MDOT University Region Active Transportation Plan

Appendices



If you require assistance accessing this information or require it in an alternative format, contact the Michigan Department of Transportation's (MDOT) Americans with Disabilities Act (ADA) coordinator at Michigan.gov/MDOT-ADA.

Appendix A: Reviewed Plans and GIS Data Sources

Reviewed Plans and GIS Data Sources 1
Key Themes in Among Active Transportation Plans in the University Region 1
Key Takeaways from Select Plans 2
Reviewed Plans and Resources 19

Reviewed Plans and GIS Data Sources

The project team reviewed over 60 planning documents and compiled GIS data from agency partners across the region while applying MDOT's new bicycle and pedestrian GIS Data Standards. Many of the plans were completed after the previous University Region Active Transportation Plan was completed in 2015. The full list of plans and resources reviewed are identified at the end of this document.

Key Themes in Among Active Transportation Plans in the University Region

Four key themes emerged in reviewing active transportation plans in the University Region:

Safety

The plans emphasize the goal of reducing traffic fatalities and injuries to zero, prioritizing the implementation of low-cost engineering treatments, and promoting comprehensive safety programs like Vision Zero to enhance pedestrian and bicyclist safety and other vulnerable road users.

Connectivity

The plans highlight the importance of expanding and improving multimodal connections, including enhancing intermodal access, establishing regional bicycle and pedestrian corridors, and promoting seamless travel across jurisdictional boundaries to promote a connected and efficient transportation network.

Equity

Equity is a central focus, with the plans aiming to provide equitable transportation choices and access to economic opportunities, while addressing the needs of disadvantaged communities and vulnerable road users through targeted safety assessments and infrastructure improvements.

Partnerships

The plans stress the importance of collaboration and coordination between agencies, municipalities, and community members to promote active transportation through regional connectivity and improved data sharing.

Key Takeaways from Select Plans

Michigan Mobility 2045 (MM2045) State Long-Range Transportation Plan (2021)

The Michigan Mobility 2045 (MM2045) state long-range transportation plan presents the state's vision for Michigan's existing and future transportation systems and identifies goals and strategies to guide long-term, multimodal transportation investments over the next 25 years. Adopted in 2021, the plan considers all modes of transportation, including active transportation.

According to the MM2045 vision, four guiding principles shape all transportation investments: Preservation, Modal Choice, Future Oriented, and Sustainable Communities. Several MM2045 objectives are especially relevant to this plan, including:

- Create opportunities for safe physical activity, equitable transportation choice, and community engagement.
- Improve access and connectivity between modes.
- Reduce the number of lives lost and injuries sustained on Michigan's transportation network, striving for zero.
- Preserve and improve the condition of Michigan's transportation network so that all modes are reliable, resilient, and adaptable.
- Pursue transportation improvements to expand access to economic opportunities, jobs, core services, activity centers, tourist destinations, and land uses.
- Strengthen coordination of transportation facilities and services between agencies and municipalities.
- Support right-sizing strategies that align infrastructure with community context, needs, and use—especially in areas with underutilized or outdated roadway capacity. Right-sizing can create opportunities to repurpose space for safer, more accessible active transportation infrastructure.

MM2045 Active Transportation Plan: A Bold Vision (2021)

While developing MM2045, MDOT identified active transportation as a vital factor in Michigan's vision for a 21st century transportation system that improve Michiganders' safety, addresses climate change and enhance infrastructure conditions, mobility options and system reliability to drive statewide economic investments. MDOT developed this Active Transportation Plan as a standalone document to be integrated into and support MM2045's vision of the transportation future in Michigan across all modes, recognizing active transportation as a vital form of transportation (Pg.5, MM2045 Active Transportation Plan).

The vision and goals of the MM2045 Active Transportation Plan align with the vision and goals of the broader Long-Range Transportation Plan. One of the key differentiators of this plan is the detailed strategies it provides to achieve the vision and goals for active transportation. Below are important strategies from MM2045 that could be integrated into the University Region's planning process:

STRATEGY - Implement low-cost engineering treatments to increase pedestrian safety and facilitate pedestrian access and mobility along and across roadways.

STRATEGY - Expand connected bicycle and pedestrian networks in cities, metro areas, and rural areas to increase access and improve safety, while prioritizing connectivity of the network to provide more options for local travel.

STRATEGY - Regularly review and update policies and guidance to recognize the needs of pedestrians and bicyclists and promote accommodations are considered at all stages of project development.

STRATEGY - Expand bicycling and walking infrastructure to support tourism and attract new visitors.

STRATEGY - Conduct analyses to help quantify the economic impacts of biking and walking.

STRATEGY - Establish methods and approaches for assessing bicycle and pedestrian network needs, identifying gaps, and targeting improvements.

STRATEGY - Conduct regular reviews of policies and guidance related to data collection and promote pedestrian- and bicycle-related data is being collected, used, and disseminated.

STRATEGY - Establish or update multi-modal inventories along roadways and promote that project planning and design processes address local Complete Streets needs.

STRATEGY - Improve training and education for all roadway users and design professionals in emphasizing bicycle and pedestrian safety.

STRATEGY - Improve access to data and best practice examples to evaluate alternatives, conduct outreach, and adopt effective policies and plans.

STRATEGY - Eliminate gaps and barriers in the bicycle and pedestrian network in conjunction with larger transportation improvement projects.

STRATEGY - Utilize the U.S. Census Bureau's American Community Survey journey-to-work data to determine a baseline for walking and bicycle riding. Recognize that this information does not include other nonmotorized transportation modes and only includes the primary mode of transportation.

STRATEGY - Establish and implement a pedestrian and bicyclist monitoring (counting) program and conduct counts on a regular basis. These counts need to include the number of trips that use multiple modes of transportation (i.e., transit and active transportation).

STRATEGY - Strengthen communications channels between MDOT and the Michigan Department of Natural Resources and their efforts in state route and trail planning, recreation planning, state park siting, and recreation grant-funding efforts.

STRATEGY - Strengthen communications channels between MDOT and the Michigan Department of Health and Human Services to leverage the strengths of each agency to promote active transportation and healthy lifestyles.

STRATEGY - Develop Complete Streets training for MDOT staff as well as interested local and regional staff.

STRATEGY - Hold workshops designed to train local officials, agency staff, and professional engineers to effectively meet ADA accessibility requirements on state, county, and local road projects.

On page 25, the MM2045 Active Transportation Plan also describes four key areas of policy, practice, and programs:

- Zero-Focused Traffic Safety Programs include Road to Zero, Toward Zero Deaths, and Vision Zero.
- Complete Streets are streets designed, operated, and maintained to enable safe use and support mobility for all users.
- Safe Routes to School is a program that reduces the barriers that limit or hinder children who commute to school via active transportation.

- First- and Last-Mile Connections are multi-modal types of transportation that get commuters from their starting (first-mile) or ending (last-mile) locations to and from a transportation transfer point.

The plan includes performance measures on page 34 to track the effectiveness of infrastructure and program improvements, which can guide the University Region's performance measures. These are listed on the following page.

Performance Measures from the MM2045 Active Transportation Plan

Performance Measure	Priority Areas Performance Measure Informs				Timeframe for Establishing the Measure	Agency Responsible for Implementation				
	Complete Steets	Safe Routes to School	Toward Zero Deaths	First/ Last Mile Connect		MDOT	MPOs	Counties	Cities	MFF
Pedestrian and bicyclist counting program.	✓	✓	✓	✓	Mid-Term	✓	✓		✓	
Percentages of active transportation mode share. American Community Survey to determine baseline for walking and biking. Increased mobility.	✓	✓	✓	✓	Current					
Trips using multiple modes of transportation.	✓	✓	✓	✓	Mid-Term					
Utilization of standard crash data for improvements for active transportation users. Establish a nonmotorized safety baseline.	✓	✓	✓	✓	Current	✓	✓	✓	✓	
Five-year moving average: number of nonmotorized fatalities and serious injuries (all public roads): MM2045.	✓	✓	✓		Current	✓	✓	✓	✓	
Statewide statistics on pedestrian and bicycle crashes: frequency of crashes per year, time of year, time of day.	✓	✓	✓		Current	✓	✓	✓	✓	
Utilization of risk assessment tools.	✓	✓	✓		Mid-Term	✓	✓	✓	✓	
Statistical models to identify bicycle compatibility ratings for roads.	✓	✓	✓	✓	Lomg-Term		✓		✓	
Number of school districts enrolled in the Safe Routes to School program.	✓	✓	✓		Current				✓	✓
Carpool lots, Amtrak, transit stops, airport and bike rack availability. Cross modes at carpool lots.	✓			✓	Mid-Term	✓	✓		✓	
Review of safety data for equity throughout various populations.	✓	✓	✓	✓	Mid-Term	✓	✓	✓	✓	

MPO – Metropolitan Planning Organization
MFF – Michigan Fitness Foundation

MM2045 Strategic Multimodal Corridors Report (2021)

With adoption of the Michigan Mobility 2045 state long-range transportation plan, the Michigan Department of Transportation (MDOT) has defined a network of strategic multimodal corridors representing an integrated, multimodal system to support the safe and efficient movement of people, services, and goods.

The intentional decision to include all modes that fall within the strategic corridor band of 20 miles of an NHS freeway, 10 miles of a US route non-freeway, and 5 miles of non-freeway NHS route, is a recognition that a resilient, equitable transportation system is one that provides multiple options for connecting population and employment centers.

Michigan's strategic multimodal corridors carry most miles traveled in the state, regardless of mode. Analyzing corridor performance provides policymakers and decision-makers a wider lens to help identify and prioritize segments of the network that may benefit from more detailed planning, engineering, construction, or maintenance.

State of Michigan Vulnerable Road User Safety Assessment (2023)

Vulnerable road users are people walking and biking. The VRU Safety Assessment is an assessment of the safety performance of a State with respect to vulnerable road users and the plan of the State to improve the safety of vulnerable road users.

On page 2 of the VRU Safety Assessment, State's goal of reducing the number of traffic deaths to zero is emphasized:
"The Michigan Department of Transportation (MDOT), and many other organizations recognize that zero is the only acceptable number of deaths on our Nation's roads – Michigan is moving Towards Zero Deaths; not 50, or even five is acceptable."

The assessment notes the following facts about equity and crashes in the University Region on page 66:

- University Region has 403 census tracts, ranging from zero (0) to 29.6 pedestrian crashes per year, with an average of 2.18. Only 25 reported zero crashes (6.2 percent).
- Washtenaw County has the two (2) highest tracts in the region (and eight (8) of the highest fifteen (15)), while Ingham County holds the other seven (7).
- With regards to bicycle crashes, University Region ranges from zero (0) to 12.0 reported crashes per year, averaging 0.76. 96 tracts reported zero (0) crashes (23.8 percent).
- Ingham County has the two (2) highest tracts (and seven (7) of the highest seventeen (17) tracts), while Washtenaw County has the other ten (10) highest.

- Per 1,000 residents, University Region averages 0.71 pedestrian crashes per 1,000 residents, ranging from zero (0) to 28.28. For bicycle crashes, the average is 0.27, with a range of 0.0 to 13.68.
- 80 tracts in University Region are identified as disadvantaged per the CEJST data. These tracts average 1.16 pedestrian crashes per 1,000 residents and 0.34 bicycle crashes.

University Region, Total Disadvantaged Categories Exceeded by Census Tract according to CEJST. (VRU Assessment, Page 66)

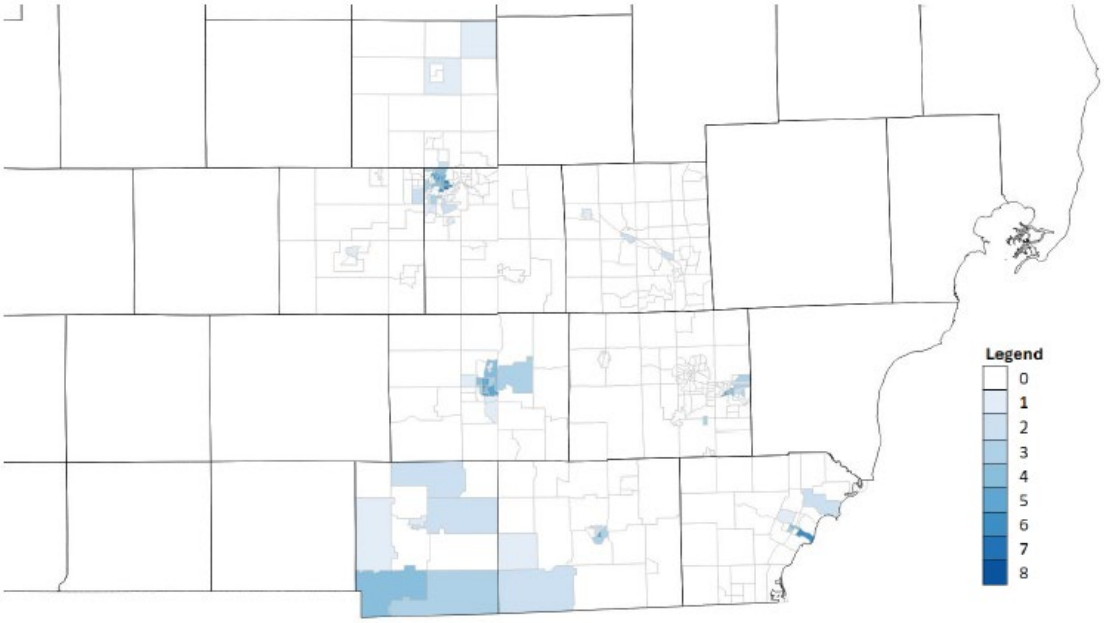
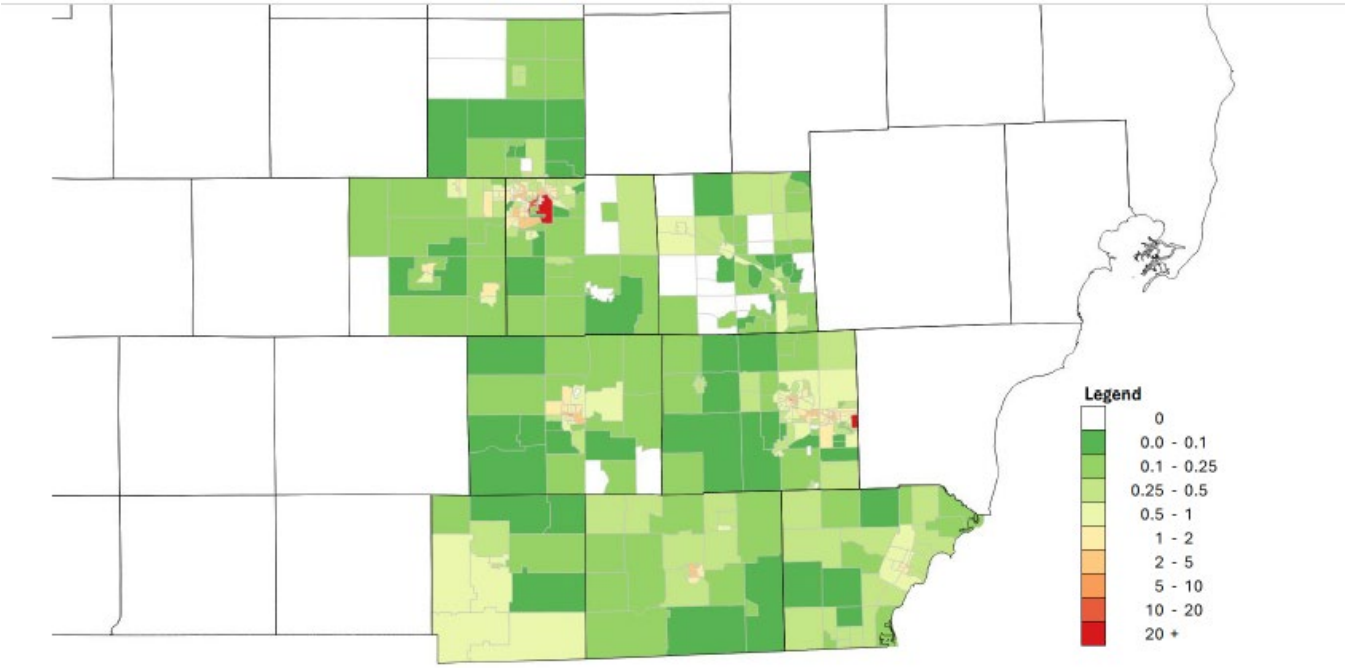
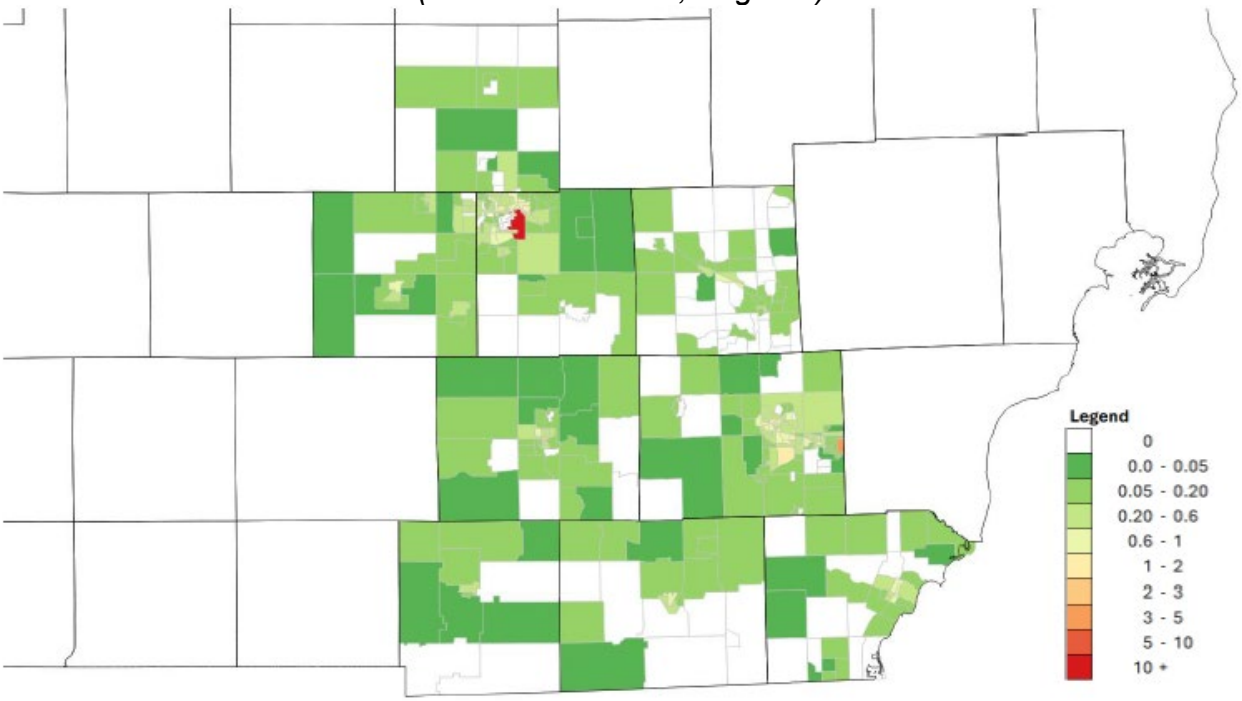


Figure 48 - University Region, Total Disadvantaged Categories Exceeded by Census Tract

University Region Average Yearly Pedestrian Crashes per 1,000 Residents by Census Tract. (VRU Assessment, Page 65)



University Region Average Yearly Bicycle Crashes per 1,000 Residents by Census Tract. (VRU Assessment, Page 65)



State of Michigan Strategic Highway Safety Plan (2023)

The Michigan Strategic Highway Safety Plan (Michigan SHSP) is a data-driven, four-year comprehensive plan whose purpose is to identify key safety needs and guide investment decisions to eliminate highway fatalities and serious injuries.

According to the plan, Michigan strives to reach zero pedestrian and bicyclist fatalities and serious injuries through actions which are proactive and data driven. These strategies focus on improving safety in communities at a higher risk of VRU crashes (Michigan SHSP, Page 33).

According to the plan, fatalities and serious injuries in Michigan disproportionally impact minority or low-income areas. Environmental Justice Zones account for 36 percent of centerline road miles but 47 percent of fatalities and 48 percent of serious injuries in the state. Current trends indicate the number of fatalities and serious injuries in these zones are increasing at a higher rate than the rest of Michigan. In addition, fatalities due to traffic crashes disproportionately affect people living in rural areas, individuals with disabilities, and older adults. Traffic deaths among people who walk or bike are increasing more sharply than for those who drive (Michigan SHSP, Page 7).

To address this context, the State of Michigan is adopting a safe systems approach, which represents an evolutionary step in addressing roadway safety as it is human centered. The SSA is founded on the principle that all humans make mistakes and that human bodies have a limited ability to tolerate crash impacts. It is a redundant system that strives to eliminate fatalities and serious injuries by reducing risks and anticipating mistakes. The responsibility of a crash is shared between road users, vehicles, speeds, roads, and post-crash care to promote that crashes do not lead to fatalities or serious injuries. It requires all parts of the transportation system be strengthened, so that if one part fails, the other parts still protect people (Michigan SHSP, Page 13).

While all the strategies in the plan are relevant to biking and walking in the University Region, the plan offers the following strategies that are especially tailored to promote pedestrian and bicycle safety (Michigan SHSP, Page 14):

- Recognize successful pedestrian and bicycle safety initiatives by identifying existing and new research practices, programs, or initiatives that are successful or innovative.
- Raise awareness of pedestrian and bicycle safety by improving motorist, bicyclist, and pedestrian knowledge and behavior.
- Engage with partners to provide recommendations related to pedestrian and bicycle safety legislation by identifying inconsistencies or gaps in current law pertaining to pedestrian and bicycle safety.
- Identify and promote the use of best practices when designing and operating transportation facilities by looking at network connectivity as well as pedestrian and bicycle facilities throughout Michigan.
- Achieve TZD by supporting, promoting, and implementing the TZD National Strategy.

Bicycle and Pedestrian Mobility Plan for Southeast Michigan (2020)

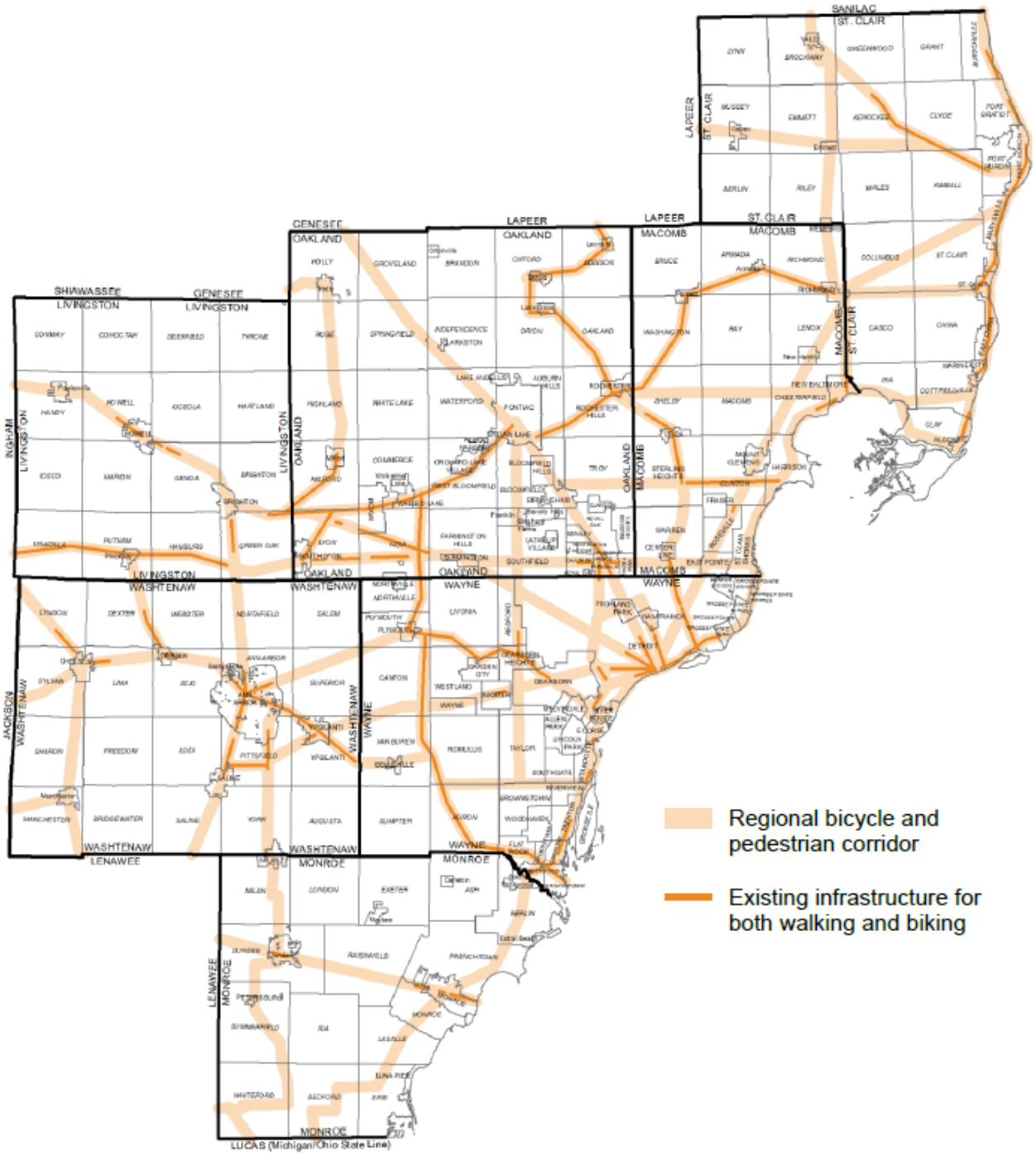
Adopted in 2020, this document is the Southeast Michigan Council of Governments (SEMCOG) active transportation for their region. The plan documents the existing and planned facilities that support bicycle and pedestrian travel and analyzes their connectivity as a regional network. It also includes strategies to enhance active transportation in the region, and promotes increased mobility, safety, recreation, placemaking opportunities, economic development, and community health.

This plan focuses heavily on the coordination and development of an interconnected regional network of bicycle and pedestrian facilities. The plan establishes regional bicycle and pedestrian corridors that may serve as the primary routes for longer distance trips, while also

connecting local networks. SEMCOG used various analyses to determine these corridors, including user input, existing infrastructure, travel demand, equity factors, and crash analyses. By establishing regional bicycle and pedestrian corridors, the plan can be used to facilitate cross-jurisdictional collaboration toward a common vision for bicycle and pedestrian mobility in Southeast Michigan.

On page 9, the plan states that at the regional scale, the bicycle and pedestrian network should seamlessly cross jurisdictional boundaries, connect residents to important destinations, and serve as an attraction that improves quality of life for both residents and visitors.

SEMCOG's Regional Bicycle and Pedestrian Corridors (Bicycle and Pedestrian Mobility Plan for Southeast Michigan, Page 10)



Jackson Metropolitan Planning Organization JACTS 2050 Long Range Transportation Plan (2023)

Adopted in 2023, The Jackson Area Comprehensive Transportation Study (JACTS), is the long-range transportation plan for the Metropolitan Planning Organization (MPO) for the City of Jackson and Jackson County for the next 20 years. This plan evaluates all modes of transportation, not just active transportation. Jackson MPO's vision aligns with MM2045, to create a transportation system that promotes safety and provides strong, multimodal connections to and within communities that is sustainably funded and well-maintained.

The plan includes the following goals and objectives that are especially relevant to the University Region's Active Transportation Plan:

- Goal 1. Safety & Security
    - Increase the safety and security of the transportation system for motorized and nonmotorized users.
    - Objectives
        - Reduce crashes and eliminate hazardous locations.
        - Minimize crashes and conflicts among all transportation modes and users.
        - Use best practices to increase safety.
        - Continue to support MDOT's safety targets and Vision Zero.
- Goal 2. Accessibility & Mobility
    - Increase the accessibility and mobility options available to people and freight.
    - Objectives
        - 2.1 Minimize transportation barriers for all people, especially the physically challenged, senior citizens, young people, and persons who do not have automobiles available, have limited economic means, or choose not to travel by automobile.
        - 2.2 Provide appropriate transportation connections, especially for non-motorized modes, to major land uses and activity centers within Jackson County, including residence, employment, recreation, community facilities, and commercial centers.
        - 2.3 Improve or increase facilities for pedestrians and bicyclists.

- Goal 7. Operations & Maintenance
    - Promote efficient system management and operation.
    - Objectives
    - 7.4 Encourage the multiple use of transportation rights-of-way by different modes, including pedestrians and bicyclists.
- Goal 10. Travel & Tourism
    - Enhance travel and tourism.
    - 10.1 Consider the impact on tourism when making investment decisions.
    - 10.2 Provide and maintain economical non-motorized facilities in urban, suburban, and rural areas that may transform the region into a non-motorized travel destination.
    - 10.3 Integrate water trails into the transportation framework to promote travel and tourism in the region.

Moving Mid-Michigan Tri-County Metropolitan Transportation Plan (2020)

Adopted by the Tri-County Regional Planning Commission in 2020, the document is both a plan for specific transportation projects and improvements and a vision-based conversation guide that can be used as a tool for informed transportation and policy decisions.

The following policies and key performance indicators (KPI) from the plan are especially relevant to the University Region's Active Transportation Plan. These are described on pages 23-49 of the Plan.

- Enhance intermodal access and connectivity between transit, auto, rail, air, freight, and non-motorized facilities, networks, and travel modes
    - KPI: prioritization of TIP projects that improve access to intermodal facilities or multiple facilities; coordinated/seamless cross-boundary connections between local transit services; access to the Capital Region International Airport; passenger enplanements; transit to Capital Area Multimodal Gateway; passenger rail boardings/deboardings; private bussing coordination/services; pedestrian gaps to transit facility access; connectivity of bicycle facilities and shared use pathways; support of shared mobility initiatives
- Promote seamless interregional travel

    - KPI: improved connectivity across municipal boundaries, regions, and statewide systems for all travel modes

- Consider emerging technologies in planning activities
    - KPI: review of work programs; support of future connected and automated vehicle (CAV)/autonomous vehicle initiatives/studies; CAV-ready TIP projects; local micromobility deployment and/or ordinances (e.g., electric scooters, motorized ; promotion of federal resources for alternative fuels
- Promote connectivity, accessibility, and efficiency of multimodal transportation options to businesses and urban/city centers
    - KPI: economic health indicators; success of commercial corridors; % of populations within walking, biking, busing, or driving distance to essential services/community amenities; diversity of mobility options; % of commutes for pleasure
- Provide transportation services and intermodal connectivity that help retain and expand existing businesses and attracts new businesses.
    - KPI: prioritization and emphasis of TIP projects that contribute to enhancing economic vitality; economic health indicators; success of commercial corridors; % of populations within walking, biking, busing, or driving distance to essential services/community amenities Washtenaw County Non-Motorized Transportation Plan (2018)
- Provide and maintain economical bicycle, pedestrian, and shared-use path facilities in rural, suburban and urban areas that may transform the region into a non-motorized travel destination
    - KPI: creation of regional trails/non-motorized plan; TIP projects that enhance regional and cross-boundary non-motorized connectivity
- Integrate water trails into the transportation framework as a means for promoting travel and tourism in the region
    - KPI: maintenance and implementation of Water Trail Development Plan; TIP projects that enhance connectivity to riverfront developments, launch points, and other water amenities; support of state water trails program(s)
- Support safest possible transportation network design and travel for all users

    - KPI: implementation of recommendations of Regional Safety Plan; monitoring of crash trends for all modes; traffic control measures and Intelligent Transportation Systems applications; analysis of lighting, signage, and innovative construction and design solutions

- Promote active transportation
    - KPI: % of non-SOV trips; non-motorized TIP projects; support of statewide educational and outreach initiatives
- Encourage investment and planning in integrated multimodal safety improvements
    - KPI: Complete Streets ordinances and designs; TAP-funded TIP projects; programs considering traffic calming, pedestrian and rail crossings, paved shoulders, bicycle lanes, safety education, and enforcement; SRTS implementation
- Improve air quality by reducing mobile source (vehicle) emissions
    - KPI: transportation projects that reduce/mitigate emissions or prevent congestion; reduction of vehicle miles traveled; and/or associated increase in pedestrian and bicycle trips; air conformity/quality analysis/modeling; clean commute programs and shared mobility initiatives; promotion of cleaner/alternative fuels and vehicle technology; number of publicly available EV charging stations
- Promote energy conservation, security, sustainability, and resilience
    - KPI: analysis of transportation projects for impacts on gas mileage, vehicle miles traveled, and frequency and length of trips; % of SOV trips; per capita VMT; analysis of utility infrastructure
- Enhance access to community spaces
    - KPI: % of populations within walking, biking, busing, or driving distance to community/public amenities; analysis of transportation project connectivity to parks and recreational amenities, water trail and riverfront/launch point sites, cultural and historic centers, religious organizations, regional attractions (Michigan State Capitol, Spartan Stadium, Wharton Center for Performing Arts, Breslin Student Events Center, Jackson Stadium, Michigan History Center, etc.), and other public facilities; linkages and mode options between parks and recreational facilities

- Promote equitable access to essential services
    - KPI: implementation of regional coordinated mobility and human services plans; % of populations – including EJ communities – within walking, biking, busing, or driving distance to essential services (health care, education, food centers, employment concentrations, etc.)

Ann Arbor Moving Together Towards Vision Zero (2021)

Ann Arbor: Described on page 1, Moving Together builds on the city's success over the past decade in creating a safer, more sustainable, accessible, and equitable transportation system for everyone. By bringing together diverse perspectives from across the city and the wider region, this plan defines the city's mobility values and goals and details our strategy for managing, operating, upgrading, and maintaining our transportation system today and into the future.

The plan offers 5 mobility values that provide the foundation for the ideas, actions, projects, and policies described in the plan and may guide the city's transportation decision making and investments over the next 20 years, including:

- Safety
    - Ann Arbor is a safe city where everyone participates in creating an environment in which people feel confident and comfortable traveling.
- Mobility
    - Ann Arbor prioritizes moving people and goods efficiently, making it easier for people to choose sustainable modes of transportation.
- Accessibility for All
    - In Ann Arbor, people of all abilities, ages and stages of life, income, races, cultures and ethnicities have equitable access to the places where they live, work, and play.
- Healthy People & Sustainable Places
    - Ann Arbor's transportation system supports a healthy population, sustainable environment, and robust economy, while celebrating and enhancing a unique quality of place.
- Regional Connectivity

- Ann Arbor works to expand travel options throughout the region and integrate its transportation system with wider regional networks.

Notably, this is the only active transportation plan in the University Region that sets the goals to for zero deaths and zero serious injuries on city streets as well as a carbon-neutral transportation system by 2030.

Reviewed Plans and Resources

As part of the development of the MDOT University Region Active Transportation Plan, a wide range of state, regional, and local planning documents were reviewed to ensure alignment with existing goals, policies, and infrastructure priorities. This appendix provides a summary of the plans consulted during the planning process. Please note that some documents may have been updated since the development phase of this plan. Readers are encouraged to consult the managing jurisdiction for the most current version of each referenced plan.

