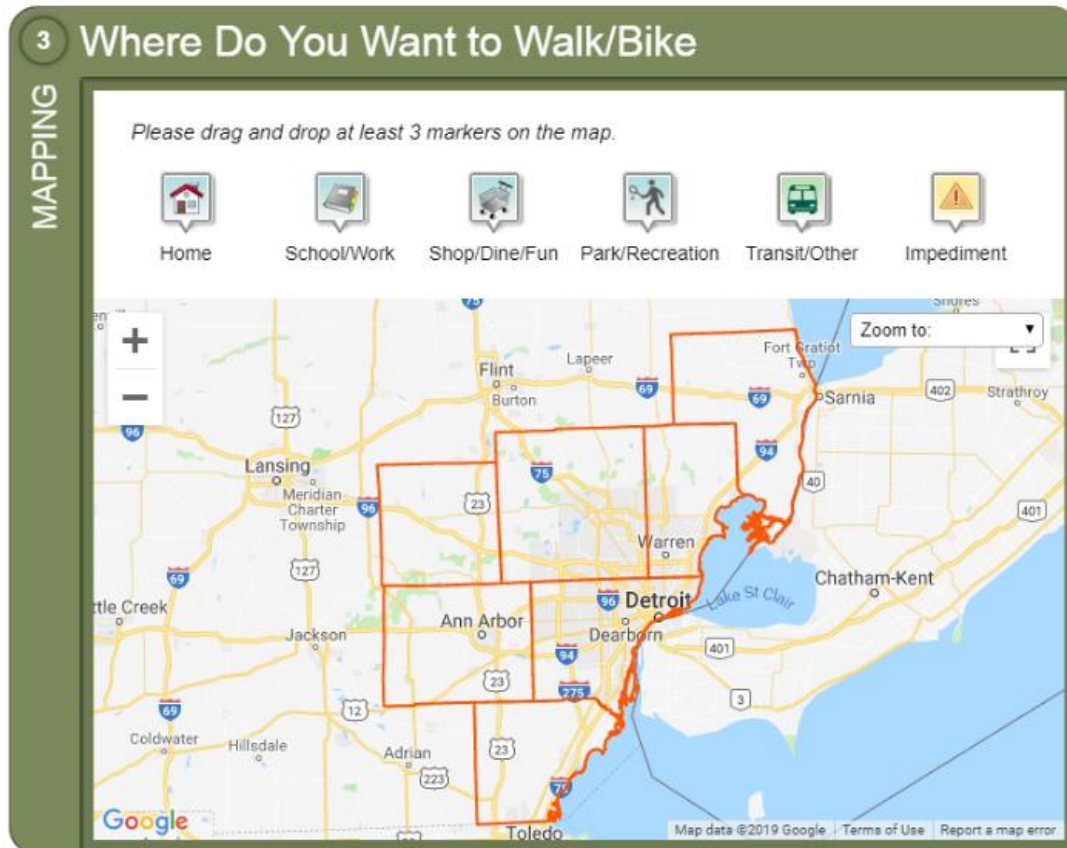
4. **Priorities** – Using the "priority ranking tool," the survey allowed participants to rank their top five priorities for bike- and/or pedestrian-related infrastructure investment.

5. **Wrap up: Stay Involved** – The final screen collected participants' demographic information and encouraged them to stay involved in development of the Bicycle and Pedestrian Mobility Plan for Southeast Michigan.
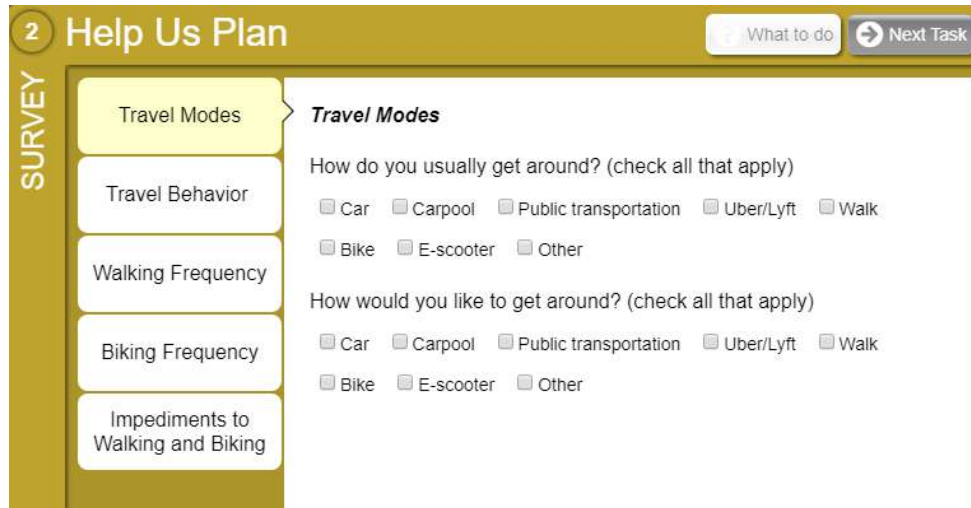
# Findings

The first survey questions were under the **Help Us Plan** screen. These questions focused on providing a greater understanding of survey participants' travel mode preferences, travel behavior, walking and biking frequency, and the impediments they encounter when walking and/or biking.

## Travel Modes



These were the major findings for survey participants' preferences to travel by mode:

How do you typically get around (for this question participants were allowed to choose more than one option)?

- 96 percent usually get around by car.
- 46 percent rely on walking and biking to get around, typically in conjunction with other modes.
- Eight percent usually get around by public transportation. However, none indicated they rely on public transportation as the *only* mode they use to get around.

How would you like to get around (for this question participants were allowed to choose more than one option)?

- While 96 percent of people typically drive, approximately one-third of respondents would prefer to use other modes more often.
- While just under half of the respondents said they typically walk or bike, nearly two-thirds would like to walk more, and three-quarters would like to bike more.
- More than any other mode, people said they would prefer to use public transportation more often, with more than five times the amount of current users saying they would like to use it.
- There is a small but growing interest in e-scooters, with less than one-and-a-half percent of people having used them, but seven percent saying they would like to do so.

## Travel Behavior



These were the major findings for survey participants' travel behavior:

Which transportation mode (car, bike, and/or public transportation) do you have access to (for this question participants were allowed to choose more than one option)?

- 10 percent indicated they only have access to a car, while less than one percent only had access to either a bike or public transportation.
- About one-third of participants indicated they have access to all three modes – car, bike, and public transportation.
- The majority of those who participated in the survey indicated that they have access to both a car and bike.

What describes your travel behavior best (for this question participants were allowed to choose more than one option)?

- More than half indicated that they bike and walk by themselves or with other adults.
- Walking and biking with children were among the least selected option/s.

## Walking Frequency



Figure 96 provides the results of survey participants' walking frequency, divided by **most often** (daily, multiple times a week, or about once a week), **least often** (a few times a month or a few times a year), and **never**.

The major finding is that:

- Eight in 10 participants walk on a weekly basis, with about one-third indicating that they walk/jog/run on daily basis.

Figure 96
**Walking Frequency**
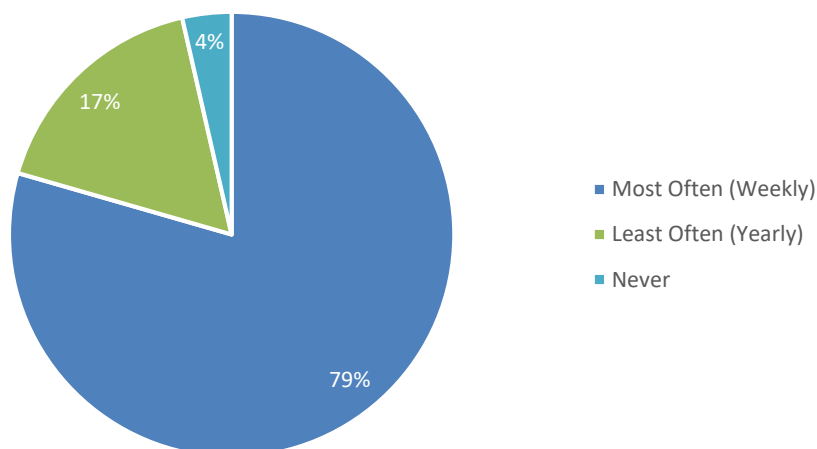
Figure 97 provides the results of survey participant's purpose (transportation and/or recreation) for making walking trips.

The major finding is that:

- Nine in 10 participants typically walk for recreational purposes, with up to 26 percent of trips also serving as transportation.

Figure 97
**Walking Purpose**

## Biking Frequency



Figure 98 provides the results of survey participants' biking frequency, divided by **most often** (daily, multiple times a week, or about once a week), **least often** (a few times a month or a few times a year), and **never**.

These were the major findings:

- While the frequency of bike trips tends to be more varied than walking, one-third of respondents reported biking multiple times per week.
- 54 percent bike on a weekly basis, with one-third of them reporting biking multiple times per week.

Figure 98
**Biking Frequency**
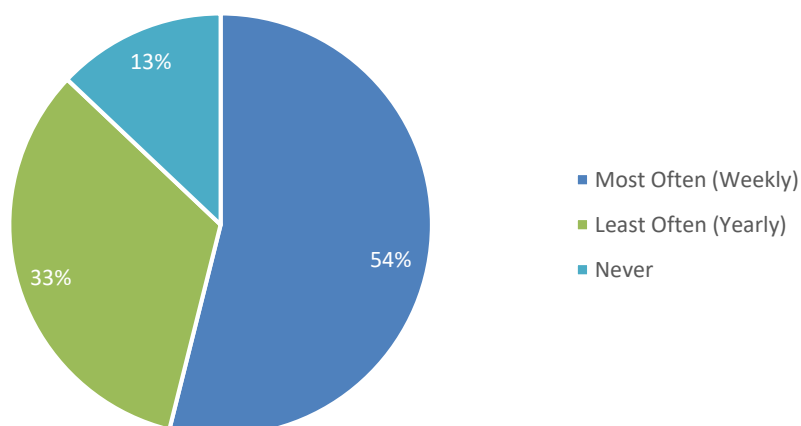
Figure 99 provides the results of survey participants' purpose (transportation and/or recreation) for making biking trips.

The major finding is that:

- Comparable to walking purpose results, 95 percent of people who took the survey indicated that they typically bike for recreational purposes, with up to 31 percent of trips also serving as transportation.

Figure 99
**Biking Purpose**



- Recreation
- Transportation
- Both (Recreations & Transportation)

**Impediments to Walking and Biking**

Figures 100 and 101 show the results of survey participants' top impediments to walking and biking, respectively. These are the major findings across both modes of travel:

- The top four impediments to walking were weather (63 percent), distance or time constrains (52 percent), lack of sidewalks or paths (43 percent), and personal safety/security (25 percent).

- Lack of facilities or infrastructure was identified as the greatest impediment to biking, followed closely by weather.

- Based on the responses of those who took the survey, distance is more of an impediment to walking than biking.

- About six in 10 of those who took the survey identified weather as one of the top impediments to both walking and biking.

- Lack of adequate infrastructure is more of an impediment to biking than walking.

- Personal safety and security was among the top reported impediments to biking, and it appears to be more of an impediment to biking than walking.

Figure 100
**Top Impediments to Walking**
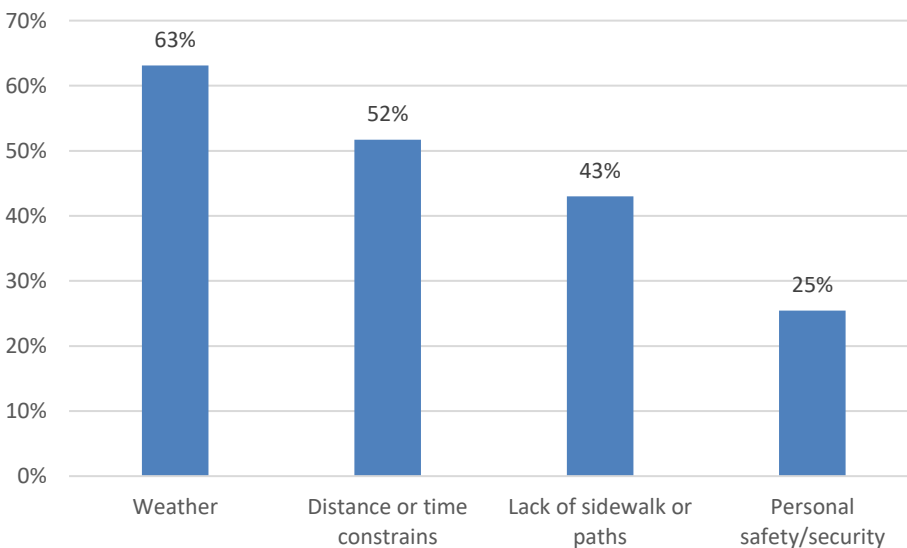
Figure 101
**Top Impediments to Biking**
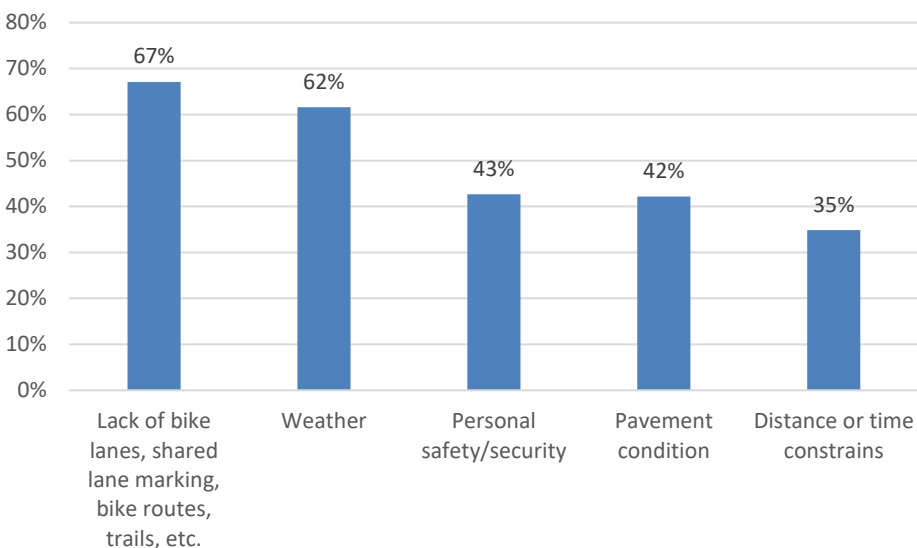


## Mapping

The next major section of the survey was a mapping exercise in which participants were asked to mark the locations to which they walk and/or bike as well as where they wish they could walk and/or bike to. The markers for various destinations were classified in four groups: "School/Work," "Shop/Dine/Fun," "Park/Recreation," and "Transit/Other." Participants were allowed to drag and drop multiple markers on the map for each category.