Reviewed Plans

Level	Jurisdiction	Plan	Year	Key Pg.
State	MDOT	Michigan Mobility 2045 (MM2045) State Long-Range Transportation Plan	2021	67
State	MDOT	MM2045 Active Transportation Plan: A Bold Vision	2021	59
State	MDOT	MM2045 Strategic Multimodal Corridors Report	2021	19
State	MDOT	2023 State of Michigan Vulnerable Road User Safety Assessment	2023	66
State	MDOT	2023-2026 State of Michigan Strategic Highway Safety Plan	2023	75
State	MDOT	2015 MDOT University Region: Regional Non-Motorized Plan	2015	36
State	MTGA	Connecting Michigan: Statewide Trailways Vision and Action Plan	2007	15
Regional	SEMCOG	2023 Southeast Michigan Transportation Safety Plan (SEMCOG)	2023	42
Regional	SEMCOG	2019 2045 Regional Transportation Plan for Southeast Michigan (SEMCOG)	2019	54
Regional	SEMCOG	2020 Bicycle and Pedestrian Mobility Plan for Southeast Michigan (SEMCOG)	2020	18
Regional	SEMCOG	Parks and Recreation Plan for Southeast Michigan (SEMCOG)	2019	10

Level	Jurisdiction	Plan	Year	Key Pg.
Regional	Jackson MPO	2023 Jackson Metropolitan Planning Organization JACTS 2050 Long Range Transportation Plan	2023	61
Regional	Tri-County Regional Planning Commission	2023 Moving Mid-Michigan Tri-County Metropolitan Transportation Plan	2023	51
Regional	Tri-County Regional Planning Commission	2023 Tri-County Regional Planning Commission Regional Trails Feasibility Plan	2023	73
County	Washtenaw County	2024 Long Range Transportation Plan for Washtenaw County	2024	
County	Washtenaw County	2018 Washtenaw County Non-Motorized Transportation Plan	2018	31
County	Jackson County	2020 Jackson City + County Nonmotorized Plan	2020	45
County	Livingston County	2020 Livingston County Trails Plan	2020	6
County	Monroe County	Monroe County Trail and Bicycle Plan	2021	33
County	Lenawee	Connecting Lenawee Plan: A Non-Motorized Vision for Lenawee County	2015	26
Other	Washtenaw County	Hudson Mills Master Plan	2017	31
Other	MTGA	Lake to Lake Trail Route 1	2024	
Other	MTGA	Iron Belle Trail	2024	
Other	MSU	Michigan State University Bicycle Facilities Plan	2007	22
City	Ann Arbor	2021 Ann Arbor Moving Together Towards Vision Zero	2021	19
City	Ann Arbor	2023 Ann Arbor Quick Build Survey Results	2023	
City	City of Brighton	2018 City of Brighton Complete Streets Plan	2018	54
City	Village of Fowlerville	2017 Village of Fowlerville Master Plan	2017	115
City	City of Chelsea	2019 City of Chelsea Master Plan	2019	35
City	City of Howell	2023 City of Howell Recreation Plan	2023	88
City	City of Luna Pier	2009 City of Luna Pier Master Plan	2009	1

Level	Jurisdiction	Plan	Year	Key Pg.
City	City of Milan	2013 City of Milan Parks and Recreation Master Plan	2013	22
City	City of Saline	2023 City of Saline Master Plan	2023	65
City	Village of Pinckney	2015 Village of Pinckney Master Plan	2015	46
City	City of Ypsilanti	2021 City of Ypsilanti Non-Motorized Transportation Plan	2021	56
City	City of Lansing	2011 Lansing Non-Motorized Plan	2011	38
City	City of East Lansing	2011 East Lansing Non-Motorized Plan	2011	39
Township	Green Oak	2014 Green Oak Township Master Plan	2014	123
Township	Ypsilanti Township	2014 Ypsilanti Township Reimagine Washtenaw Corridor Improvement Study	2014	
Township	Salem Township	2019 Salem Township Master Plan	2019	126
Township	Genoa Township	2023 Genoa Township Master Plan	2023	133
Township	Scio Township	2023 Scio Township Recreation Plan	2023	83
Township	Ann Arbor	2020 Ann Arbor Township Parks, Recreation & Open Space Master Plan	2020	45
Township	Ash Township	2020 Ash Township Master Plan	2020	67
Township	Augusta Township	2023 Augusta Township Master Plan	2023	53
Township	Bedford Township	2015 Bedford Township Master Plan Update	2015	48
Township	Brighton Township	2009 Brighton Township Pathways Master Plan	2009	54
Township	Charter Township of Brighton	2020 Charter Township of Brighton Master Plan	2020	45
Township	Erie Township	2018 Erie Township Master Plan	2018	31
Township	Frenchtown Charter Township	2022 Frenchtown Charter Township Parks and Recreation Master Plan	2022	61
Township	Hamburg Township	2023 Hamburg Township Parks and Recreation Master Plan	2023	124

Level	Jurisdiction	Plan	Year	Key Pg.
Township	Howell Township	2023 Howell Township Recreation Master Plan	2023	48
Township	Lyndon Township	2017 Lyndon Township Recreation Plan	2017	147
Township	Ypsilanti Township	2020 Ypsilanti Township Non-Motorized Transportation Plan	2020	42
Township	Pittsfield Township	2022 Preserving Pittsfield Master Plan	2022	244
Township	Putnam Township	2023 Pinckney-Putnam Parks and Recreation Master Plan	2023	50
Township	Superior Township	2010 Superior Township Master Plan	2010	24
Township	Delhi Township	Delhi Township Non-Motorized Transportation Plan	2016	26
Township	Meridian Township	2004 Meridian Township Greenspace Plan	2004	56

GIS Data Sources

Jurisdiction	Contents	Year	Geographic Coverage
TCRPC	Local Shared Use Path	2017	University Region
TCRPC	Shared Use Regional Path	2017	University Region
TCRPC	Existing Trails	2017	Tri-County Area (Lansing)

Jurisdiction	Contents	Year	Geographic Coverage
TCRPC	Existing Non-Motorized	2022	Tri-County Area (Lansing)
TCRPC	Regional Trails Plan	2023	Tri-County Area (Lansing)
MDOT	County Connectors	2019	Jackson County
MDOT	Local Shared Use Path	2017	University Region
MDOT	Shared Use Regional Path	2017	University Region
Livingston County	Bicycle Network	No Date	Livingston County
Livingston County	DNR Trails	No Date	Livingston County
Livingston County	Long Term Routes	No Date	Livingston County
Livingston County	Potential Routes	No Date	Livingston County
City of Lansing	Streets/Non-Motorized Facilities		City of Lansing
City of Lansing	Sidewalks	2018	City of Lansing
Region 2 Planning Commission	Proposed Trails		Lenawee County
Region 2 Planning Commission	Proposed Bike Lanes		Lenawee County
Region 2 Planning Commission	Multi-Use Trails	2024	Lenawee County
Region 2 Planning Commission	Bike Lanes	2024	Lenawee County
Region 2 Planning Commission	Parma to Albion Rail-with-Trail		Jackson County
Region 2 Planning Commission	Proposed Trails		Jackson County
Region 2 Planning Commission	Proposed Bike Lanes		Jackson County
Region 2 Planning Commission	Multi-Use Trails	2024	Jackson County

Jurisdiction	Contents	Year	Geographic Coverage
Region 2 Planning Commission	Bike Lanes	2023	Jackson County
Region 2 Planning Commission	Proposed Trails	2024	Hillsdale County
Region 2 Planning Commission	Multi-Use Trails	2024	Hillsdale County
Tri-County Region	County Trails		Washtenaw County
Tri-County Region	Non-Motorized	2023	Ann Arbor
Tri-County Region	Sidewalks/Crosswalks	2019	Ann Arbor Area
Tri-County Region	Bicycle Network	2020	Ann Arbor Area
Bath Township	Public Sidewalks		Bath Township
Bath Township	Trails		Bath Township
Bath Township	Non-Motorized		Bath Township
Meridian	Pathways		Meridian
East Lansing	Bike Lanes		East Lansing
East Lansing	Paved Shoulder/Bike Lanes		East Lansing
East Lansing	Trails		East Lansing
East Lansing	Sidewalks		East Lansing
East Lansing	Crosswalks		East Lansing
SEMCOG	Cornerstone Bike Route		Monroe County

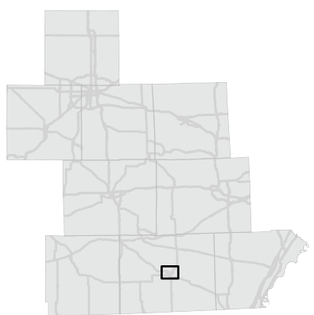
CITY OF ADRIAN

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
- Marked Shared Lane
- Other (Recreational Trail)

Proposed Facilities
- Shared-Use Path / Sidepath
- Bike Lane or Paved Shoulder
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

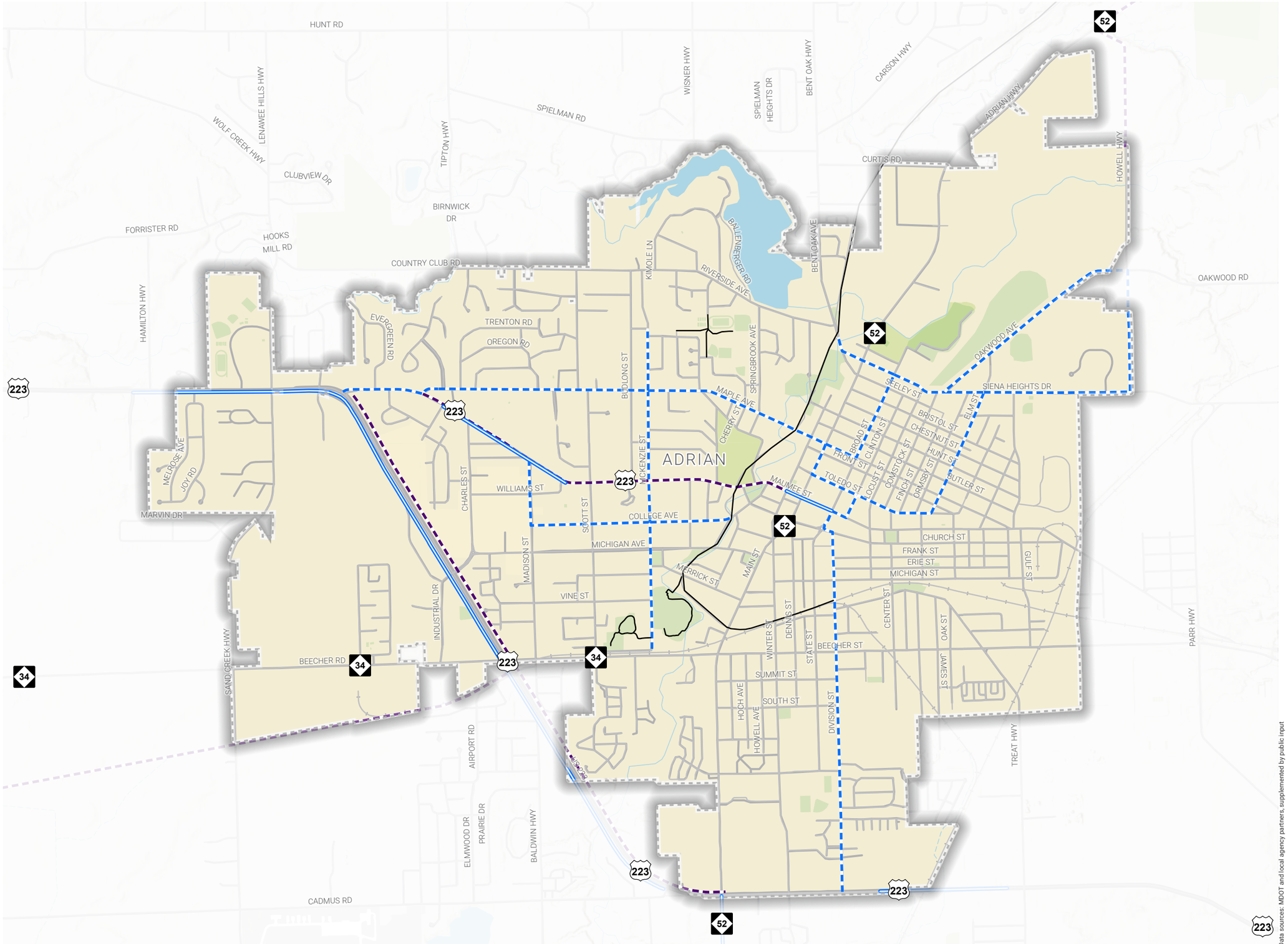


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

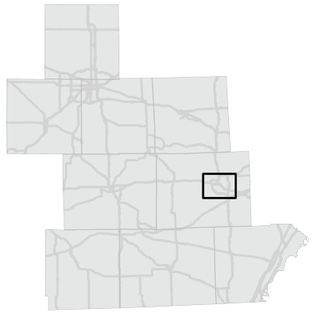
CITY OF ANN ARBOR

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
- Marked Shared Lane
- Other (Recreational Trail)

Proposed Facilities
- Shared-Use Path / Sidepath
- Bike Lane or Paved Shoulder
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

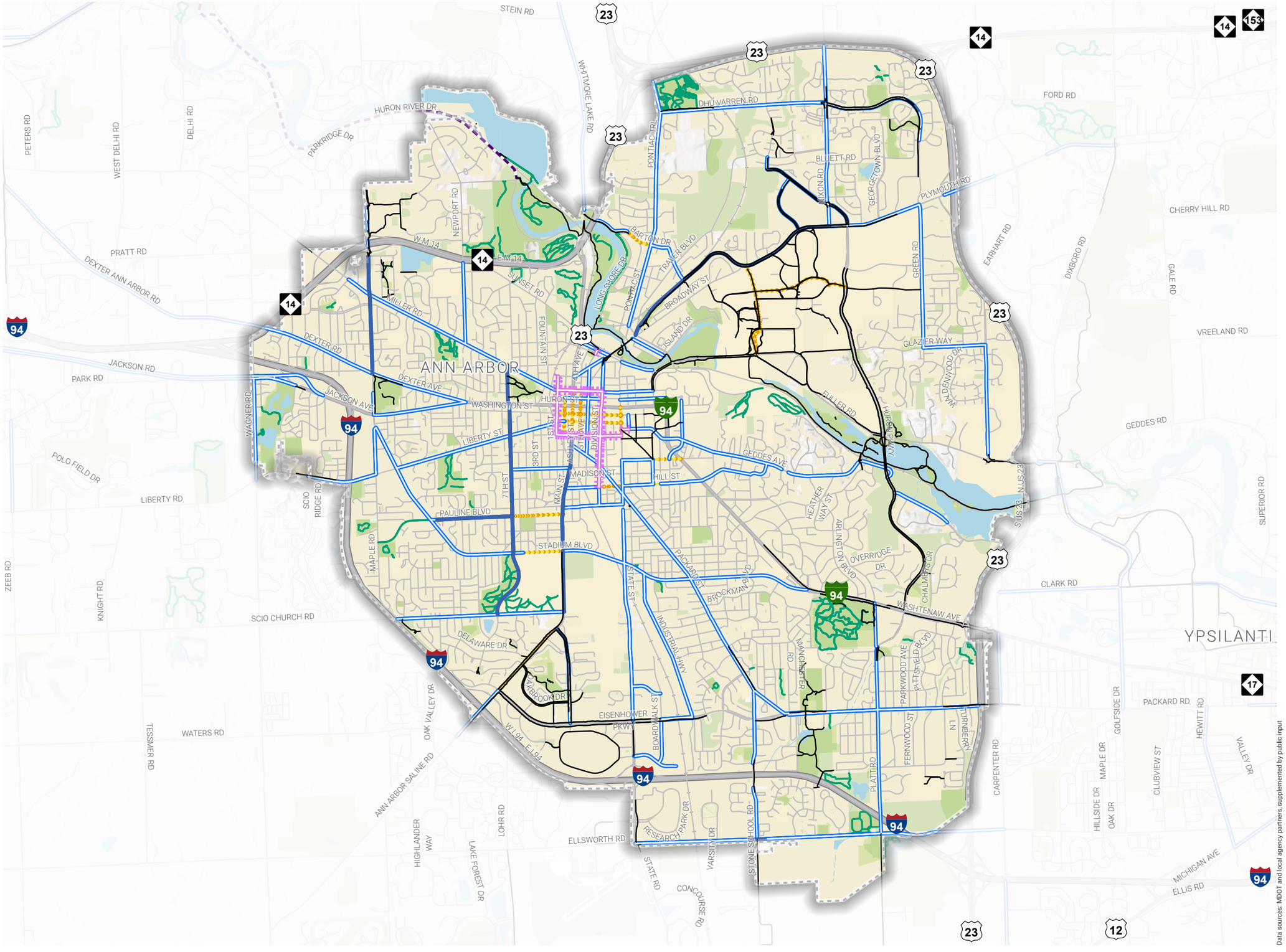


0 0.55 1.1 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

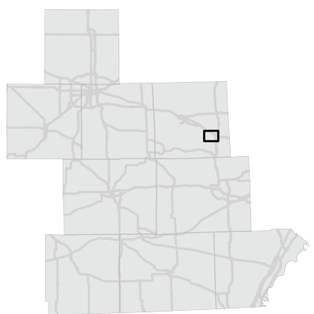
CITY OF BRIGHTON

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
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- Buffered Bike Lane
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Proposed Facilities
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- City Boundary

UNIVERSITY REGION

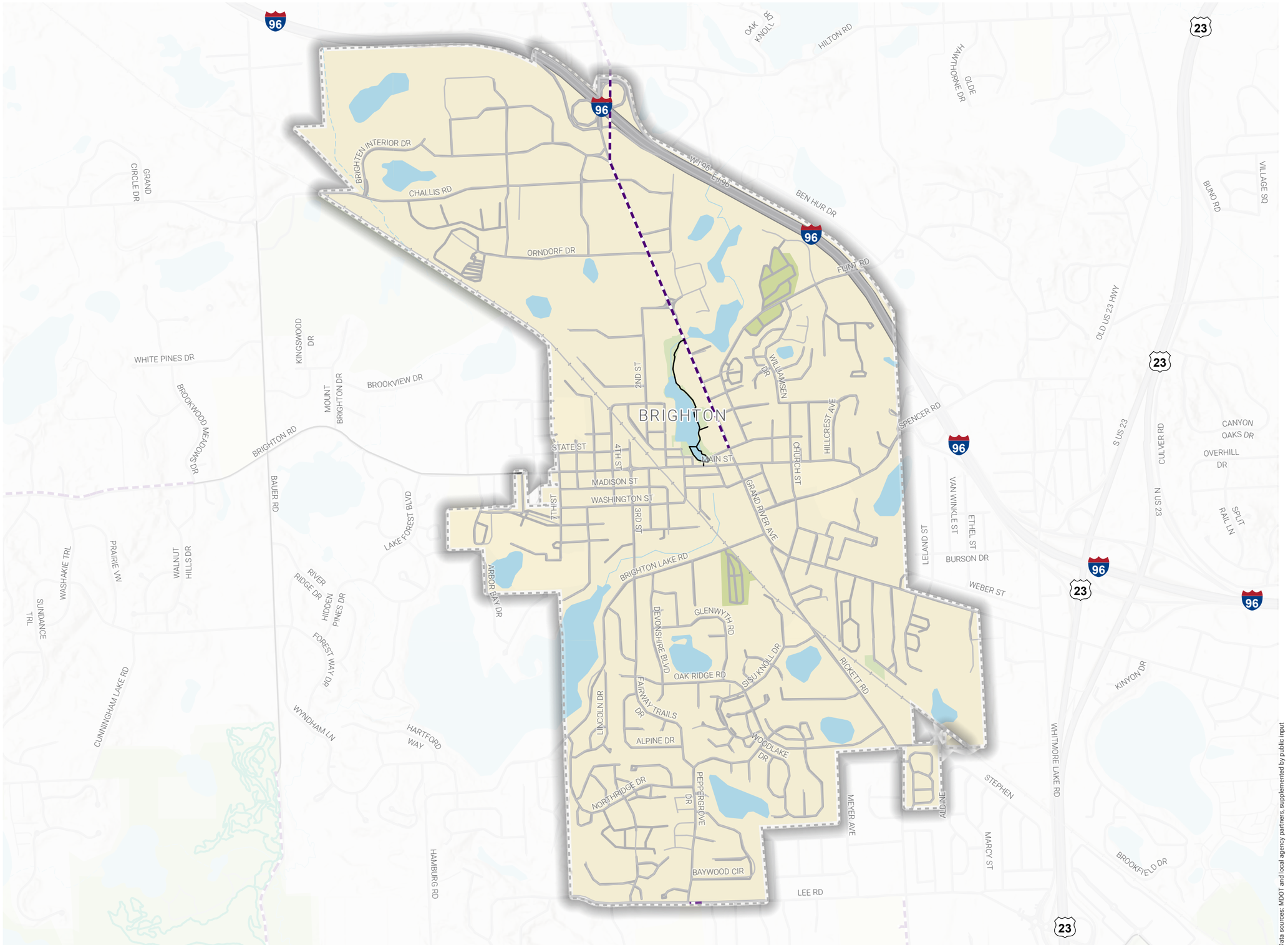


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

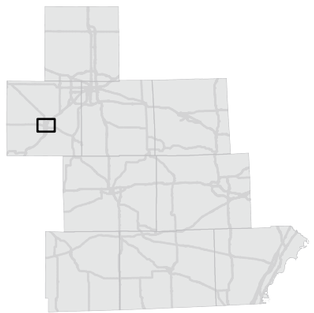
CITY OF CHARLOTTE

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
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- Bike Lane or Paved Shoulder (greater than four feet)
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Proposed Facilities
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- Railroads
- City Boundary

UNIVERSITY REGION

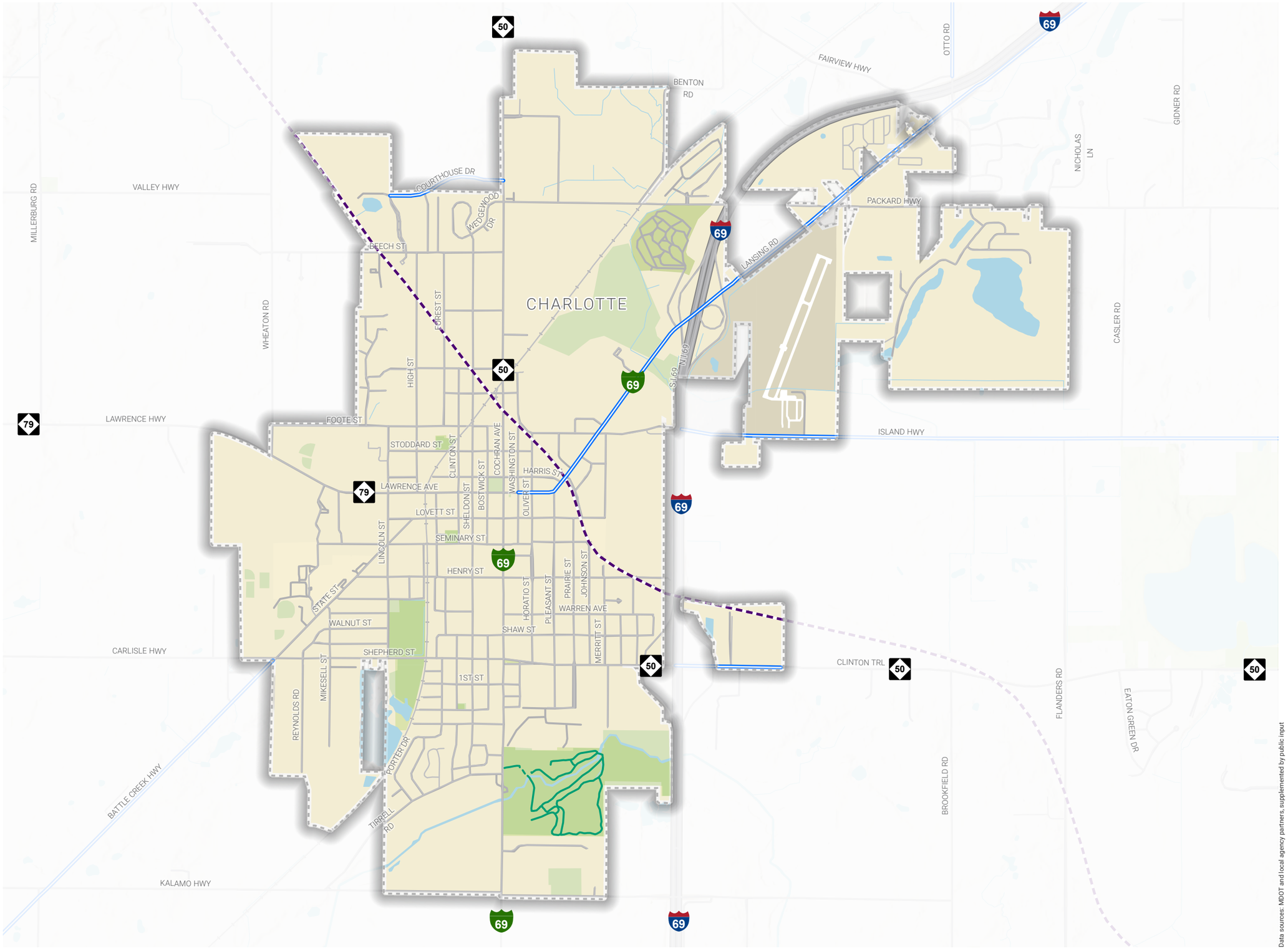


0 0.3 0.6 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

CITY OF HILLSDALE

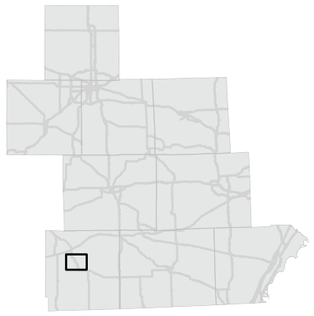
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UNIVERSITY REGION

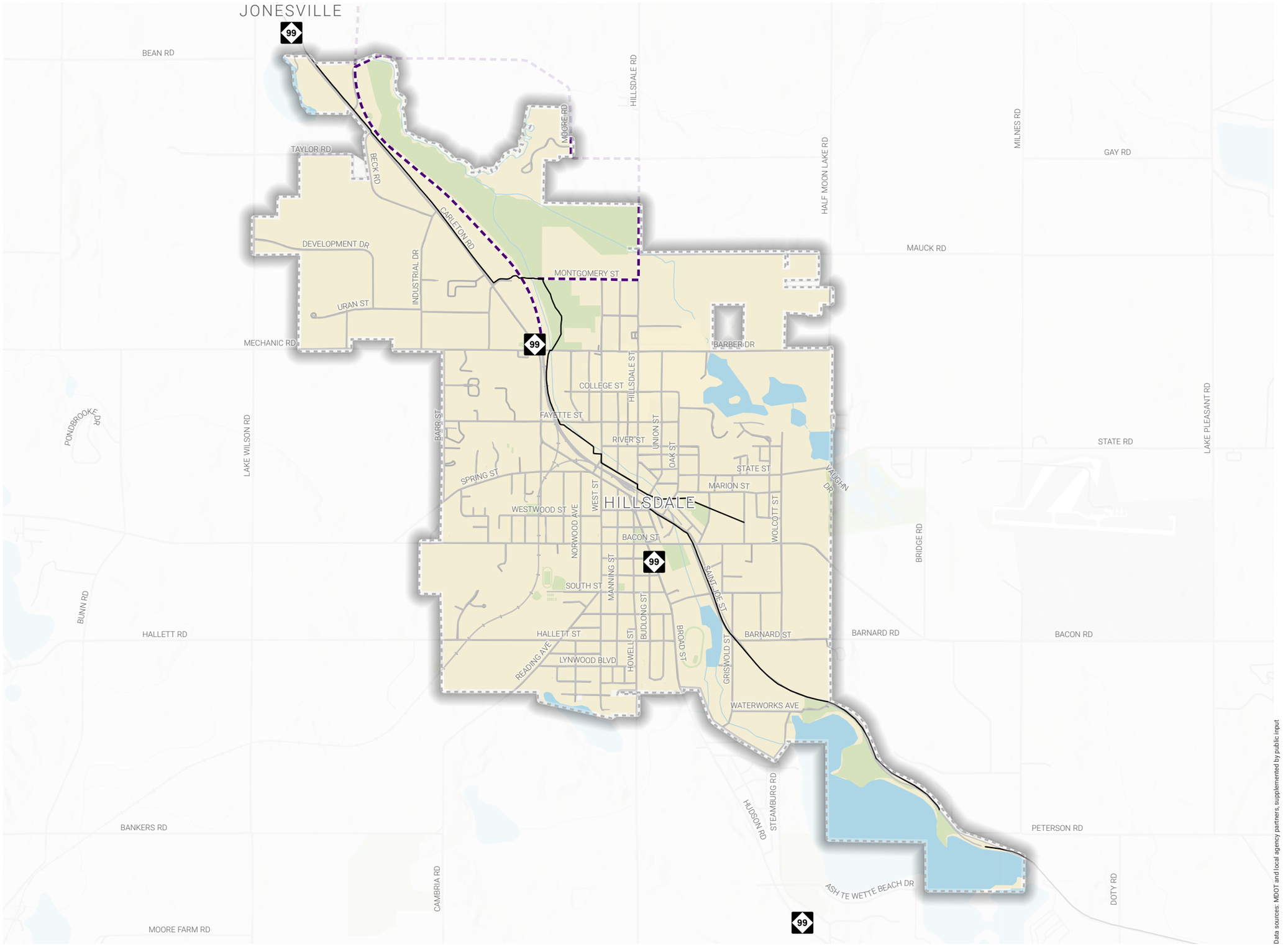


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

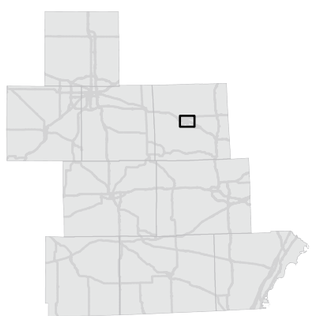
CITY OF HOWELL

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
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UNIVERSITY REGION

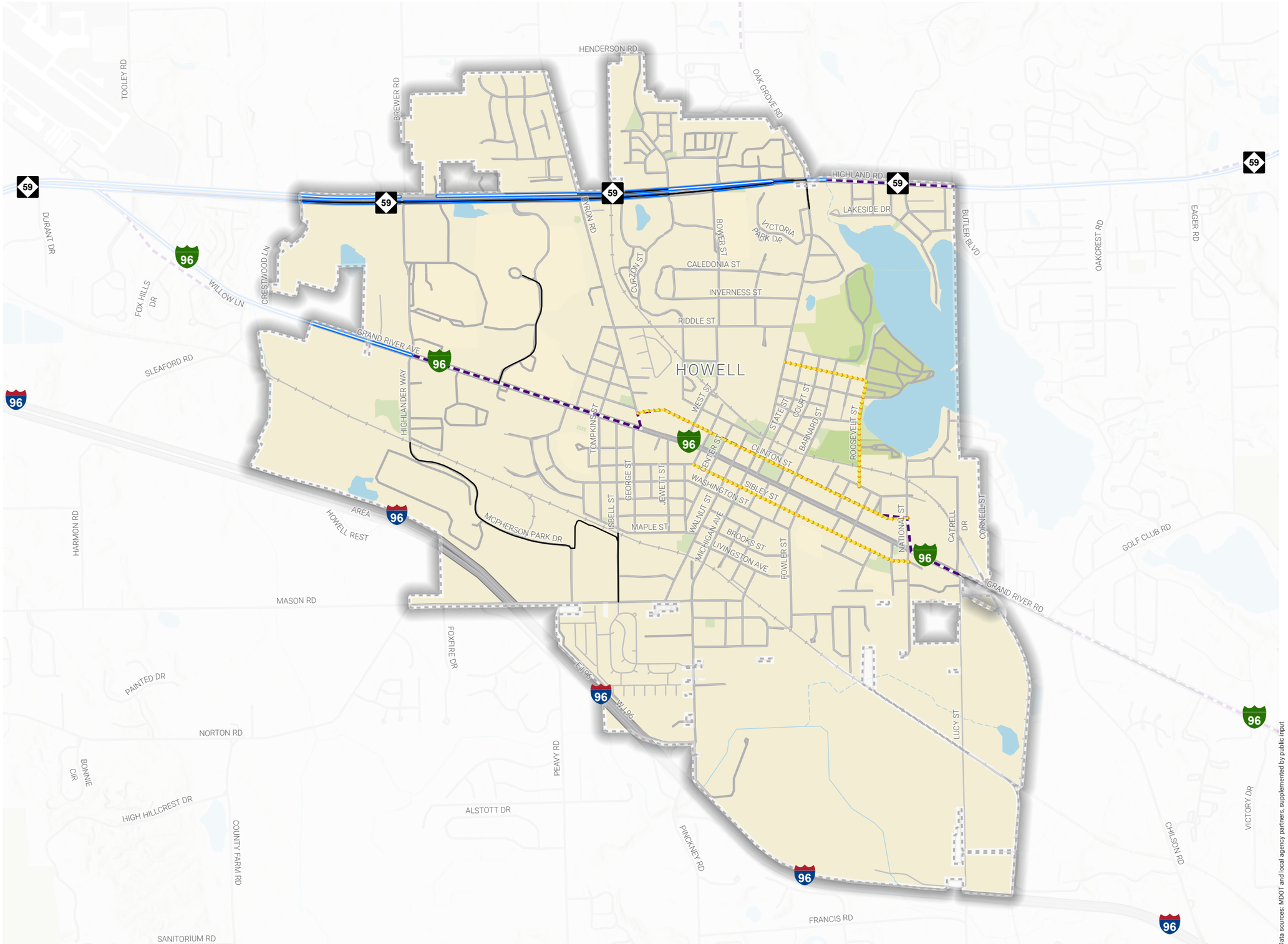


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

CITY OF JACKSON

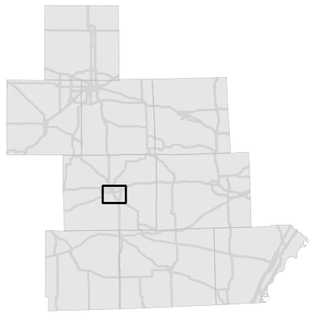
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UNIVERSITY REGION

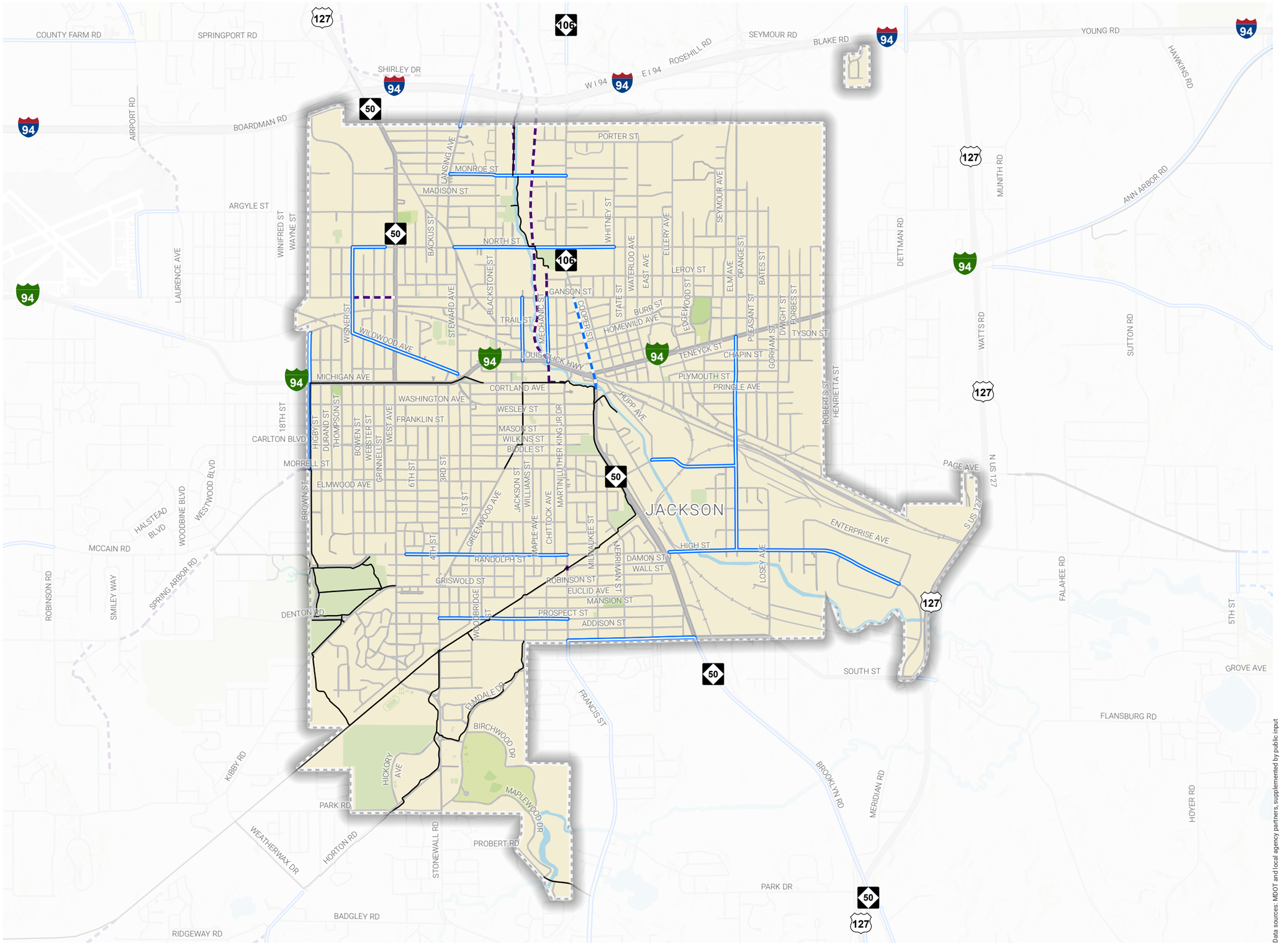


0 0.4 0.8 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

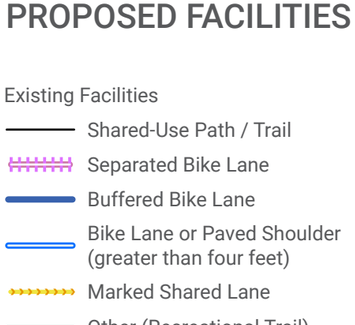
CITY OF LITCHFIELD

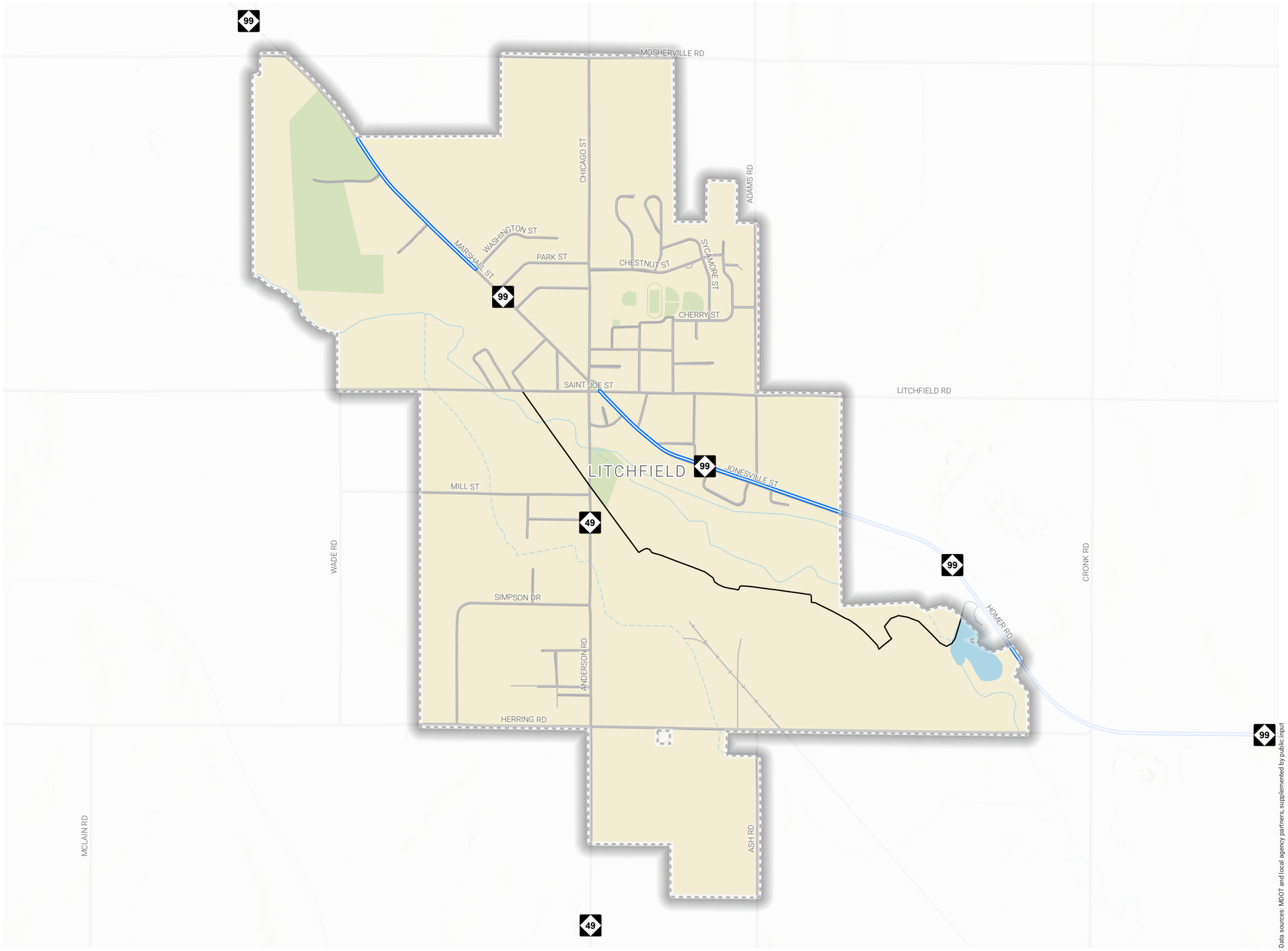
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- Parks
- Railroads
- City Boundary





0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

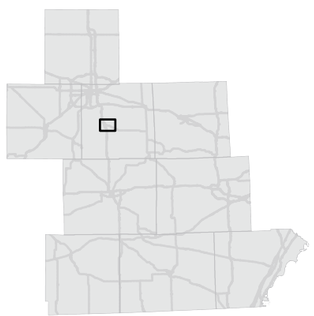
CITY OF MASON

EXISTING AND PROPOSED FACILITIES

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UNIVERSITY REGION

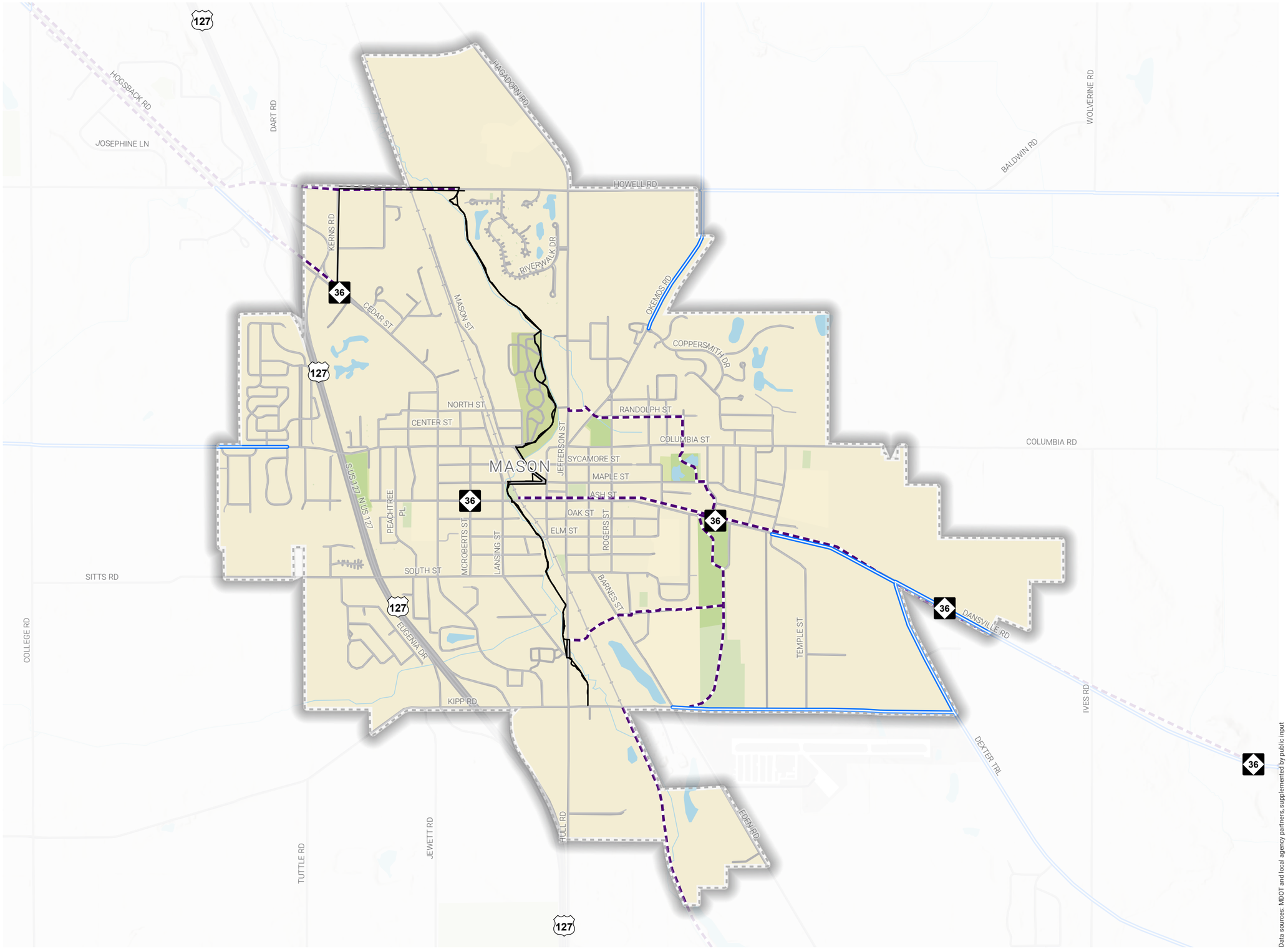


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

CITY OF MILAN

EXISTING AND PROPOSED FACILITIES

Existing Facilities
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UNIVERSITY REGION

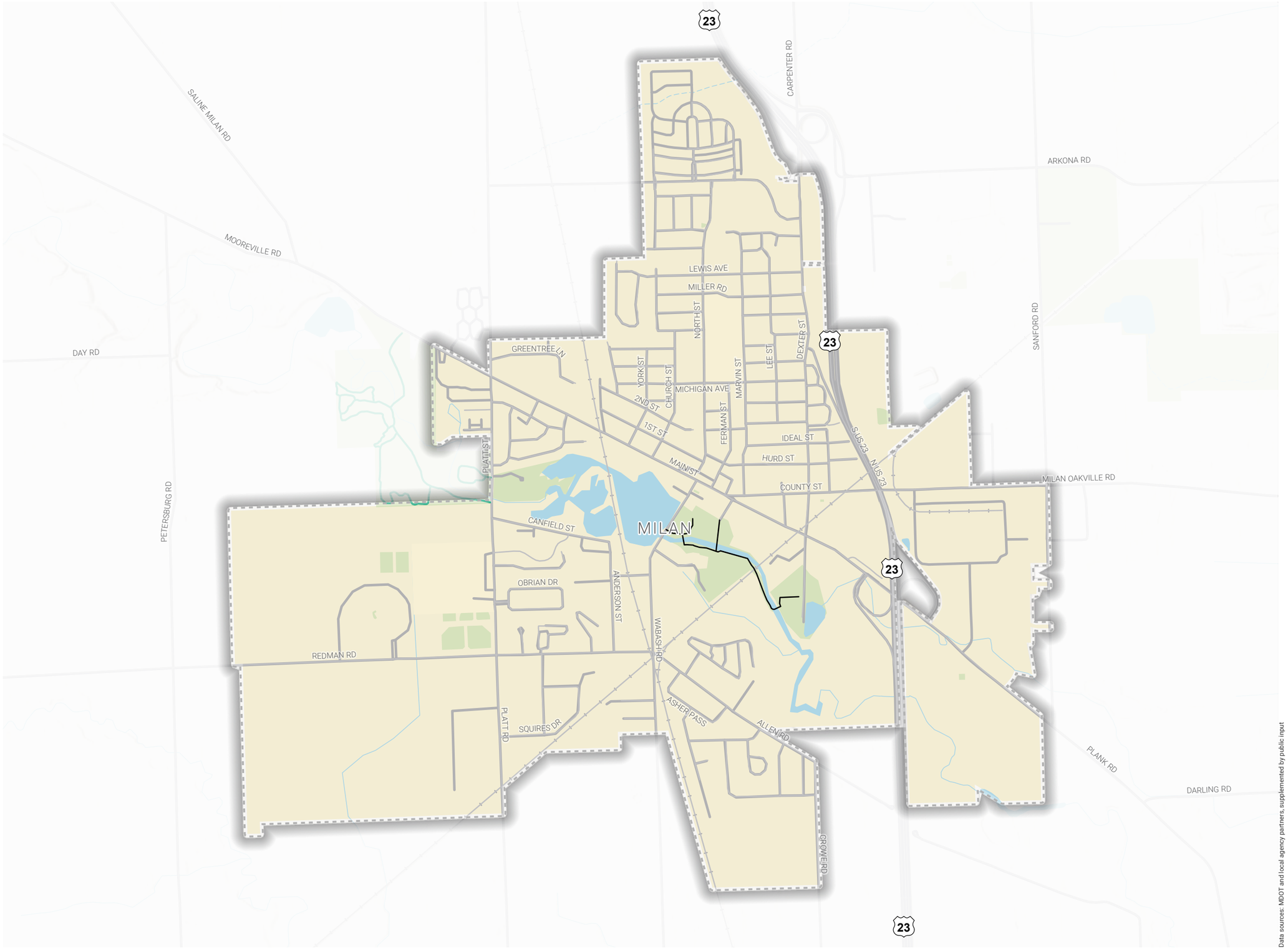


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

CITY OF MONROE

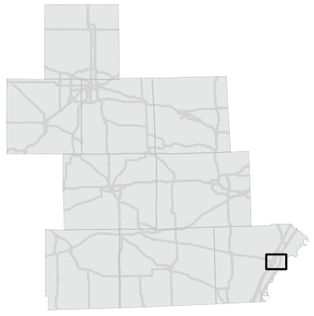
EXISTING AND PROPOSED FACILITIES

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UNIVERSITY REGION

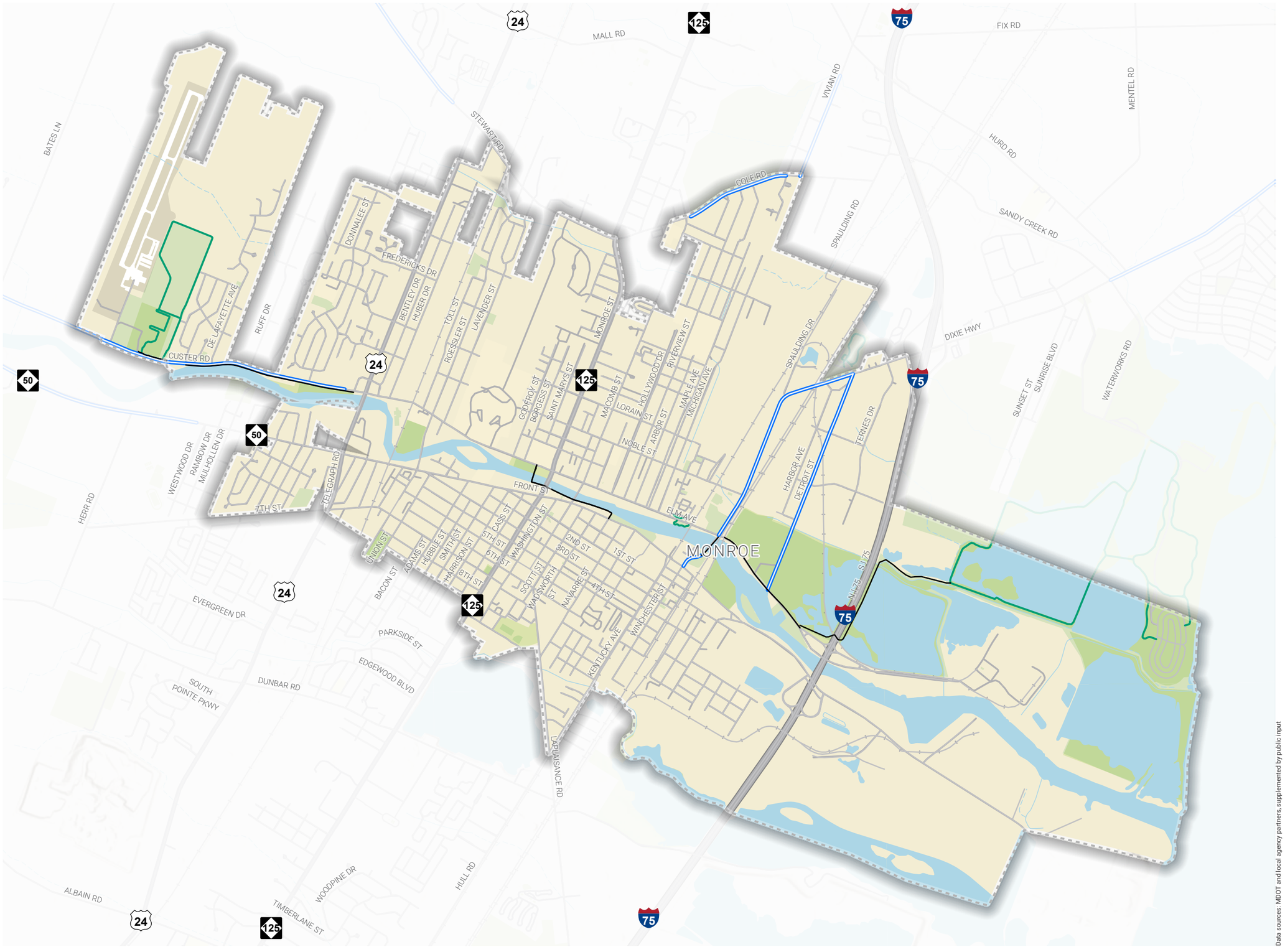


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

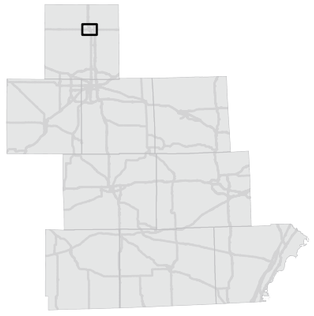
CITY OF ST JOHNS

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
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UNIVERSITY REGION

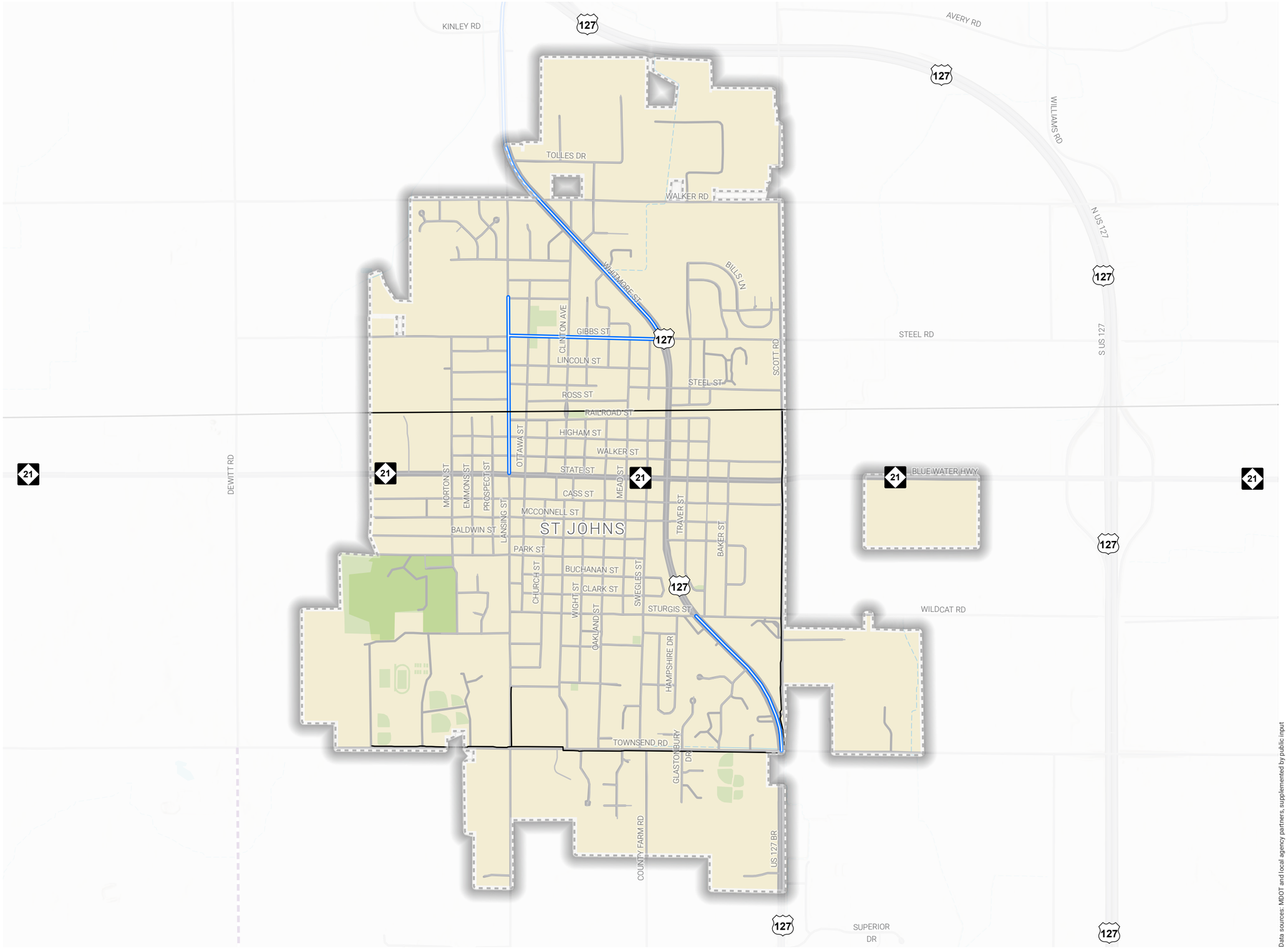


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

CITY OF TECUMSEH

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
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- Parks
- Railroads
- City Boundary

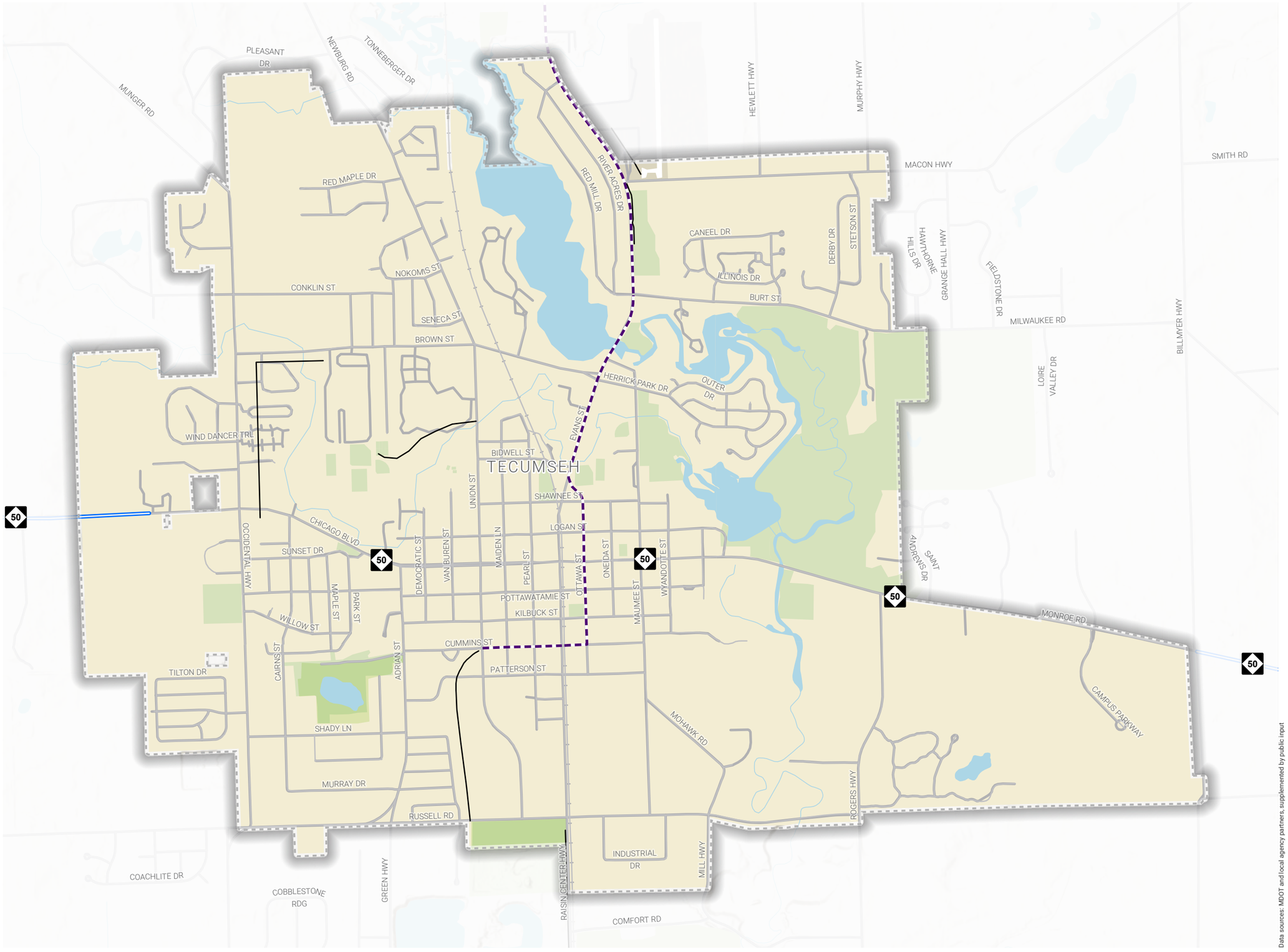
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

CITY OF YPSILANTI

EXISTING AND PROPOSED FACILITIES

Existing Facilities
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UNIVERSITY REGION

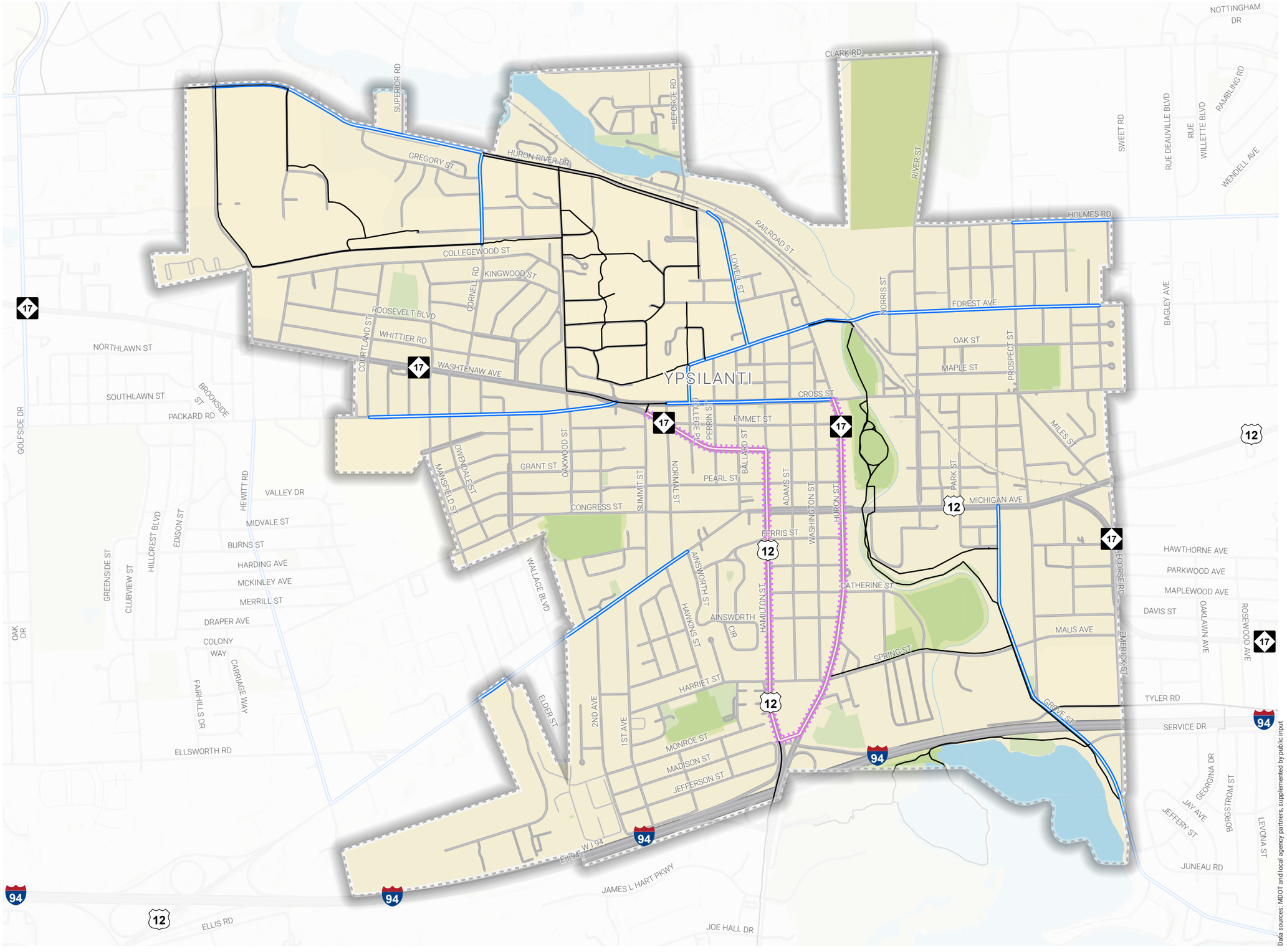


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

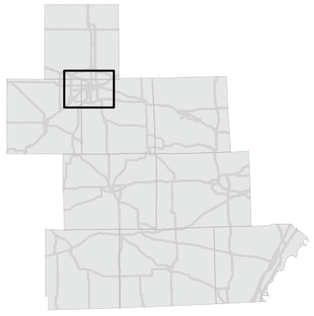
GREATER LANSING

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
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UNIVERSITY REGION

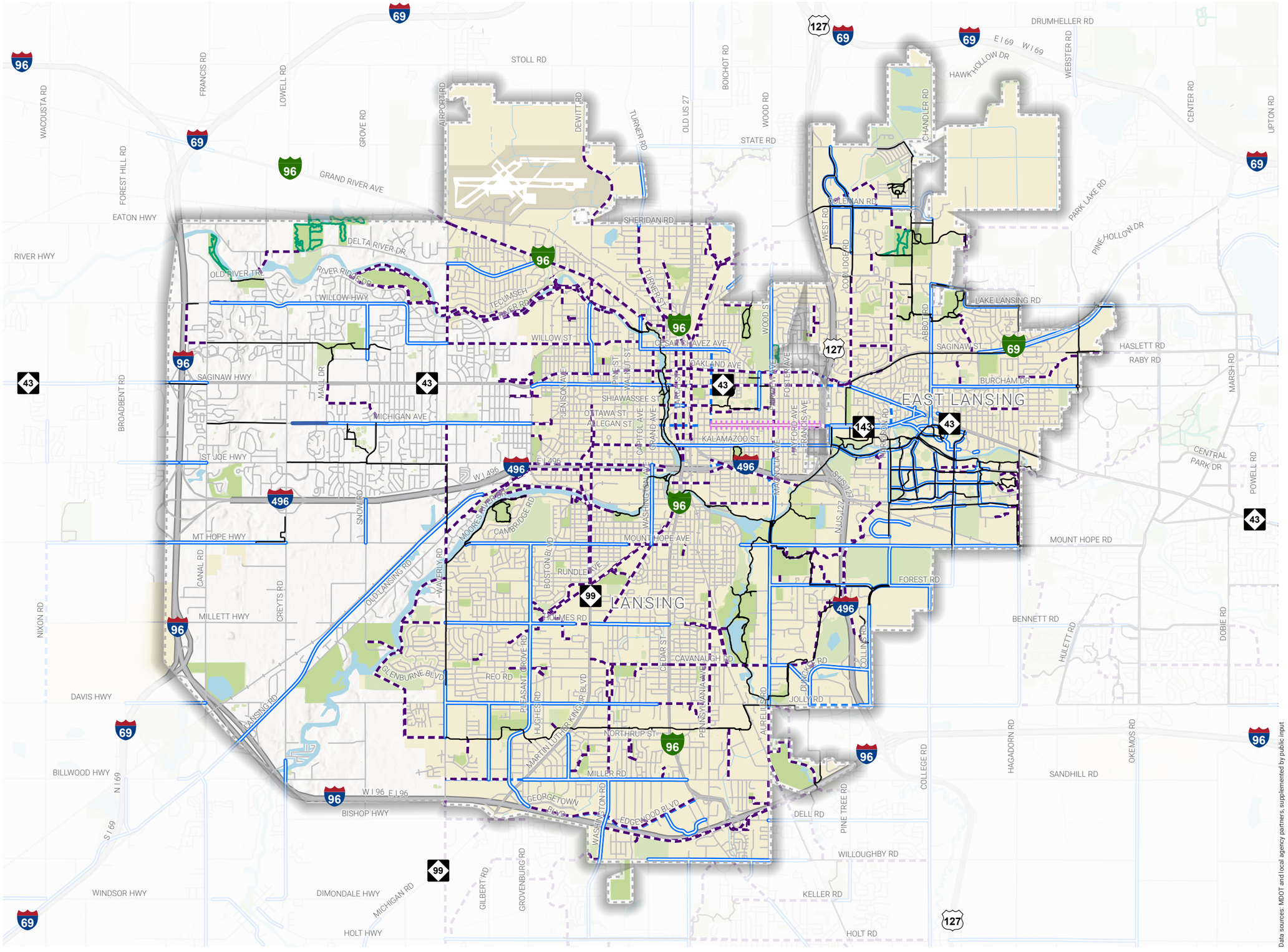


0 0.85 1.7 MILES

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MDOT Michigan Department of Transportation

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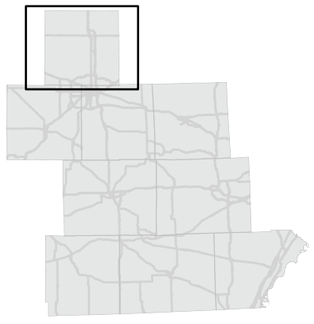
CLINTON COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
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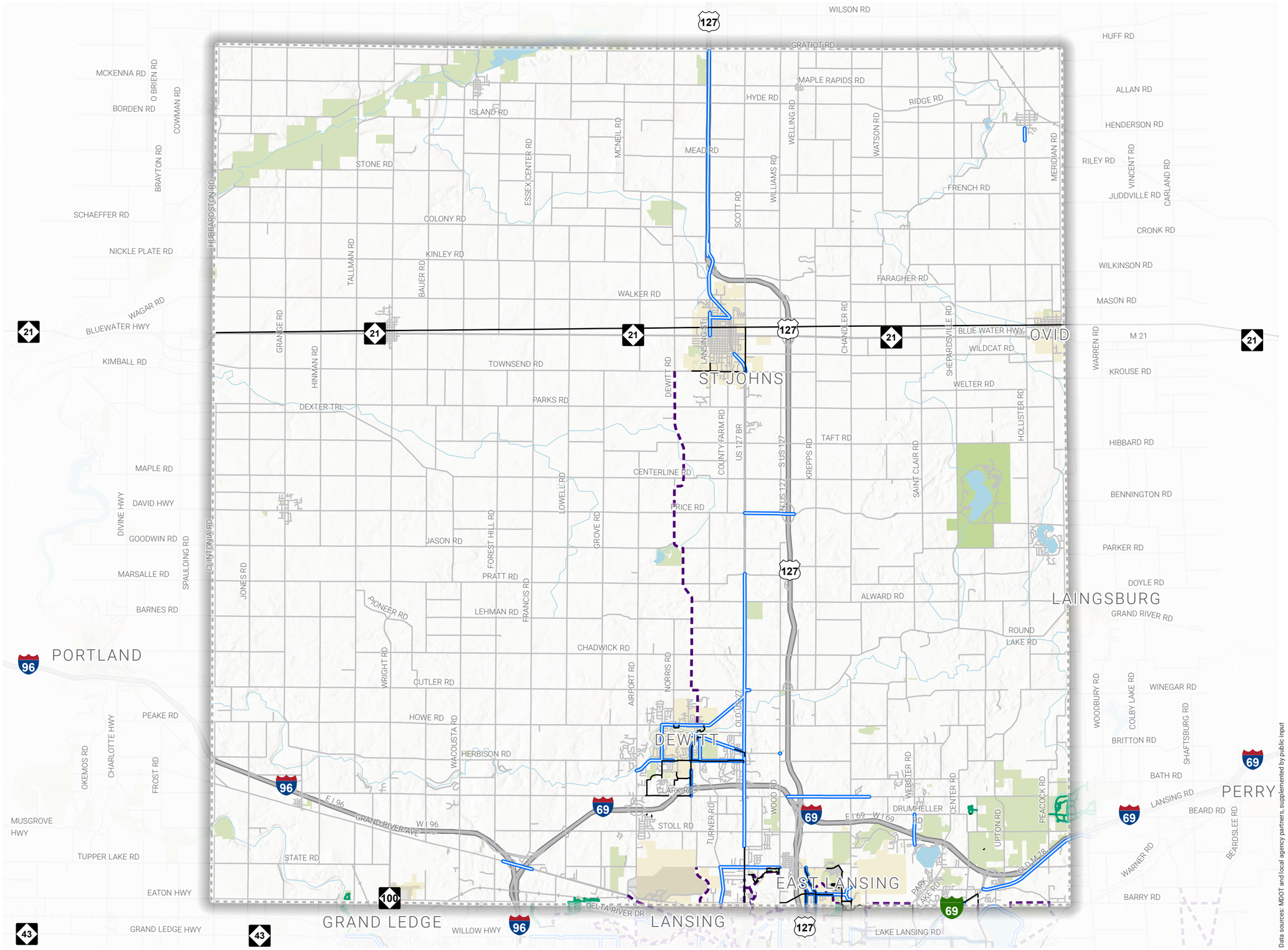


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

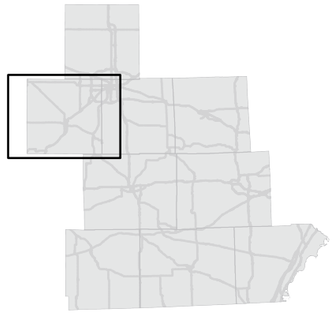
EATON COUNTY

EXISTING AND PROPOSED FACILITIES

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UNIVERSITY REGION

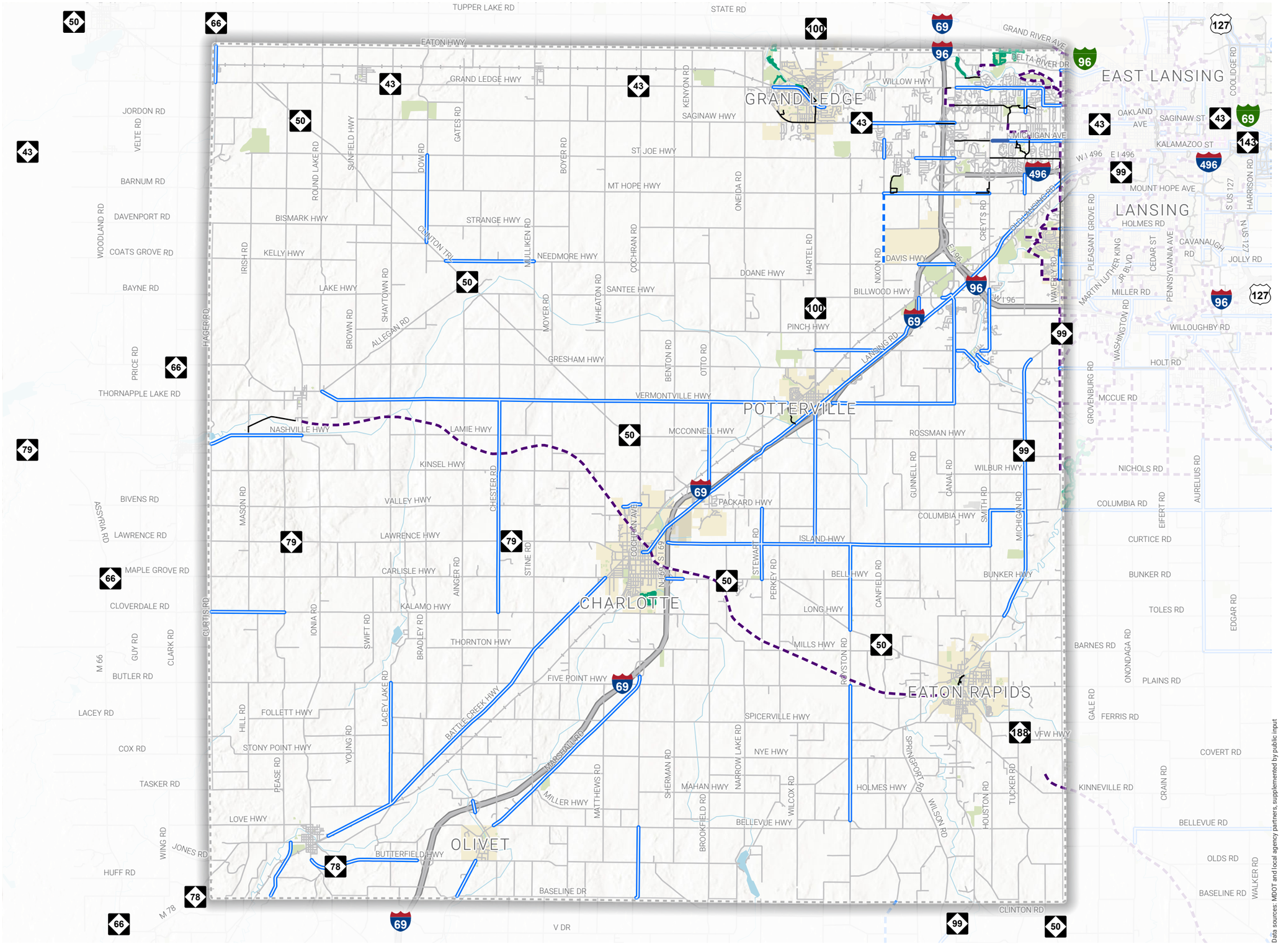


0 2 4 MILES

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MDOT Michigan Department of Transportation

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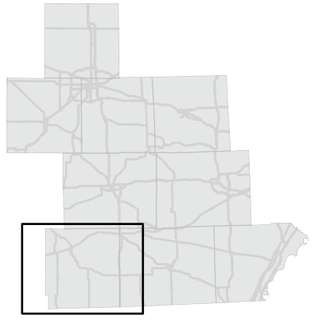
HILLSDALE COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
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- Bike Lane or Paved Shoulder (greater than four feet)
- Marked Shared Lane
- Other (Recreational Trail)

Proposed Facilities
- Shared-Use Path / Sidepath
- Bike Lane or Paved Shoulder
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

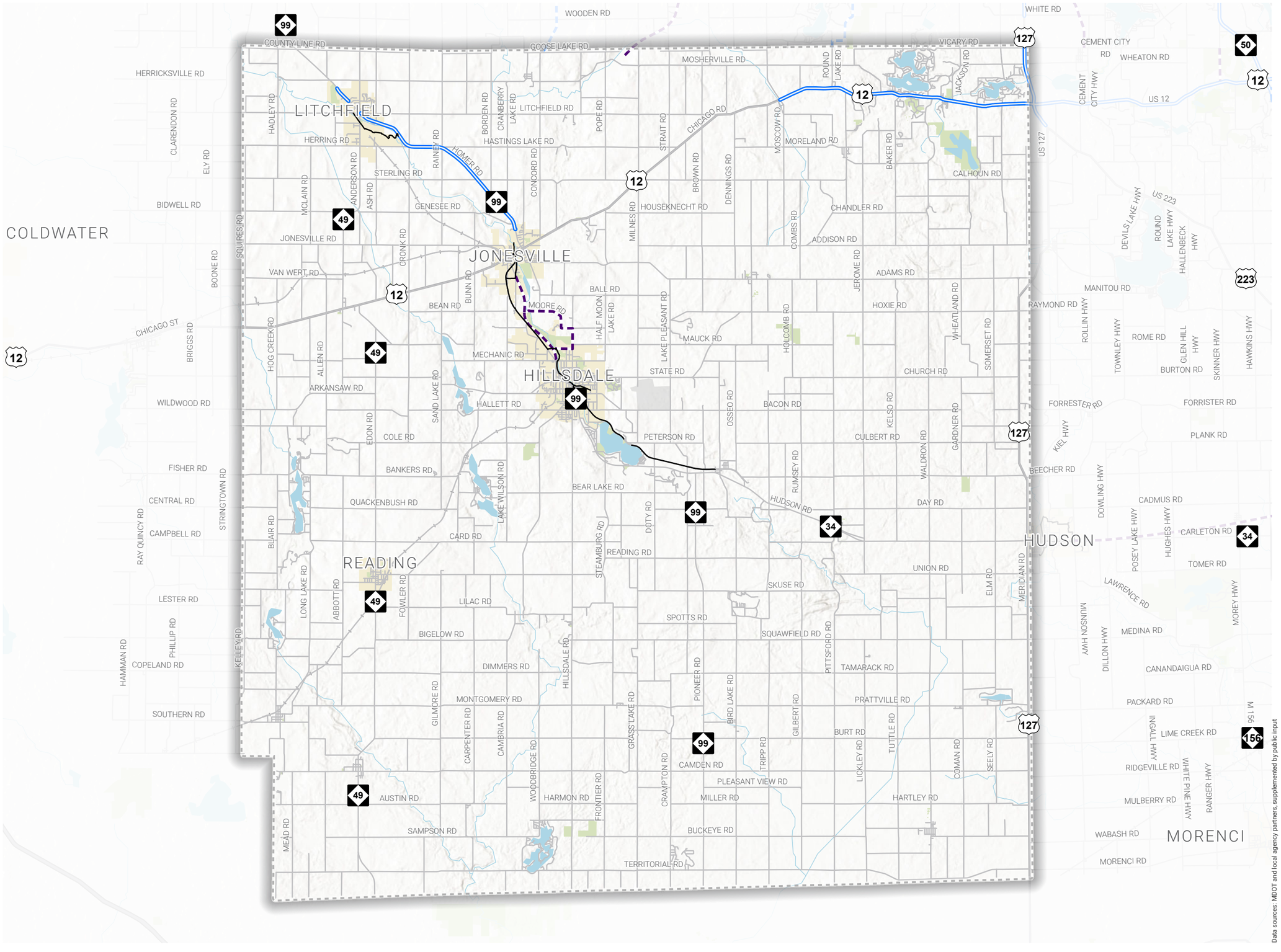


0 2 4 MILES

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MDOT Michigan Department of Transportation

alta



Data sources: MDOT and local agency partners, supplemented by public input

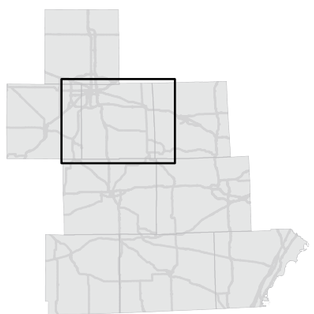
INGHAM COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
- Marked Shared Lane
- Other (Recreational Trail)

Proposed Facilities
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UNIVERSITY REGION