Table 10 shows the destinations participants marked, by both count and percentage. The most popular destination participants identified was park and recreation locations, followed by shopping, dining, and fun locations.

Table 10
**Map Markers by Destination Type**

| Map Marker Type | Count | Percentage |
|---|---|---|
| Work/School | 934 | 20% |
| Shop/Dine/Fun | 1490 | 32% |
| Park/Recreation | 1990 | 42% |
| Transit/Other | 283 | 6% |

Figure 102 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach the following destinations:

- Work or school;
- Shopping, dining, or fun
- Transit/Other

Locations with the highest concentrations include the City of Detroit, Southeast Oakland County, and Ann Arbor. The cities of Dearborn, Livonia, and Rochester Hills also show fairly high concentrations.

Figure 102
**Map Marker Concentrations**
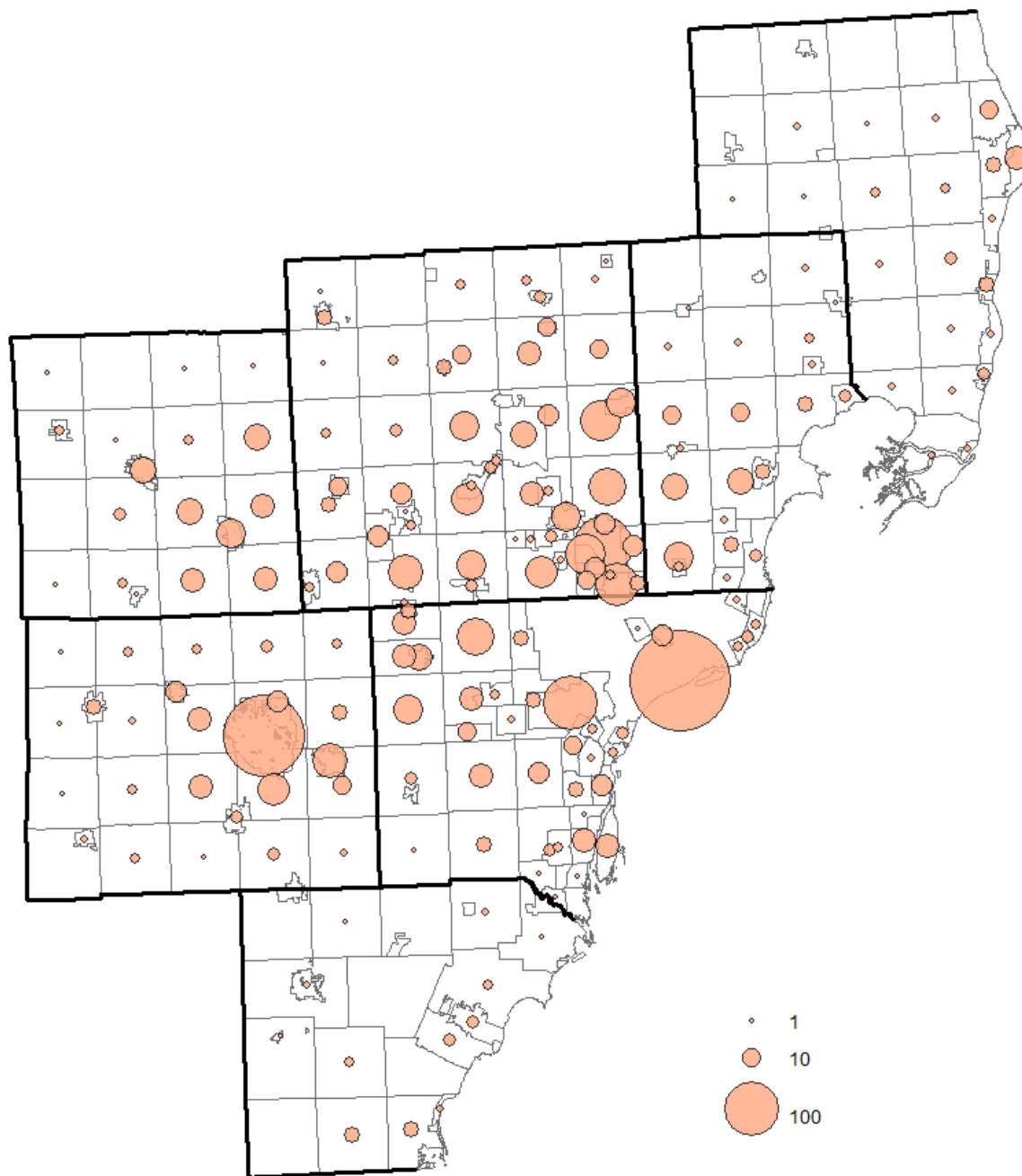
**"Work/School" Markers**

Based on the analysis of where survey participants placed "Work/School" markers:

- 144 communities in the region had a at least one work/school marker
- 23 communities had 10 or more work/school locations

Figure 103 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach work or school. Locations were spread out across the region with three major centers, including Detroit, Ann Arbor, and Dearborn.

Figure 103
**Map Marker Concentrations for Work/School**
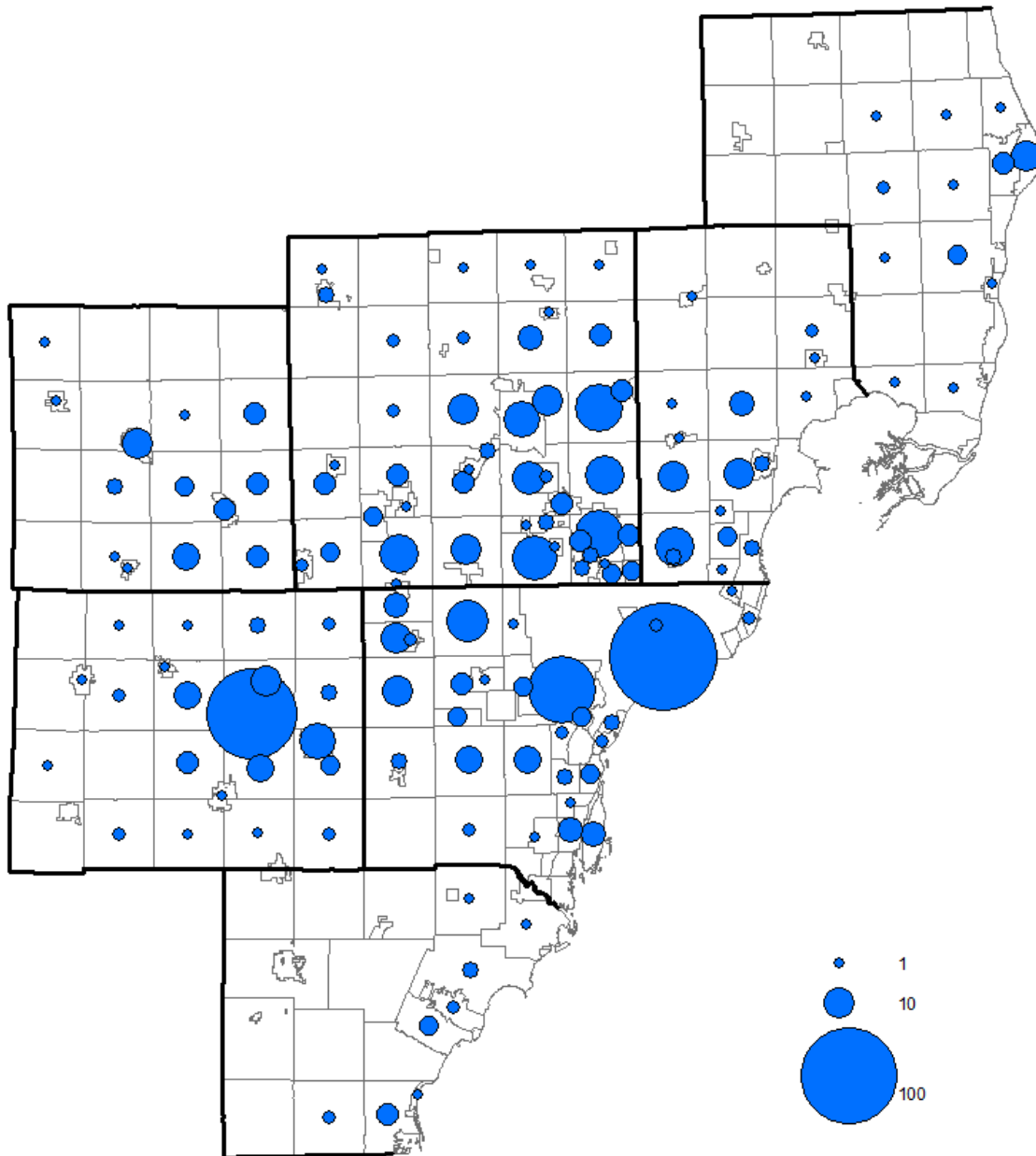
Under each Work/School marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- The majority of universities across the region have good access.
- Of the four marker categories, work/school destinations were least accessible.
- 22 percent of those who placed a map marker indicated they currently can walk or bike to their "Work/School" destinations.
- 33 percent of those who placed a map marker indicated they wish they could walk or bike to their "Work/School" destinations.

Choosing from three mode options (Walk, Bike, Combination of walking and biking), participants' response by mode in reaching work and/or school destinations, included:

- 16 percent could walk.
- 48 percent could bike.
- 36 percent indicated they could use a combination of walking and biking.

Choosing from three mode options (Walk, Bike, Combination of walking and biking), participants' response by mode in "wishing they could" reach work and/or school destinations, included:

- Four percent indicated they would like to walk.
- 26 percent indicated they would like to bike.
- 71 percent indicated they would like to use a combination of walking and biking to get to their school and/or work.

Table 11 shows the map marker analysis for the top 10 communities receiving the highest number of "Work/School" map markers.

Table 11
**Top 10 Highest Number of Markers for Work/School Destinations**

| Community | Total "Work/School" Map Markers | I Can Walk/Bike Here (Percentage) | I Wish I could Walk/Bike Here (Percentage) |
|---|---|---|---|
| Detroit | 126 | 25% | 34% |
| Ann Arbor | 90 | 40% | 23% |
| Dearborn | 49 | 18% | 41% |
| Royal Oak | 25 | 20% | 28% |
| Rochester Hills | 24 | 38% | 38% |
| Southfield | 22 | 14% | 50% |
| Livonia | 19 | 11% | 68% |
| Novi | 18 | 17% | 50% |
| Troy | 17 | 6% | 41% |
| Warren | 17 | 18% | 47% |

General "comment" themes reported by participants:

- Lack of infrastructure or gaps in the network, prevent people from walking and biking

- Need for better public transportation in combination with walking and biking

- Surface condition of the existing infrastructure prevents people from walking and biking

- Distance restrictions

- Safety concerns

- Weather restrictions

**"Shop/Dine/Fun" Markers**
Based on the analysis of where survey participants placed "Shop/Dine/Fun" markers:

- 69 communities in the region had a at least one shopping/dining/fun marker

- 40 communities had 10 or more shopping/dining/fun locations

- six communities had more than 30 markers

Figure 104 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach shopping, dining, or fun destinations. Communities with the highest concentrations included Ann Arbor, Berkley, Dearborn, Detroit, Ferndale, and Royal Oak.

Figure 104
**Map Marker Concentrations for Shop/Dine/Fun**
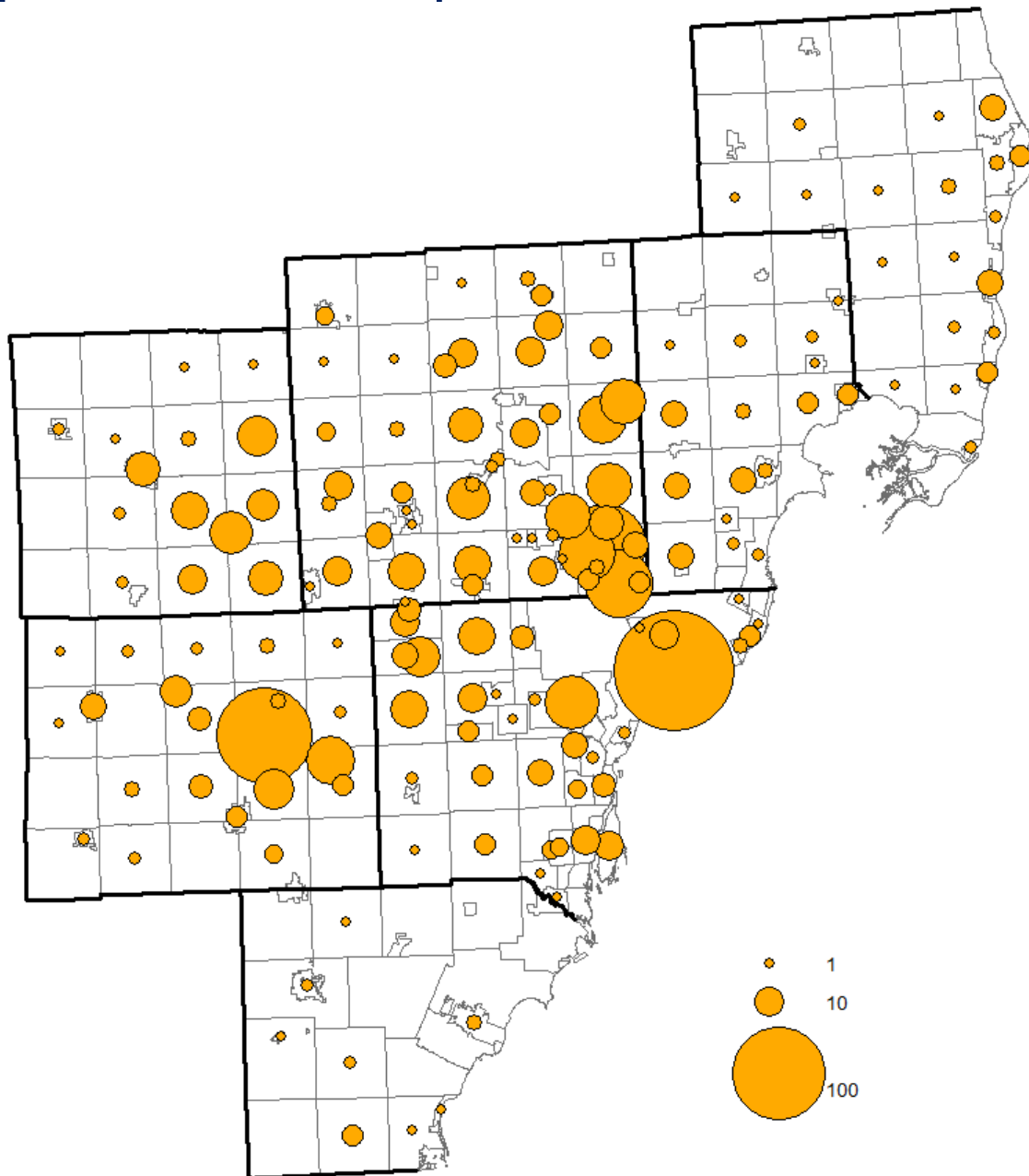


Locations with generally "good" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Greater downtown Detroit, Southeast Oakland County (Berkley, Ferndale, and Royal Oak)
- Smaller cities/villages (Chelsea, Dexter, Farmington, Lake Orion, Northville, Plymouth, and Rochester)

Locations with generally "limited" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Riding east/west through Detroit. Desire to access Eastern Market from westside and Corktown from eastside
- Shopping centers in townships (in particular – Genoa Twp., Green Oak Twp., Hartland Twp., Lyon Twp., and Pittsfield Twp.)