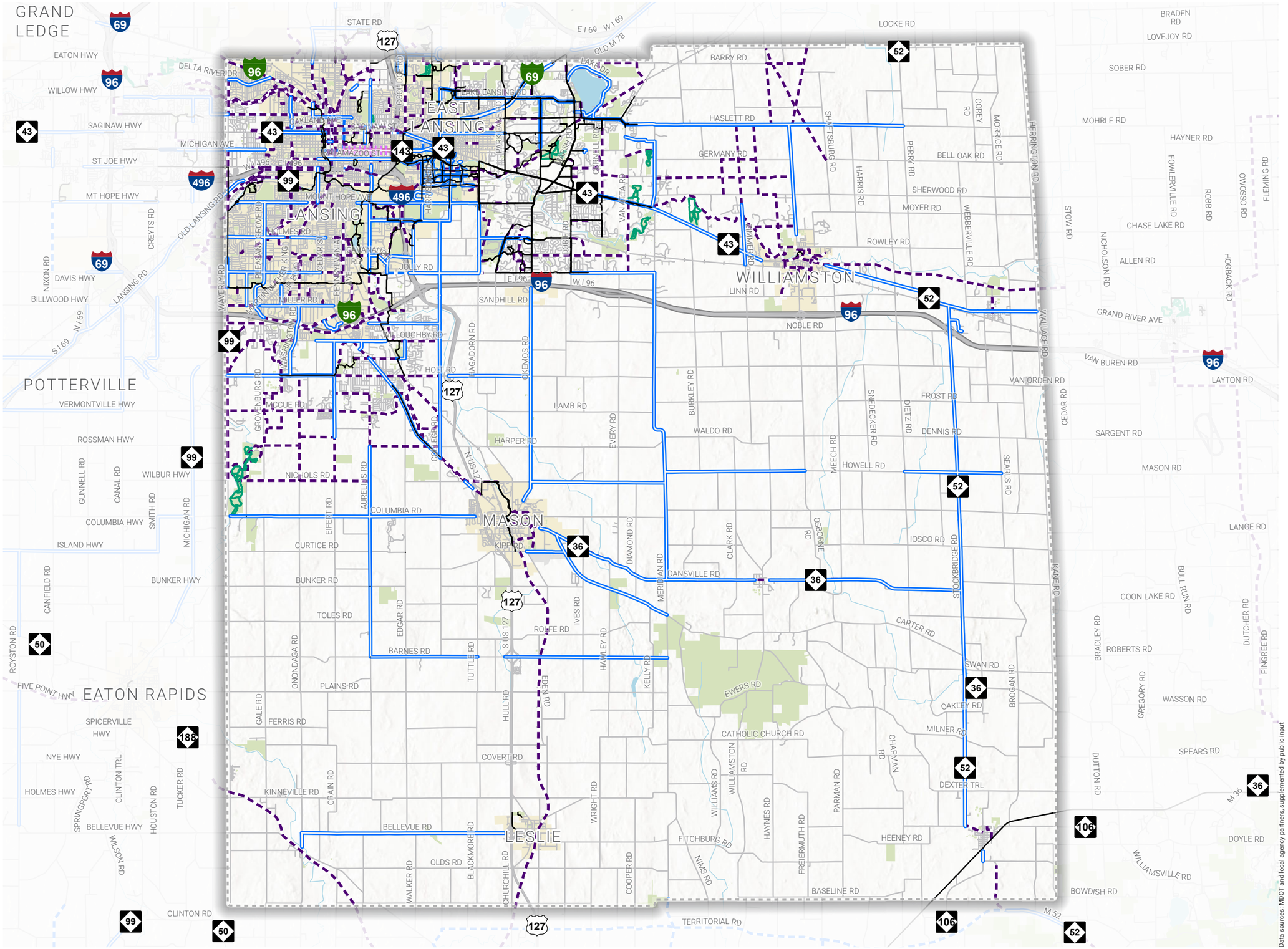


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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

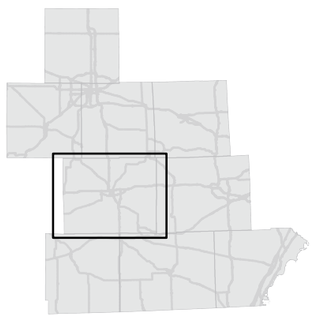
JACKSON COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
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- Buffered Bike Lane
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UNIVERSITY REGION

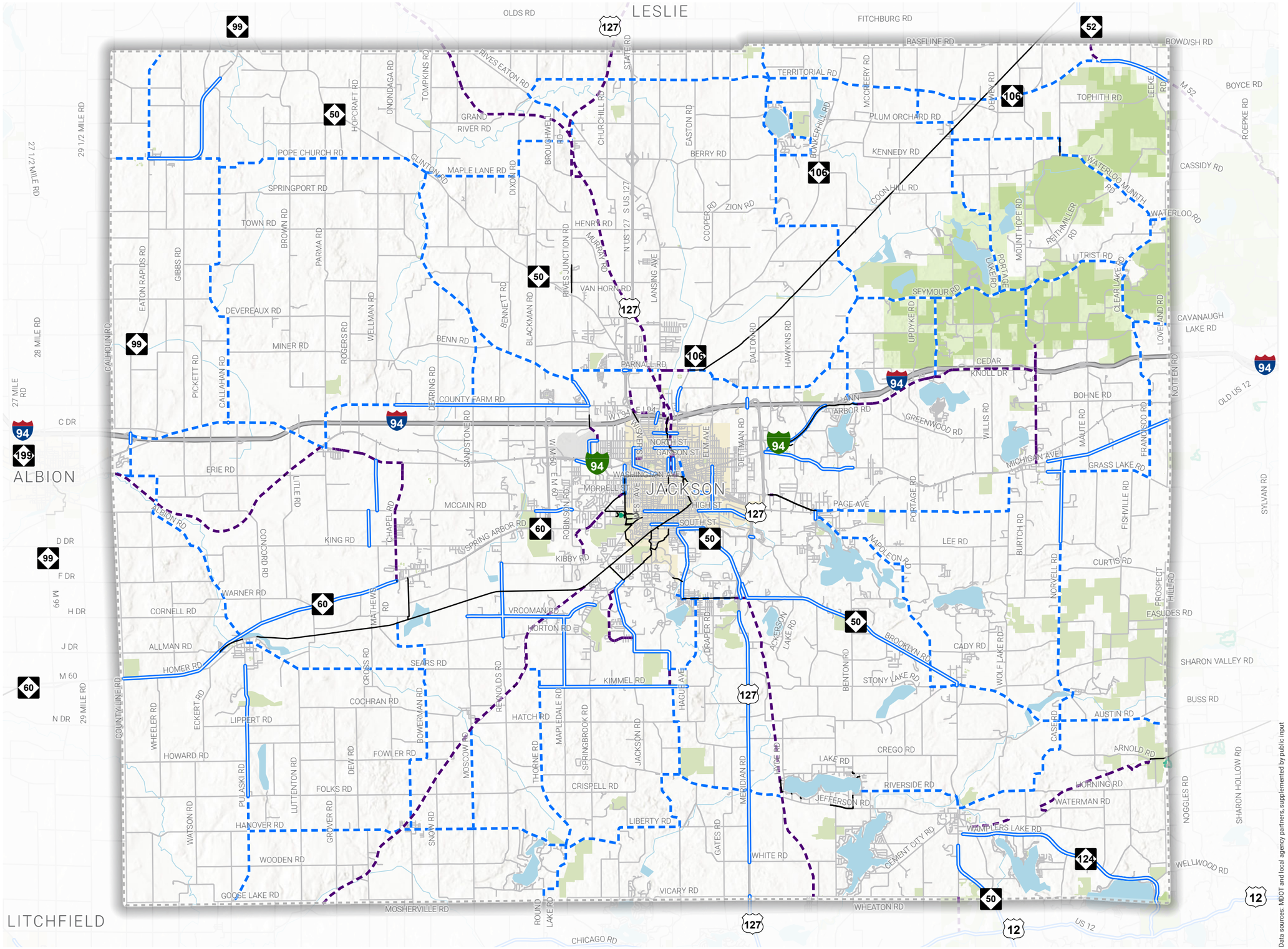


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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

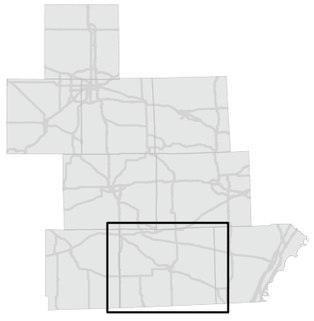
LENAWEE COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
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Proposed Facilities
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- Bike Lane or Paved Shoulder
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

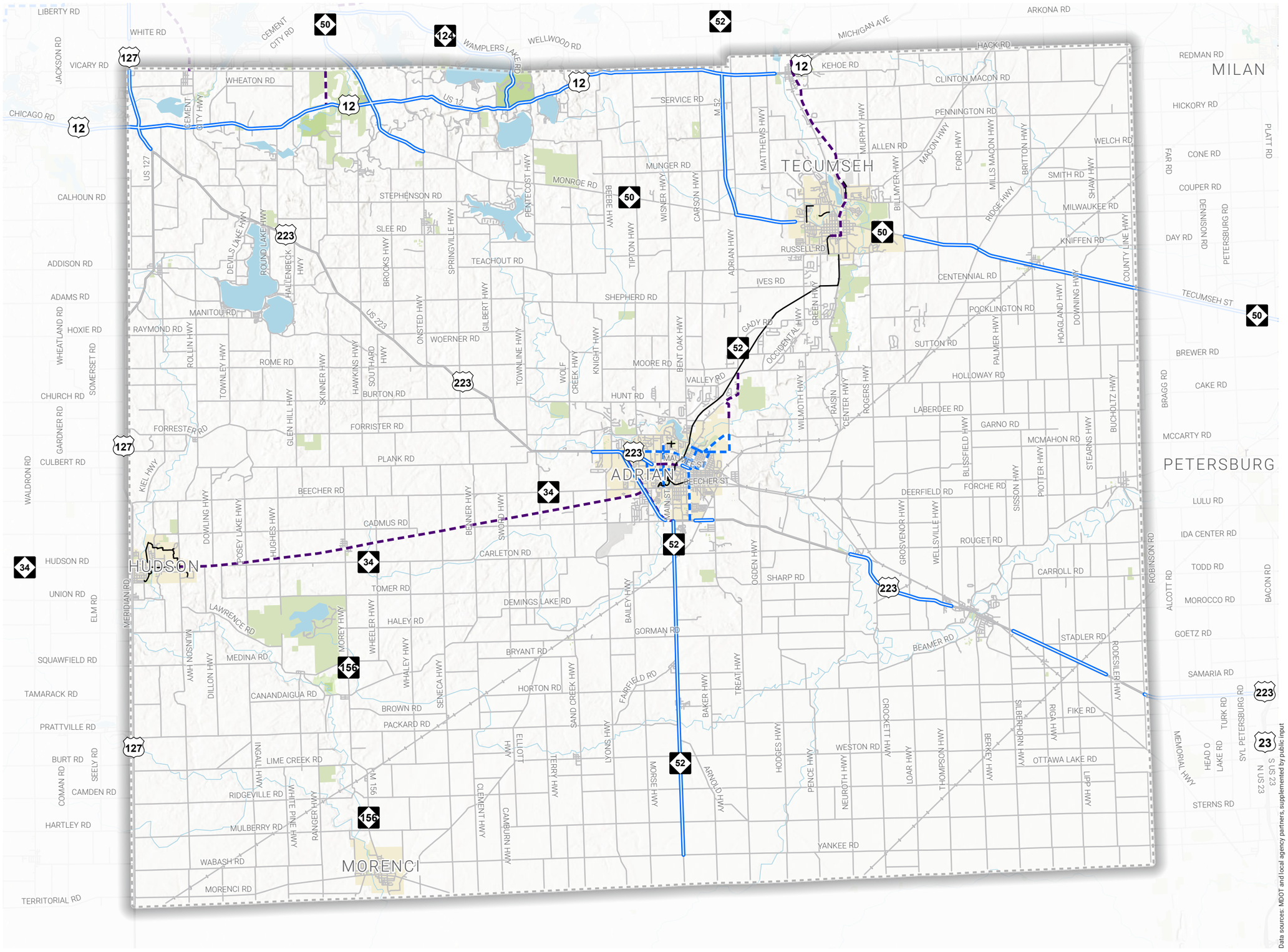


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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

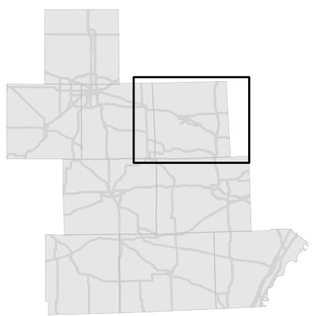
LIVINGSTON COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
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Proposed Facilities
- Shared-Use Path / Sidepath
- Bike Lane or Paved Shoulder
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

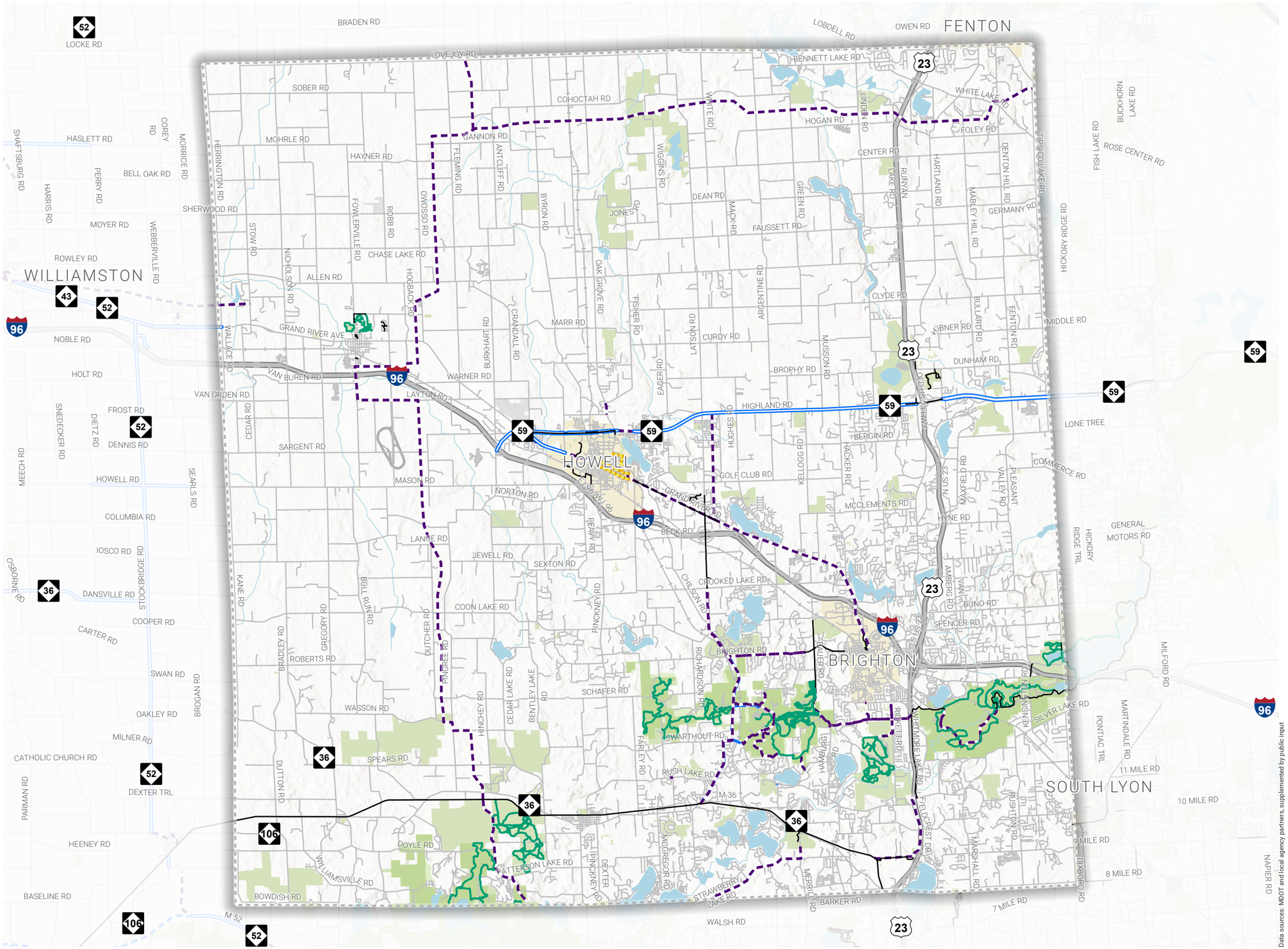


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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

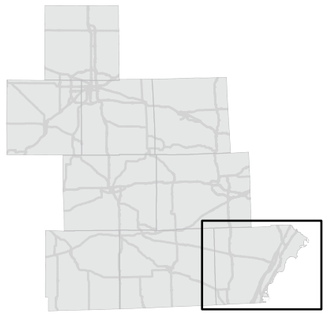
MONROE COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
- Marked Shared Lane
- Other (Recreational Trail)

Proposed Facilities
- Shared-Use Path / Sidepath
- Bike Lane or Paved Shoulder
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

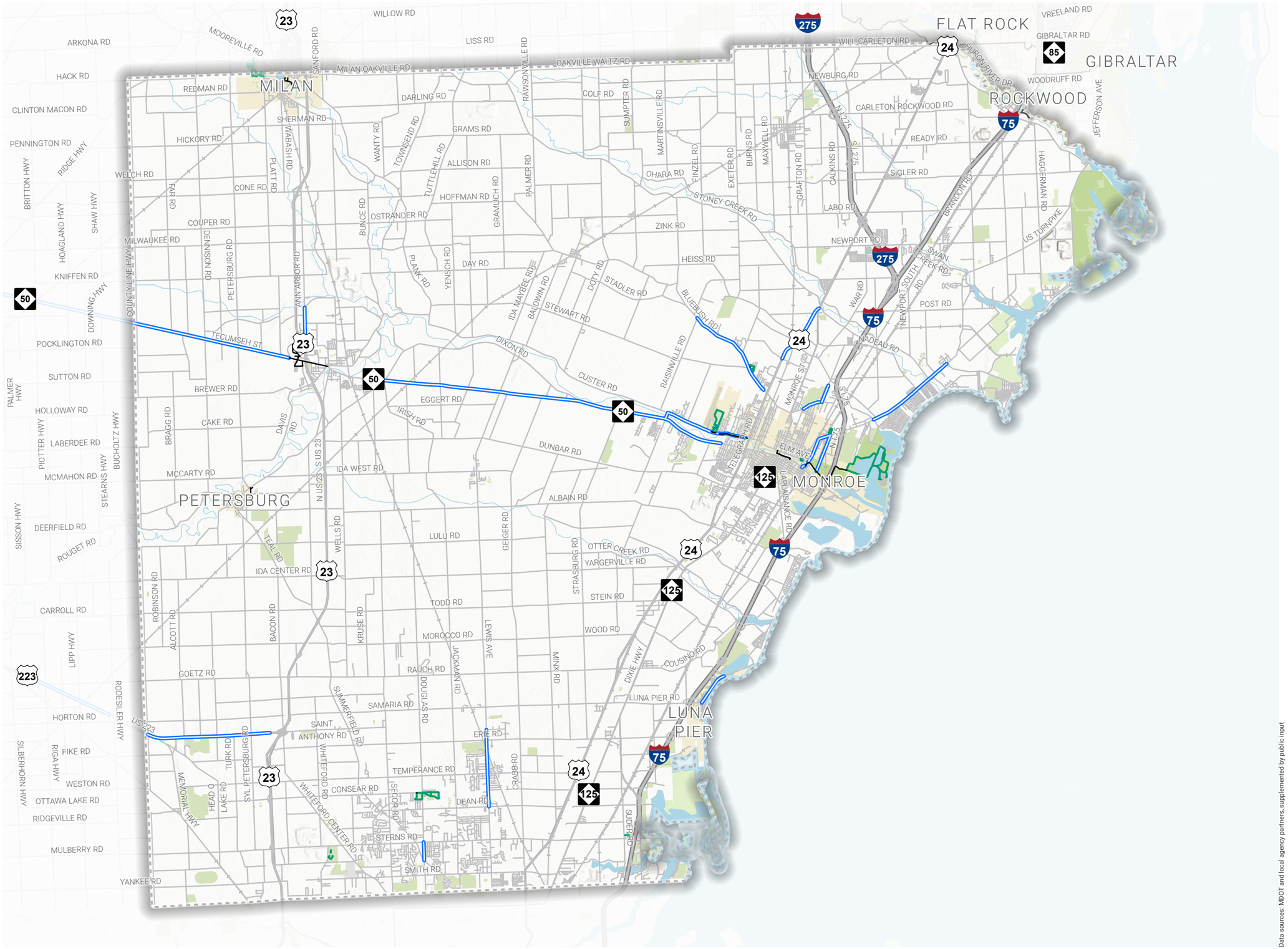


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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

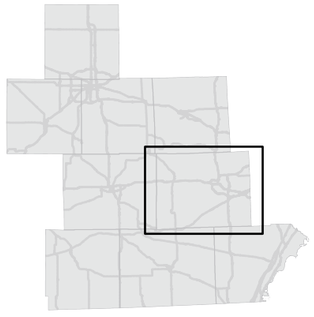
WASHTENAW COUNTY

EXISTING AND PROPOSED FACILITIES

Existing Facilities
- Shared-Use Path / Trail
- Separated Bike Lane
- Buffered Bike Lane
- Bike Lane or Paved Shoulder (greater than four feet)
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UNIVERSITY REGION

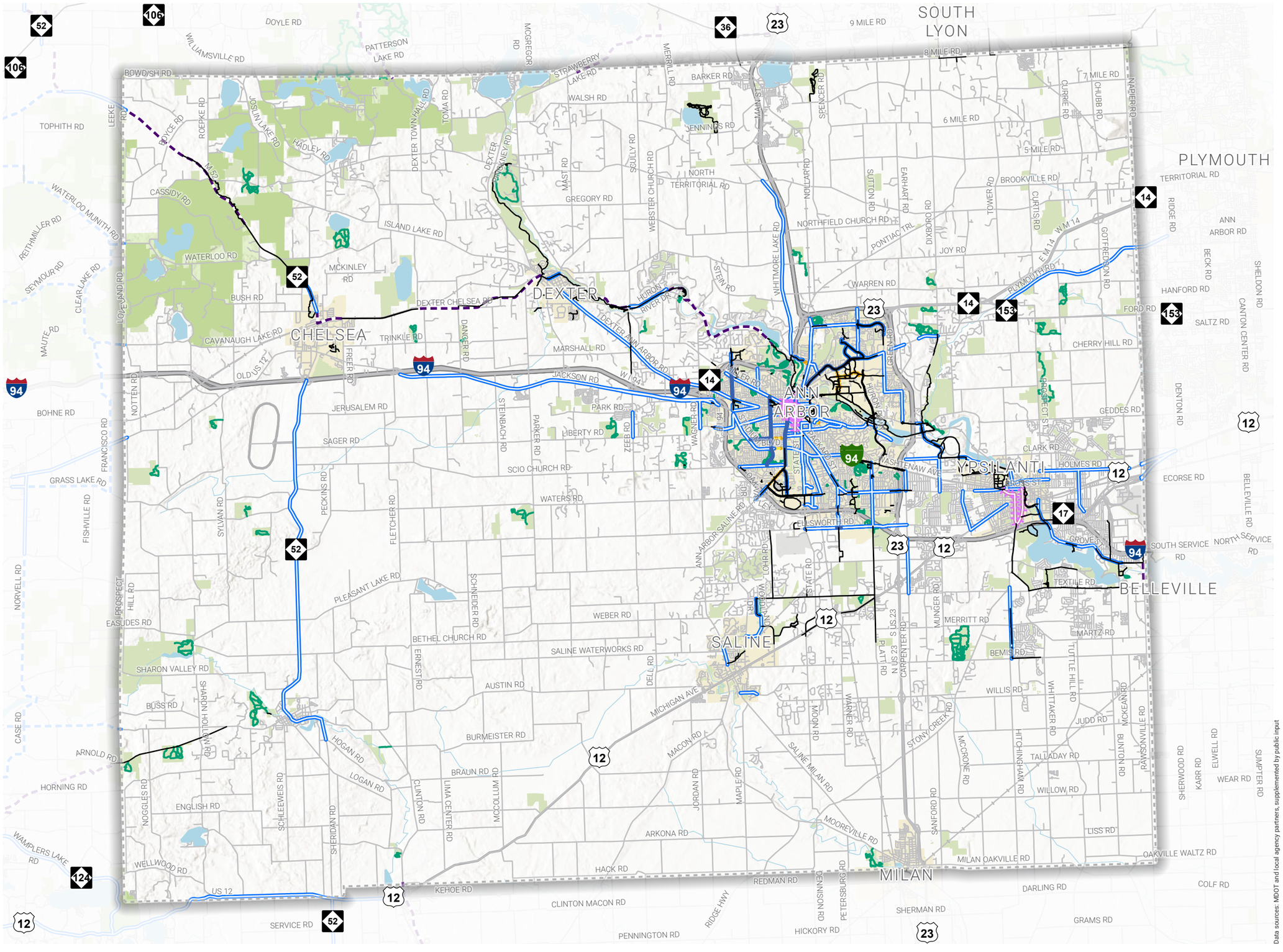


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MDOT Michigan Department of Transportation

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Data sources: MDOT and local agency partners, supplemented by public input

Appendix C: Current Conditions Detailed Results

Introduction

This memo describes the findings from five key analyses conducted as part of *Task D: Analysis/Conceptual Plan*.[1] The results of these analyses will play a crucial role in shaping facility recommendations for the conceptual plan, as well as informing project prioritization based on identified needs and opportunities. Each analysis focuses on different aspects of the transportation network to enhance active transportation infrastructure, with an emphasis on safety, accessibility, and inclusivity. The five analyses conducted include:

Bicycle Level of Traffic Stress (BLTS) Analysis: The BLTS analysis aims to identify specific segments of the roadway network that can present high levels of stress for cyclists. By identifying these segments, the analysis helps inform where improvements—such as separated bike lanes or traffic calming measures—may be most needed to create safer, more inviting cycling routes. This analysis is essential in recommending future bicycle facilities that align with the existing roadway design and its surrounding context.

Pedestrian Soft Barrier Analysis: This analysis focuses on identifying "soft barriers" for pedestrians—features of the urban environment that, while not impassable, create discomfort or difficulty during crossings. These barriers can discourage walking, even on routes that are otherwise low-stress or attractive for pedestrians. By pinpointing these locations, the analysis helps to recommend improvements that would encourage walking and enhance pedestrian safety across the transportation network.

Demand Analysis: The demand analysis examines the potential for walking and biking trips based on current land use patterns, population density, and other factors that influence travel behavior. This analysis helps to identify gaps in the existing network where additional infrastructure could support greater levels of walking or biking. For instance, areas that lack direct or safe connections to key destinations like schools, entertainment, or transit hubs may be highlighted for future investment.

Demographic Analysis: The demographic analysis compiles socioeconomic and demographic data to better understand how transportation infrastructure serves—or underserves—different communities within the study area. By highlighting these underserved areas, the analysis ensures that the plan prioritizes projects that promote transportation

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[1] *Alta Planning + Design staff utilize various generative AI resources to design, develop, ideate, quality check, and generate feedback on client products. All outputs are reviewed by a human being and fact-checked for errors and any quality control issues. For this memo, ChatGPT 4o was used to refine the writing by clarifying concepts and checking for grammar and tone on 9/24/24.*

access, helping to create a more inclusive network that benefits all residents, regardless of their socioeconomic background or physical ability.

Crash Analysis: The crash analysis reviews collision data to identify locations where crashes involving vehicles and pedestrians or cyclists have occurred. By mapping these incidents, the analysis seeks to understand patterns and pinpoint high-risk areas where safety interventions are most needed. This could involve infrastructure improvements such as better lighting, separated bike lanes, pedestrian refuge islands, or enhanced crosswalk visibility. Ultimately, this analysis ensures that safety is a key factor in the project prioritization process, aiming to reduce the likelihood of future crashes and create a safer environment for all road users.

Study Areas

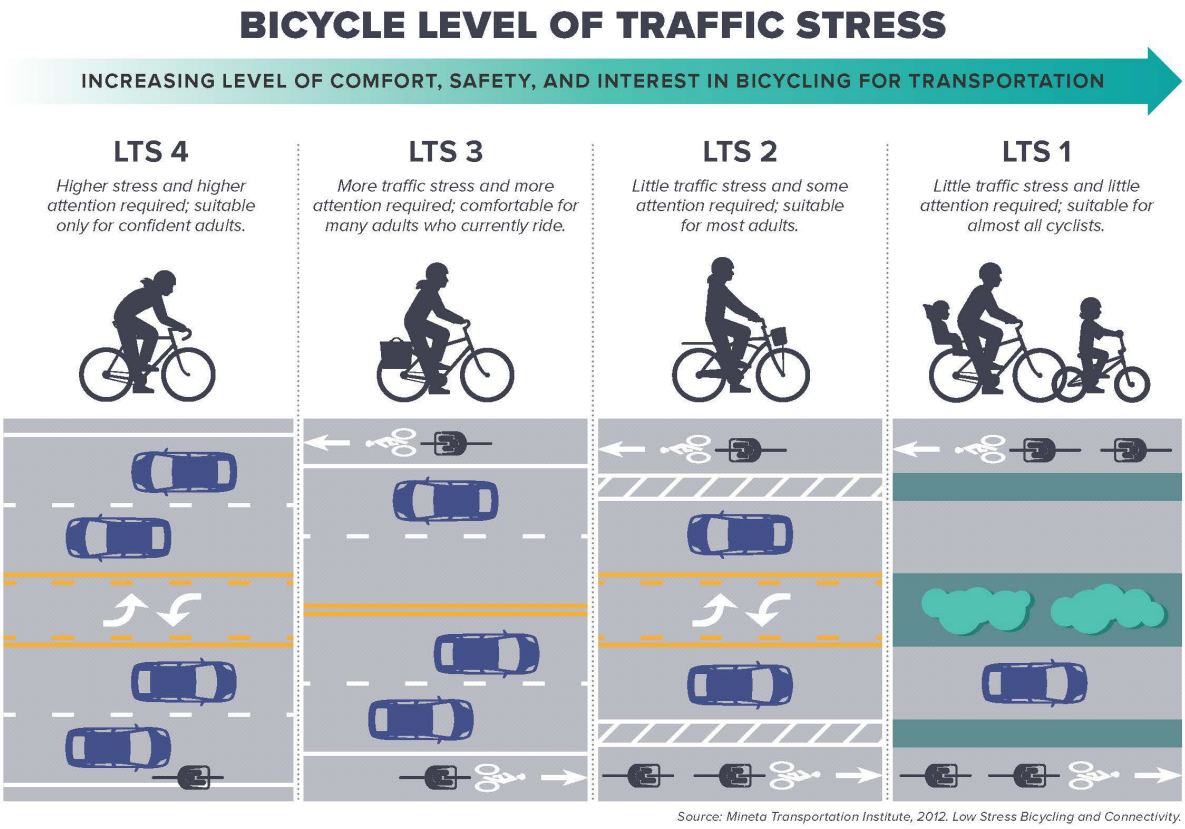
Each analysis was conducted at the University Region level, as well as for each county within the region. In addition, several cities within the region were selected for more detailed, intra-regional analysis. The cities chosen for further review included:

- City of Adrian
- City of Brighton
- City of Lansing and City of East Lansing (Note: these cities were combined due to their coterminous nature)
- City of Ann Arbor
- City of St Johns
- City of Litchfield
- City of Mason
- City of Ypsilanti
- City of Jackson
- City of Monroe
- City of Milan
- City of Howell
- City of Hillsdale
- City of Charlotte
- City of Tecumseh

This selection provided a representative sample of different jurisdiction types and regional contexts for comparison. By examining a diverse range of cities—spanning from larger urban centers like Lansing and Ann Arbor to smaller towns such as Litchfield and Tecumseh—the analysis team was able to capture the unique transportation challenges and opportunities across the region. This comparative approach ensured that the findings and recommendations would be relevant to a variety of urban, suburban, and rural settings within the University Region. In total, 24 study areas were evaluated as well as the University Region in total.

Bicycle Level of Traffic Stress (BLTS) Analysis

To support the development of a comfortable and connected active travel network, Alta conducted a Level of Traffic Stress (LTS) analysis for the bicycle network across the University Region. This analysis categorized streets based on the level of stress they present to bicyclists, ranking them from LTS 1 (low stress, suitable for children and novice riders) to LTS 4 (high stress, suitable only for experienced, 'strong and fearless' cyclists). The ranking was determined by various roadway factors, such as speed limits, the number of traffic lanes, and the presence or absence of bicycle facilities, as the figure below illustrates.



Graphic of the Bicycle Level of Traffic Stress (BLTS) classifications

The LTS analysis was based on data from the *Version 24 (v24) Roads & Highways (R&H) Centerline Attribution Data* feature class provided to Alta by the Michigan Department of Transportation (MDOT). Where MDOT data was incomplete or unavailable, it was supplemented with information from OpenStreetMap (OSM), an open-source mapping platform. Key roadway attributes, including posted speed limits, lane configurations, and the existence of bike lanes or pathways, were derived from MDOT's road centerline data and merged bicycle network data from *Task B: Local Data Merge*, as these factors directly

influence the LTS score of a roadway. For a detailed explanation of how Bicycle LTS (BLTS) was calculated, please refer to **Appendix D.**

Bicycle Level of Traffic Stress Results

The analysis revealed that in most jurisdictions within the region—including Ann Arbor, Lansing, East Lansing, and Ypsilanti—downtown areas and key activity centers tend to have streets with higher levels of traffic stress for bicyclists. This is often due to higher traffic volumes and speeds, combined with a lack of separated or separated bicycle infrastructure . These high-stress conditions make it more challenging for cyclists, particularly less experienced riders, to navigate the central urban areas.

However, in cities like Lansing and East Lansing, despite the higher-stress roadways in the downtown cores, there are trails and shared-use paths that offer lower-stress alternatives for cyclists. These routes, while sometimes more circuitous, provide a safer and more comfortable way to traverse downtown areas, especially along scenic routes such as those adjacent to the Grand and Red Cedar rivers.

In contrast, local streets in more suburban contexts are categorized as low stress, making them more suitable for a wider range of cyclists, including families and casual riders. However, the analysis shows that rural areas tend to have very high-stress roads. This is primarily due to higher speed limits and the absence of any dedicated infrastructure, such as bike lanes or shoulders. For example, in Hillsdale County—located on the southwestern border of the University Region—many roads outside of the city of Hillsdale are classified as high-stress. Cyclists in these areas may find it difficult to locate alternative, safer routes, as rural road networks often lack adequate infrastructure for non-motorized users.

Pedestrian Soft Barrier Analysis

The purpose of this analysis is to identify “soft barriers” for pedestrians, focusing on roadways that create discomfort during crossings. These soft barriers, such as wide streets, high traffic volumes, or fast-moving vehicles, can discourage active travel even on routes that might otherwise feel low-stress or safe to pedestrians. By highlighting these barriers, the analysis aims to improve pedestrian safety and accessibility, particularly in areas that would benefit from more walkable connections. A detailed description of the soft barrier methodology is available in **Appendix E.**

Unlike a traditional Pedestrian Level of Traffic Stress (PLTS) analysis—which requires detailed data on sidewalks, including their presence, width, and condition—this soft barrier analysis provides a more adaptable and practical alternative. In many areas within the MDOT region, sidewalk data is inconsistent or outdated, making it difficult to conduct a comprehensive PLTS

analysis. Instead, the soft barriers approach leverages readily available data such as Average Annual Daily Traffic (AADT), the number of travel lanes, and posted speed limits to evaluate pedestrian comfort. This method relies on MDOT's centerline data, supplemented by OpenStreetMap where needed, allowing for a broad, scalable analysis that can be applied effectively across different jurisdictions.

Pedestrian Soft Barrier Analysis Results

Like the BLTS analysis, cities such as Adrian, Ann Arbor, Hillsdale, Lansing, East Lansing, Ypsilanti, and Tecumseh experience significant pedestrian barriers where highways and major arterials cut through key activity centers and downtown areas. These high-traffic roadways disrupt pedestrian flow, making it more difficult and uncomfortable for people to walk between destinations. The lack of adequate pedestrian infrastructure, such as well-timed crosswalks, pedestrian islands, or reduced lane widths, can exacerbate these issues, particularly in busy urban environments.

In contrast, towns like Brighton and Litchfield tend to have fewer soft barriers due to their relatively lower traffic volumes and fewer lanes on major roads. This makes it easier for pedestrians to traverse the road network in these areas without the same level of discomfort or risk experienced in larger cities. However, even in these towns, attention to potential barriers is necessary to ensure that the pedestrian network remains accessible and safe for all users.

Demographic Analysis

Studies from across the country routinely find that some demographic groups typically face greater barriers than others in getting to the places they need to go, especially in communities designed primarily for motor vehicles. These demographic groups include (but are not limited to): people who identify as black, indigenous and people of color; youth; older adults; people with low incomes; people without a high school diploma; people without access to a motor vehicle; and people over-burdened by housing costs.[2] [3][4] For example, many youths and seniors are not be able to drive and therefore may experience reduced mobility in a transportation system designed solely for motor vehicles; someone without a high school diploma who works multiple part-time jobs to make ends meet may not have access to a direct, reliable bus route after a late shift; and someone living below the poverty line may be further

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[2] *Dannenberg A, Frumkin H, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.*
[3] *International City/ County Management Association. Active Living for Older Adults: Management Strategies for Healthy & Livable Communities.; 2003. http://www.ca-ilg.org/sites/main/files/file-attachments/resources__Active_Living.pdf.AccessedFebruary22,2020.*
[4] *Mckenzie B. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008 –2012. Am Community Surv Reports. 2014*

burdened by the high cost of owning and maintaining a car, or may be unable to afford to live in a place with multiple transportation options.

In addition to potential socioeconomic barriers, some barriers in communities are a result of historic patterns of injustice that have shaped the physical environment. Infrastructural barriers can negatively affect people's ability to access jobs, services, and education, among other destinations. For example, highways and high-stress roadways have often been built through communities of color and through low-income communities, displacing residents and cutting people off from jobs, services, and economic opportunity. The practice of redlining and other racially discriminatory real-estate practices has also had a lasting impact on the demographic spatial distribution in many American cities. Racially explicit and damaging housing policies of the past have implications for transportation today, as communities of color may be more vulnerable to gentrifying housing pressures which can lead to displacement to areas with fewer economic opportunities, less publicly funded infrastructure, and limited transportation options. In many places, the physical barriers in a city are further compounded by second-order effects such as worsened air quality, increased urban heat, limited opportunities for physical exercise, and higher crash rates – amounting to environmental, health, and safety burdens that are not distributed equally across the population. Critically examining these disparities is important because many of the barriers within our transportation system, their resulting burdens, and the communities who experience them are often spatially related. Too often, the communities in the places most impacted by transportation investments are excluded from the planning processes that can influence them. Contemporary transportation planning practice seeks to address this by naming specific demographic groups because many transportation disparities today can be traced to historical government policies that have resulted in barriers for those demographic groups. In the absence of accounting for demographics, transportation planners risk further cementing inequality in our transportation systems.

Improving transportation options that don't rely on single-occupancy vehicles – e.g., by improving connections through public transit, walking, or biking—is an effective way for the Michigan Department of Transportation to begin overcoming disparities where they exist. This analysis seeks to discover where people with the highest need for transportation options live within the University Region**.** Understanding where these communities are most densely located will help to prioritize improvements and ensure that the benefits of future investments reach everyone. Working towards an improved transportation system may mean prioritizing active and public transportation funding in areas with a greater concentration of disadvantaged populations instead of distributing funding equally based on geography.

The project team gathered multiple demographic datasets into a database at the census block group level to complete the demographic analysis. The project team compiled ten variables,

percentile ranked[5] them relative to the study area (the University Region), and then combined them through a weighted sum. Once the index was calculated, a map of the results was generated by categorizing all the census block groups into four bins that indicate how high they score on the index.[6] Higher scores indicate areas of higher need. A detailed description of the demographic analysis methodology is available in **Appendix F.**

Demographic Analysis Results

The demographic analysis for the University Region illustrates that while most high need communities exist in urban centers, there are multiple rural communities that scored in the top quartile too. Overall, the spatial distribution of high demographic need scores center around the largest cities in each county. However, it is also true that as a general trend, lower demographic need scores tend to exist in suburban areas towards the northeast half of the University Region and higher demographic need scores tend to exist in the more rural areas toward the southwest half of the University Region.