Under each Shop/Dine/Fun marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- 33 percent indicated they currently can walk or bike to their *Shop/Dine/Fun* destinations
- However, 27 percent indicated they wish they could walk or bike to their *Shop/Dine/Fun* destinations

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in reaching shop/dine/fun destinations, included:

- 20 percent could walk
- 43 percent could bike
- 36 percent indicated they could use a combination of walking and biking

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in "wishing they could" reach shop/dine/fun destinations, included:

- Eight percent indicated they would like to walk
- 52 percent indicated they would like to bike
- 39 percent indicated they would like to use combination of walking and biking

Table 12 shows the map marker analysis for the top 10 communities receiving the highest number of "Shop/Dine/Fun" map markers.

Table 12
**Top 10 Highest Number of Markers for Shop/Dine/Fun Destinations**

| Community | Total "Shop/Dine/Fun" Map Markers | I Can Walk/Bike Here (Percentage) | I wish I Could Walk/Bike Here (Percentage) |
|---|---|---|---|
| **Detroit** | 171 | 42% | 19% |
| **Ann Arbor** | 108 | 49% | 22% |
| **Royal Oak** | 82 | 34% | 29% |
| **Ferndale** | 57 | 47% | 19% |
| **Berkley** | 39 | 33% | 8% |
| **Dearborn** | 36 | 44% | 19% |
| **Rochester Hills** | 28 | 64% | 21% |
| **Ypsilanti** | 27 | 63% | 33% |
| **Troy** | 26 | 19% | 12% |
| **Rochester** | 24 | 63% | 13% |

General "comment" themes reported by participants:

- Safety concerns (highway/road crossing, roundabouts, high traffic volume, high speeds, unprotected bike facilities)
- Lack of dedicated infrastructure
- Need for surface improvements
- Gaps in the network
- Need for public transportation to be used in combination with walking and biking
- Distance and weather restrictions
- Lack of bike rack/parking

**"Park/Recreation" Markers**
Based on the analysis of where survey participants placed "Park/Recreation" markers:

- All sizes of parks are visited
- The most visited are the larger county parks, state parks, and Metroparks

Figure 105 shows the concentrations by park of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach park/recreation destinations.

Figure 105
**Map Marker Concentration for Parks and Recreation**
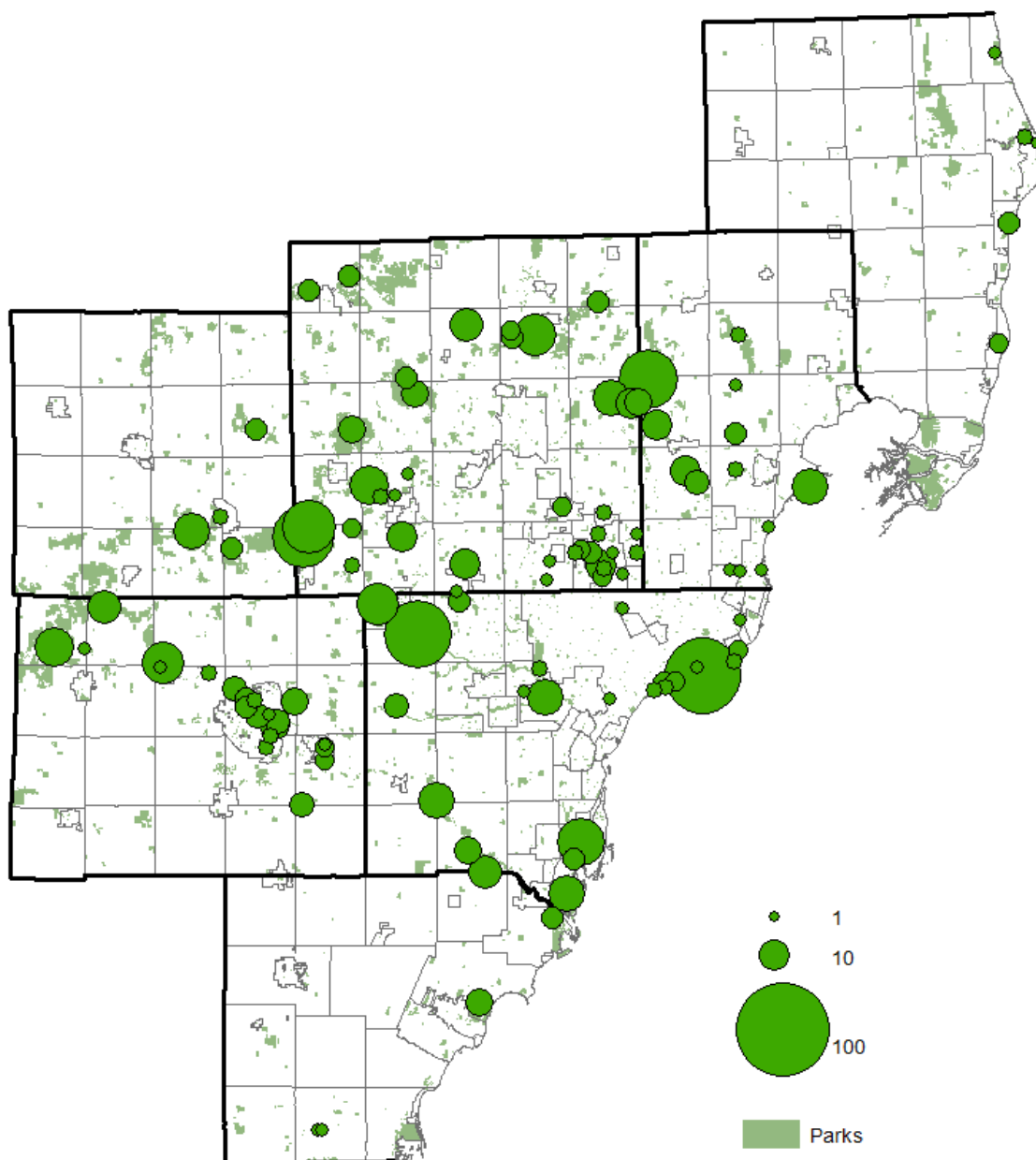


Parks and recreation locations with generally "good" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Large urban parks (Belle Isle, Elizabeth Park, and Rochester Municipal Park)
- Large parks connected with regional trails (Bloomer Park, Hines Parkway, Lake Erie Metropark, Lower Huron Metropark, and Lower Rouge)

Parks and recreation locations with generally "limited" access, as reported by survey participants in reaching destinations by walking, biking, or a combination of the two were:

- Largest parks in northern portion of the region (Kensington Metropark, Lake St. Clair Metropark, Proud Lake State Recreation Area, and Stony Creek Metropark)
- Even if these parks were on regional trails, there seems to be a limit as to how far people will travel for parks

Under each Park/Recreation marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- 36 percent indicated they currently can walk or bike to their *Park/Recreation* destinations
- 24 percent indicated they wish they could walk or bike to their *Park/Recreation* destinations

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in reaching park/recreation destinations, included:

- 15 percent could walk
- 49 percent could bike
- 36 percent indicated they could use a combination of walking and biking

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in "wishing they could" reach park/recreation destinations, included:

- Five percent indicated they would like to walk
- 58 percent indicated they would like to bike
- 37 percent indicated they would like to use combination of walking and biking

Table 13 shows the map marker analysis for the top ten parks receiving the highest number of "Parks/Recreation" map markers.

Table 13
**Top 10 Highest Number of Markers for Park/Recreation Destinations**

| Park | Total "Park/Recreation" Map Markers | I can Walk/Bike Here (Percentage) | I wish I could Walk/ Bike Here (Percentage) |
|---|---|---|---|
| **Belle Isle** | 64 | 34% | 17% |
| **Hines Park** | 51 | 53% | 24% |
| **Island Lake Recreation Area** | 44 | 50% | 23% |
| **Stony Creek Metropark** | 38 | 26% | 37% |
| **Kensington Metropark** | 34 | 21% | 38% |
| **Elizabeth Park** | 25 | 52% | 16% |
| **Bald Mountain State Recreation Area** | 21 | 29% | 19% |
| **Maybury State Park** | 20 | 25% | 30% |
| **Hudson Mills Metropark** | 19 | 58% | 16% |
| **Proud Lake State Recreation Area** | 18 | 33% | 50% |

General "comment" themes reported by participants:

- Walk/bike to parks with kids and friends
- Safety concerns
- Lack of dedicated facilities
- Gaps in the network
- Concern about the pavement quality
- Need for paved trails
- Need for accessibility improvements to parks
- Distance restriction
- Need for public transportation to use in combination with walking and biking
- Need for bike parking/racks

**"Transit/Other" Map Markers**
Based on the analysis of where survey participants placed "Transit/Other" markers seven out of 10 markers were within a half-mile of a transit line.

Figure 106 shows the concentrations by community of where survey participants either currently walk and/or bike and where they wish they could walk and/or bike to reach transit/other destinations.

Figure 106
**Map Marker Concentration for Transit/Other**
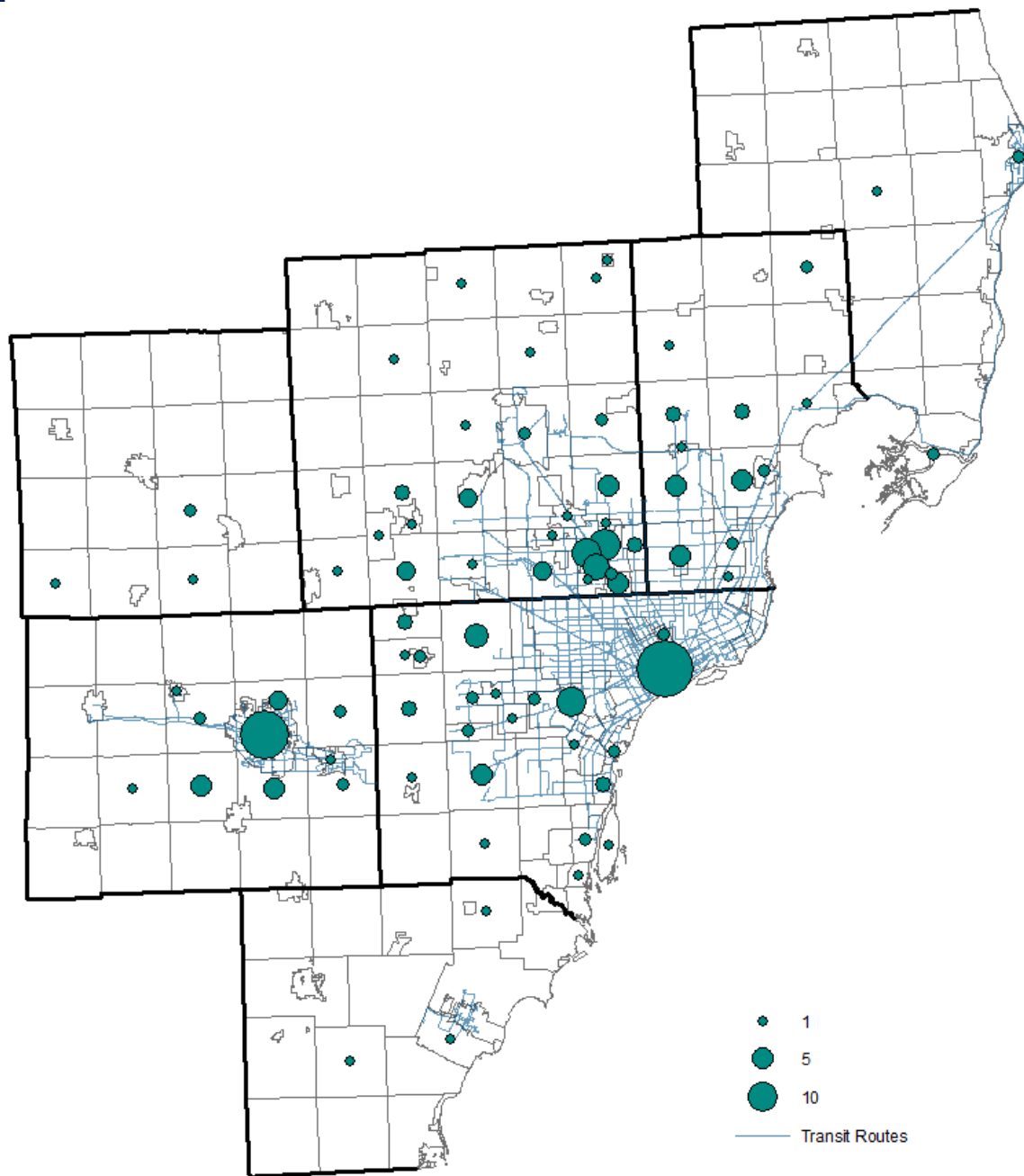


Under each Transit/Other marker, participants were asked if they can walk or bike to that destination, choosing from two options (I can walk or bike here, I wish I could walk or bike here). The analysis for this question shows:

- 33 percent indicated they currently can walk or bike to their *Transit/Other* destinations
- 29 percent indicated they wish they could walk or bike to their *Transit/Other* destinations.

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in reaching transit or other destinations, included:

- 36 percent could walk
- 29 percent could bike
- 34 percent indicated they could use a combination of walking and biking

Choosing from three mode options (walk, bike, combination of walking and biking), participants' response by mode in "wishing they could" reach transit or other destinations, included:

- Five percent indicated they would like to walk
- 49 percent indicated they would like to bike
- 45 percent indicated they would like to use combination of walking and biking

Table 14 shows the map marker analysis for the top 10 communities receiving the highest number of "Transit/Other" map markers.