Although the total number of census block groups varies in each county, the project team looked at the median scores of each county as rough starting point for understanding how demographics compare across the University Region at a high level. Visually, one can tell that Livingston County and Clinton County have generally lower demographic need scores than Jackson County and Ingham County, and the numbers below confirm that notion.

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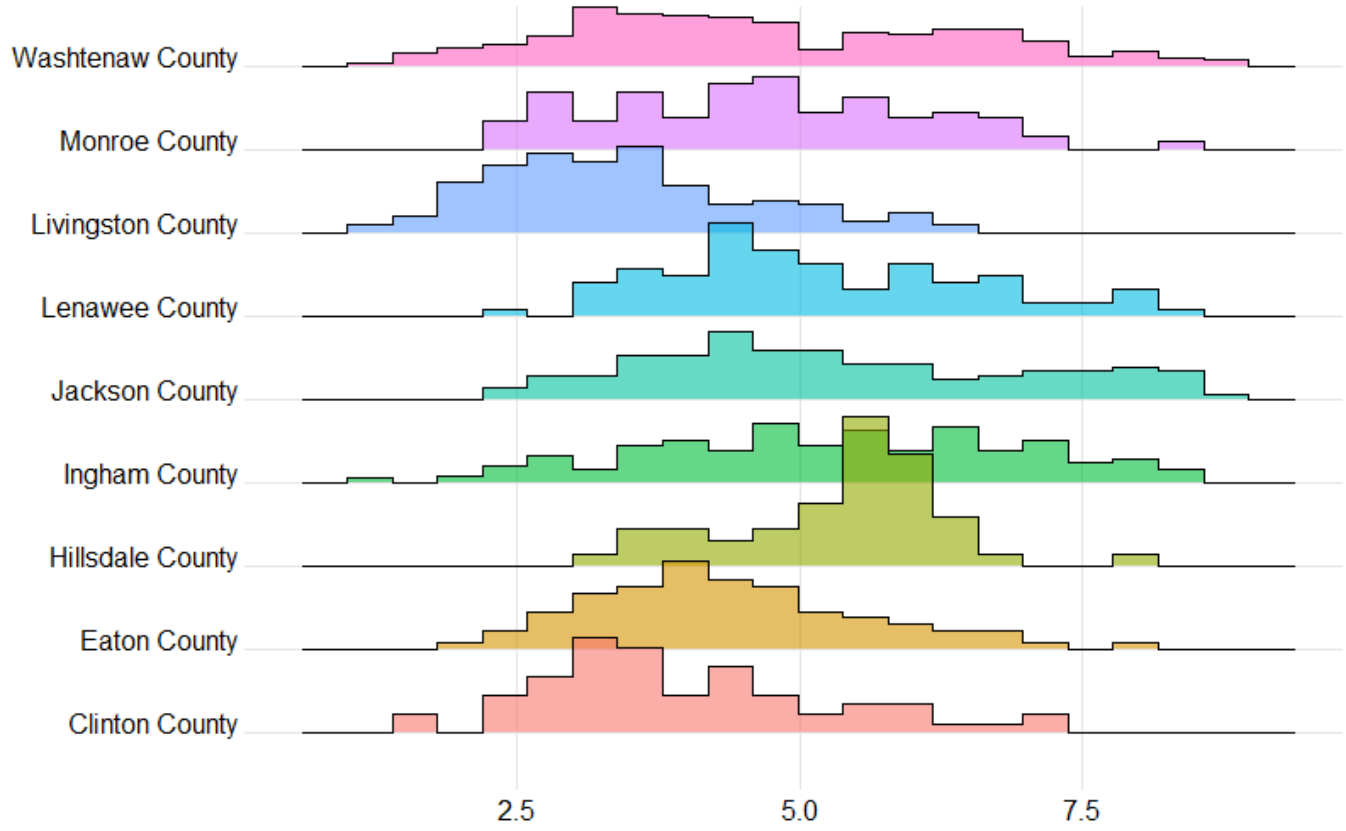
[5] Percentile ranking is a way to evaluate the relative standing of a value within a data set. A percentile rank is the percent of scores in the distribution that are less than it. For example, if Block Group A receives a 0.65 percentile rank for total population, that means that out of all the census block groups in the study area, 65% of them have a smaller total population than Census Block A.

[6] The census block groups are categorized using quintiles, which means that the distribution of their index scores is broken out into five bins comprised of an equal number of census block groups in each bin.

Median Demographic Index Score by County

County	Median Block Group Index Score
Hillsdale County	5.6
Ingham County	5.4
Jackson County	5.1
Lenawee County	5.0
Monroe County	4.6
Washtenaw County	4.4
Eaton County	4.2
Clinton County	3.7
Livingston County	3.3

Diving deeper beyond the median scores, the project team looked at the distribution of demographic scores among all census block groups in each county. By looking at the distribution of scores, one can tell how much higher the high scoring block groups are relative to the rest of the county and the region. This also provides a more granular scan of scores that isn't provided on the maps, which only use four bins.



Distribution of Demographic Index Scores among all census block groups in each county. Above, the range of possible demographic index scores is shown on the x-axis, and the number of census block groups with a given score is shown on the y-axis.

The distribution chart reveals that most counties have a normally distributed range of scores, like Eaton County. While Livingston County tends to have very low demographic need scores, Hillsdale County tends to have higher scores. Washtenaw County has both the lowest scoring census block groups and the highest scoring census block groups. Jackson County and Ingham County both have sizeable numbers of census block groups that score above a 7.5.

State Highways in High-Need Communities

The following section highlights key locations in the University Region where the state's roadway network intersects with high-need communities (the census block groups that scored in the highest quartile among all demographic measures). These state roadway segments identified below exist in a gap between high-need communities or divide them. These locations could be places for MDOT to prioritize investments in active transportation infrastructure or other safety improvements. Active transportation improvements in these locations would serve as ways to connect these communities and bridge the barriers to walking and biking posed by the roadway system.

Washtenaw County

- Ann Arbor: I-94 BL (Huron St), US-23 BR (Main St)
- Ypsilanti: Highways US-12 BR (Hamilton St/Huron St), M-17 (Washtenaw Ave)

Ingham County

- Lansing/East Lansing: I-96 BL (Cedar St/Larch St), M-43 (Saginaw St/Oakland Ave), Old US-27 (East St), M-99 (Martin Luther King Jr Blvd)

Livingston County

- Howell: I-96 BL (Grand River Ave)

Jackson County

- Jackson: M-50 (Cooper St), M-106 (Cooper St), I-94 BL (Michigan Ave)

Monroe County

- Monroe: US-24 (Telegraph Rd), M-125 (Monroe St)

Eaton County

- Charlotte: M-50 (Cochran Ave) and I-69 BL (Lansing Rd)

Lenawee County

- Adrian: M-52 (Main St), US-223, and M-34 (Beecher Rd)

Clinton County

- Old US-27 (North of Lansing)

Hillsdale County

- Hillsdale: M-99 (Carleton Rd)
- Camden: M-49 (Main St)

Mobility Disability

In response to initial feedback from the steering committee the project team explored the spatial distribution of mobility disability across the University Region. According to the CDC, 'mobility disability' is measured as the proportion of survey[7] respondents aged ≥18 years who answered "yes" to the question "Do you have serious difficulty walking or climbing stairs?".[8]

The results appear to be closely linked to age distributions across the University Region. Washtenaw County, for example, is home to a very young population compared to Hillsdale

[7] *Behavioral Risk Factor Surveillance System. CDC. 2023. CDC - BRFSS*
[8] *Disabilities Measure Definitions | PLACES: Local Data for Better Health | CDC*

County – and the mobility disability data reflects those differences. Hillsdale County has the most census block groups by area with the highest shares of adults with mobility challenges, though there are significant communities in Jackson County, Lenawee County, Monroe County, and Ingham County as well. While Washtenaw County appears to have the least mobility disability in the University Region, there are communities with significant mobility challenges in and around Ypsilanti that warrants attention.

Lack of Reliable Transportation

The project team also mapped another dataset provided by the CDC that details the proportion of adults who reported a lack of reliable transportation keeping them from medical appointments, meetings, work, or from getting things needed for daily living in the past 12 months, modeled across the University Region based on survey data.[9]

The results are interesting when compared to the previous survey on Mobility Disability, as it appears there are some areas in the University Region where people may have physical mobility challenges but have access to reliable transportation. For example, Hillsdale County, Jackson County, Lenawee County, and Monroe County all have populations with significant physical mobility challenges, yet the proportion of people who lack reliable transportation options is less pronounced. However, there are multiple areas in the University Region where communities have significant physical mobility challenges and lack reliable transportation options: within Ingham County, there are areas in north and south Lansing where both measures are high (Around Old US-27, M-99 (Martin Luther King Jr Blvd), I-96 BL (Cedar St/Larch St). Similar patterns exist in Hillsdale, Jackson, Adrian, Monroe, and Ypsilanti.

This is especially notable given that Ingham County, e.g., Lansing and Hillsdale County, e.g., Hillsdale have sizeable populations of people who walk or bike to work:

ACS 2018-2022 5-Year Estimates for Table B08301: Means of Transportation to Work

County	Population	Drove Alone	Transit	Walk	Bike
Washtenaw County	370,231	63%	4.1%	6.5%	1.1%
Ingham County	282,540	69%	3.1%	4.4%	1.3%
Livingston County	194,302	80%	0.2%	1.1%	0.1%
Jackson County	160,637	80%	0.7%	2.1%	0.2%
Monroe County	154,823	83%	0.3%	1.5%	0.1%
Eaton County	109,072	77%	0.5%	1.4%	0.2%

[9] *Health-related Social Needs | PLACES: Local Data for Better Health | CDC*

Lenawee County	99,263	82%	0.2%	2.8%	0.1%
Clinton County	79,249	79%	0.8%	1.7%	0.0%
Hillsdale County	45,698	76%	0.4%	4.5%	0.6%

Note: Percents will not add to 100% as work from home, taxi, and motorcycle mode shares are not shown.

Demand Analysis

The Live, Work, Play 2.0 tool can be used to assess both existing and suppressed demand for active transportation. Suppressed demand, also known as latent demand, refers to trips that people would like to take but do not or cannot due to the absence of key infrastructure elements—such as safe, comfortable, and connected pathways for walking or cycling. By analyzing both trip generators (where people live and work) and trip attractors (destinations like schools, parks, and retail establishments where people learn and play), the tool creates a composite heat map. This map provides a generalized view of both existing and latent demand for active transportation across an area.

This generalized demand profile can serve as a standalone tool or be combined with more detailed transportation data, such as areas with high concentrations of short trips, to identify network gaps. Specifically, it can help pinpoint areas where infrastructure improvements, like pedestrian paths or bike lanes, are needed to support immediate demand. These gaps often fall along existing transportation desire lines—the most logical routes that people would take if adequate infrastructure were available. For more information on how the Live, Work, Play 2.0 tool was constructed, see **Appendix G.**

The Live, Work, Play Demand analysis was conducted for the entire University Region, factoring in existing conditions and using the variables mentioned above. This analysis helped estimate the demand for walking and biking by identifying key locations with trip generators and attractors.

Demand Analysis Results

Estimated Demand for Walking

The demand for walking is typically highest in dense shopping centers with public transit options, where a variety of services attract pedestrians. These pedestrian activity centers often feature a mix of retail establishments, making them frequent destinations for nearby residents. Proximity to schools—both K-12 and higher education institutions—further increases foot traffic, as students, parents, and employees travel regularly to these sites. Higher-density residential areas located near these commercial hubs also see elevated walking demand,

given the large number of people living within walking distance of essential services and amenities.

Estimated Demand for Bicycling

Demand for bicycling covers many of the same areas as walking demand but follows a slightly different pattern due to the nature of biking. Since bicycles enable people to travel longer distances more quickly than on foot, areas of high biking demand tend to span wider regions. It should also be noted that with invention of electric bicycles (e-bikes) the distance individuals can travel has increased even more. Some areas that show moderate walking demand may see higher biking demand because cycling expands the range of feasible trips. These areas may include outer neighborhoods, trails, or corridors that connect more distant destinations.

Crash Analysis

Understanding where and why collisions occur is a critical first step in developing recommendations to improve safety for all roadway users. While it is essential to consider all collisions to identify patterns and areas needing further study, this analysis emphasizes collisions based on two key characteristics:

- **Severity**: Collisions that result in fatalities or severe injuries (known as Killed or Severely Injured [KSI] collisions) are prioritized due to the significant personal and societal impacts they cause. These collisions not only result in tragic loss of life or long-term disability but also incur substantial economic costs, including emergency response, medical care, and long-term rehabilitation expenses.
- **Active Mode Users**: The analysis focuses specifically on collisions involving active mode users—pedestrians and cyclists. By assessing where these incidents occur, the project team can better identify areas where safety improvements would most benefit the bicycle and pedestrian networks.

The safety analysis uses data from MDOT focusing on bicycle and pedestrian collisions that occurred between 2011 and 2021. Not all recorded collisions took place on applicable roads—some occurred in private parking lots, highways, or on-ramps, which are outside the scope of this analysis. These off-network incidents were excluded when calculating severity scores for the road network to ensure the analysis focused on roadway conditions that can be improved through infrastructure changes. Furthermore, collisions used in the calculation of severity scores were limited to the last 5 years of data (2017-2021) since these years are most likely to reflect current infrastructure conditions.

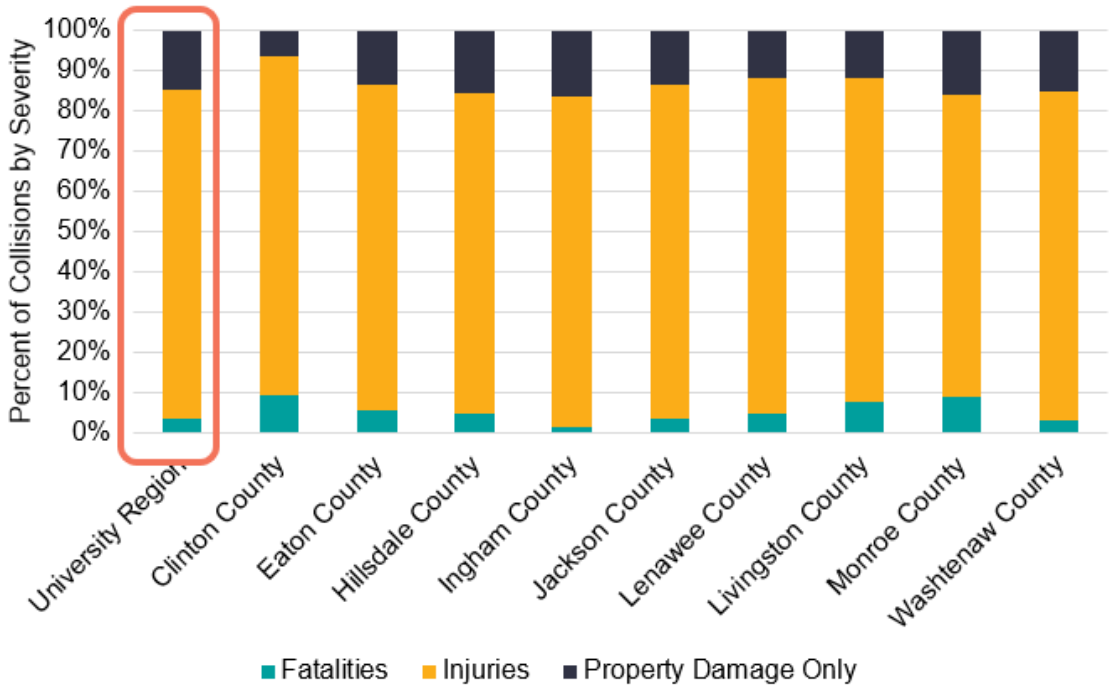
Aside from the road network severity scores, the memorandum provides detailed collision tabulations, ensuring that the scope of the data (including the number of collisions analyzed) is clearly stated in each section. This clarity allows for a precise understanding of safety challenges across different parts of the University Region. See **Appendix H** for more details on the Safety Analysis and results.

Crash Analysis Results

Crash Statistics

Between 2011 and 2021, a total of 7,219 collisions involving bicyclists or pedestrians occurred within and around the University Region of Michigan. After excluding collisions that took place on the edges of the district, 6,177 collisions remain within the defined boundaries of the region. Of these, 5,256 collisions—or approximately 85%—resulted in either a fatality or an injury, highlighting the significant vulnerabilities faced by pedestrians and cyclists.

While most counties show a similar pattern of collision outcomes—primarily resulting in injuries—there are some notable differences (see figure below). In counties such as Clinton, Hillsdale, Monroe, and Livingston, the proportion of fatalities appears disproportionately high. This is likely due to a combination of factors, including the total number of collisions being relatively low in these areas. As a result, even a small number of fatal incidents can significantly increase the percentage of fatalities when compared to counties with a higher volume of collisions. Additionally, the lack of robust active mode infrastructure in these counties may contribute to the increased severity of collisions, as cyclists and pedestrians are more vulnerable on roads without adequate infrastructure, such as bike lanes, paved shoulders or pedestrian crossings. In contrast, counties with more developed active transportation networks may experience fewer fatal collisions, even if the total number of incidents is higher.

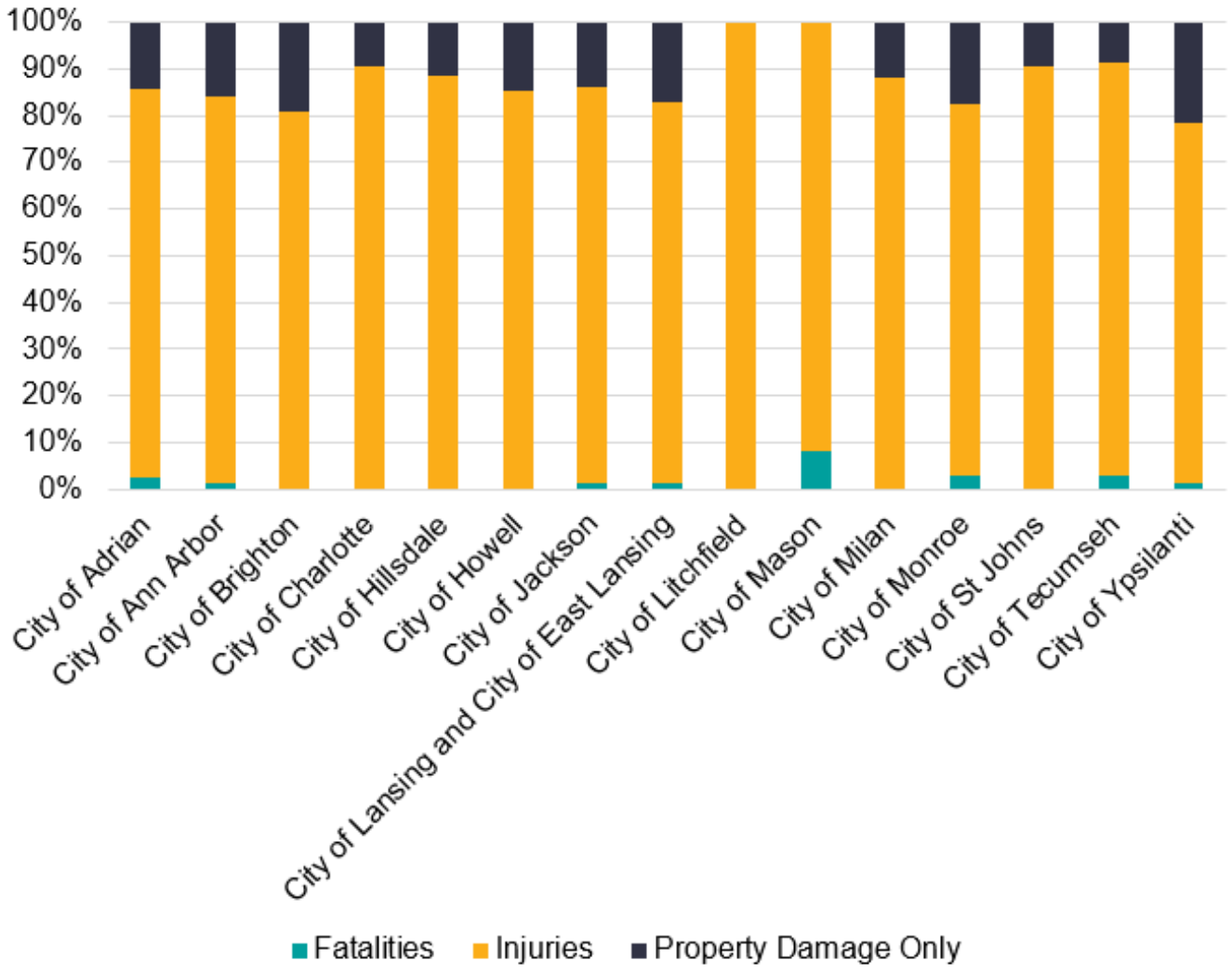


Collision severity by county for the University Region in Michigan, all years

This trend is further illustrated in the above figure**,** which compares collision severities across cities within the region. The City of Mason shows a disproportionately high percentage of fatalities, which is largely due to its small size and low total number of collisions—just 12 incidents over a 10-year period. In such cases, even a single fatality can significantly inflate the fatality percentage.

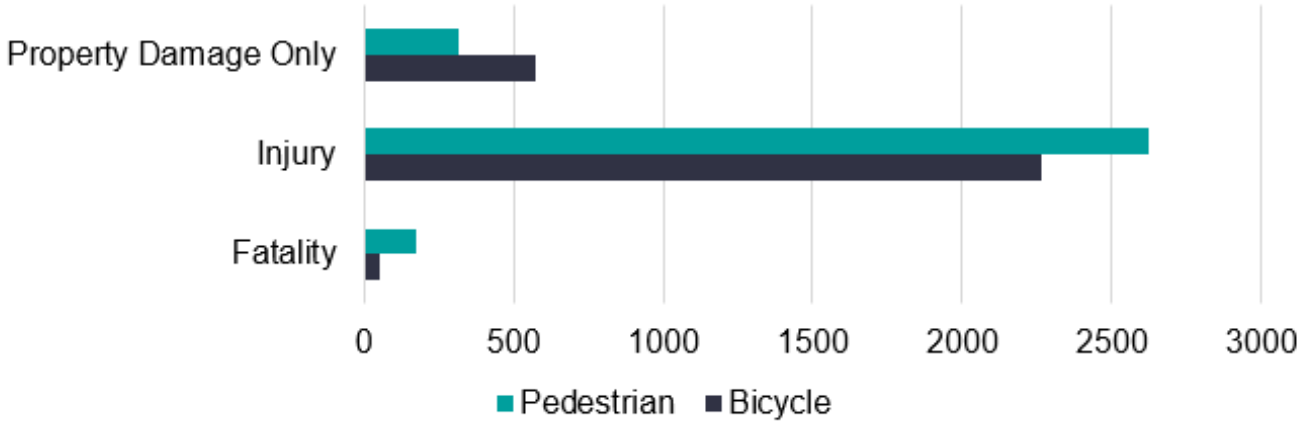
In contrast, cities like Adrian, Monroe, and Tecumseh have both larger populations and a greater total number of collisions, resulting in a higher absolute number of fatalities. These cities have larger denominators, making their higher proportion of fatalities more reflective of broader safety issues and potentially a lack of infrastructure for active mode users.

Meanwhile, cities such as Ypsilanti, Brighton, and Lansing show relatively lower numbers of KSIs (Killed or Severely Injured collisions) compared to other cities analyzed. This may indicate that these cities have more effective safety measures or infrastructure in place to protect pedestrians and cyclists, leading to fewer severe outcomes from collisions.



Collision Severity by City for the University Region in Michigan, all years

The overwhelming majority of collisions for both pedestrians and cyclists resulted in injuries as illustrated the figure below. Pedestrians accounted for the highest number of injury-related collisions, with over 2,500 incidents reported, while bicycle-related injury collisions were somewhat lower but still significant. This highlights the vulnerability of both active mode users, but particularly pedestrians, in the region's transportation network. It is worth noting that there is no baseline count of pedestrian or bicycle exposure, so there could be far more pedestrians than bicyclists and therefore the proportion of collisions experienced by each group is not reflected in this chart.

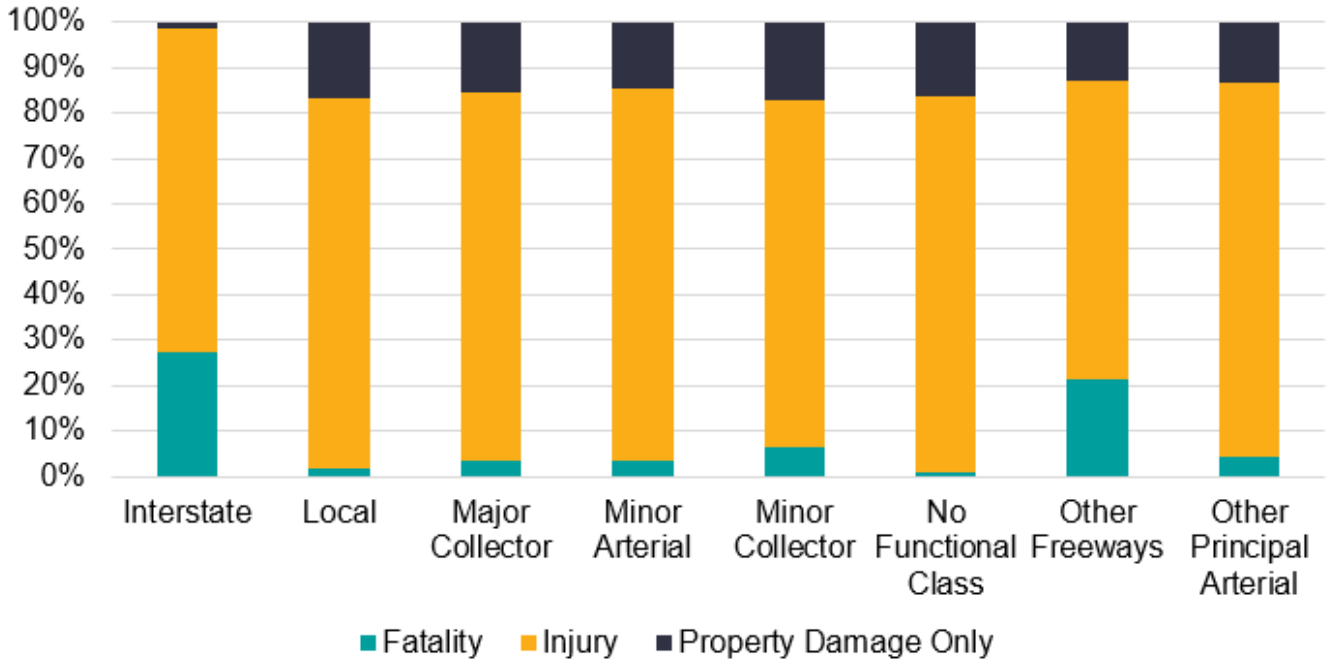


Count of Collisions by Severity and Active Mode for University Region, all years

The figure below illustrates the distribution of bicycle and pedestrian collisions across various road functional classifications. A notable observation from the data is the disproportionately high number of fatalities occurring on interstates and freeways. However, it's important to recognize that both cyclists and pedestrians are prohibited from using these types of roadways. As a result, these fatalities represent only a small fraction of the total collisions involving active mode users and are highly sensitive to outliers. Another functional classification with few reported collisions is Minor Collectors. These roads see a relatively low volume of bicycle and pedestrian traffic, making their collision data more susceptible to skewing by isolated incidents. Due to the smaller sample size, percentages in this category should be interpreted cautiously.

The most significant finding is that a majority of fatal bicycle and pedestrian collisions occur on Principal Arterials, Minor Arterials, and Major Collectors. These road types tend to have higher traffic volumes and speeds, which increases the risk of severe or fatal collisions for active mode users. Arterials often lack adequate infrastructure to serve pedestrians and cyclists, such as dedicated bike lanes, sidewalks, or enhanced crossing points.

This distribution highlights the need for targeted safety improvements on arterial and collector roads, where most fatal collisions are occurring. Safety measures such as traffic calming, separated bicycle lanes, and improved pedestrian crossings on these road classifications could significantly reduce the occurrence and severity of collisions for vulnerable road users.



Count of Collisions by Severity and Road Functional Classification for University Region, all years

The figure below reveals that a vast majority—92%—of all bicycle and pedestrian collisions occur on just four functional classifications of roads:

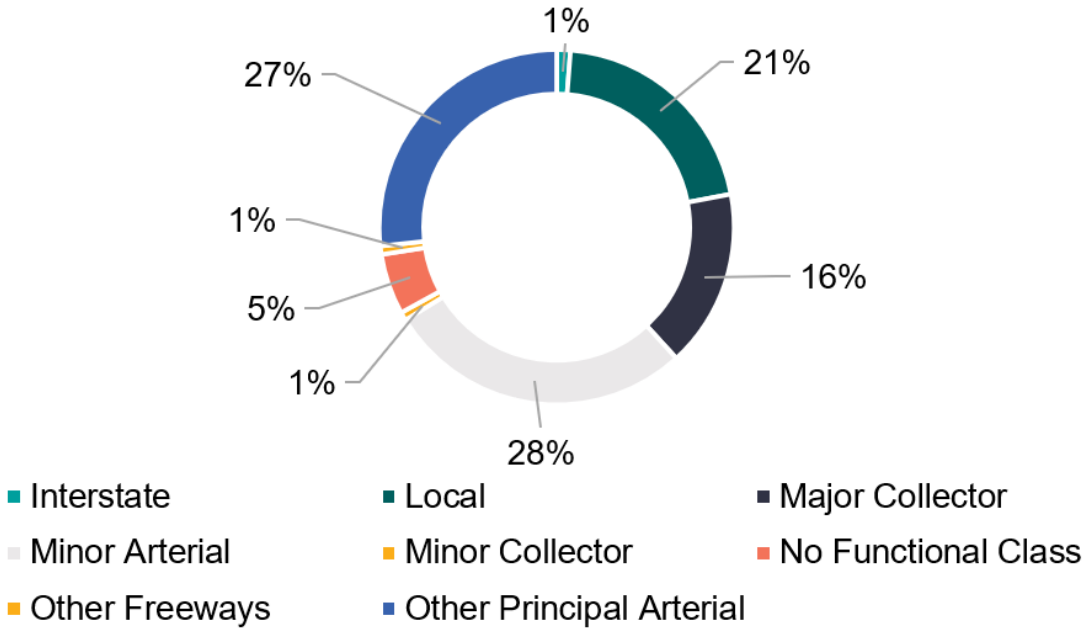
- Minor Arterials: 28%
- Other Principal Arterials: 27%
- Local Roads: 21%
- Major Collectors: 16%

These four classifications represent the most common types of roads used by pedestrians and cyclists, and their high collision rates suggest that these roads often lack adequate infrastructure to support ease of movement for active mode users. Minor Arterials and Other Principal Arterials, which account for over half of the collisions, are typically designed to prioritize vehicle traffic, with higher speeds and limited infrastructure like sidewalks and bike lanes. This makes them particularly hazardous for cyclists and pedestrians, and possibly contributing to a high rate of collisions.

Local Roads, which often have slower traffic and lower volumes, still account for 21% of collisions. This finding suggests that even on roads where traffic may be calmer, a lack of safe crossings, poor visibility, or insufficient separation between vehicles and active mode users can lead to significant safety risks. Finally, Major Collectors contribute to 16% of collisions,

underscoring the importance of addressing safety on these roads, which serve as key connections between local streets and arterial roads.

These findings point to the need for focused safety improvements on these four road types, particularly Arterials and Collectors. Implementing separated bike lanes, enhanced pedestrian crossings, and traffic-calming measures on these roadways could significantly reduce the high incidence of collisions and improve overall safety for cyclists and pedestrians.

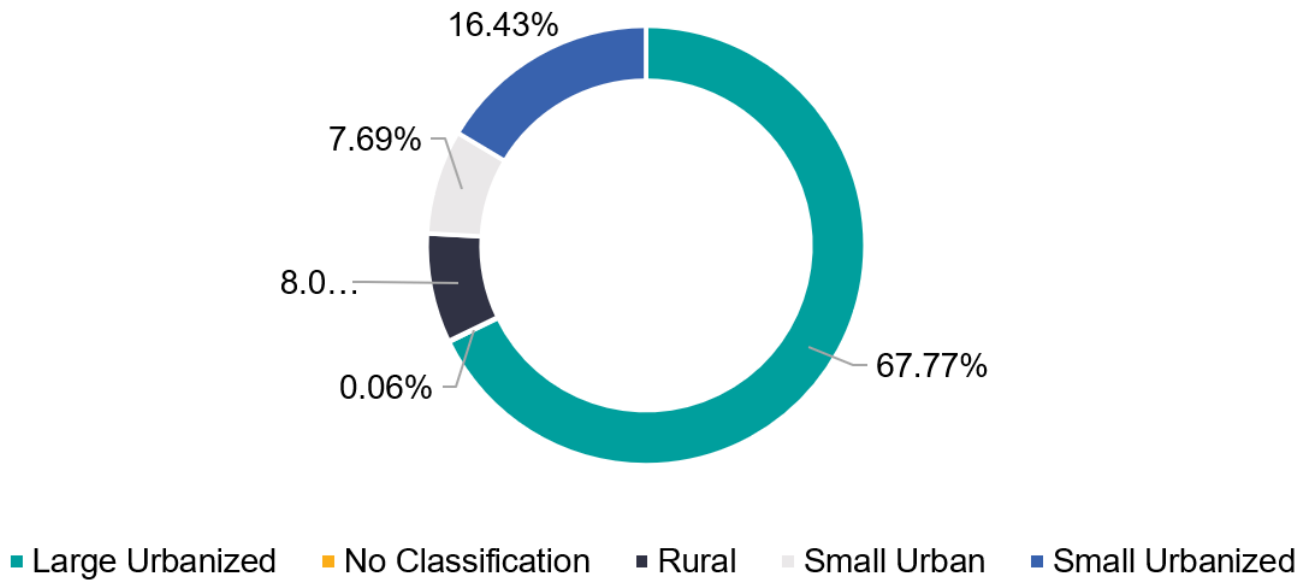


Count of Collisions by Road Functional Classification for University Region, all years

The Figure below shows that 68% of bicycle and pedestrian collisions occur in Large Urbanized Areas. This is unsurprising, as dense urban environments naturally support higher levels of walking and cycling due to their compact layout, mixed land use, and greater access to amenities. In these areas, people are more likely to walk or bike to their destinations, increasing exposure to motor vehicle traffic and, consequently, the risk of collisions.

In contrast, dispersed or rural urban contexts—where fewer people are likely to walk or bike due to longer distances between destinations—see a lower proportion of collisions. However, while the collision rates may be lower in these areas, the potential for severe injuries or fatalities can be higher due to factors like higher vehicle speeds and a lack of pedestrian and cycling infrastructure.

This finding underscores the importance of prioritizing pedestrian and bicycle supportive infrastructure in large, urbanized areas, where most of the active mode travel and collisions occur. Urban areas should focus on creating separated bike lanes, enhanced pedestrian crossings, and traffic-calming measures to reduce vehicle speeds and collision risks. At the same time, improving safety in rural and dispersed areas, where speed limits tend to be higher, should not be neglected.



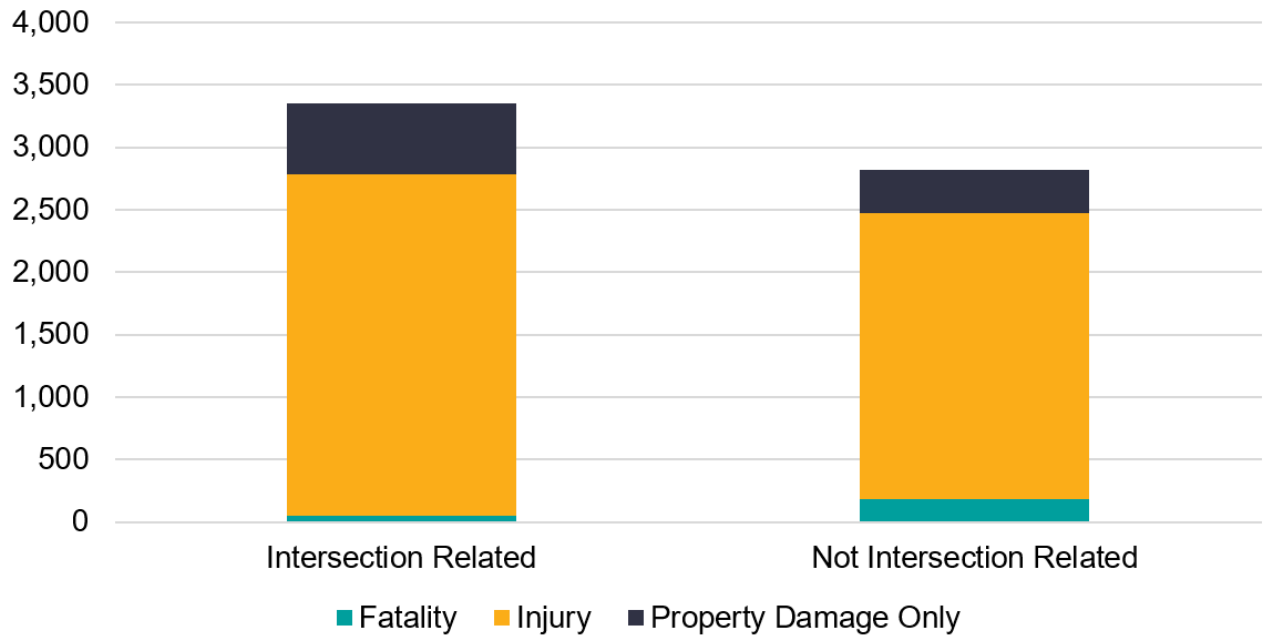
Count of Collisions by Urban Classification for University Region, all years

The figure below illustrates the relationship between the severity of bicycle and pedestrian collisions and their proximity to intersections. The data reveals that a greater number of collisions occur near intersections than outside the intersection's zone of influence. This is likely due to the higher pedestrian and cyclist activity in these areas, where people frequently cross paths with vehicles.

However, collisions that occur outside of intersections tend to result in more fatal and serious injuries compared to those occurring near intersections. This can be attributed to higher vehicle speeds on mid-block segments of roadways, where drivers may not anticipate pedestrians or cyclists, and fewer traffic-calming measures are in place to slow down vehicles. In contrast, speeds tend to be lower at intersections, where drivers are more likely to be alert to crosswalks, traffic signals, and turning movements, reducing the severity of collisions.

These findings suggest the need for enhanced safety measures both at and outside intersections. While intersections see a greater number of collisions, mid-block areas—where fatal and serious collisions are more common—require targeted interventions such as speed

reduction strategies, improved signage, separated lanes, and crossing points to mitigate the severity of collisions. Intersection design could continue to be improved with features like clear pedestrian signals, bike boxes, two-stage turn boxes and curb extensions to reduce the overall number of incidents.



Count of Collisions by Severity and Intersection Proximity for University Region, all years

These findings emphasize the critical need for targeted infrastructure improvements to better serve cyclists and pedestrians, particularly in high-risk urban corridors and major roadways. Enhancing safety measures such as separated bike lanes, traffic-calming measures, intersection redesigns, and improved pedestrian crossings will be essential to reducing both the frequency and severity of collisions. By focusing on these areas, municipalities can create safer environments for all road users and improve overall transportation access across the region.

Severity Score

To identify more specific corridors and interventions, the analysis team generated severity scores on all roadways. The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values:

- Fatal injury: 4

- Major or minor injury: 1
- Property damage only: 0.5

Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. This weighted scoring system ensures that the most dangerous locations, particularly those with frequent fatal or serious injury collisions, receive higher priority in the analysis.