Table 14
**Top 10 Highest Number of Markers for Transit/Other Destinations**

| Community | Total "Transit/Other" Map Markers | I Can Walk/Bike Here (Percentage) | I Wish I Could Walk/Bike Here (Percentage) |
|---|---|---|---|
| Detroit | 40 | 50% | 18% |
| Ann Arbor | 29 | 62% | 7% |
| Royal Oak | 13 | 46% | 38% |
| Dearborn | 11 | 36% | 36% |
| Berkley | 10 | 30% | 40% |
| Huntington Woods | 8 | 38% | 25% |
| Livonia | 7 | 29% | 43% |
| Warren | 6 | 33% | 17% |
| Lodi Twp | 6 | 33% | 33% |
| Romulus | 5 | 0% | 20% |
| Ferndale | 5 | 60% | 40% |

General "comment" themes reported by participants specific to transit:

- Need for covered bike racks/parking at bus stops
- Lack of connection between bike/pedestrian network to transit system
- Safety concerns
- Proximity to bus stop

General "comment" themes reported by participants specific to "other:"

- Friends/family member's house
- Church

**Impediments**

The mapping exercise also included an "impediment" marker in which participants were able to identify specific locations of impediments, as well as specify the type by choosing from three options (physical barrier, safety issue, maintenance issue). If desired, participants could also provide comments for each marker.

Table 15 shows the impediments participants marked, by both count and percentage. The most common impediment was Physical Barrier/Gap, accounting for 40 percent, followed by safety issues (37 percent), and Maintenance/Condition (12 percent).

Table 15
**Map Markers by Impediment Type**

| Impediments Type | Count | Percentage |
|---|---|---|
| **Maintenance/Condition** | 92 | 12% |
| **Physical barrier/Gap** | 309 | 40% |
| **Safety issue** | 284 | 37% |
| **Other** | 81 | 11% |

Figure 107 shows the concentrations, by community, of where survey participants marked an impediment.

Figure 107
**Map Marker Concentration for Impediments**
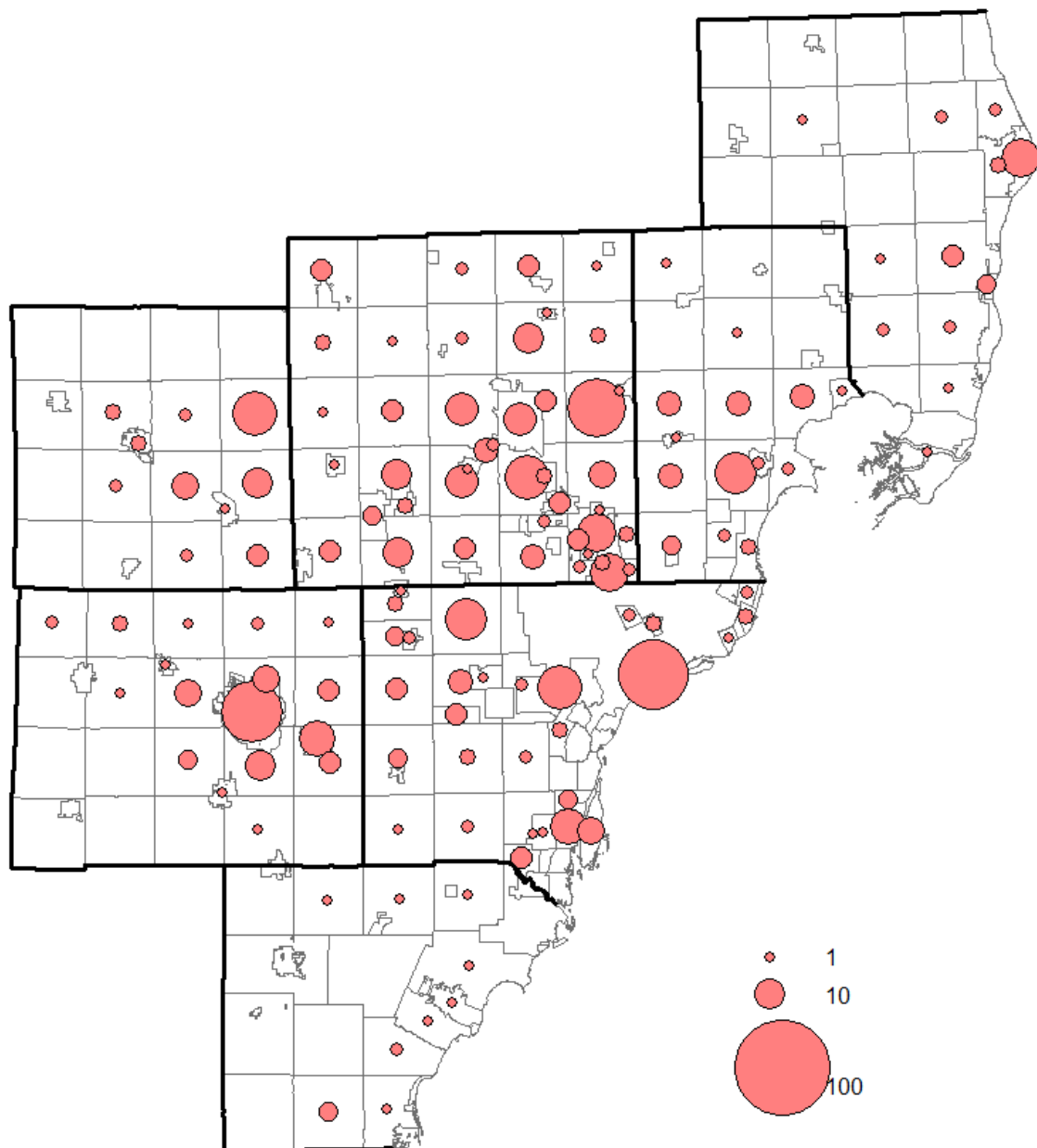


Figure 108 displays the location of impediment by type (physical barrier/gap; safety issue; maintenance/condition; other). For each impediment type, participants were able to provide comments. General "comment" themes by impediment type included:

Physical Barrier/Gap

- In suburban and rural areas of the region, there is a lack of sidewalks and bicycle paths to amenities such as parks, schools, and regional trails

- In urban areas, there is a desire to connect to densely populated areas
- Incomplete shared-use paths

Safety Issue

- Cars travel too fast to want to ride in streets
- Bike lanes are too narrow to feel safe
- Too many driveways to conflict with pedestrians
- No crosswalk
- Not enough time at crosswalk
- Driver aggression

Maintenance/Condition

- Region-wide, road construction, railroad crossings, and flooded streets resulted in less pedestrian and bicycle travel
- Infrastructure needs to be cleaned – street sweeping
- Need better winter maintenance

Other Comments

- Physical disability

Figure 108
**Impediment Map Markers by Type**

Maintenance/Condition (92)
Physical Barrier/Gap (309)
Safety issue (284)
Other (81)
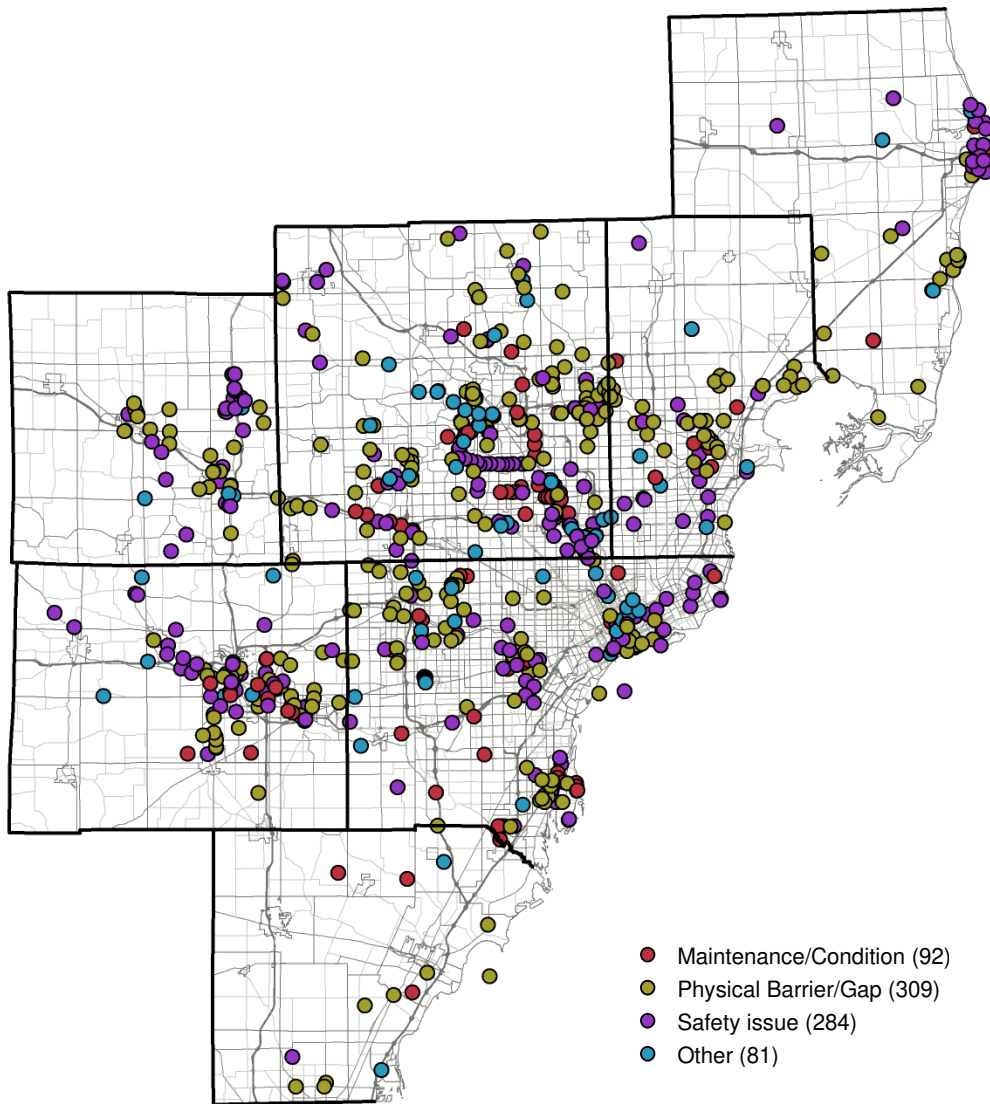
## Ranking Priorities

The third major section of the survey was a ranking of priorities exercise in which participants were asked to rank the top five bike- and/or pedestrian-related infrastructure priorities for additional investment.

Figure 109 displays the top five investment priorities (the smaller average rank, or closer to one, the higher the priority).

Figure 109
**Top Five Investment Priorities (Average Rank)**
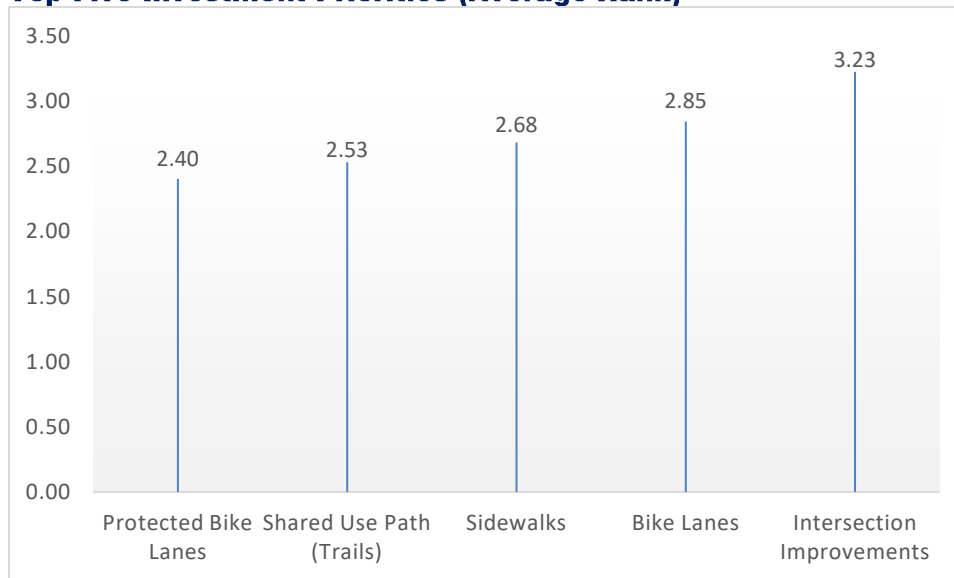


Below is the list of investment priorities in order of ranking by survey participants, along with the summary of comments received for each item. (The ✓ icon next to comment summary represents the comments in favor of investments vs. the ✗ icon, which represents the comments not in favor of investments.)

1.  Protected Bike Lanes (Average Rank 2.40)

    • Comments received for this item:

        ✓  It provides higher safety, especially in areas with higher traffic volume.
        ✗  Cost and weather restrictions.

2.  Shared-Use Path (Trails), (Average Rank 2.53)

    • Comments received for this item:

        ✓  Support for off-road walking and biking facilities
        ✓  Demand for amenities along shared-use paths
        ✓  Safety
        ✓  Great for recreation purposes
        ✓  Demand for security improvements along shared-use paths, such as lighting, cameras, safety patrols.
        ✗  Concern about the maintenance

3. Sidewalks (Average Rank 2.68)

   - Comments received for this item:

     - ✓ Improve the surface condition and ADA accessible
     - ✓ Winter maintenance
     - ✓ Improve the sidewalk network connectivity, especially in suburban areas
     - ✓ Sidewalks should be wide enough to accommodate multi-modes
     - ✓ Improve the access to core services via sidewalks
     - ✗ Concern about the bike and pedestrian conflict on sidewalks

4. Bike Lanes (Average Rank 2.85)

   - Comments received for this item:

     - ✓ Cost effective
     - ✓ Improve the winter maintenance
     - ✓ Improve the surface condition
     - ✗ Safety concerns
     - ✗ Not in support of having bicyclists on road (lane reduction), since they do not pay registration fees

5. Intersection Improvements (e.g., bicycle and pedestrian crosswalk improvements at major roadway intersections and traffic signals, including high visibility crosswalk markings, countdown pedestrian signals, and curb extensions) (Average Rank 3.23)

   - Comments received for this item:

     - ✓ Would encourage more walking
     - ✓ Consider all abilities (people with disabilities, elderly) in intersection improvements such as in signal's crossing time
     - ✓ Need for more educational campaigns as well as crosswalk enforcement
     - ✓ Improves the safety of bicyclists and pedestrians
     - ✓ Need for improvements in highway crossings
     - ✓ Need for surface improvements

6. Bike Routes and Signage (Average Rank 3.29)

   - Comments received for this item:

     - ✓ Need for intersection signage improvements
     - ✓ Support for bike routes since they help the user navigation
     - ✗ Safety Concerns

7. Midblock Crosswalks (Average Rank 3.51)

   - Comments received for this item:

     - ✓ Improves sidewalk and trails network connectivity
     - ✓ Improves safety in wide roads and also in roads with high traffic volume
     - ✓ Support for midblock crossing with signals and median islands

8. Shared Lane Markings (Average Rank 3.94)

   - Comments received for this item:

 ✖ Need for more driver education
 ✖ Safety concerns
 ✖ Not practical

Among all the eight items listed for investment, Shared Lane Marking (3.94) was ranked as the least preferred item for additional investment.