Targeting these high-severity locations for infrastructure upgrades—such as improved crosswalks, separated bike lanes, or traffic calming measures—offers a high return on investment by addressing areas with the most significant safety risks. However, it is important to note that project recommendations should be complemented by site assessments and engineering reviews to ensure that the most effective countermeasures are selected and implemented in each specific context.

Key Takeaways:

- Ann Arbor's university area and downtown corridors have some of the highest severity scores, highlighting the urgent need for enhanced safety measures in areas with heavy student and pedestrian traffic. These risks extend into nearby Ypsilanti, particularly around Eastern Michigan University. Implementing focused safety planning around university campuses could greatly improve pedestrian and cyclist safety in these high-traffic zones.

- In Lansing and East Lansing, major thoroughfares like South Cedar Street and East Grand River Avenue are hotspots for severe bicycle incidents.

- Monroe's river-crossing roads show elevated bicycle severity but lower pedestrian incidents on certain streets, suggesting location-specific factors affecting cyclist safety. Most bicycle incidents appear to occur near intersections, suggesting that improvements to intersection design, signal timing, and crosswalk visibility may be needed to enhance pedestrian safety in these areas.

More detailed results for bicycle and pedestrian severity scores are discussed below.

Bicycle Severity Scores

In the City of Jackson**,** East Michigan Avenue has a particularly high bicycle severity score of 5, with all collisions in this area resulting in fatalities or serious injuries (KSI). Similarly, N West Avenue in Jackson holds a high score of 4.5, indicating that these corridors present significant risks to cyclists. These findings point to the need for infrastructure improvements, such as enhanced safety measures or dedicated bike lanes, to mitigate future incidents.

In the Cities of Lansing and East Lansing, several roadways exhibit bicycle severity scores exceeding 6, marking them as key areas of concern. Notable corridors include S Martin Luther King Blvd, S Cedar Street, E Michigan Avenue, E Grand River Avenue, Abbot Road, and W Saginaw Street. Among these, S Cedar Street stands out with the highest score in the area at 11.5, followed closely by E Grand River Avenue with a score of 11. These routes, which serve as major thoroughfares, require targeted safety interventions to reduce the high rate of collisions involving cyclists.

In the City of Monroe, the highest bicycle severity scores are concentrated on road segments that cross the river, including S Telegraph Road, N Roessler Street, and N Monroe Street. These findings suggest that the river-crossing infrastructure in Monroe may pose unique challenges for cyclists, and safety improvements—particularly at intersections—should be explored to prevent further collisions.

The City of Ypsilanti also presents several high-scoring corridors, with Washtenaw Avenue, Packard Road, and Carpenter Road identified as key areas where cyclists face elevated risks. Part of Washtenaw Ave is adjacent to Eastern Michigan University and does not have existing bicycle infrastructure, with speeds up to 45 mph. These corridors likely see heavy active mode travel, and the absence of adequate bicycle infrastructure likely contributes to their high severity scores.

In nearby Ann Arbor, the road network surrounding the University of Michigan features several high-risk areas for cyclists. Stadium Boulevard has a severity score ranging between 5 and 8.5, reflecting the significant hazards cyclists face on this busy thoroughfare. The corridor connects to Ypsilanti via Washtenaw Avenue, a further indication of the need for comprehensive safety measures along this route. E Huron Street, running through downtown Ann Arbor, has the highest bicycle severity score in the city, with a total of 13.5. Other high-severity corridors, such as E Washington Street (with a score of 8.5) and E Liberty Street (with a score of 7), run parallel to E Huron Street and face similar safety challenges.

Additional high-risk routes in Ann Arbor include Packard Street, which holds a severity score of 13, and Hill Street, with a score of 9. These scores highlight critical areas for infrastructure upgrades, particularly given the high volume of traffic in these areas due to their proximity to the University of Michigan and Germantown. Addressing these corridors with improved safety measures, such as separated bike lanes, intersection enhancements, and traffic-calming interventions, will be essential to mitigating the risks cyclists face in these high-severity zones.

Pedestrian Severity Scores

In the City of Adrian, several roadways have been identified as high-risk for pedestrians, including Beecher Street, Division Street, and N Main Street. These streets experience a high level of pedestrian activity, but the lack of adequate crossing infrastructure and traffic calming measures likely contributes to the elevated severity scores, indicating the need for targeted safety improvements.

In the Cities of Lansing and East Lansing, several major corridors show particularly high pedestrian severity scores. Notable routes include E Cesar E Chavez Avenue, E Grand River

Avenue, Marsh Road, E Michigan Avenue, and N Waverly Road. Of special concern is Saginaw Highway, where severity scores range between 7 and 10.5, indicating significant risks for pedestrians along this busy corridor. These areas, frequented by pedestrians navigating dense urban spaces, highlight the urgent need for crosswalk improvements, pedestrian islands, or traffic signal adjustments to improve safety.

In Ann Arbor, several streets present substantial safety challenges for pedestrians. Hill Street, W Washington Street, and S Division Street each have severity scores of 10, making them some of the most dangerous corridors for pedestrians in the city. Additionally, S 4th Avenue, N Main Street, W Liberty Street, Packard Street, and E Ann Street are also high-risk areas for pedestrian collisions. The pedestrian traffic in these areas, especially in proximity to the University of Michigan and downtown Ann Arbor, demands further safety interventions such as improved lighting, better pedestrian crossings, and traffic calming measures.

In Ypsilanti, E Michigan Avenue stands out with a pedestrian severity score of 10.5, marking it as one of the most hazardous streets for pedestrians in the city. In Jackson, N West Avenue also has a significant pedestrian severity score of 7.5, reflecting the dangers faced by pedestrians in this area.

In Monroe, a particularly interesting finding is that Roessler Street was identified as a major corridor for bicycle collisions, but not pedestrian collisions. S Telegraph Road and N Monroe Street had high bicycle severity scores and are also high-risk zones for pedestrians, where targeted interventions could reduce the occurrence of collisions for all active mode users.

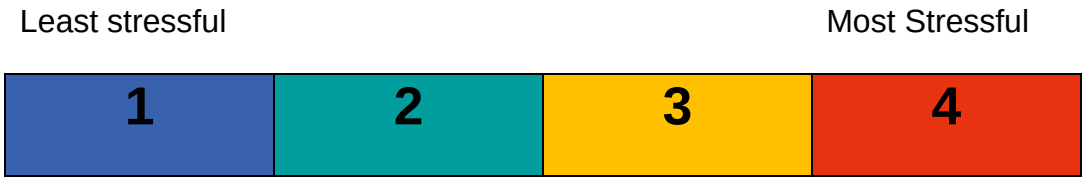
Appendix D: Bicycle Level of Traffic Stress Analysis

Overview

The bicycle level of traffic stress (BLTS) analysis estimates the level of comfort for people biking on a given roadway segment. The BLTS analysis identifies where "gaps" or deficiencies in a bike network exist and provides a measure of how likely different types of riders, based on ability and comfort level, are to use the facility.

Alta's BLTS analysis methodology is adapted from the 2012 Mineta Transportation Institute Report 11-19: *Low-Stress Bicycling and Network Connectivity*.[1] BLTS is determined by characteristics of a given roadway segment that affect a bicyclist's perception of safety and comfort, including posted speed limit, number of travel lanes, and the presence and character of bicycle lanes. The combination of these criteria classifies a road segment into one of four levels of traffic stress:

- **BLTS 1** represents roadways where bicyclists of all ages and abilities would feel comfortable riding. These roadways are generally characterized by low volumes, low speeds, no more than two travel lanes, and traffic control measures at intersections. These roadways may have bicycle facilities; separated shared-use paths for bicycles also fall into this category.
- **BLTS 2** represents slightly less comfortable roadways, where most adults would feel comfortable riding.
- **BLTS 3** represents moderately uncomfortable roadways, where most experienced bicyclists would feel comfortable riding.
- **BLTS 4** represents high-stress roadways where only strong and fearless bicyclists would feel comfortable riding. These roadways are generally characterized by high volumes, high speeds, several travel lanes, and complex transitions approaching and crossing intersections.



[1] *Mineta Institute. Mekuria M., Furth P., Nixon H. Low-Stress Bicycling and Network Connectivity. 2012. https://transweb.sjsu.edu/research/Low-Stress-Bicycling-and-Network-Connectivity.*

The results of the BLTS analysis identify existing areas that are low stress for many bicyclists, as well as the degree to which roadways must be improved to provide a comfortable experience for riders of all ages and abilities.

Methodology

BLTS analysis is completed through an assessment of street segments using spatial data. Each segment of the roadway is evaluated based on its characteristics; if multiple scores are present within a segment, the highest (most stressful) score is used as the overall segment score. Notes on data inputs and assumptions are found in Table 1. Segment scores are assigned as shown in Table 2 and Table 3.

Data Inputs and Assumptions

Inputs	Notes	Assumptions
Bicycle Facilities	Bicycle lanes have a positive impact on BLTS and are a primary input for developing a BLTS model. The width of facilities can have an impact on the associated comfort level. Wider facilities provide greater comfort, especially on high-speed roadways.	Where facility width data is not available, Alta will make assumptions about standard widths based on facility type. • Bike lane or paved shoulder – 5 feet • Buffered bike lane – 6 feet Separated bike lanes are scored as a BLTS 1 by default because of the physical separation from vehicle traffic.
Speed Limit	High-speed roadways can be less comfortable for bicyclists, particularly in mixed traffic or with minimal separation from motor vehicles. Low-speed roadways are considered more comfortable.	Roads where speed limit data is not available will be filled with an assumed value based on the functional classification. • Urban arterial or collector – 35 mph • Rural arterial, collector, or local – 55 mph • Urban local – 25 mph
Number of Lanes	The number of travel lanes corresponds with an increase in the roadway width, which influences bicyclists' level of stress. Roadways with fewer lanes are generally less stressful for bicyclists.	Roads where number of lanes data is not available will be filled with an assumed value based on the functional classification. • Local – 2 lanes • Collector – 3 lanes • Arterial – 4 lanes
Shared-use paths	Trails, side paths, and shared-use path facilities can be a vital component of a municipality's active transportation network. Increased separation from motor vehicles can improve comfort and safety.	Shared-use paths are scored as a BLTS 1 by default because of the physical separation from vehicle traffic.

The tables provided specify the scoring criteria based on roadway configuration, speed, and bike lane presence and width. The criteria are adapted from the original 2012 Mineta Institute report. These tables are used in combination to assign an overall BLTS score; if multiple scores are present within a segment, the highest (most stressful) score is used as the overall

segment score. These tables are used in combination to create the segment, approach, and intersection scores described previously.

Criteria for Bicycle Level of Traffic Stress in Mixed Traffic

Prevailing Speed or Speed Limit (mph)	Street Width		
	2 3 Lanes	4 5 Lanes	6+ Lanes
≤ 25	BLTS 1 or 2	BLTS 3	BLTS 4
30	BLTS 2 or 3[1]	BLTS 4	BLTS 4
≥ 35	BLTS 4	BLTS 4	BLTS 4

1. Lower value is assigned to streets without marked centerlines or classified as residential with fewer than three lanes.

Criteria for Bicycle Level of Traffic Stress on Roads with Bike Lanes

	BLTS 1	BLTS 2	BLTS 3	BLTS 4
Street Width (through lanes per direction)	1	2	More than 2	(no effect)
Bike Lane Width	6 feet or more	5.5 feet or less	(no effect)	(no effect)
Speed Limit (mph)	30 mph or less	(no effect)	35 mph	40 mph or more
Bike lane blockage[1]	Rare	(no effect)	Frequent	(no effect)

1. Bike lane blockage is part of Alta's analysis methodology, but assumed to be rare by default.

The tables above account for on-street bike lanes not separated from traffic. Separated bike lanes are automatically scored as an LTS 1.

Bicycle Level of Traffic Stress Maps

CITY OF ADRIAN

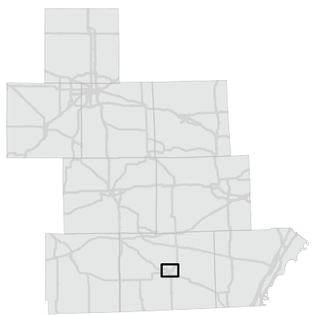
BICYCLE COMFORT ANALYSIS

LEGEND

Bicycle Level of Traffic Stress

- 4 (Higher Stress)
- 3
- 2
- 1 (Lower Stress)
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

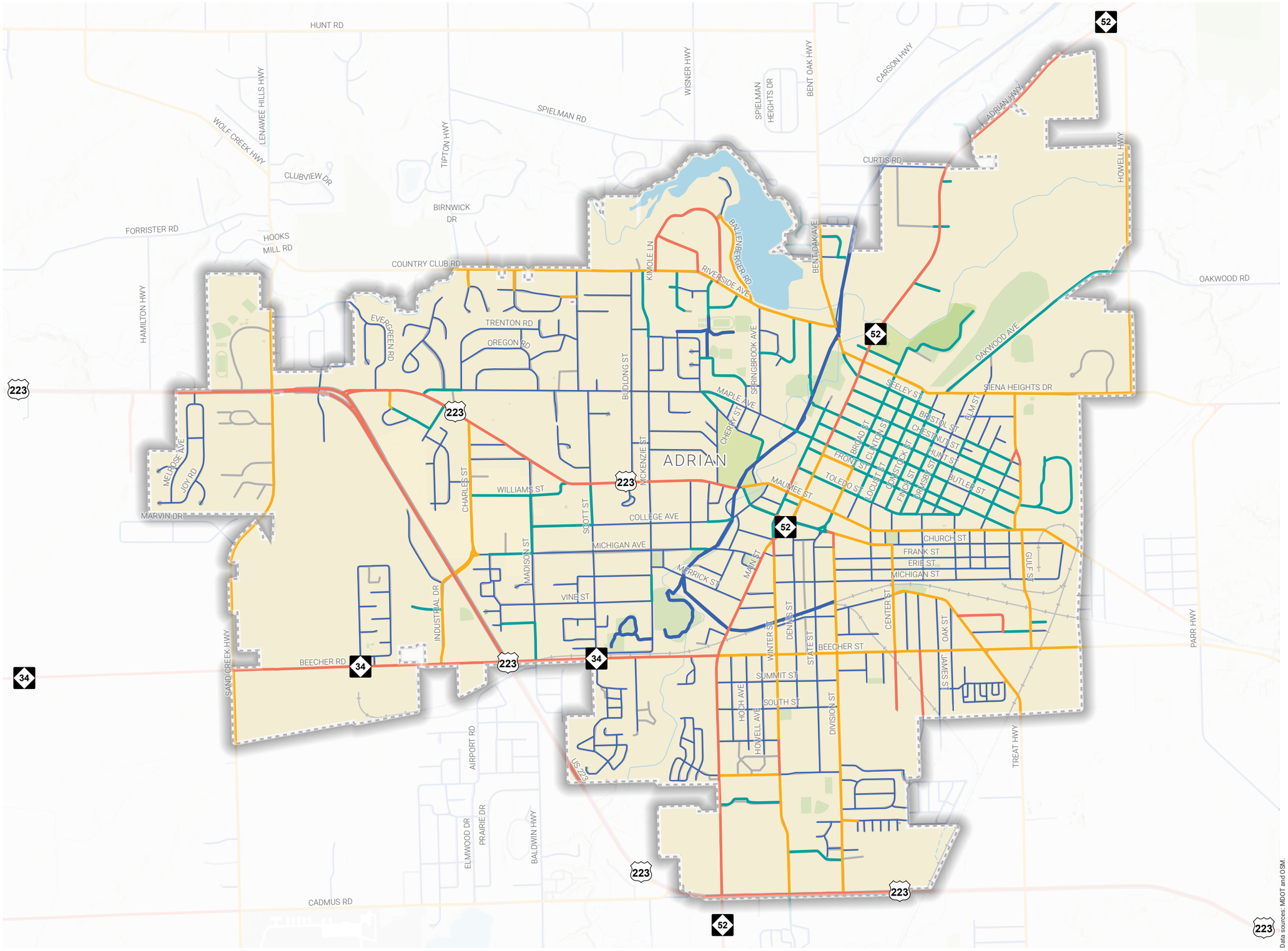


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OSM.

CITY OF ANN ARBOR

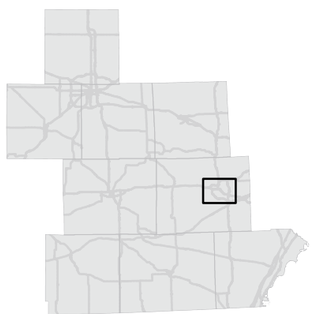
BICYCLE COMFORT ANALYSIS

LEGEND

Bicycle Level of Traffic Stress

- 4 (Higher Stress)
- 3
- 2
- 1 (Lower Stress)
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

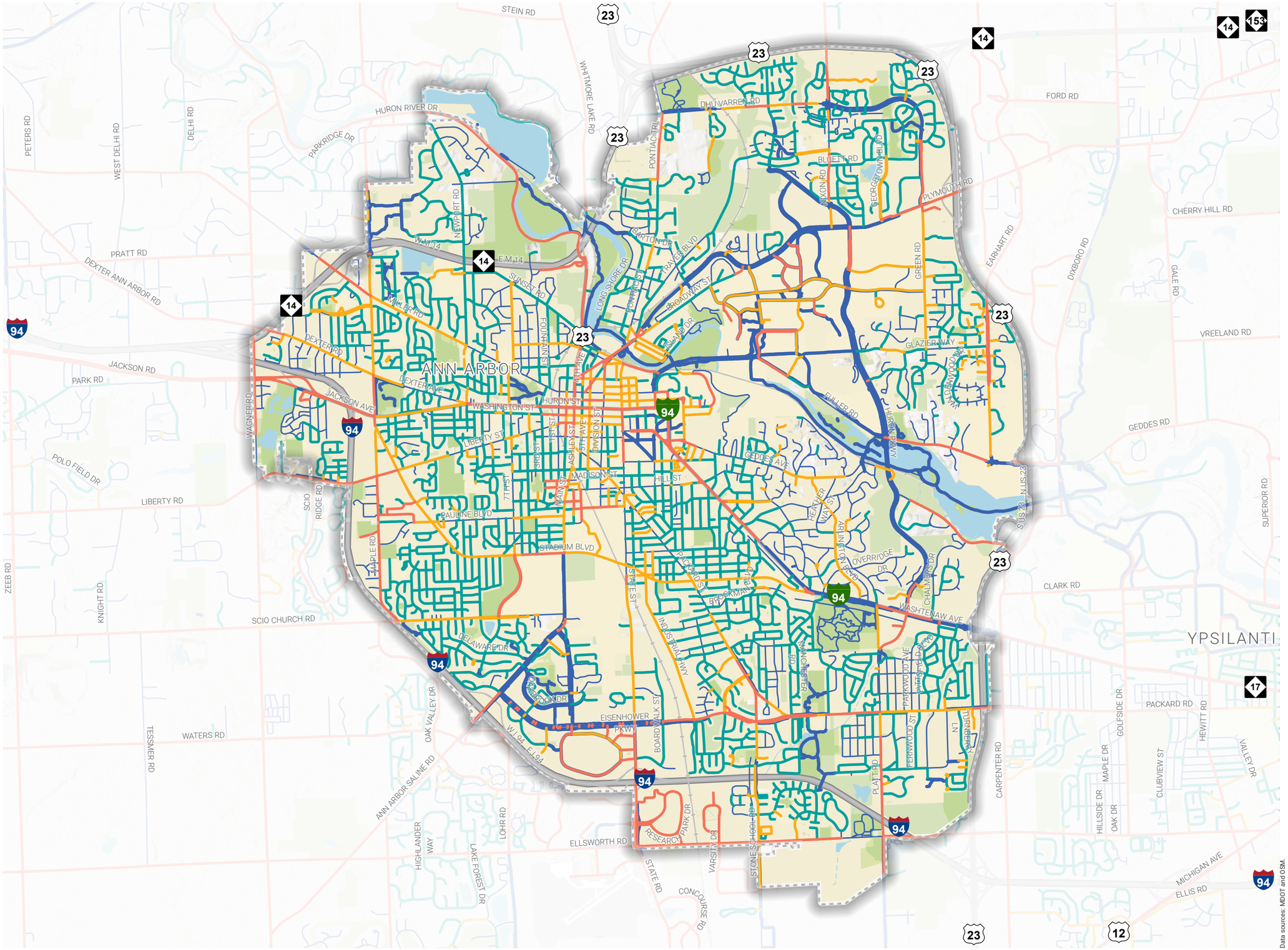


0 0.55 1.1 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OSM.

CITY OF BRIGHTON

BICYCLE COMFORT ANALYSIS

LEGEND

Bicycle Level of Traffic Stress

- 4 (Higher Stress)
- 3
- 2
- 1 (Lower Stress)
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

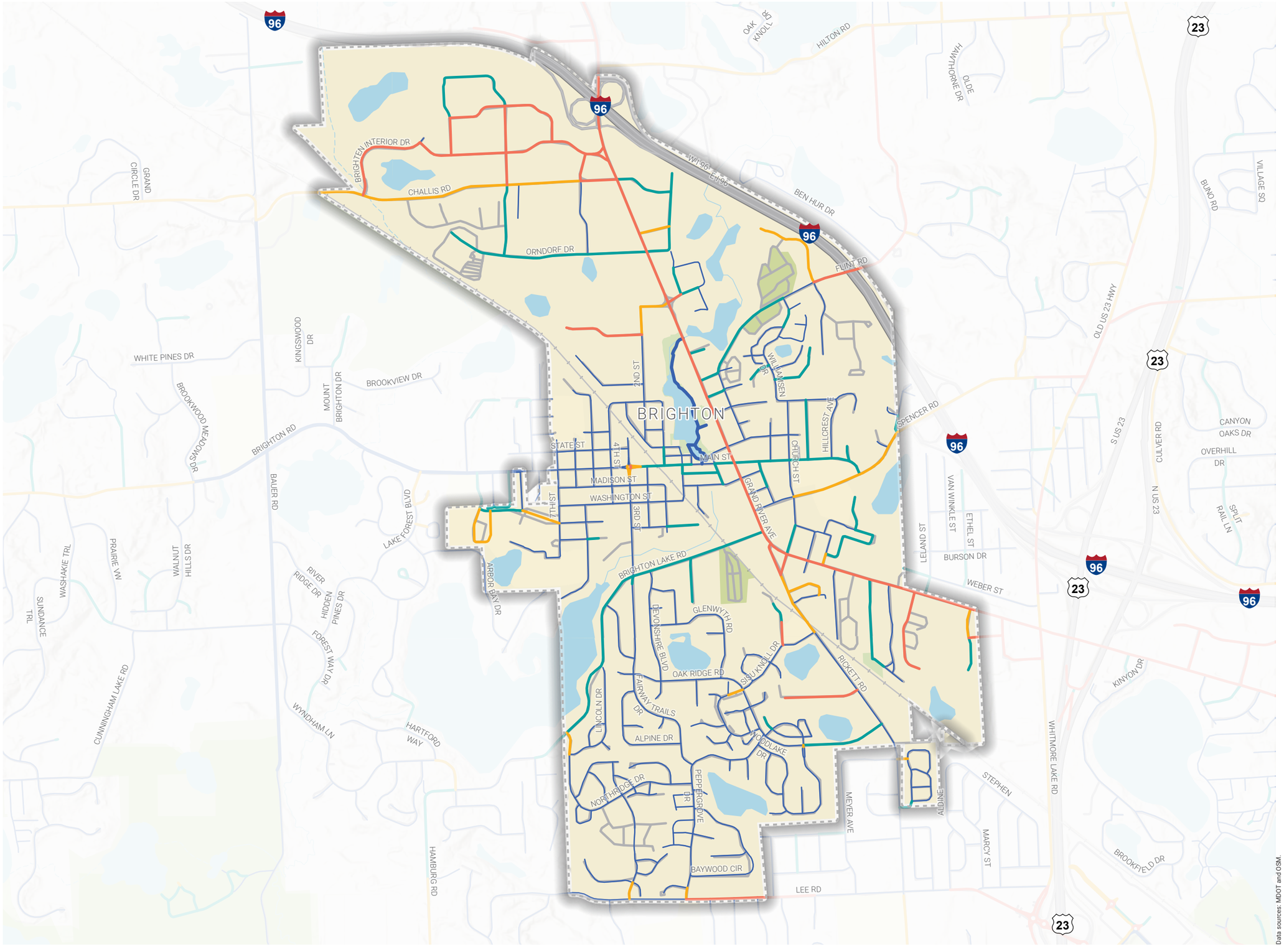
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

CITY OF CHARLOTTE

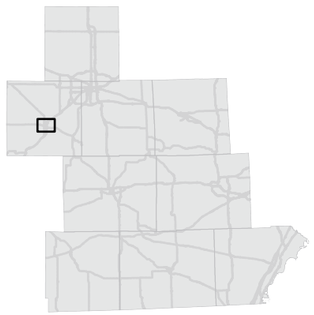
BICYCLE COMFORT ANALYSIS

LEGEND

Bicycle Level of Traffic Stress

- 4 (Higher Stress)
- 3
- 2
- 1 (Lower Stress)
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION



0 0.3 0.6 MILES

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CHARLOTTE

50 69 79

MILLERBURG RD
VALLEY HWY
COURTHOUSE DR
WEDGEWOOD DR
BEECH ST
WHEATON RD
FOREST ST
HIGH ST
LAWRENCE HWY
FOOTE ST
STODDARD ST
CLINTON ST
COCHRAN AVE
WASHINGTON ST
HARRIS ST
LAWRENCE AVE
BOSTWICK ST
SHELDON ST
OLIVER ST
LOVETT ST
LINCOLN ST
SEMINARY ST
HENRY ST
STATE ST
WALNUT ST
HORATIO ST
PLEASANT ST
PRAIRIE ST
JOHNSON ST
WARREN AVE
SHAW ST
MERRITT ST
CARLISLE HWY
SHEPHERD ST
MIKESELL ST
REYNOLDS RD
1ST ST
PORTER DR
TIRRELL RD
BATTLE CREEK HWY
KALAMO HWY
BENTON RD
FAIRVIEW HWY
OTTO RD
PACKARD HWY
LANSING RD
S I-69
N I-69
NICHOLAS LN
GIDNER RD
CASLER RD
ISLAND HWY
CLINTON TRL
BROOKFIELD RD
FLANDERS RD
EATON GREEN DR

Data sources: MDOT and OSM.

CITY OF HILLSDALE

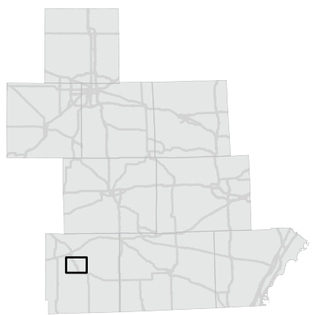
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UNIVERSITY REGION

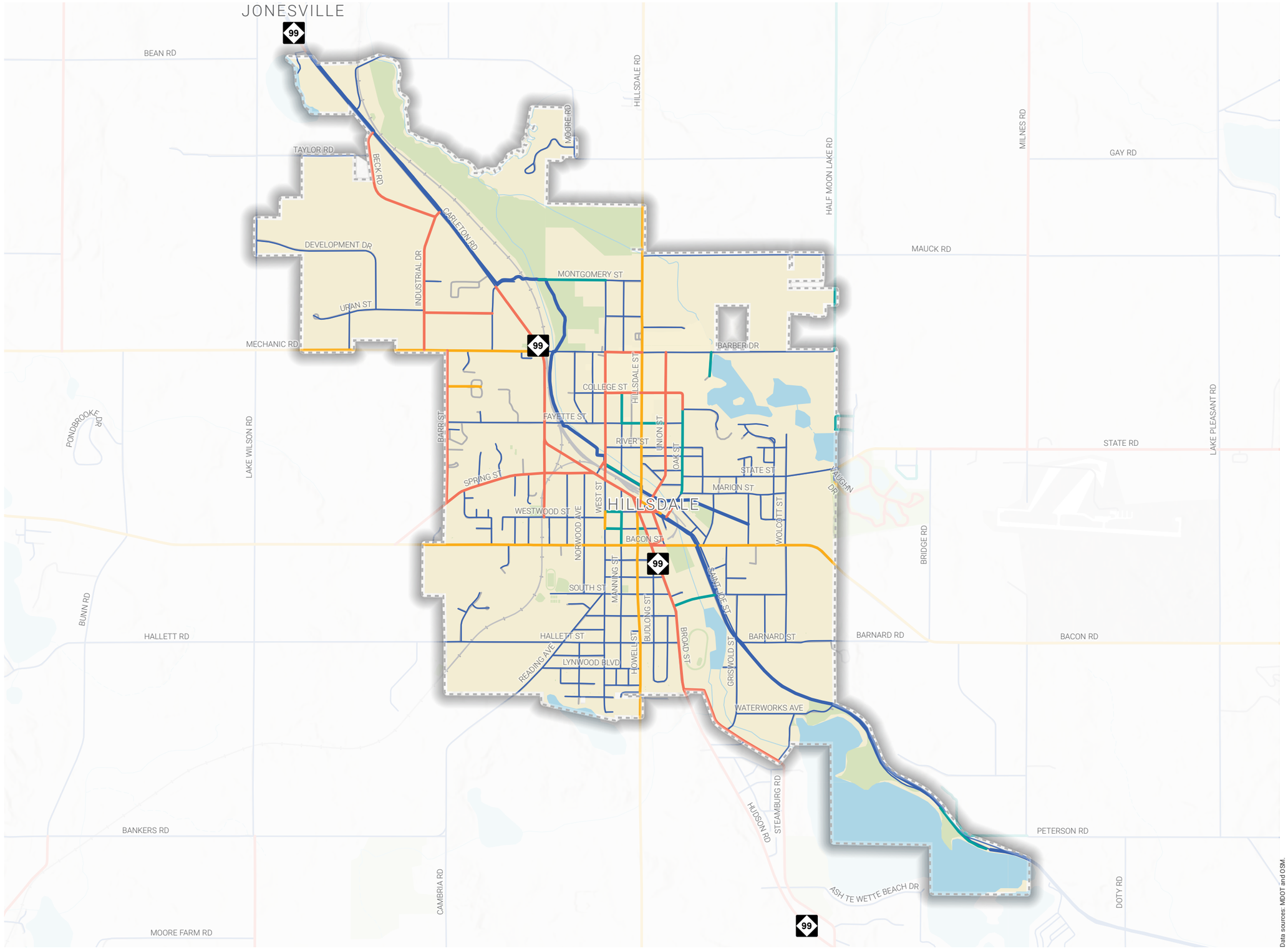


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

CITY OF HOWELL

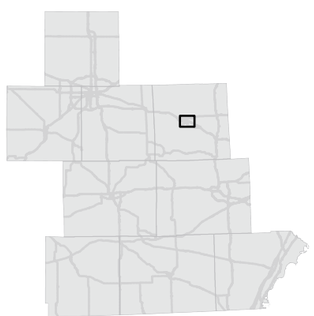
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UNIVERSITY REGION



0 0.25 0.5 MILES

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HENDERSON RD
TOOLEY RD
BREWER RD
OAK GROVE RD
HIGHLAND RD
LAKESIDE DR
BUTLER BLVD
OAKCREST RD
EAGER RD
DURANT DR
BYRON RD
BOWER ST
VICTORIA PARK DR
CURZON ST
CALEDONIA ST
INVERNESS ST
RIDDLE ST
CRESTWOOD LN
WILLOW LN
FOX HILLS DR
GRAND RIVER AVE
SLEAFORD RD
HOWELL
HIGHLANDER WAY
TOMPKINS ST
WEST ST
CENTER ST
STATE ST
COURT ST
BARNARD ST
ROOSEVELT ST
CLINTON ST
GEORGE ST
RUSSELL ST
JEWETT ST
WASHINGTON ST
SIBLEY ST
MAPLE ST
WALNUT ST
MICHIGAN AVE
BROOKS ST
LIVINGSTON AVE
FOWLER ST
NATIONAL ST
CATRELL DR
CORNELL ST
GOLF CLUB RD
GRAND RIVER RD
HARMON RD
AREA
HOWELL REST
MCPHERSON PARK DR
MASON RD
FOXFIRE DR
PAINTED DR
NORTON RD
BONNIE CIR
HIGH HILLCREST DR
COUNTY FARM RD
SANITORIUM RD
PEAVY RD
ALSTOTT DR
I-196
LUCY ST
PINCKNEY RD
FRANCIS RD
CHILSON RD
VICTORY DR

Data sources: MDOT and OSM.

CITY OF JACKSON

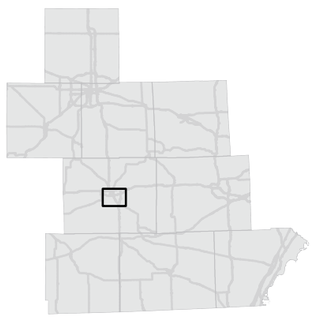
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UNIVERSITY REGION

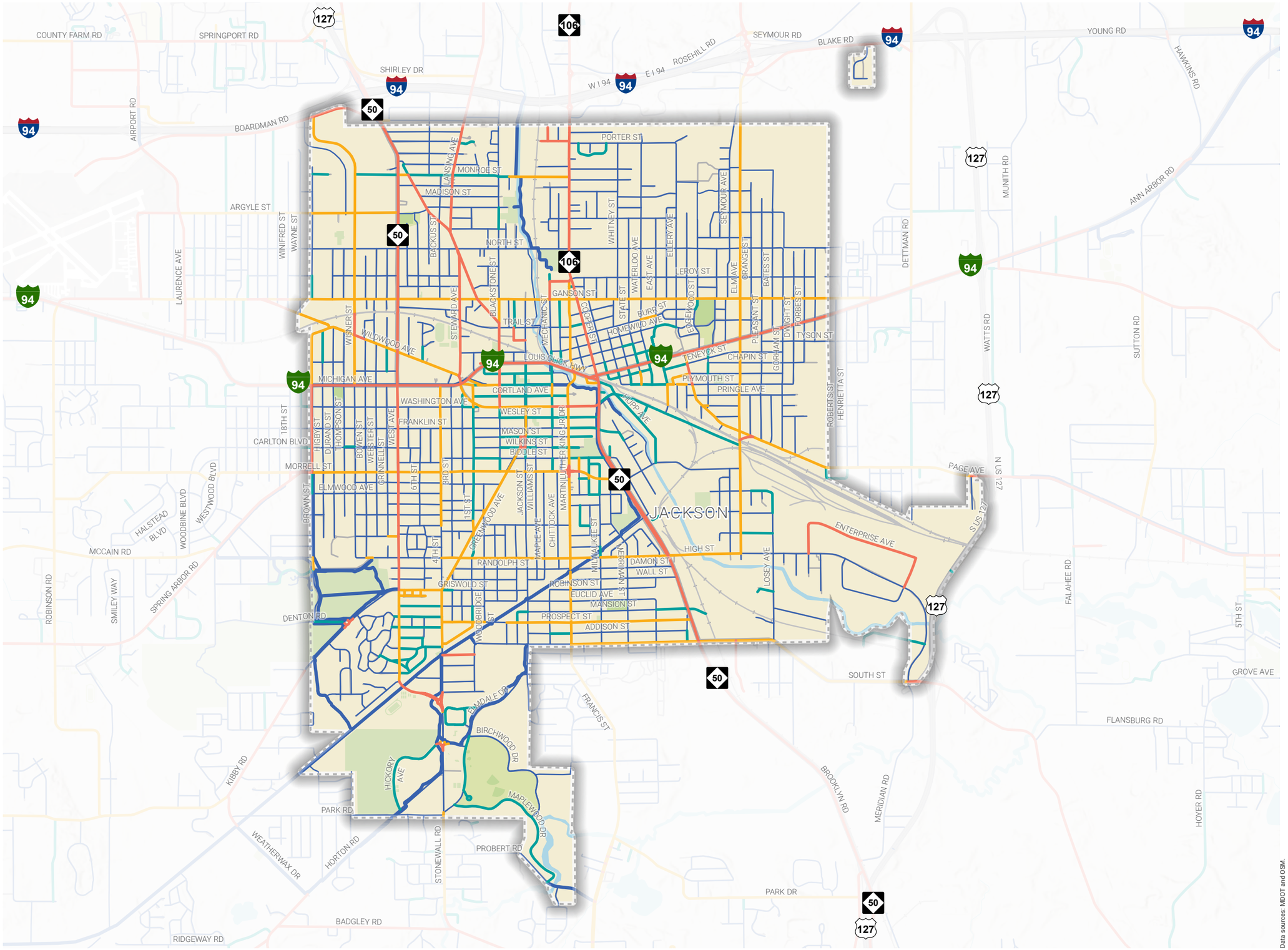


0 0.4 0.8 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

CITY OF LITCHFIELD

BICYCLE COMFORT ANALYSIS

LEGEND

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UNIVERSITY REGION

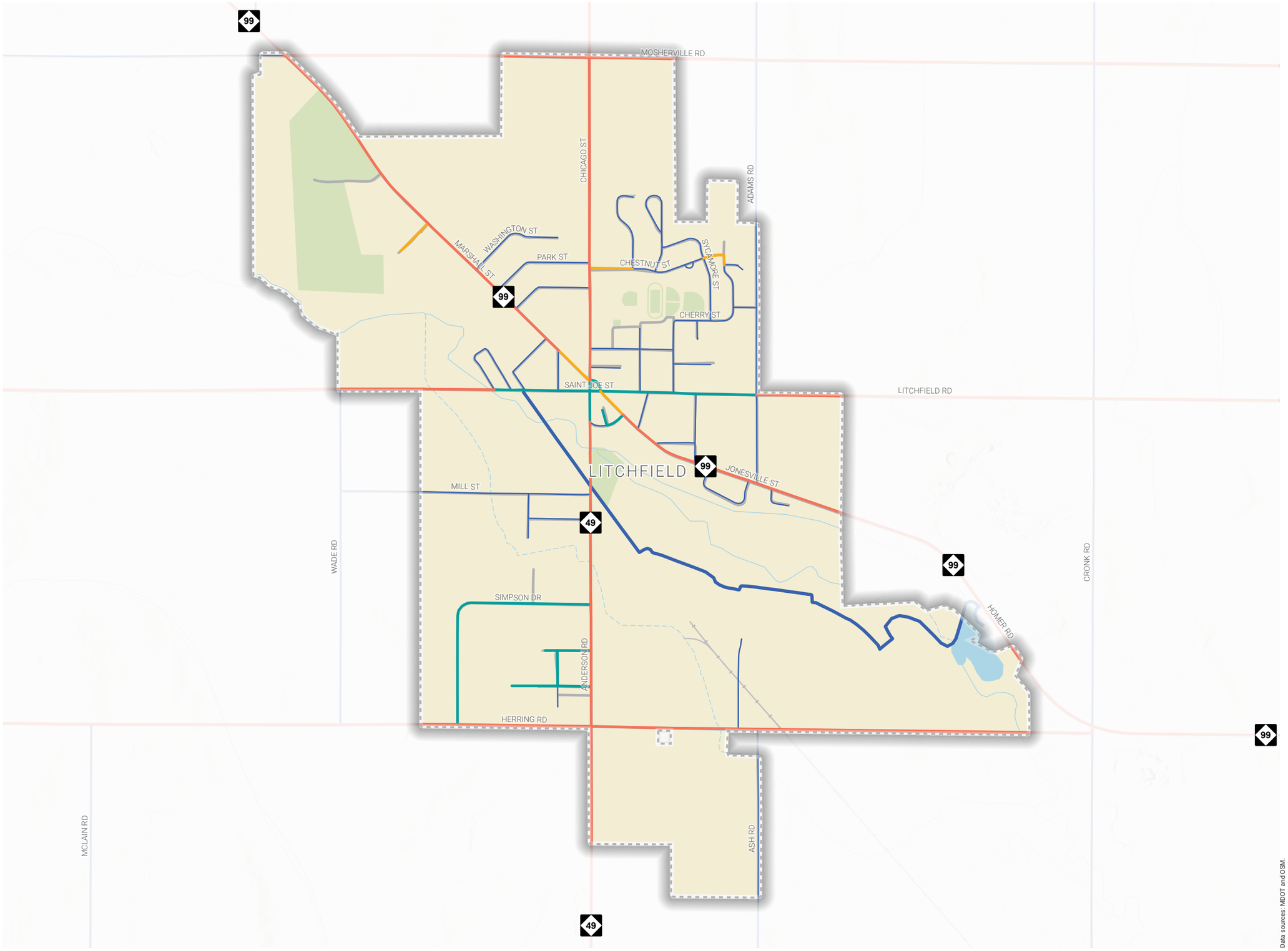


0 0.2 0.4 MILES

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Data sources: MDOT and OSM.

CITY OF MASON

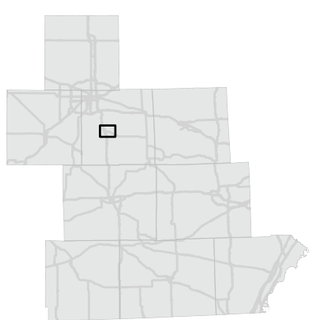
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UNIVERSITY REGION

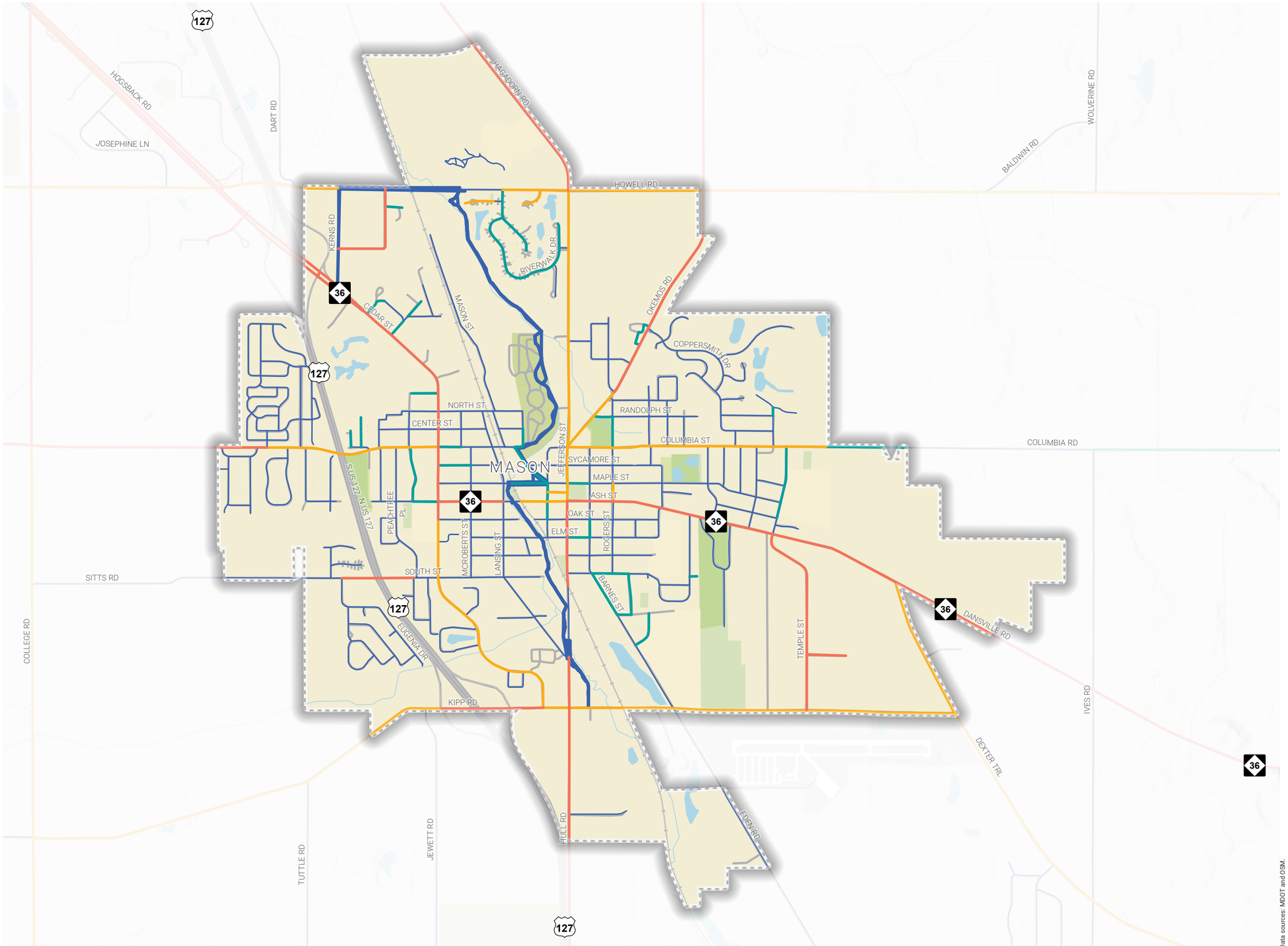


0 0.25 0.5 MILES

N

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Data sources: MDOT and OSM.

CITY OF MILAN

BICYCLE COMFORT ANALYSIS

LEGEND

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UNIVERSITY REGION

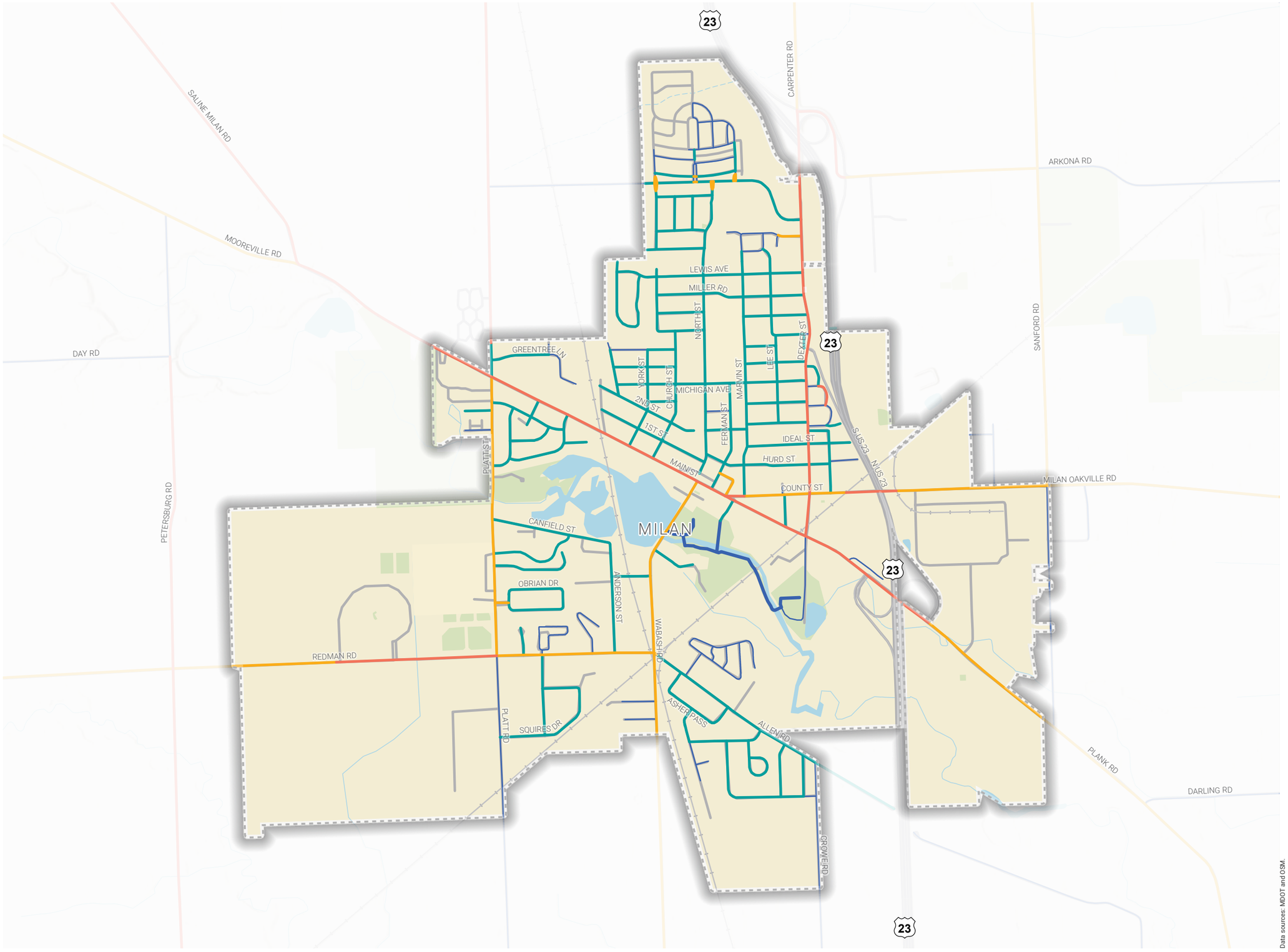


0 0.2 0.4 MILES

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Data sources: MDOT and OSM.

CITY OF MONROE

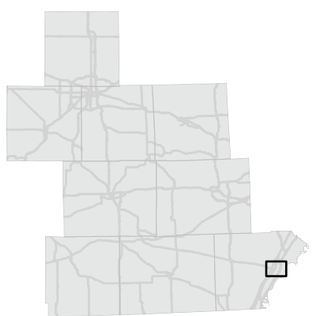
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UNIVERSITY REGION

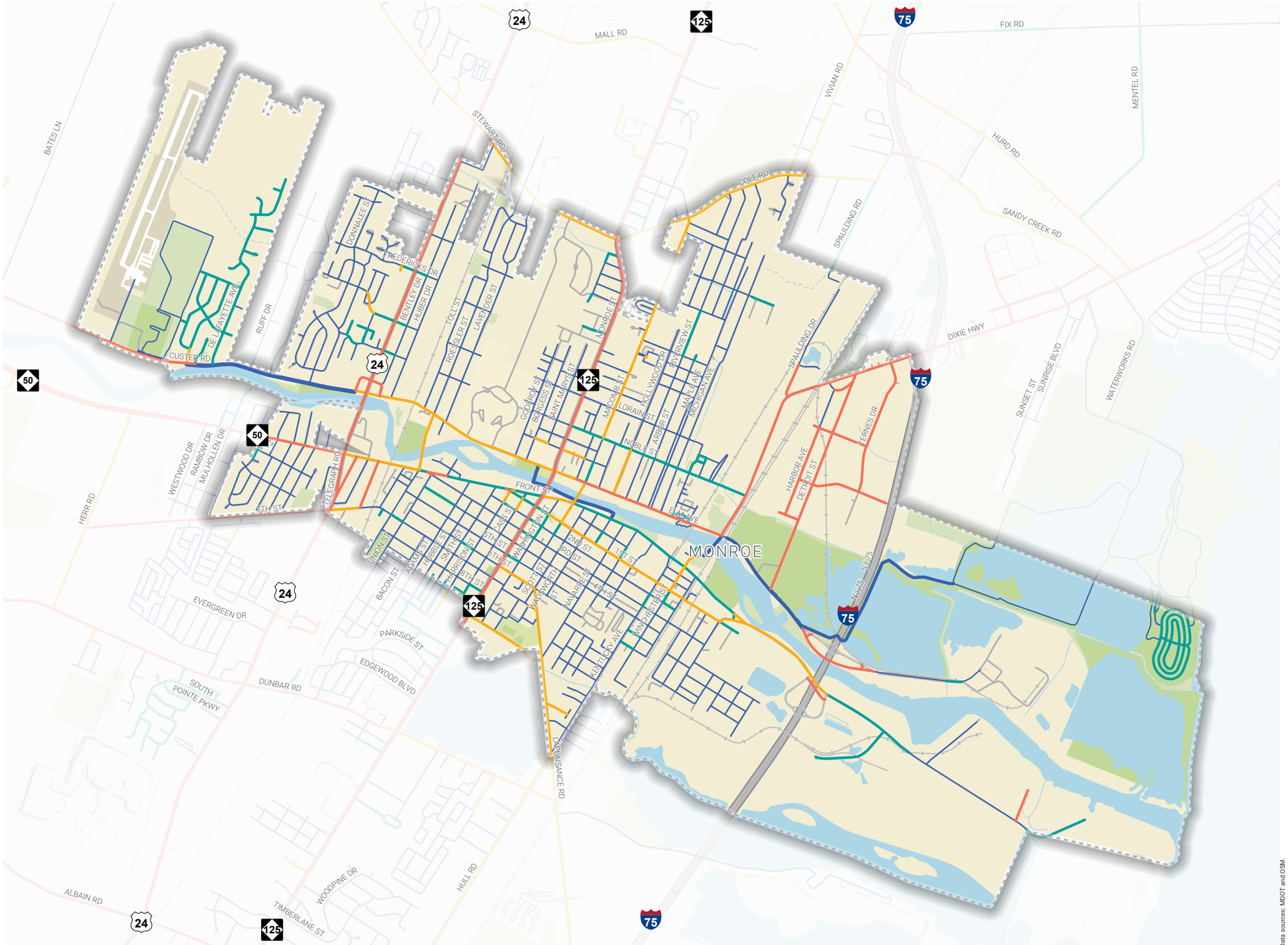


0 0.35 0.7 MILES

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Data sources: MDOT and OSM.

CITY OF ST JOHNS

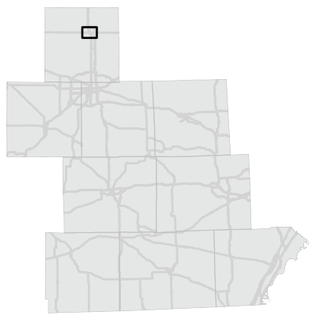
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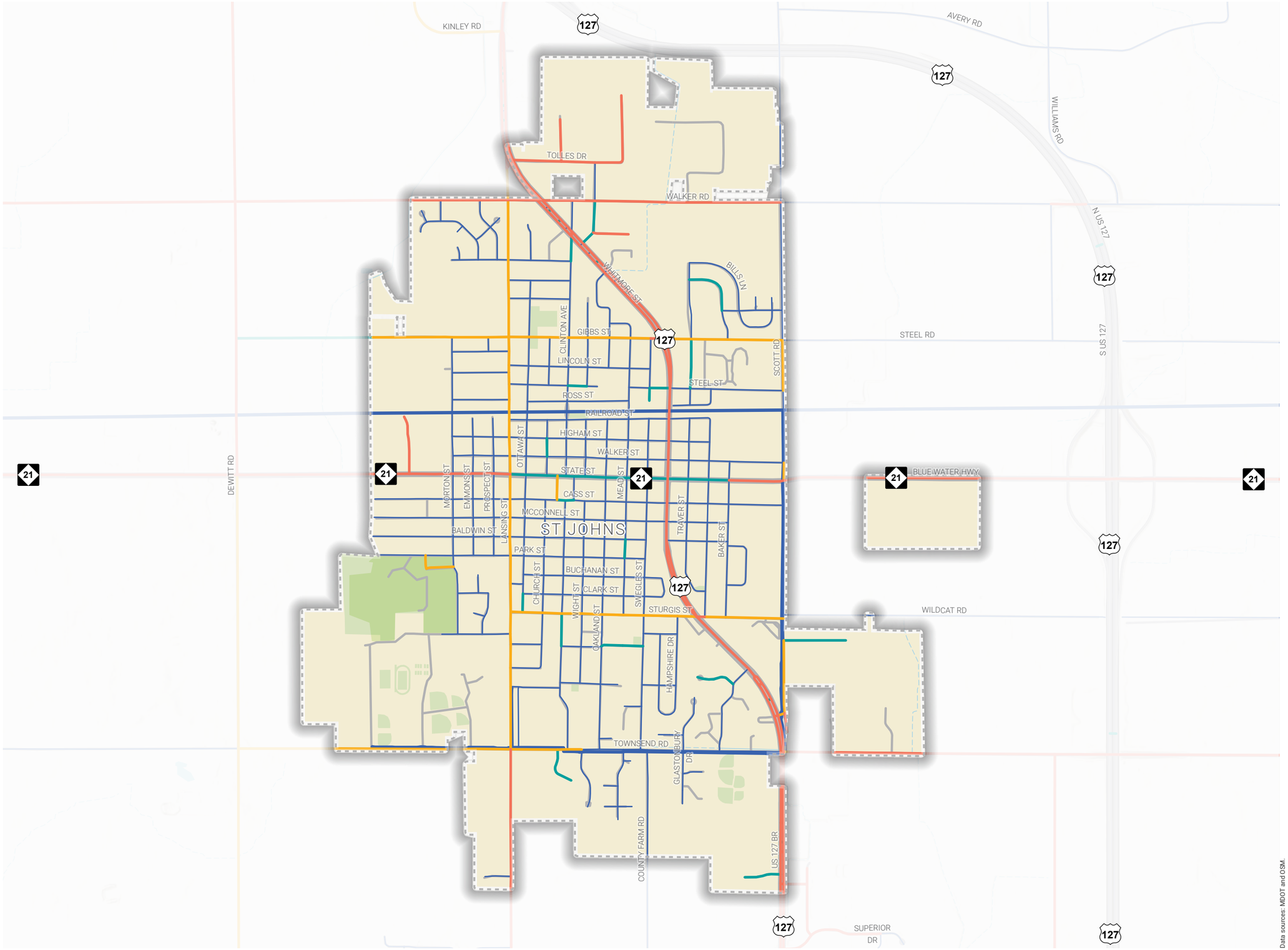


0 0.25 0.5 MILES

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Data sources: MDOT and OSM.

CITY OF TECUMSEH

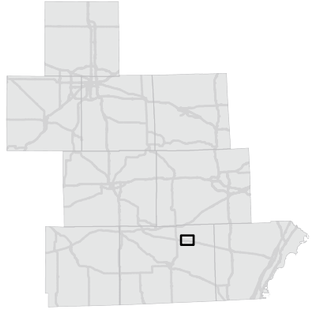
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UNIVERSITY REGION

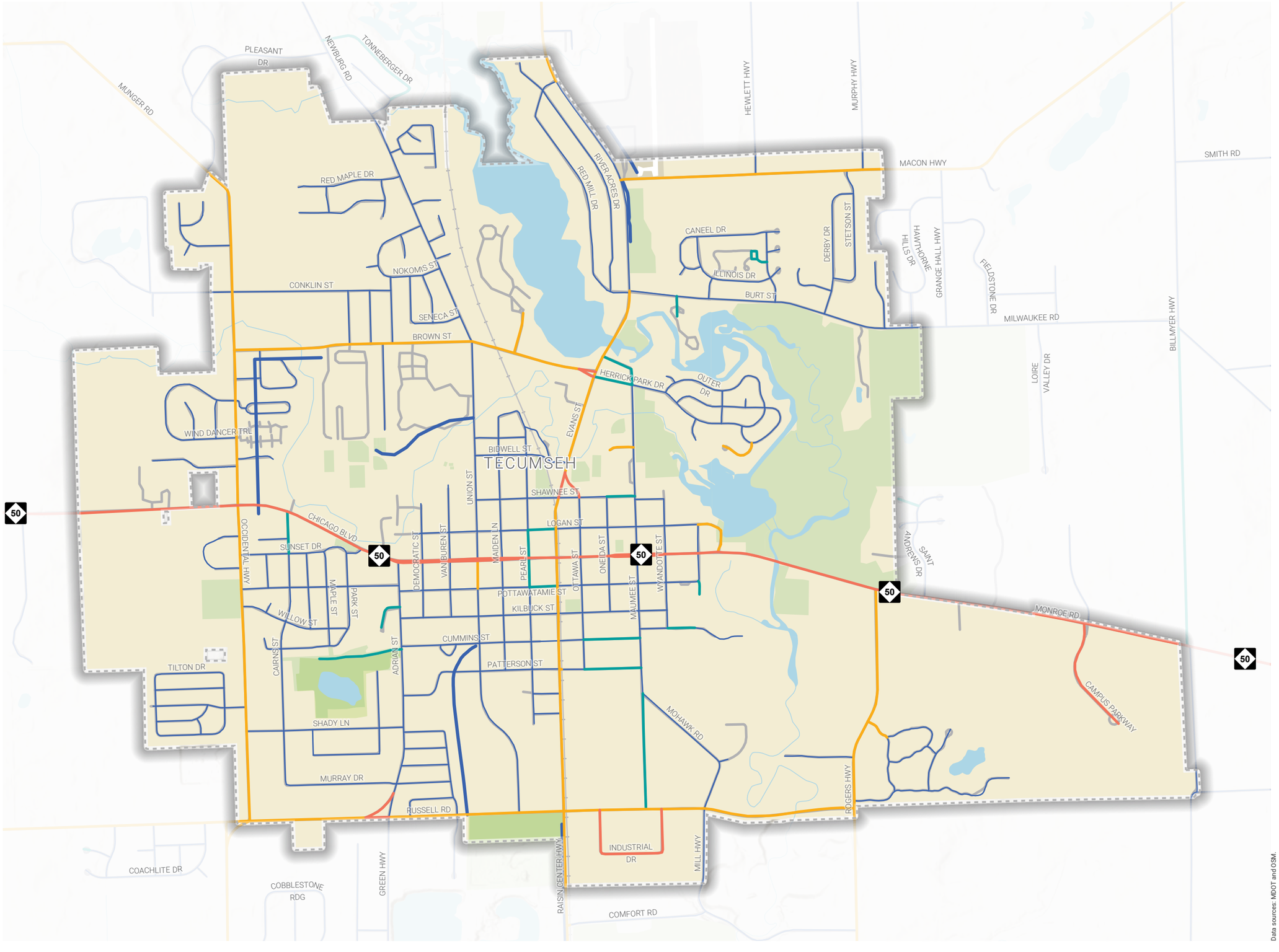


0 0.2 0.4 MILES

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Data sources: MDOT and OSM.

CITY OF YPSILANTI

BICYCLE COMFORT ANALYSIS

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UNIVERSITY REGION

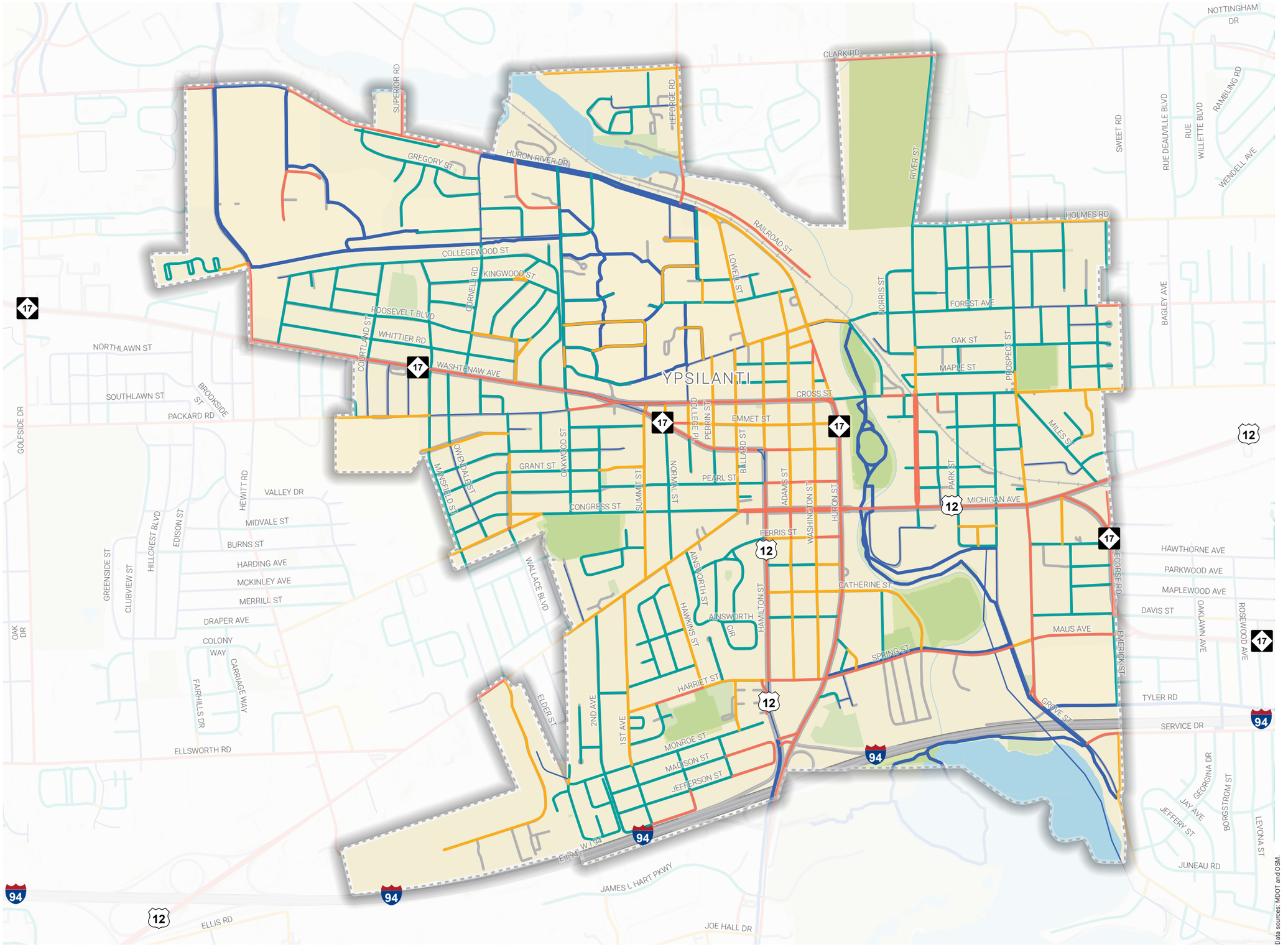


0 0.2 0.4 MILES

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Data sources: MDOT and OSM.

CLINTON COUNTY

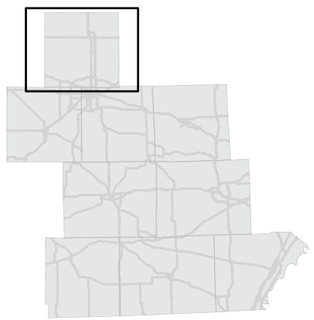
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UNIVERSITY REGION

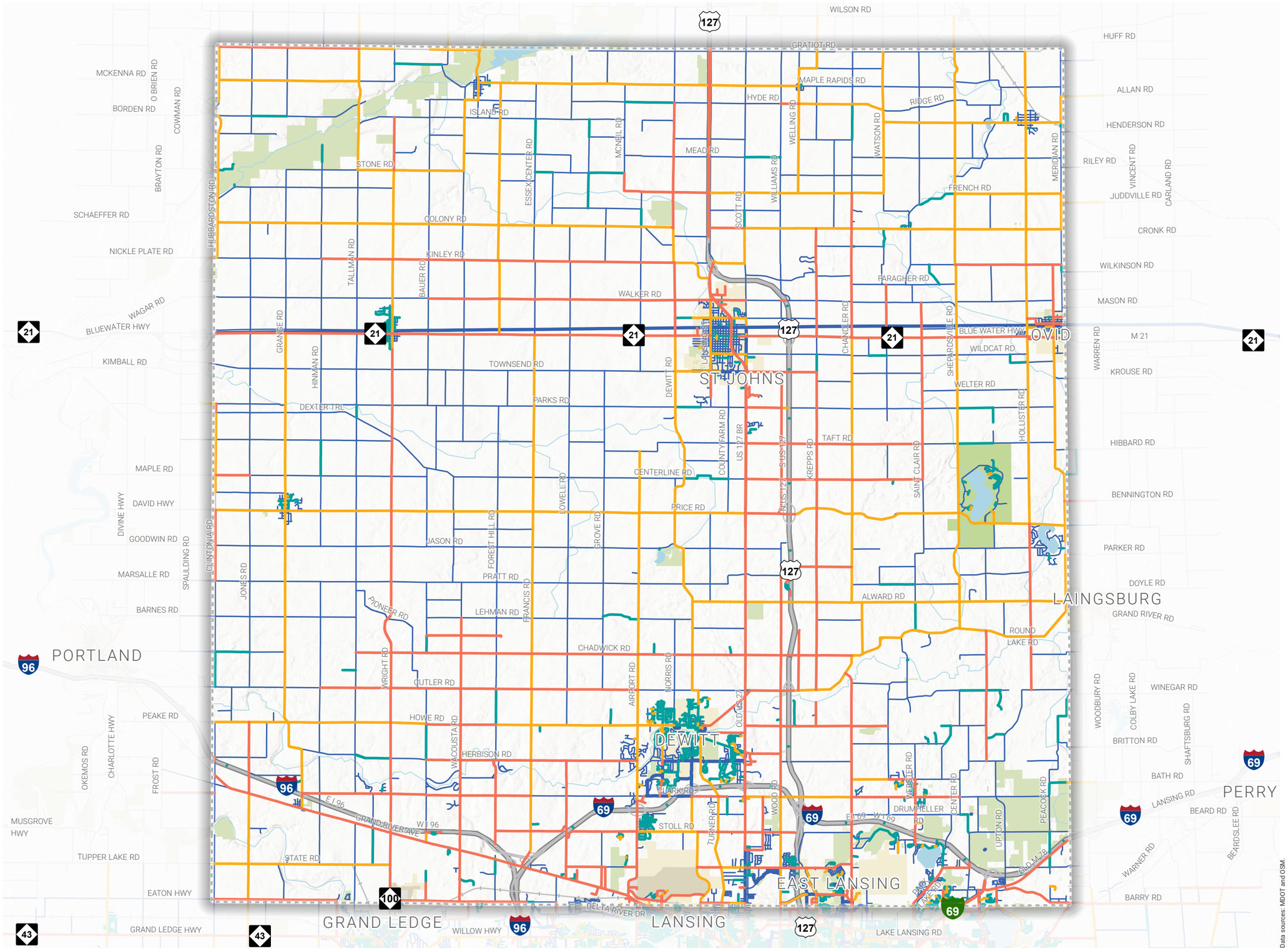


0 2 4 MILES

N

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Data sources: MDOT and OSM.

EATON COUNTY

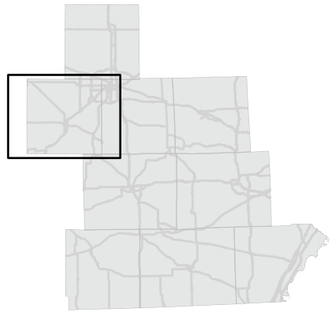
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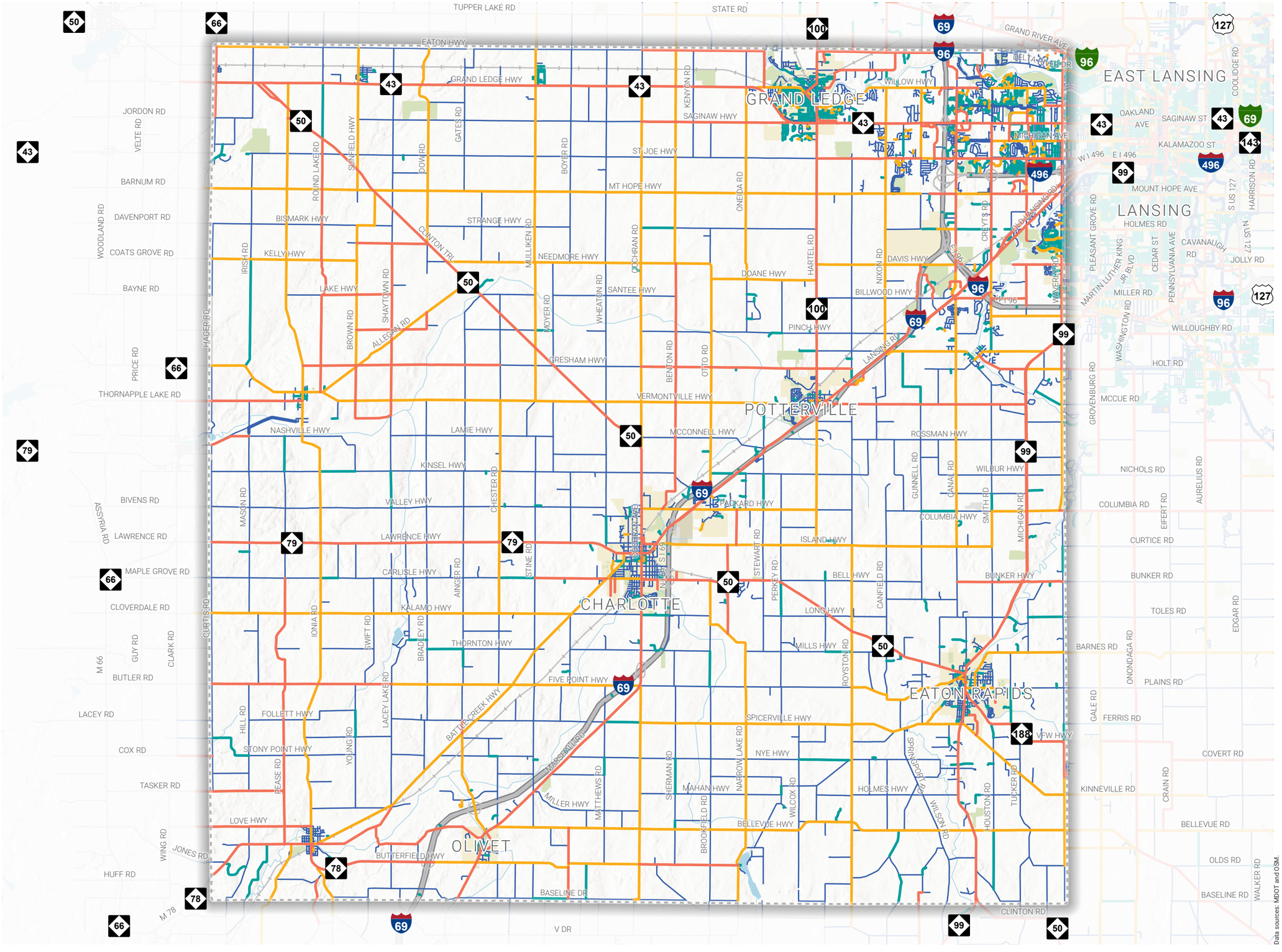


0 2 4 MILES

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GREATER LANSING

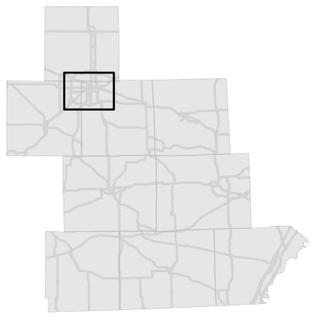
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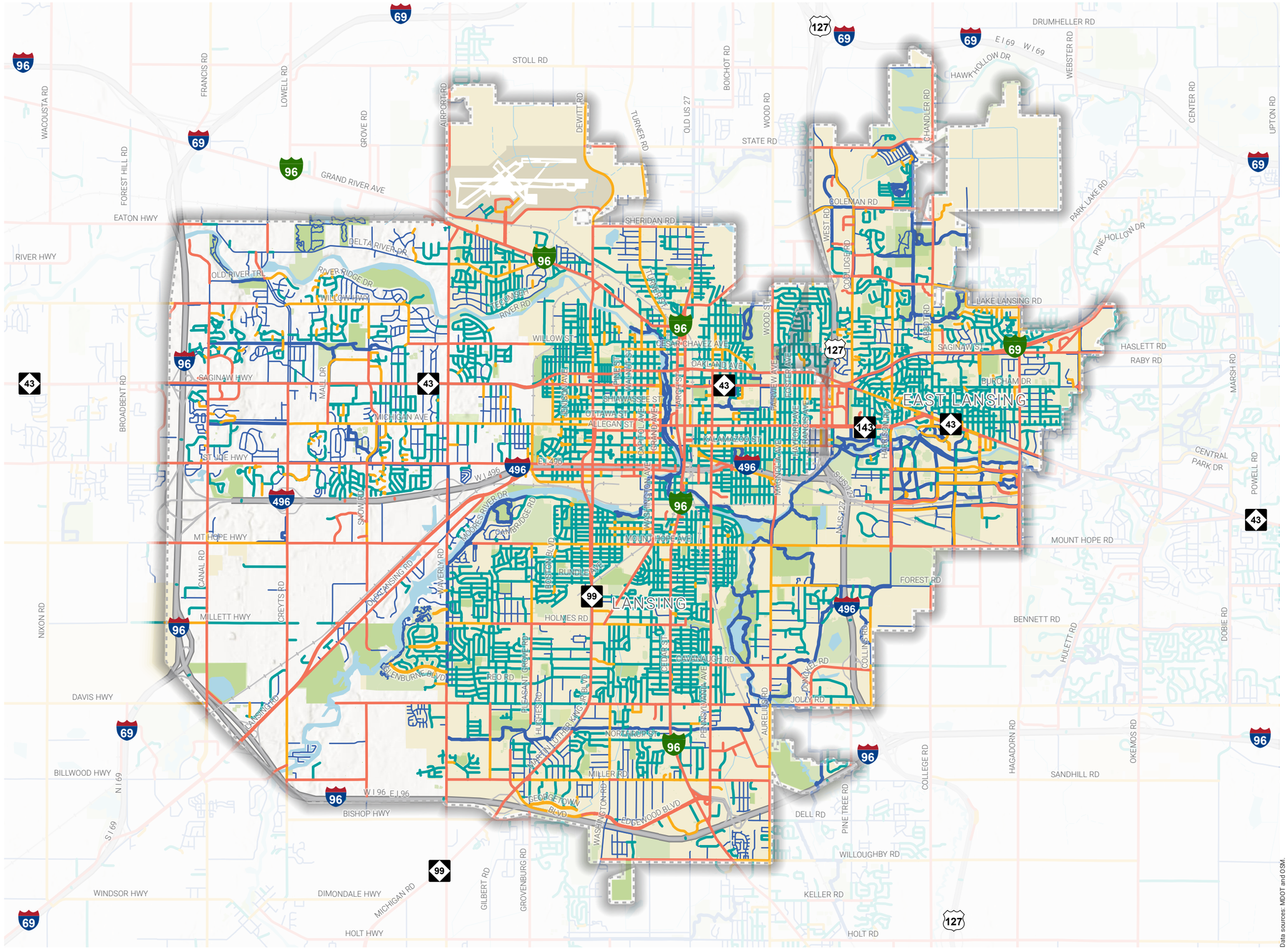