Other priorities pointed out by survey respondents were classified in different groups, including:

- Enforcement and public education

- Facilities maintenance and surface improvements

- Connectivity of the network

- Bike parking/Racks

- Facilities safety and security improvements, including lighting

- Public transportation

From those who used the "Suggest another" option in this screen to comment on bicycle and pedestrian related infrastructure for investment, there were respondents who were not in favor of investing in more bike facilities, explaining that not every road should have biking facilities

# Appendix D — Bicycle and Pedestrian Safety Analysis

This Appendix is an analysis of bicycle and pedestrian-involved traffic crashes between 2014 and 2018 in Southeast Michigan. Traffic crash data used in this analysis is from the Michigan State Police, Criminal Justice Information Center (CJIC).

## Injury Severity

Table 16 and Table 17 illustrate the severity of injury to pedestrians and bicyclists across five levels of injury for 2014 through 2018. Over this five year period there were 460 pedestrian crashes resulting in a fatality and 57 bicycle crashes resulting in a fatality.

Figure 110 shows that 88 percent of pedestrian crashes resulted in some level of injury and 23 percent resulted in either a fatality or serious injury. Figure 111 shows that 79 percent of bicycle crashes resulted in some level of injury and 8 percent result in either a fatality of serious injury.

Table 16
**Pedestrian Crashes by Severity, 2014-2018**

| Year | Fatal Crashes | Serious Injury Crashes | Minor Injury Crashes | Possible Injury Crashes | No Injury Crashes |
|------|------|------|------|------|------|
| **2014** | 94 | 194 | 363 | 477 | 138 |
| **2015** | 102 | 192 | 385 | 501 | 128 |
| **2016** | 99 | 167 | 372 | 400 | 168 |
| **2017** | 84 | 218 | 390 | 371 | 163 |
| **2018** | 81 | 218 | 397 | 429 | 183 |
| **Total** | 460 | 989 | 1,907 | 2,178 | 780 |

Table 17
**Bicycle Crashes by Severity, 2014-2018**

| Year | Fatal Crashes | Serious Injury Crashes | Minor Injury Crashes | Possible Injury Crashes | No Injury Crashes |
|------|--------------|------------------------|----------------------|-------------------------|-------------------|
| 2014 | 12 | 67 | 282 | 341 | 171 |
| 2015 | 15 | 54 | 311 | 366 | 186 |
| 2016 | 16 | 68 | 370 | 376 | 239 |
| 2017 | 5 | 89 | 362 | 284 | 174 |
| 2018 | 9 | 52 | 299 | 266 | 188 |
| Total | 57 | 330 | 1,624 | 1,633 | 958 |

Figure 110
**Distribution of Pedestrian Crashes by Severity, 2014-2018**



- Fatal crashes
- Serious injury crashes
- Minor injury crashes
- Possible injury crashes
- No injury Crashes
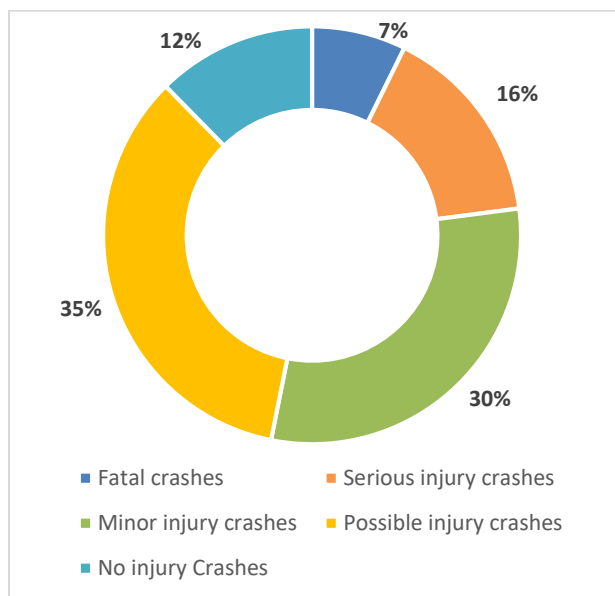
Figure 111
**Distribution of Bicycle Crashes by Severity, 2014-2018**



Legend:
- Fatal crashes
- Serious injury crashes
- Minor injury crashes
- Possible injury crashes
- No injury Crashes
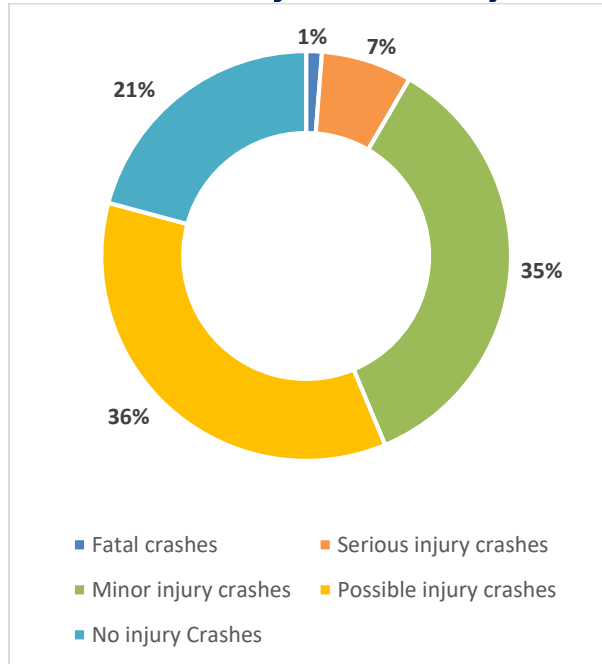
# Average Rate of Crashes

Tables 18 and 19 show the annual average rate of pedestrian and bicycle crashes, fatalities, and serious injuries for the region and by county, using SEMCOG's latest population estimates. Over the five year period (2014-2018), nearly two pedestrians were killed and more than four were seriously injured for every 100,000 residents in the region. Over the same period, 0.23 bicyclists were killed and another 1.4 were seriously injured for every 100,000 residents.

Wayne County's pedestrian fatality rate was 52 percent higher than the regional average. Three counties exceeded the region's average bicyclist fatality rate, with Washtenaw more than doubling the average.

Table 18

**Annual Average Pedestrian Crash, Fatality, and Serious Injury Rate per 100,000 Residents by County, 2014-2018**

| County | Crashes | Fatalities | Serious Injuries |
|--------|---------|------------|------------------|
| **Livingston** | 7.79 | 1.04 | 1.45 |
| **Macomb** | 19.57 | 1.57 | 3.17 |
| **Monroe** | 14.68 | 1.72 | 2.64 |
| **Oakland** | 16.96 | 1.28 | 2.98 |
| **St. Clair** | 15.43 | 1.00 | 3.26 |
| **Washtenaw** | 28.65 | 1.23 | 4.72 |
| **Wayne** | 40.44 | 2.95 | 6.13 |
| **SEMCOG Average** | 26.49 | 1.94 | 4.25 |

Table 19

**Annual Average Bicycle Crash, Fatality, and Serious Injury Rate per 100,000 Residents by County, 2014-2018**

| County | Crashes | Fatalities | Serious Injuries |
|--------|---------|------------|------------------|
| **Livingston** | 5.61 | 0.21 | 0.42 |
| **Macomb** | 19.20 | 0.23 | 1.00 |
| **Monroe** | 14.68 | 0.26 | 1.45 |
| **Oakland** | 14.58 | 0.17 | 1.22 |
| **St. Clair** | 15.18 | 0.38 | 1.76 |
| **Washtenaw** | 24.74 | 0.54 | 1.61 |
| **Wayne** | 23.89 | 0.21 | 1.75 |
| **SEMCOG Average** | 19.31 | 0.23 | 1.40 |

# Fatalities and Serious Injuries by Age and Gender

Figures 112 and 113 illustrate the distribution of pedestrian and bicyclist fatalities and serious injuries by age group. Serious injuries were highest among younger age groups, age 20-24 for pedestrians and 15-19 for bicyclists, and then peak again for people age 55-59. Fatalities increased with age, peaking at age 55-59 for pedestrians and 50-54 for bicyclists.

Figure 112
**Pedestrian Fatalities and Serious Injuries by Age, 2014-2018**
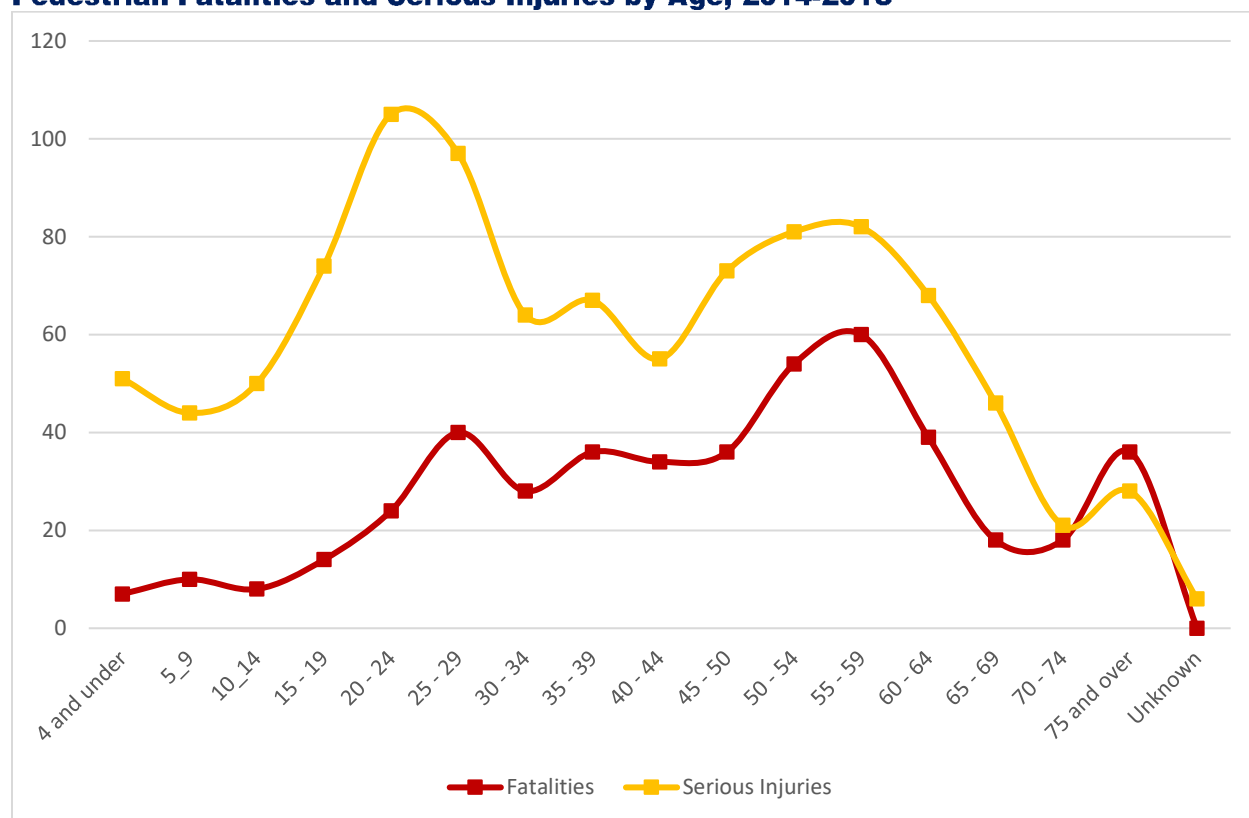
Figure 113
**Bicycle Fatalities and Serious Injuries by Age, 2014-2018**
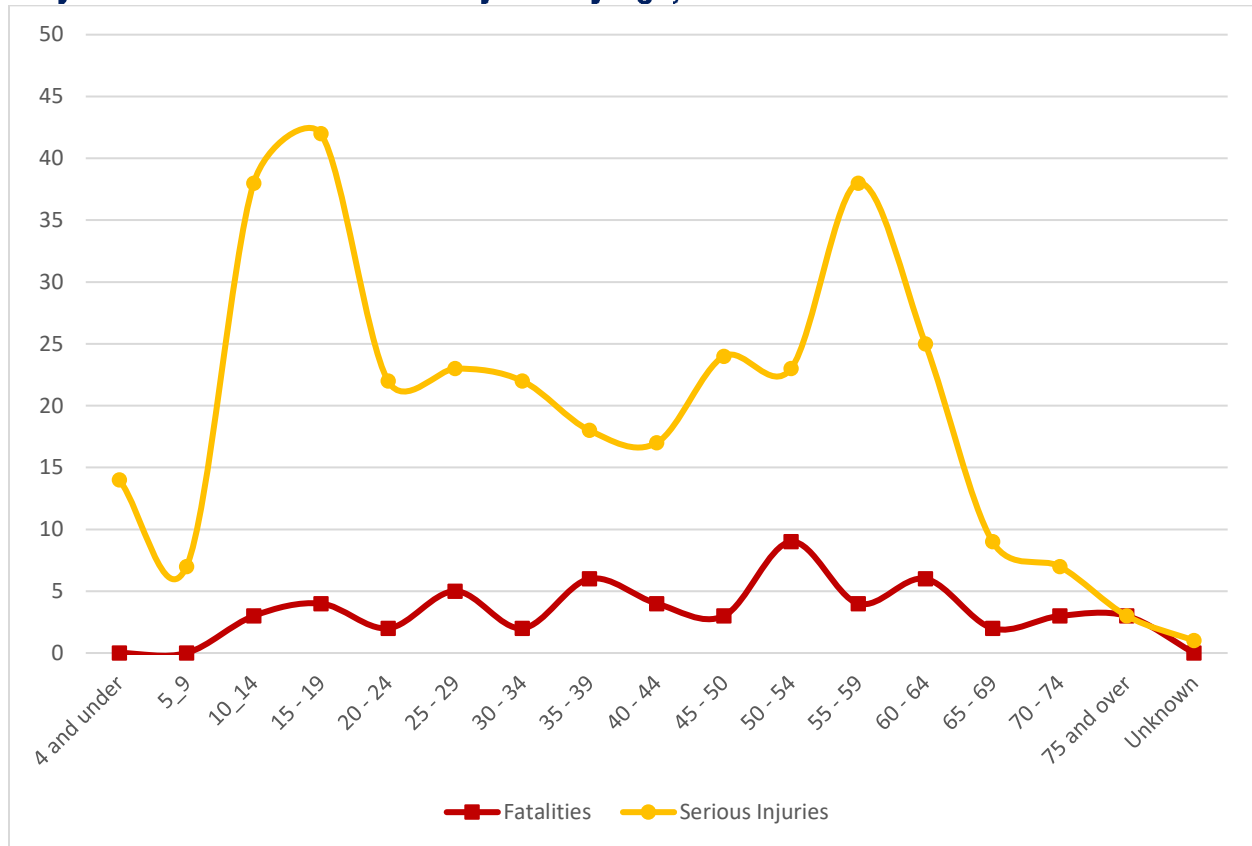


Figures 114 and 115 illustrate the distribution of pedestrian fatalities and serious injuries by gender. The majority of both pedestrians and bicyclists killed were male. The share of female pedestrians killed or seriously injured from 2014 to 2018 was more than double the share of female bicyclists killed or seriously injured in the same time period.

Figure 114
**Distribution of Pedestrian Fatalities and Serious Injuries by Gender, 2014-2018**



34%

66%

■ Female  ■ Male
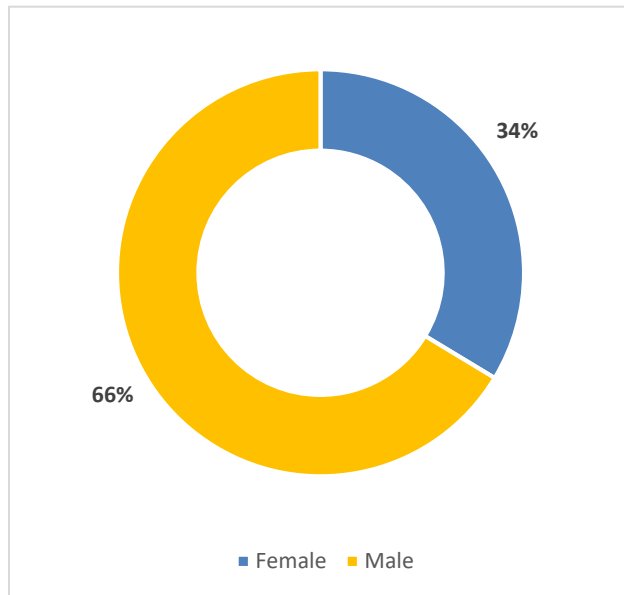
Figure 115
**Distribution of Bicycle Fatalities and Serious Injuries by Gender, 2014-2018**



16%

84%

■ Female  ■ Male
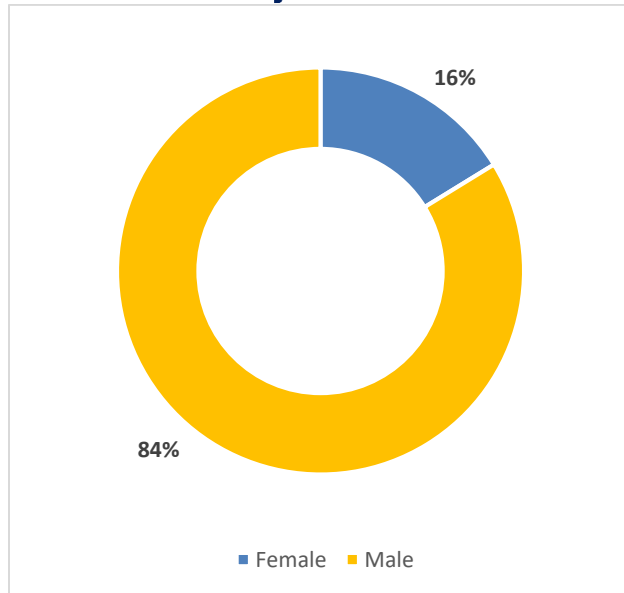
# Crashes by Road Jurisdiction

Figures 116 and 117 show the distribution of pedestrian and bicycle crash severity for crashes where road jurisdiction is known. Crashes that occurred on state-owned roads were more likely to result in a fatality or serious injury compared to county and locally-owned roads. Local roads, on the other hand, had the highest share of no-injury crashes.

Figure 116
**Distribution of Pedestrian Crashes by Severity and Road Jurisdiction, 2014-2018**
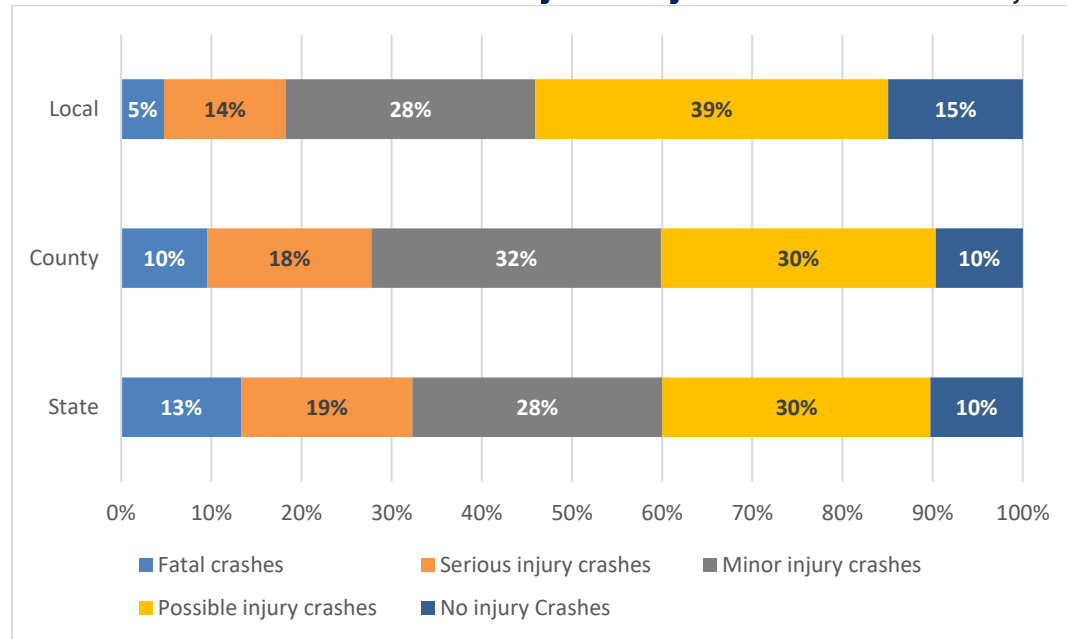


Figure 117
**Distribution of Bicycle Crashes by Severity and Road Jurisdiction, 2014-2018**
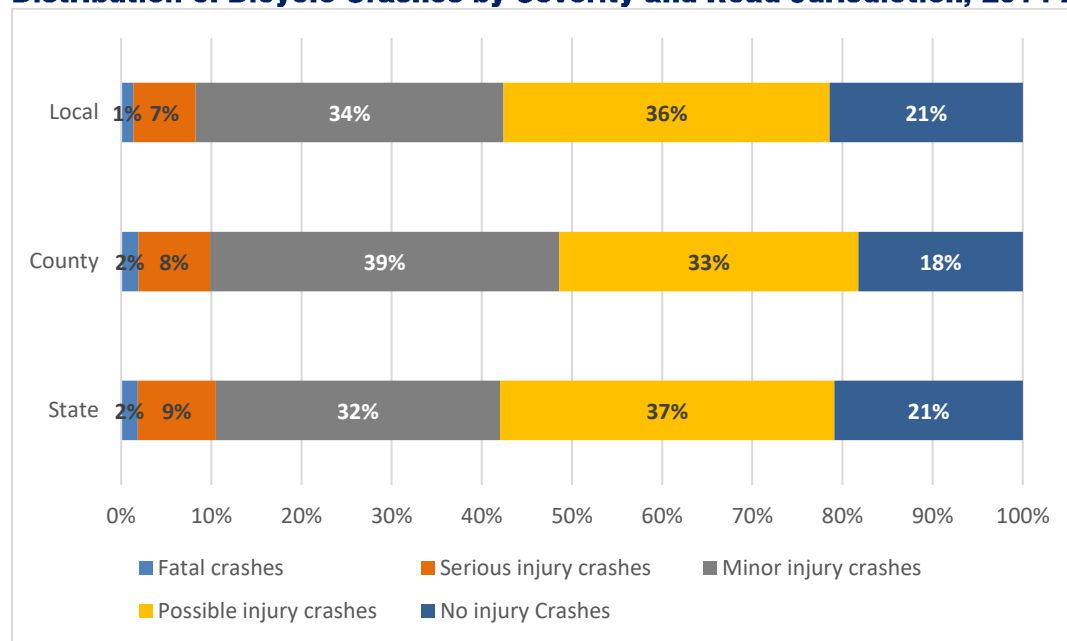
# Crashes by County

Tables 20 and 21 show the share of all traffic crashes, fatalities, and serious injuries that involved pedestrians and bicyclists for the region and by county. Less than one percent of all crashes involved a pedestrian, though over 24 percent of all people killed and nearly 10 percent of people seriously injured were pedestrians. Bicyclists also made up a higher percent of people killed and seriously injured than their share of traffic crashes. Furthermore, pedestrians and bicyclists made up a larger portion of the people killed and seriously injured on the roads in Southeast Michigan compared to the State.

Table 20
**Distribution of Pedestrian Crashes and Injuries by County, 2014-2018**

| County | Crashes | Fatalities | Serious Injuries |
|---|---|---|---|
| **Livingston** | 0.3% | 11.2% | 3.7% |
| **Macomb** | 0.7% | 26.4% | 8.2% |
| **Monroe** | 0.6% | 11.9% | 5.1% |
| **Oakland** | 0.5% | 24.3% | 8.8% |
| **St. Clair** | 0.6% | 9.2% | 6.2% |
| **Washtenaw** | 1.0% | 15.5% | 11.7% |
| **Wayne** | 1.4% | 29.1% | 11.9% |
| **SEMCOG Average** | 0.9% | 24.2% | 9.8% |
| **Michigan Average** | 0.7% | 16.0% | 7.3% |

Table 21
**Distribution of Bicycle Crashes and Injuries by County, 2014-2018**

| County | Crashes | Fatalities | Serious Injuries |
|---|---|---|---|
| Livingston | 0.2% | 2.2% | 1.1% |
| Macomb | 0.7% | 3.8% | 2.6% |
| Monroe | 0.6% | 1.8% | 2.8% |
| Oakland | 0.4% | 3.3% | 3.6% |
| St. Clair | 0.6% | 3.4% | 3.3% |
| Washtenaw | 0.8% | 6.8% | 4.0% |
| Wayne | 0.8% | 2.0% | 3.4% |
| SEMCOG Average | 0.6% | 2.9% | 3.2% |
| Michigan Average | 0.6% | 2.7% | 2.7% |

# Appendix E — USDOT Pedestrian and Bicycle Funding Opportunities

**Pedestrian and Bicycle Funding Opportunities**
**U.S. Department of Transportation Transit, Highway, and Safety Funds**
Revised August 9, 2018

This table indicates potential eligibility for pedestrian and bicycle projects under U.S. Department of Transportation surface transportation funding programs. Additional restrictions may apply. See notes and basic program requirements below, and see program guidance for detailed requirements. Project sponsors should fully integrate nonmotorized accommodation into surface transportation projects. Section 1404 of the Fixing America's Surface Transportation (FAST) Act modified 23 U.S.C. 109 to require federally-funded projects on the National Highway System to consider access for other modes of transportation, and provides greater design flexibility to do so.

| Key: $ = Funds may be used for this activity (restrictions may apply). ~$ = Eligible, but not competitive unless part of a larger project. $* = See program-specific notes for restrictions. | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activity or Project Type** | BUILD | INFRA | TIFIA | FTA | ATI | CMAQ | HSIP | NHPP | STBG | TA | RTP | SRTS | PLAN | NHTSA 402 | NHTSA 405 | FLTTP |
| Access enhancements to public transportation (includes benches, bus pads) | $ | ~$ | $ | $ | $ | $ | | $ | $ | $ | | | | | | $ |
| ADA/504 Self Evaluation / Transition Plan | | | | | | | | | $ | $ | $ | | $ | | | $ |
| Bicycle plans | | | | $ | | | | | $ | $ | | $ | $ | | | $ |
| Bicycle helmets (project or training related) | | | | | | | | | $ | $SRTS | | $ | | $* | | |
| Bicycle helmets (safety promotion) | | | | | | | | | $ | $SRTS | | $ | | | | |
| Bicycle lanes on road | $ | ~$ | $ | $ | $ | $ | $ | $ | $ | $ | | $ | | | | $ |
| Bicycle parking | ~$ | ~$ | ~$ | $ | $ | $ | | $ | $ | $ | $ | $ | | | | $ |
| Bike racks on transit | $ | ~$ | $ | $ | $ | $ | | | $ | $ | | | | | | $ |
| Bicycle repair station (air pump, simple tools) | ~$ | ~$ | ~$ | $ | $ | $ | | | $ | $ | | | | | | $ |
| Bicycle share (capital and equipment; not operations) | $ | ~$ | $ | $ | $ | $ | | $ | $ | $ | | | | | | $ |
| Bicycle storage or service centers (example: at transit hubs) | ~$ | ~$ | ~$ | $ | $ | $ | | | $ | $ | | | | | | $ |
| Bridges / overcrossings for pedestrians and/or bicyclists | $ | ~$ | $ | $ | $ | $* | $ | $ | $ | $ | $ | $ | | | | $ |
| Bus shelters and benches | $ | ~$ | $ | $ | $ | $ | | $ | $ | $ | | | | | | $ |
| Coordinator positions (State or local) | | | | | | $ 1 per State | | | $ | $SRTS | | | $ | | | |
| Crosswalks (new or retrofit) | $ | ~$ | $ | $ | $ | $* | $ | $ | $ | $ | $ | $ | | | | $ |
| Curb cuts and ramps | $ | ~$ | $ | $ | $ | $* | $ | $ | $ | $ | $ | $ | | | | $ |
| Counting equipment | | | | $ | $ | | $ | $ | $ | $ | $ | $ | $* | | | $ |
| Data collection and monitoring for pedestrians and/or bicyclists | | | | $ | $ | | $ | $ | $ | $ | $ | $ | $* | | | $ |
| Historic preservation (pedestrian and bicycle and transit facilities) | $ | ~$ | $ | $ | $ | | | | $ | $ | | | | | | $ |
| Landscaping, streetscaping (pedestrian and/or bicycle route; transit access); related amenities (benches, water fountains); generally as part of a larger project | ~$ | ~$ | ~$ | $ | $ | | | $ | $ | $ | | | | | | $ |
| Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project) | $ | ~$ | $ | $ | $ | | $ | $ | $ | $ | $ | $ | | | | $ |
| Maps (for pedestrians and/or bicyclists) | | | | $ | $ | $ | | | $ | $ | | $ | $* | | | |
| Paved shoulders for pedestrian and/or bicyclist use | $ | ~$ | $ | | | $* | $ | $ | $ | $ | | $ | | | | $ |

Key: $ = Funds may be used for this activity (restrictions may apply). ~$ = Eligible, but not competitive unless part of a larger project. $* = See program-specific notes for restrictions.

**Pedestrian and Bicycle Funding Opportunities**
**U.S. Department of Transportation Transit, Highway, and Safety Funds**

| Activity or Project Type | BUILD | INFRA | TIFIA | FTA | ATI | CMAQ | HSIP | NHPP | STBG | TA | RTP | SRTS | PLAN | NHTSA 402 | NHTSA 405 | FLTTP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian plans | | | | $ | | | | | $ | $ | | $ | $ | | | $ |
| Recreational trails | ~$ | ~$ | ~$ | | | | | | $ | $ | $ | | | | | $ |
| Road Diets (pedestrian and bicycle portions) | $ | ~$ | $ | | | | $ | $ | $ | $ | | | | | | $ |
| Road Safety Assessment for pedestrians and bicyclists | | | | | | $ | | | $ | $ | | | $ | | | $ |
| Safety education and awareness activities and programs to inform pedestrians, bicyclists, and motorists on ped/bike safety | | | | | | | | | $SRTS | $SRTS | | $* | $ | $* | $* | |
| Safety education positions | | | | | | | | | $SRTS | $SRTS | | | $ | $* | | |
| Safety enforcement (including police patrols) | | | | | | | | | $SRTS | $SRTS | | | $ | $* | $* | |
| Safety program technical assessment (for peds/bicyclists) | | | | | | | | | $SRTS | $SRTS | | $* | $ | | | |
| Separated bicycle lanes | $ | ~$ | $ | $ | $ | $ | $ | $ | $ | $ | | | $ | | | $ |
| Shared use paths / transportation trails | $ | ~$ | $ | $ | $ | $* | $ | $ | $ | $ | $ | | $ | | | $ |
| Sidewalks (new or retrofit) | $ | ~$ | $ | $ | $ | $ | $ | $ | $ | $ | $ | | $ | | | $ |
| Signs / signals / signal improvements | $ | ~$ | $ | $ | $ | $ | $ | $ | $ | $ | | | $ | | | $ |
| Signed pedestrian or bicycle routes | $ | ~$ | $ | $ | $ | $ | | $ | $ | $ | | | $ | | | $ |
| Spot improvement programs | $ | ~$ | $ | $ | | | $ | $ | $ | $ | $ | | $ | | | $ |
| Stormwater impacts related to pedestrian and bicycle projects | $ | ~$ | $ | $ | $ | | $ | $ | $ | $ | $ | | $ | | | $ |
| Traffic calming | $ | ~$ | $ | $ | | | $ | $ | $ | $ | | | $ | | | $ |
| Trail bridges | $ | ~$ | $ | | | $* | $ | $ | $ | $ | $ | | $ | | | $ |
| Trail construction and maintenance equipment | | | | | | | | | $RTP | $RTP | $ | | | | | |
| Trail/highway intersections | $ | ~$ | $ | | | $* | $ | $ | $ | $ | $ | | $ | | | $ |
| Trailside and trailhead facilities (includes restrooms and water, but not general park amenities; see program guidance) | ~$* | ~$* | ~$* | | | | | | $* | $* | $* | | | | | $ |
| Training | | | | | | $ | $ | | $ | $ | $ | $* | $ | $* | | |
| Training for law enforcement on ped/bicyclist safety laws | | | | | | | | | $SRTS | $SRTS | | | $ | | $* | |
| Tunnels / undercrossings for pedestrians and/or bicyclists | $ | ~$ | $ | $ | $ | $* | $ | $ | $ | $ | $ | | $ | | | $ |

**Abbreviations**

ADA/504: Americans with Disabilities Act of 1990 / Section 504 of the Rehabilitation Act of 1973
BUILD: Better Utilizing Investments to Leverage Development Transportation Discretionary Grants
INFRA: Infrastructure for Rebuilding America Discretionary Grant Program
TIFIA: Transportation Infrastructure Finance and Innovation Act (loans)
FTA: Federal Transit Administration Capital Funds
ATI: Associated Transit Improvement (1% set-aside of FTA)
CMAQ: Congestion Mitigation and Air Quality Improvement Program
HSIP: Highway Safety Improvement Program
NHPP: National Highway Performance Program
STBG: Surface Transportation Block Grant Program

TA: Transportation Alternatives Set-Aside (formerly Transportation Alternatives Program)
RTP: Recreational Trails Program
SRTS: Safe Routes to School Program / Activities
PLAN: Statewide Planning and Research (SPR) or Metropolitan Planning funds
NHTSA 402: State and Community Highway Safety Grant Program
NHTSA 405: National Priority Safety Programs (Nonmotorized safety)
FLTTP: Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program, Nationally Significant Federal Lands and Tribal Projects)

**Program-specific notes:** Federal-aid funding programs have specific requirements that projects must meet, and eligibility must be determined on a case-by-case basis.

- BUILD: Subject to annual appropriations. See https://www.transportation.gov/BUILDgrants for details.
- INFRA: See https://www.transportation.gov/buildamerica/infragrants for details. Focus on projects that generate national or regional economic, mobility, and safety benefits.
- TIFIA: Program offers assistance only in the form of secured loans, loan guarantees, or standby lines of credit, but can be combined with other grant sources, subject to total Federal assistance limitations.
- FTA/ATI: Project funded with FTA transit funds must provide access to transit. See Bicycles and Transit and the FTA Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements under Federal Transit Law.
  - Bicycle infrastructure plans and projects funded with FTA funds must be within a 3 mile radius of a transit stop or station, or if further than 3 miles, must be within the distance that people could be expected to safely and conveniently bike to use the particular stop or station.
  - Pedestrian infrastructure plans and projects funded with FTA funds must be within a ½ mile radius of a transit stop or station, or if further than ½ mile, must be within the distance that people could be expected to safely and conveniently walk to use the particular stop or station.
  - FTA funds cannot be used to purchase bicycles for bike share systems.
  - FTA encourages grantees to use FHWA funds as a primary source for public right-of-way projects.
- CMAQ projects must demonstrate emissions reduction and benefit air quality. See the CMAQ guidance at www.fhwa.dot.gov/environment/air_quality/cmaq/ for a list of projects that may be eligible for CMAQ funds. Several activities may be eligible for CMAQ funds as part of a bicycle and pedestrian-related project, but not as a highway project. CMAQ funds may be used for shared use paths, but may not be used for trails that are primarily for recreational use.
- HSIP projects must be consistent with a State's Strategic Highway Safety Plan and (1) correct or improve a hazardous road location or feature, or (2) address a highway safety problem.
- NHPP projects must benefit National Highway System (NHS) corridors.
- STBG and TA Set-Aside: Activities marked "$SRTS" means eligible only as an SRTS project benefiting schools for kindergarten through 8th grade. Bicycle transportation nonconstruction projects related to safe bicycle use are eligible under STBG, but not under TA (23 U.S.C. 217(a)).
- RTP must benefit recreational trails, but for any recreational trail use. RTP projects are eligible under TA and STBG, but States may require a transportation purpose.
- SRTS: FY 2012 was the last year for SRTS funds, but SRTS funds are available until expended.
- Planning funds must be used for planning purposes, for example:
  - Maps: System maps and GIS;
  - Safety education and awareness: for transportation safety planning;
  - Safety program technical assessment: for transportation safety planning;
  - Training: bicycle and pedestrian system planning training.
- Federal Lands and Tribal Transportation Programs (FLTTP) projects must provide access to or within Federal or tribal lands:
  - Federal Lands Access Program (FLAP): Open to State and local entities for projects that provide access to or within Federal or tribal lands.
  - Federal Lands Transportation Program: For Federal agencies for projects that provide access within Federal lands.
  - Tribal Transportation Program: available for federally-recognized tribal governments for projects within tribal boundaries and public roads that access tribal lands.
- NHTSA 402 project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details: http://www.ghsa.org/html/about/shsos.html
- NHTSA 405 funds are subject to State eligibility, application, and award. Project activity must be included in the State's Highway Safety Plan. Contact the State Highway Safety Office for details: http://www.ghsa.org/html/about/shsos.html

**Cross-cutting notes**

- FHWA Bicycle and Pedestrian Guidance: http://www.fhwa.dot.gov/environment/bicycle_pedestrian/
- **Applicability of 23 U.S.C. 217(i) for Bicycle Projects:** 23 U.S.C. 217(i) requires that bicycle facilities "be principally for transportation, rather than recreation, purposes". However, sections 133(b)(6) and 133(h) list "recreational trails projects" as eligible activities under STBG. Therefore, the requirement in 23 U.S.C. 217(i) does not apply to recreational trails projects (including for bicycle use) using STBG funds. Section 217(i) continues to apply to bicycle facilities other than trail-related projects, and section 217(i) continues to apply to bicycle facilities using other Federal-aid Highway Program funds (NHPP, HSIP, CMAQ). The transportation requirement under section 217(i) is applicable only to bicycle projects; it does not apply to any other trail use or transportation mode.
- There may be occasional DOT or agency incentive grants for specific research or technical assistance purposes.
- Aspects of DOT initiatives may be eligible as individual projects. Activities above may benefit safe, comfortable, multimodal networks; environmental justice; and equity.

# Appendix F — Equity Analysis Methodology

Equity is important to SEMCOG. A major indicator of how well a transportation system functions is measuring the equitable level of service provided to all segments of the population. The goal of this equity analysis is to understand where there are concentrations of various populations in the region. Of particular focus are areas in the region that have high concentrations of populations who are likely reliant on an accessible bicycle and pedestrian network to meet their needs. In determining these concentration areas, five-socio-economic indicators were used:



**Concentration of Equity Populations**
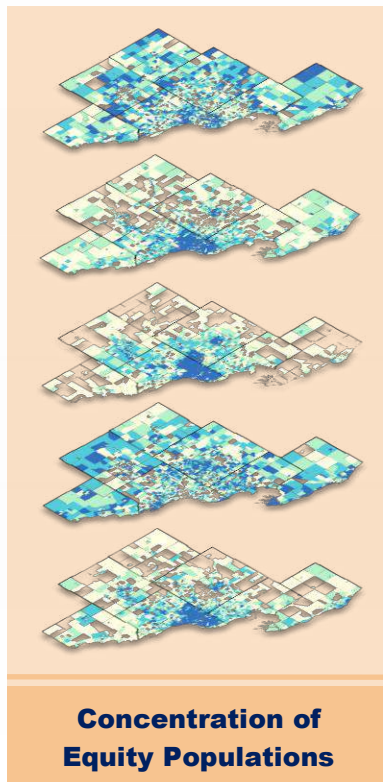
### Children Population
Population aged 17 and under, which accounts for 1,054,290 persons (22 percent of Southeast Michigan's total population).

### Low-Income Households
Households in the lowest income quartile for the region. There are 465,635 (25 percent of all households) low-income households in the region.

### Minority Population
Persons belonging to any of the following groups – Black; Hispanic; Asian; American Indian and Alaskan Native. The region's minority population is 1,446,089 (31 percent of the total population).

### Senior Population
Population aged 65 and older, which accounts for 696,810 persons (15 percent of the region's total population).

### Transit-Dependent Households
Combines zero-car households and households with fewer cars available than workers (+16 years of age). There are 143,358 (7.8 percent) households without an automobile; an additional 138,341 (7.5 percent) of households have fewer automobiles available than workers. Transit-dependent households account for 12.5 percent of the region's households.

In developing this Equity Analysis the percentage of each of the five socio-economic indicators for every Traffic Analysis Zone (TAZ) in the region was calculated and mapped. TAZs are geographic areas dividing the region into relatively similar areas of land use and land activity, and are primarily used in SEMCOG's travel demand forecasting model. There are 2,811 internal TAZs in the SEMCOG region. Following the calculation and mapping for the five socio-economic indicators, every TAZ was classified into one of five bins:

1. well above average;
2. above average;
3. average;
4. below average; and
5. well below average.

Each bin was then given a score ranging from zero to four based on which quantile the TAZ fell into. For example, TAZs that scored significantly below the regional average received a score of 0; those below average, a score of 1; those near the average, a score of 2; those above the average, a score of 3; and those significantly above average, a score of 4. A summary score of all five indicators for each TAZ (ranging from 0-20) is used to show regional concentrations of equity populations.

Then a cumulative numeric score of 0 to 20 is calculated for every TAZ on the concentration of a population identified in each of the five socio-economic indicators. Each of the region's 2,811 TAZs was scored with the maximum possible score of 20 since there are 5 indicators and a maximum bin score of 4 per indicator.

# Appendix G — Demand Analysis Methodology

SEMCOG's Demand Analysis identifies areas of bicycle and pedestrian demand, based on concentrations of people, destinations, and specific trip-making characteristics. Its goal is to highlight where bicycle and pedestrian improvements could be most impactful from a mobility perspective. Levels of demand have been assessed in three demand area categories:

- **High Demand Areas** – locations in the region that are likely the most bicycle and pedestrian friendly, or those areas with the most potential to support people walking or biking. They include the region's major downtowns and town centers, and locations with high density of people and destinations.

- **Moderate Demand Areas** – locations that are likely to support walking and biking, but in many cases driving is still necessary for some daily trips. They include many of the region's smaller town centers, as well as areas adjacent to high demand areas. Outside of town centers, they are primarily residential areas, with commercial development along major roadways and intersections. They often include transit services and grid-patterned residential streets that could provide more direct walking or biking routes.

- **Potential Demand Areas** – less densely populated locations that have clusters of activity that may support walking and biking if adequate infrastructure exists. Road networks in these areas may be less developed, making travel times less suited for walking and biking trips, which are typically shorter in distance. These areas are also typically less connected to fixed-route transit, so bicycle and pedestrian mobility is more localized, or recreational in nature. In many cases, some of the potential demand areas could become moderate demand areas with improvements in one or two component categories such as transit service or street intersection density.

Places outside of these three areas may have bicycle and pedestrian activity, but trips are more likely to be recreational in nature, and the distance between common destinations is longer than most people would reasonably walk or bike.

## Components of Demand Analysis

SEMCOG's Demand Analysis is based on region wide geographic datasets that center on the following components:

1. Clusters of People
2. Clusters of Destinations
3. Trip Making Characteristics

Each of these components play a crucial role in measuring demand based on specific data variables at the parcel or Travel Analysis Zone (TAZ) level. TAZs are geographic areas dividing the region into relatively similar areas of land use and land activity, and are primarily used in SEMCOG's travel demand forecasting model. There are 2,811 internal TAZs in the SEMCOG region. These datasets were analyzed using Geographic Information Systems (GIS), to create sub scores for each topic area that were eventually combined into one composite score.

Figure 118 displays how these three components work, the specific data sets, and basic principles for the analysis.

Figure 118
**Demand Analysis Diagram**
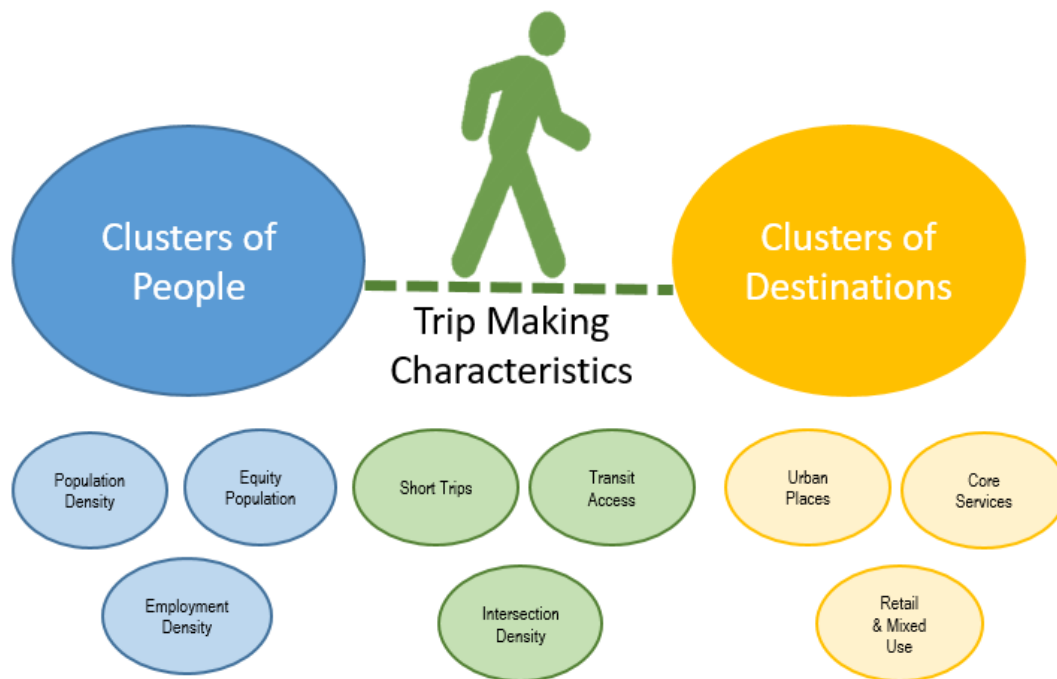


### 1. Clusters of People

At the center of the analysis are people. Where there are few people, there will be fewer pedestrians or bicyclists. SEMCOG's analysis measures three different datasets to identify concentrations of people who could be walking or biking. Datasets to identify clusters of people are: Population Density; Equity Populations; and Employment Density. In total, these three datasets for clusters of people can award an area a maximum score of 30 points.

Population Density – Where there are more people in closer proximity to each other, there is a greater pool of people who may choose to walk or bike to reach commercial, civic, or core service destinations. They are also more likely to walk or bike in reaching one another since the distances are often shorter.

***Scoring***: 5 points were awarded to census blocks where population density exceeds 1,500 people per square mile.

Equity Populations – Certain populations are likely to be more reliant on walking and biking to get reach destinations. These populations include:

- Households with low income

- Households with no access to a motor vehicle
- Minority populations
- Senior populations

**Scoring**: 2.5 points were awarded to census blocks that have 1.5 times the regional average of any of the four equity populations. A census block could receive a maximum award of 10 points if it had higher averages across all four equity populations.

Employment Density – Similar to population density, areas where there are many people working increases the opportunity to walk and bike. This density analysis includes the following employment sectors:

- General Employment, regardless of sector;
- Retail Employment; and
- Leisure/Hospitality Service Employment.

**Scoring**: Utilizing SEMCOG's Employment Density Map areas of "high" employment density were awarded 5 points, while areas of medium employment density were awarded 3.5 points for each of the three employment categories. A census block could receive a maximum of 15 points if each of the three employment sectors were high.

## 2. Clusters of Destinations

Identifying destinations is important to understanding demand since most walking and biking trips that are not recreational are likely taken to reach a desired location. In identifying destinations, this analysis included three categories — core services; retail, entertainment and commercial land use; and Walkable Urban Places. In total, these three destination clusters can award an area a maximum score of 20 points.

Core Services - Core services are major destinations that residents need to access on a regular basis including, jobs, health care facilities, supermarkets, parks, schools, and libraries. SEMCOG's Access to Core Services report provides more information, including maps and data analysis for accessibility gaps. For this Clusters of Destinations analysis, parcels that had access to multiple core services within a 10-minute and 30-minute walk and bike ride were identified.

**Scoring:** 5 points were awarded to areas where three of more core services were accessible within a 10-minute walk or bike ride. 2.5 points were awarded where three or more core services were accessible within a 30-minute walk or bike ride. A parcel could receive a maximum score of 15 points if it met all the four thresholds for both walking and biking.

Retail, Entertainment, and Commercial Land Use – Beyond core services, people are likely to walk or bike to other destinations that are near to their home, such as neighborhood hardware stores, convenience stores, and restaurants.

**Scoring:** 5 points were awarded to parcels where at least 1,500 square feet of retail, entertainment, or commercial land uses were within ¼ of a mile.

Walkable Urban Places - Walkable Urban Places or WalkUps are existing or emerging areas of walkability anchored by a mix of real-estate products, similar in nature to pre-WWII urban development. In 2015, Smart Growth America's LOCUS coalition and the George Washington School of Business partnership with Michigan State University's Land Policy Institute to develop the [WalkUP Wake-Up Call: Michigan Metros](#) report, which identifies the Walkable Urban Places and neighborhoods within the state, including Southeast Michigan. Areas designated as either an "established WalkUP", an "emerging WalkUP, or a "walkable neighborhood" in this report were overlaid as either High Demand or Moderate Demand to ensure consistency with this statewide analysis.

## 3. Trip Making Characteristics

Within the region there are certain transportation related trip making characteristics or variables that help promote demand for walking and biking trips. These variables are: the number and percentage of short trips occurring within an area; the street intersection density; and access to transit. In total, these three trip making characteristic variables can award an area a maximum score of 50 points.

**Number and percentage of short trips**
Trip length is a critical part of trip making, as shorter lengths or distances can be better suited for walking or biking trips. The shorter the trip distance the more likely walking or biking may be convenient methods of travel.

SEMCOG's Travel Demand Forecast Model was used to identify where there are high numbers of short trips occurring within the region. This model is based on SEMCOG's Household Survey data and shows all the trips occurring on a given day from one part of the region to another, regardless of mode (e.g. motor vehicle, transit, carpooling, walking, biking, etc.). It is calibrated using real world traffic counts, on-board transit survey data, and household and employment demographics to show how many trips are generated by a TAZ and what routes these trips will take to get people to their chosen destinations. Based on the model, the average trip length within Southeast Michigan is 8.9 miles (roughly a 14 minute car-trip). This is the average across all trip purposes with some types of trips being much shorter and others much longer.

Using the model, SEMCOG classified trip distances between TAZs into the following categories, which relate to the general trip distances for walking or biking:

- **Under ½ Mile:** This is the shortest distance reported in the Travel Demand Forecast Model. Trips under ½ mile are likely to be bikeable and walkable. These distances translate to less than a 5 minute bike ride or less than a 10 minute walk.

- **½ Mile to 1 Mile:** Trips between ½ mile and 1 mile are likely to be bikeable and may be walkable. These distances translate to a 5 to 10 minute bike ride or a 10 to 20 minute walk.

- **1 to 3 Miles**: Trips between one and three miles may be suitable for biking but less suitable for most walking trips. These distances translate to a 10 to 18 minute bike ride or a 20 to 60 minute walk.

- **3 to 5 Miles:** Trips between three and five miles may be bikeable but likely near the edge of what most people will travel. This distance is beyond a reasonable walk for most people. These distances translate to an 18 to 30 minute bike ride or a 60 to 100 minute walk.

- **5 to 10 Miles:** Trips between five and ten miles are the upper limit for most people biking and unlikely practical for walking. Some long distance riders may be interested to ride this far to reach a regional park or trail, but many others may not. These distances translate to a 30 to 60 minute bike ride or a 100 to 200 minute walk.

SEMCOG ranked each TAZ based on the total number and the percentage of short trips beginning or ending within that zone. A maximum of 30 points could be awarded to any one zone.

Each zone was ranked based on its number of short trips compared to all other zones within the region and then divided into four distant quartile groups for each of the five short trip ranges mentioned above.  These quartile groups are designated as:

- Very high number of short trips
- High number of short trips
- Moderate number of short trips
- Low number of short trips

***Scoring***: Zones were given points for the top three quartiles (very high to moderate), with the highest quartiles receiving the most points. Should a zone have very high number of short trips for all five ranges, it would be awarded 22.5 points (75% of the total short trip score). Table 22 displays the points awarded for each range of the three quartiles.

Table 22
**Scoring Criteria for Number of Short Trips**

| Distance | Trip Threshold | Points |
|---|---|---|
| Very High Number Short Trips Zone (75th - 100 percentile) | | |
| Under Half Mile | 706 trips or more | 6 |
| Half Mile to 1 Mile | 702 or more | 4.5 |
| 1-3 Miles | 2,844 or more | 4.5 |
| 3-5 Miles | 1,735 or more | 4.5 |
| 5-10 Miles | 2,103  or more | 3 |
| High Number of  Short Trip Zone (50th – 74th percentile) | | |
| Under Half Mile | 346-705 trips | 4.8 |
| Half Mile to 1 Mile | 360-701 | 3 |
| 1-3 Miles | 1674 - 2844 | 3 |
| 3-5 Miles | 1014 - 1734 | 3 |
| 5-10 Miles | 1,226 - 2,102 | 1.2 |
| Moderate Number of Short Trip Zone (25th – 49th percentile) | | |
| Under Half Mile | 120 - 345 trips | 2.4 |
| Half Mile to 1 Mile | 127-359 Trips | 1.6 |
| 1-3 Miles | 740 - 1,673 | 1.6 |
| 3-5 Miles | 446-1,013 | 1.6 |
| 5-10 Miles | 537 - 1,225 | 0.6 |

To ensure the analysis was inclusive of smaller town centers, zones were also ranked by the percentage of short trips occurring within each zone compared to the rest of the region.

*Scoring:* Similar to the ranking by number of trips, zones were grouped into quartiles, but points were only given for the highest quartile for each of the five short trip ranges, potentially giving a zone a maximum of 7.5 points (25% of the total short trip score).

Table 23
**Scoring Criteria for Percentage of Short Trips**

| Distance | Trip Percentage | Points |
|---|---|---|
| Under Half Mile | 8% | 2.4 |
| Half Mile to 1 Mile | 8% | 1.5 |
| 1-3 Miles | 32% | 1.5 |
| 3-5 Miles | 20% | 1.5 |
| 5-10 Miles | 25% | 0.6 |

**Street Intersection Density**
A gridded street network with a high number of intersections holds advantages for people walking or biking. A dense grid of streets minimizes circuitous travel, while providing people walking and biking more route options due to the likelihood of parallel roadways. It also gives drivers more options, reducing traffic volumes and often increasing pedestrian and bicycle comfort.

Figure 119 illustrates the benefits of street intersection density through a gridded network. This diagram displays the difference in travel options between a low intersection density network (on the left) and a higher density network with a variety of direct routes to local destinations (on the right).

Figure 119
**Street Network Intersection Density Diagram**
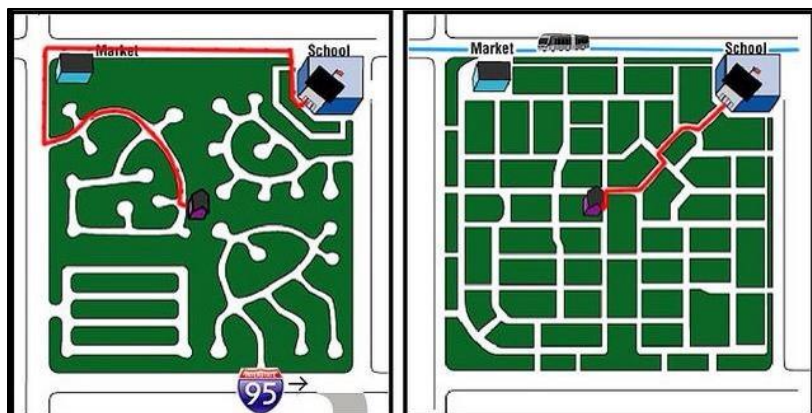


To identify street intersection density, the proximity of each parcel to four-legged intersections was analyzed. In examining the region's street network, SEMCOG determined that 12 four-legged intersections per ¼ mile was the minimum needed to support a gridded street network.

**Scoring**: 10 points were awarded to each parcel that contained at least 12 four-legged intersections per ¼ mile.

### Access to transit

Access to transit helps to expand the reach of people walking and biking to and from destinations. Conversely, walking and biking infrastructure is vital to extending the reach of a transit network. The Federal Transit Administration (FTA) has determined that bicycle and pedestrian projects up to ½ mile away from fixed route transit is deemed eligible for transit related federal funding. Based on this determination, SEMCOG conducted a buffer analysis of the region's transit network to identify areas within ¼ mile and ½ mile of fixed-route transit.

Scoring: 10 points were awarded to areas within ¼ mile of fixed-route transit service. 5 points were awarded to areas within ½ mile of fixed-route transit service.

# Results

Adding the awarded points for the three components of demand – clusters of people (maximum of 30 points), clusters of destinations (maximum of 20 points), and trip making characteristics (maximum of 50 points) – results in a possible 100 point demand analysis scale. The three demand area categories were determined by the following ranges of point totals:

- **High Demand** – areas scoring between 75 and 100 points;
- **Moderate Demand** – areas scoring between 50 and 74 points; and
- **Potential Demand** – areas scoring between 25 and 49 points.

The remaining areas of the region scored between 0 and 24 points. While demand areas are an important component to bicycle and pedestrian planning, areas outside of the three demand areas may still have infrastructure and programming needs, especially in relation to regional connectivity. Communities with areas outside of demand areas should consult the Regional Corridors map, and Appendix B to learn more about their potential role in implementing regional bicycle and pedestrian corridors.

Walkable Urban Places and Walkable Neighborhoods were also added to the high and moderate demand areas to ensure continuity with The Walk-up Michigan Metros.

Table 24 shows the three Bicycle and Pedestrian Demand Areas by total acres, land percentage of the region, and land percentage of demand areas.

Table 24
**Bicycle and Pedestrian Demand Areas**

| Bicycle and Pedestrian Demand Areas | Total Acres | Percentage of Region | Percentage of Demand Areas |
|---|---|---|---|
| High Demand | 21,721 | 1% | 3% |
| Moderate Demand | 241,741 | 9% | 30% |
| Potential Demand | 524,255 | 19% | 67% |
| *Outside of Demand Areas* | *1,935,118* | *71%* | *-* |