0 0.85 1.7 MILES

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HILLSDALE COUNTY

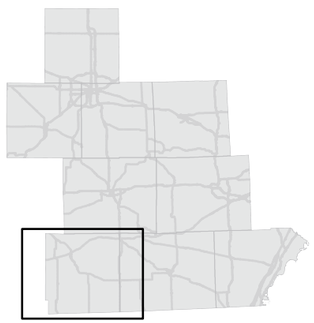
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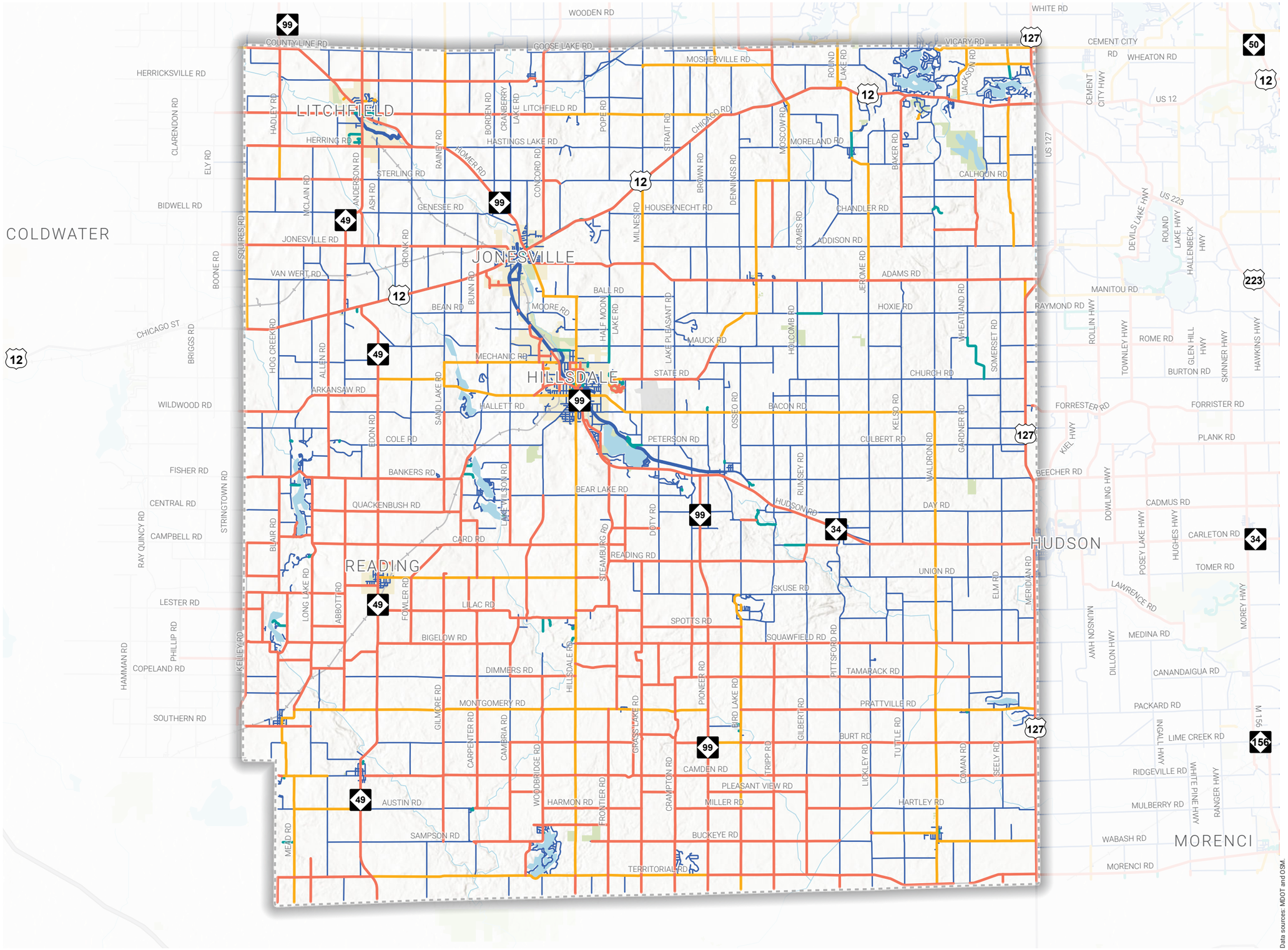


0 2 4 MILES

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INGHAM COUNTY

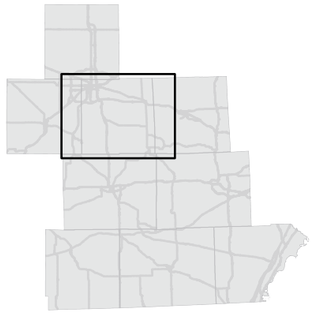
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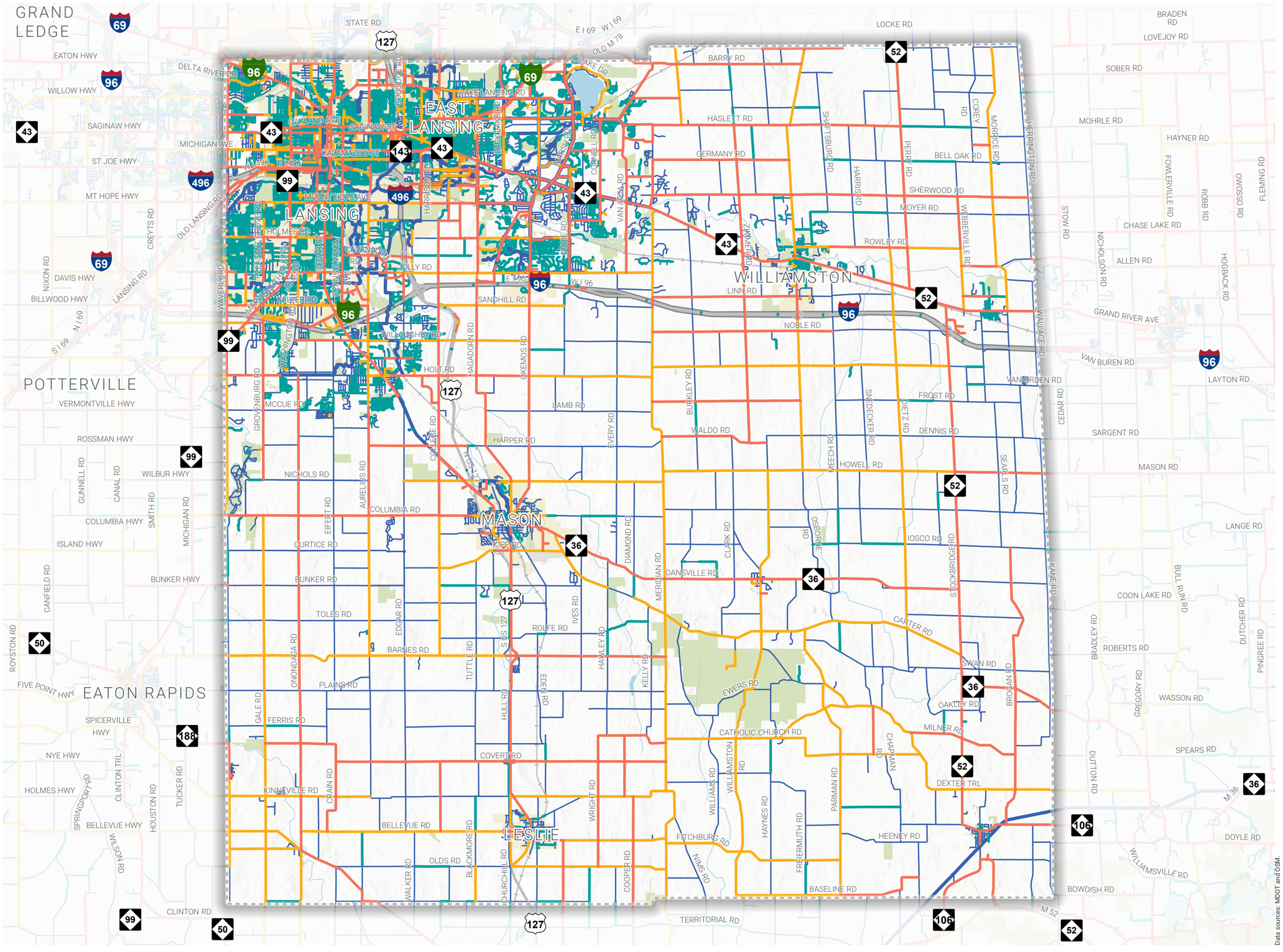


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

JACKSON COUNTY

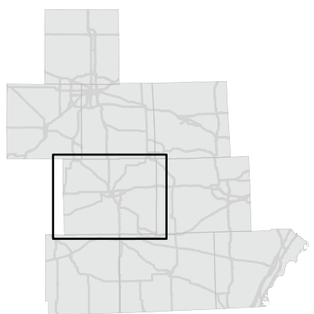
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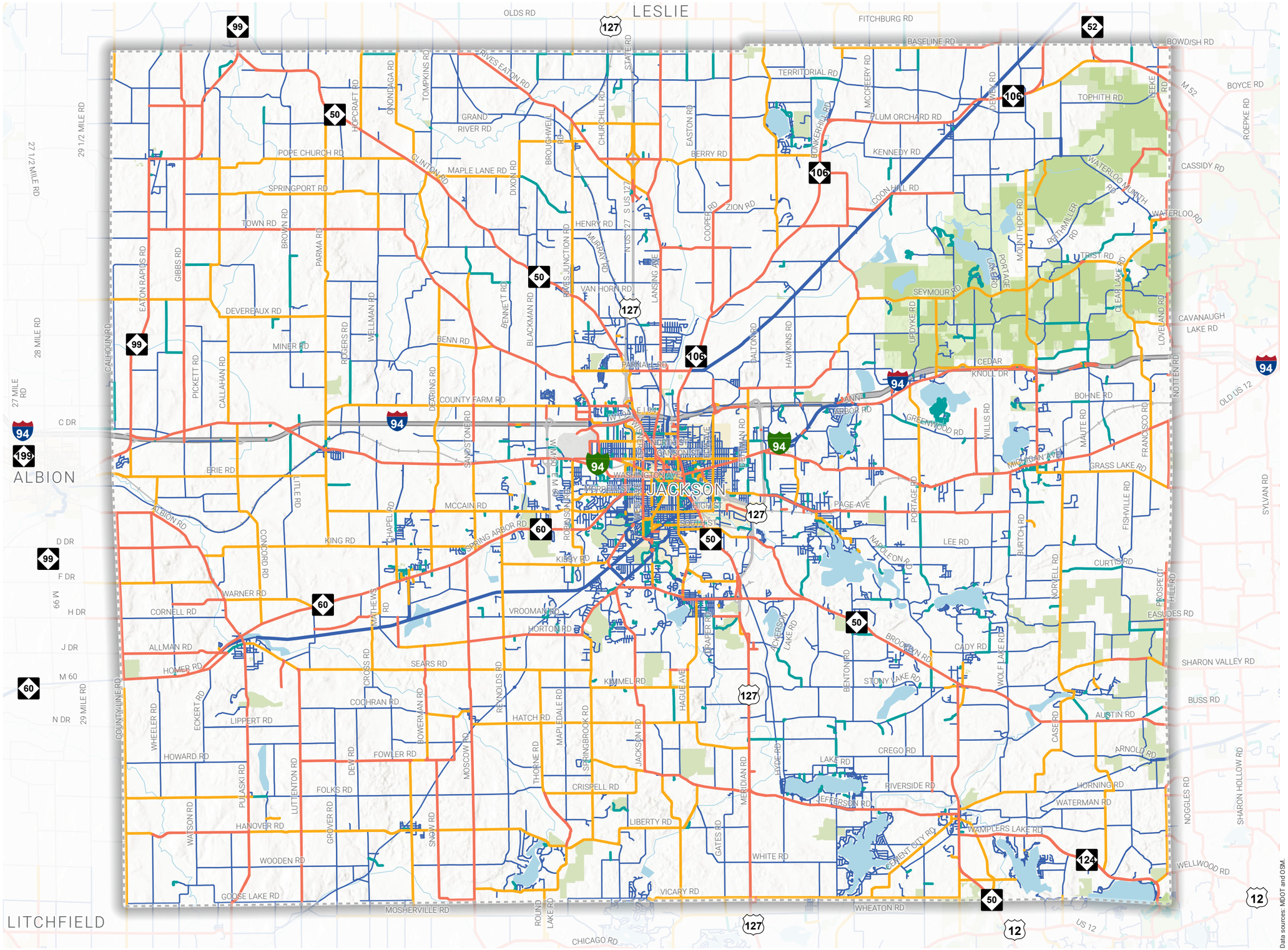


0 2 4 MILES

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LENAWEE COUNTY

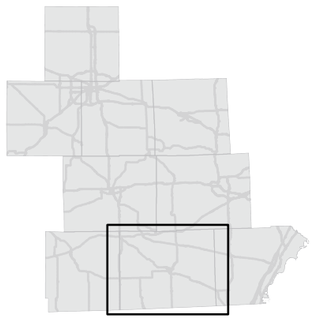
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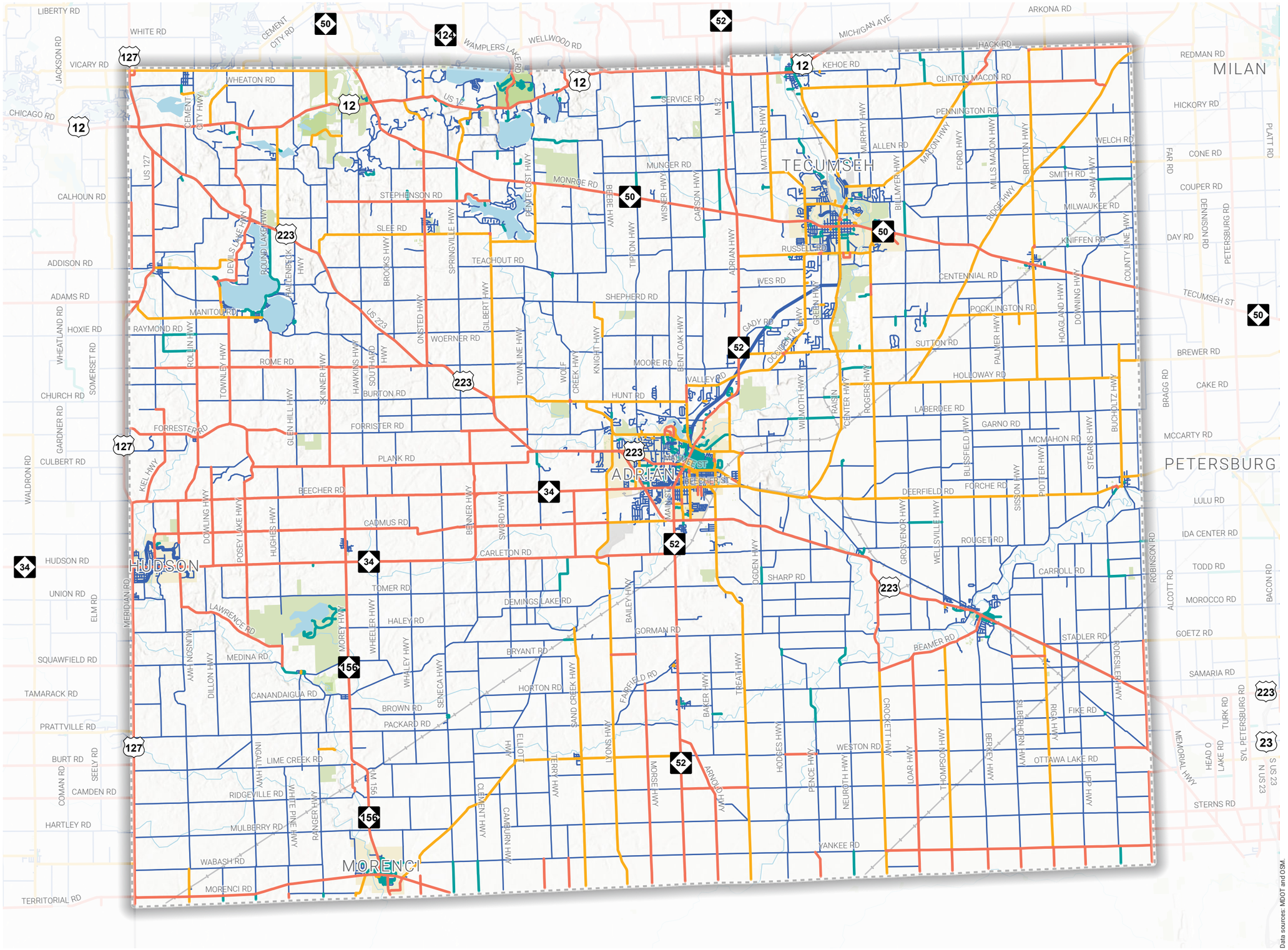


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

LIVINGSTON COUNTY

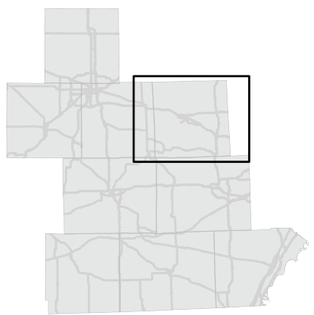
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UNIVERSITY REGION

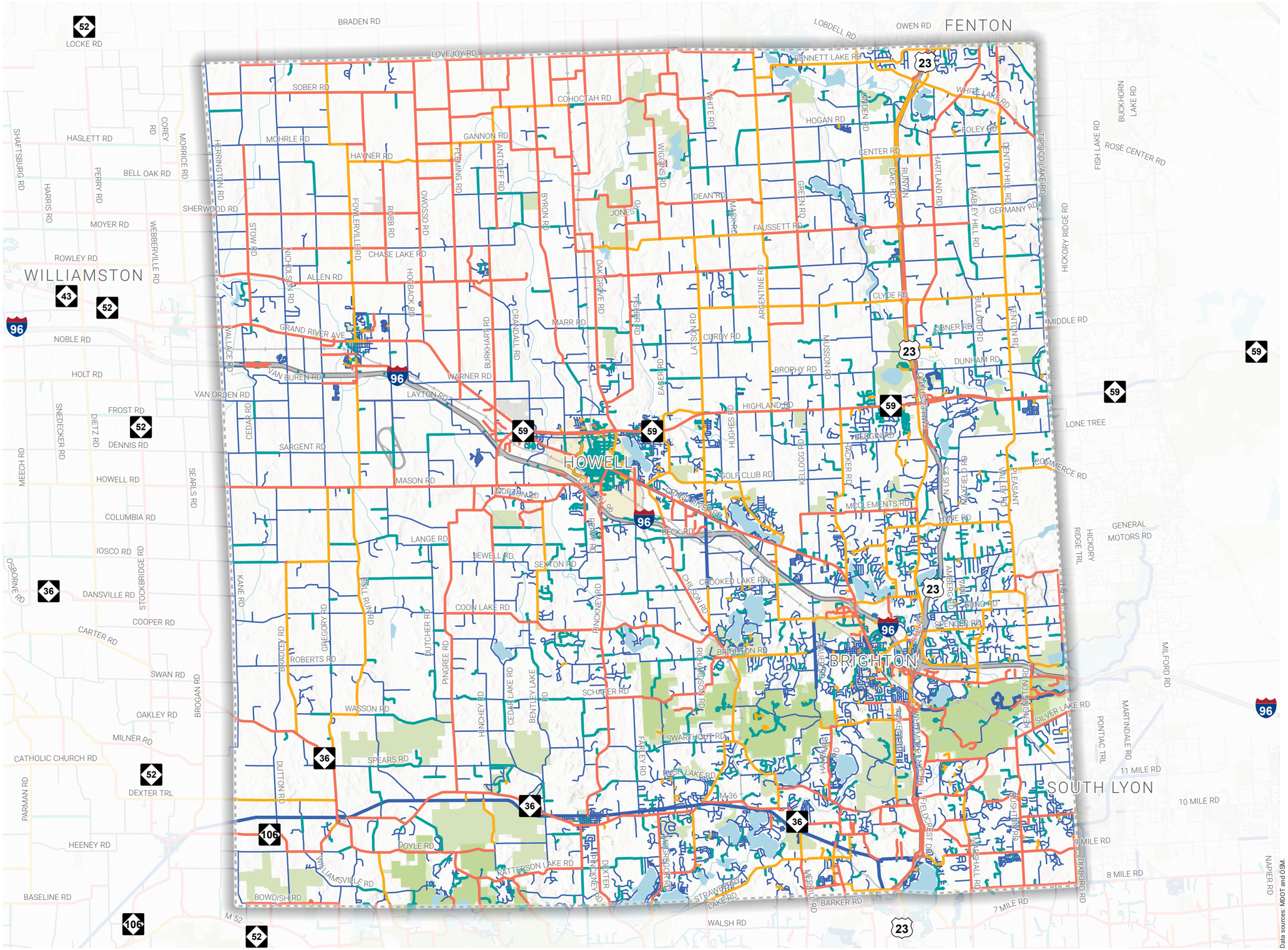


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

MONROE COUNTY

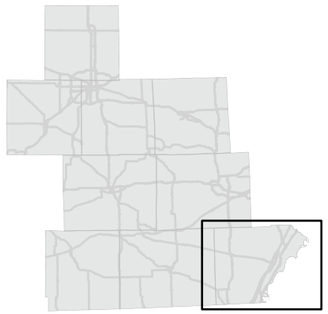
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- City Boundary

UNIVERSITY REGION

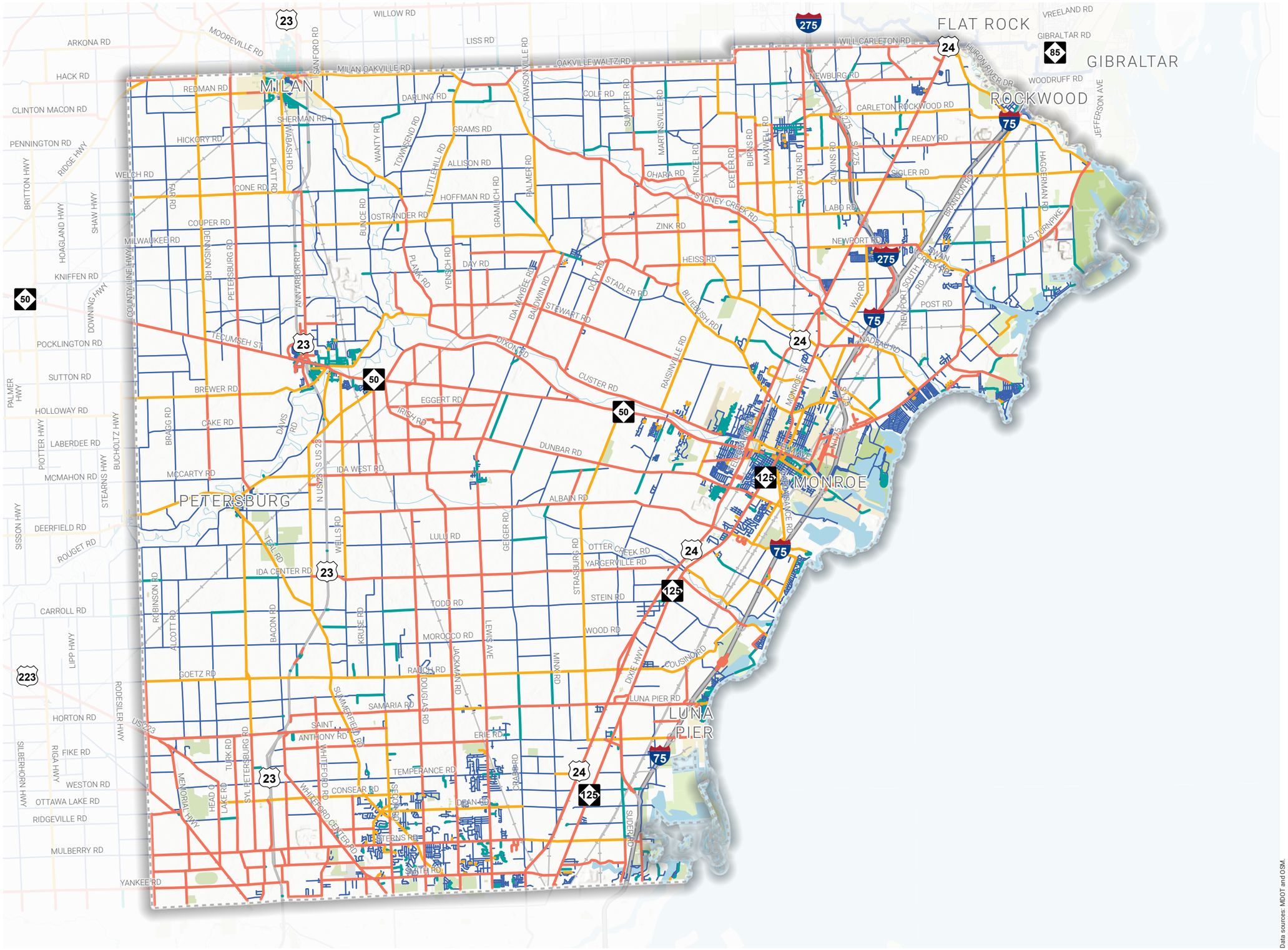


0 2 4 MILES

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MDOT Michigan Department of Transportation

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WASHTENAW COUNTY

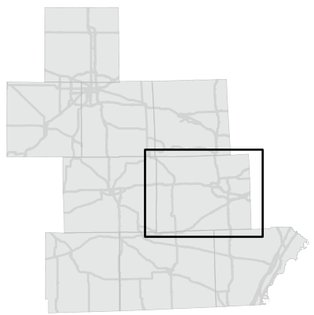
BICYCLE COMFORT ANALYSIS

LEGEND

Bicycle Level of Traffic Stress

- 4 (Higher Stress)
- 3
- 2
- 1 (Lower Stress)
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

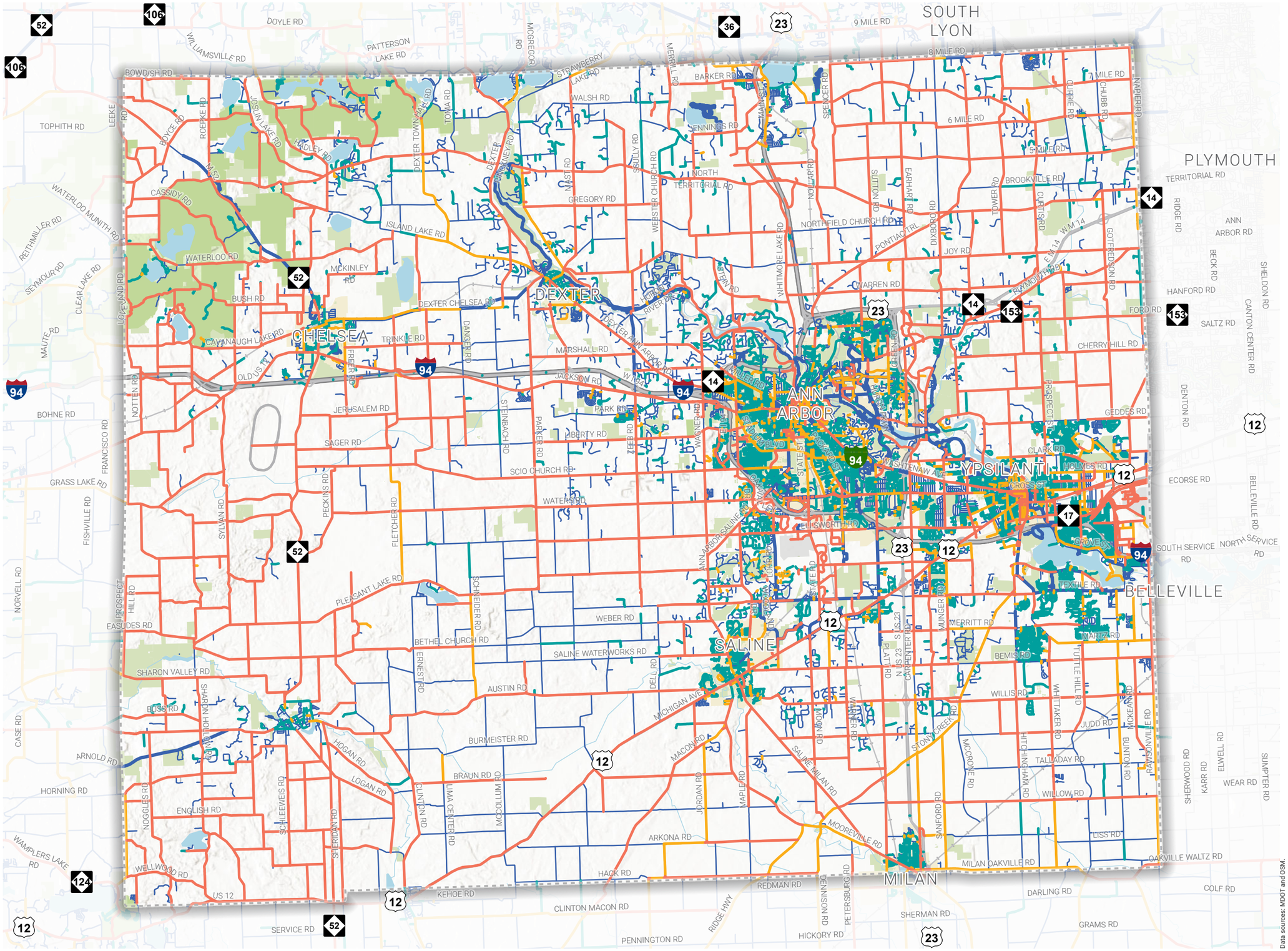


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OSM.

Appendix E: Pedestrian Soft Barrier Analysis

Overview

This analysis will identify “soft barriers” for pedestrians. Soft barriers are roads where pedestrians face uncomfortable conditions when crossing which may discourage active travel even when the route is otherwise a low-stress route. The analysis distinguishes between minor and major soft barriers based on the average annual daily traffic (AADT), number of travel lanes, and posted speed limit of the road.

A pedestrian level of traffic stress (PLTS) analysis requires detailed data on sidewalk presence, width, and condition. While some of the jurisdictions within the MDOT region have some sidewalk data, a thorough review of the sidewalk attributes showed a lack of consistency in the information available geographically and many values hadn’t been updated recently or were missing information. The strength of using the soft barrier analysis approach lies in its ability to assess pedestrian discomfort on roads without requiring detailed sidewalk location and condition data, making it a more adaptable and scalable solution for this application where multiple jurisdictions require detailed sidewalk data. Most of these attributes are available from MDOT centerline data annually and the rest can be supplemented with open data from OpenStreetMap. Overall, this approach to analyzing pedestrian facilities should result in more meaningful results than PLTS, due to the regional scale of this project and the level of available data.

Methodology

The pedestrian soft barrier analysis will use data for all roads (not including freeways and interstates) in the MDOT University region from the Version 24 (v24) Roads & Highways (R&H) Centerline Attribution Data feature class provided by MDOT. The dataset includes information on functional classification, number of travel lanes, and AADT data for most major roads in the study area. Additional values from OpenStreetMap related to median types and speed limits will be conflated with the centerline data. We propose using three variable categories to set thresholds for major and minor barriers. A road must meet at least two out of the three criteria outlined in the table below to be designated as a soft barrier.

Types of Barriers and their criteria

AADT	Lanes	Posted Speed Limit	Category
> 9,000	> 4 lanes or 4 lanes without a raised median	>= 35 MPH	If at least two of the criteria are met, **Major Soft Barrier**
>3,000	4 lanes with a raised median	>= 30 MPH	If at least two of the criteria are met, **Minor Soft Barrier**
<= 3,000	< 4 lanes	< 30 MPH	**Not a Barrier**
Major Soft Barriers: Occur when at least two of the three major barrier criteria are met. Minor Soft Barriers: Occur when at least two of the three minor barrier criteria are met. Not a Barrier: Occurs when conditions for major or minor soft barriers are not met for at least two criteria.			

Roads with missing through lanes, AADT, speed limit, and median data were filled based on values from OpenStreetMap and the imputation logic used for the LTS analysis. Despite the centerline data having attributes for median types, the values are almost entirely missing from the dataset (over 90% missing). The rest of the dataset was missing some AADT and through lane data; however, on divided (dual-carriage) roadways, the AADT and through lanes were only reported on one side. Most dual carriageways were on interstates and freeways, limiting the impact of this issue. OSM data was imputed on the segments with missing AADT and through lane data. This resulted in some arterials with dual carriageways having major barrier assignment on one side and minor barriers on another. A manual review process cleaned up these discrepancies and assigned the maximum barrier type to both sides of the divided arterial. The soft barrier scoring process was conducted in GIS.

Pedestrian Soft Barrier Maps

CITY OF ADRIAN

PEDESTRIAN SOFT BARRIERS

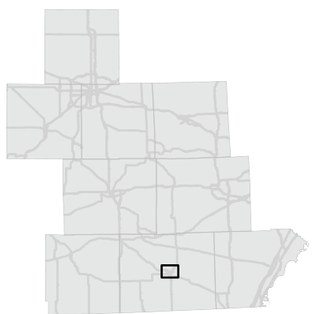
LEGEND

Pedestrian LTS (Soft Barriers Analysis)

- Major Soft Barrier
- Minor Soft Barrier
- Not a Barrier
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

This analysis identifies "soft barriers"—roadways where crossing conditions are uncomfortable for pedestrians, even if the route itself is otherwise walkable.

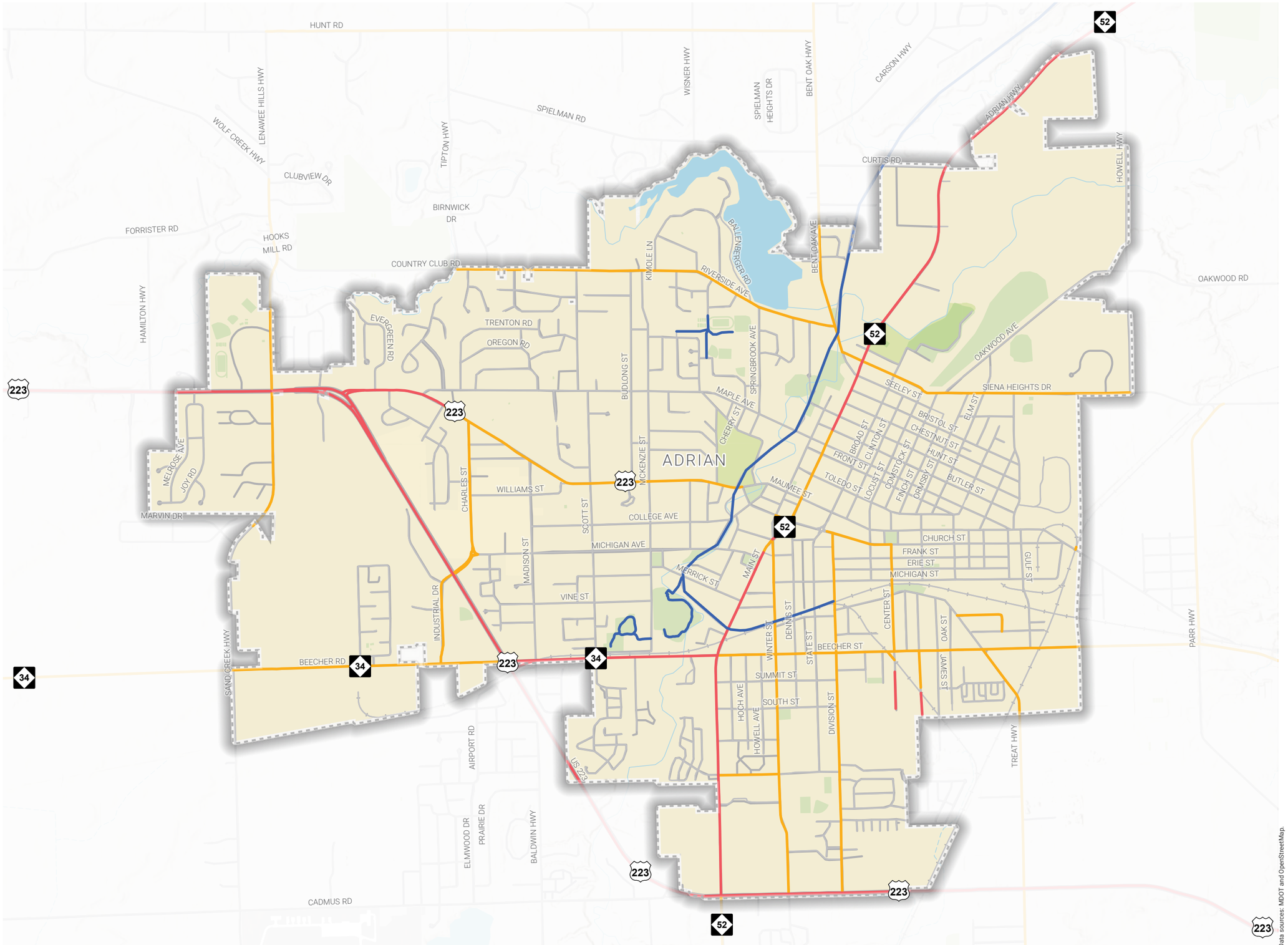
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

CITY OF ANN ARBOR

PEDESTRIAN SOFT BARRIERS

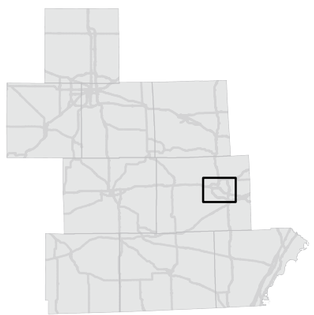
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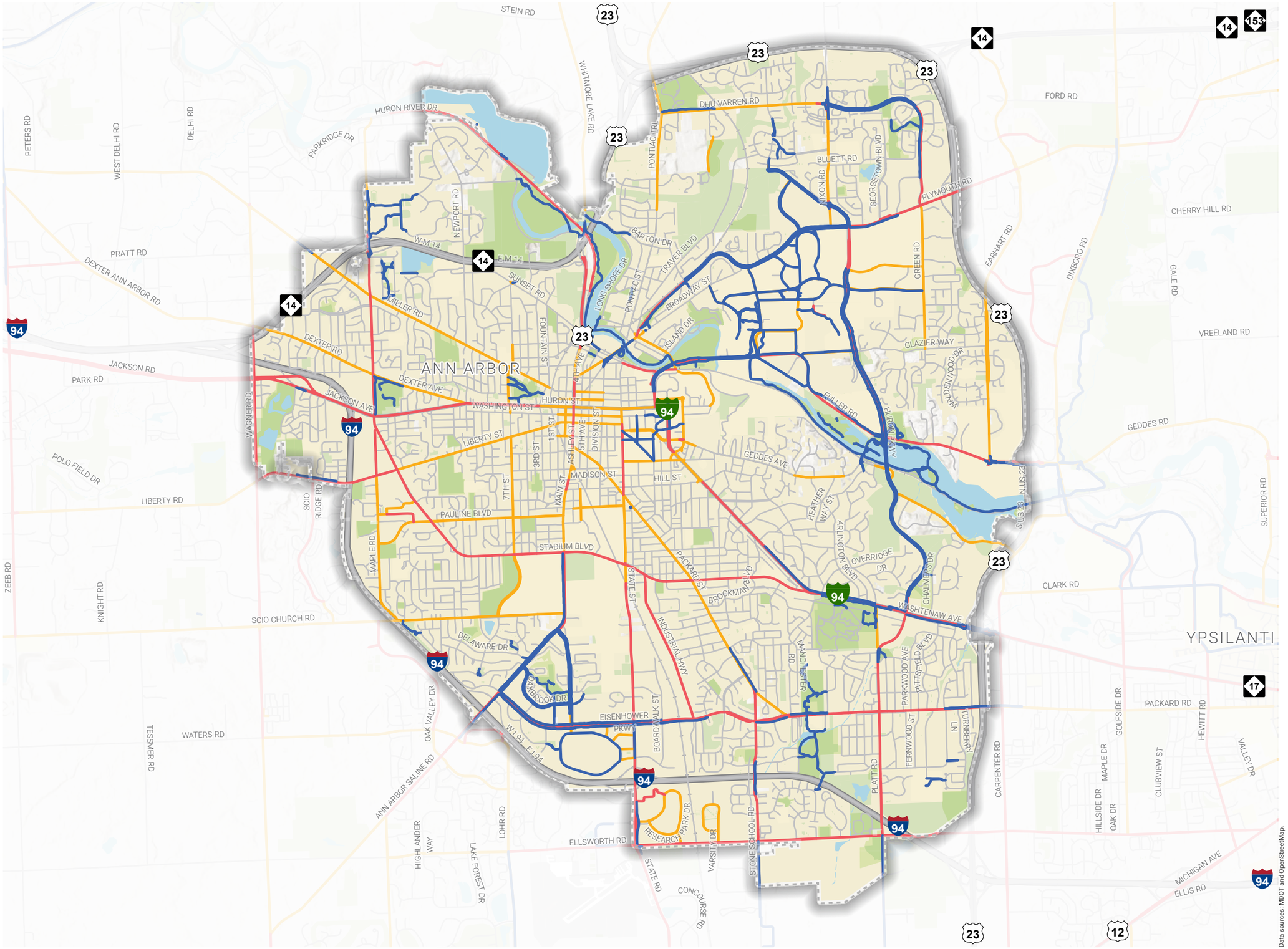
UNIVERSITY REGION



0 0.55 1.1 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

CITY OF BRIGHTON

PEDESTRIAN SOFT BARRIERS

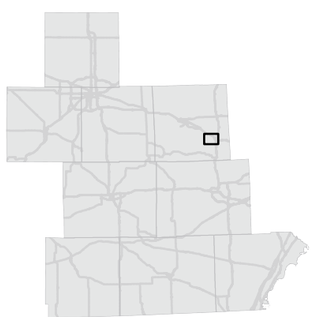
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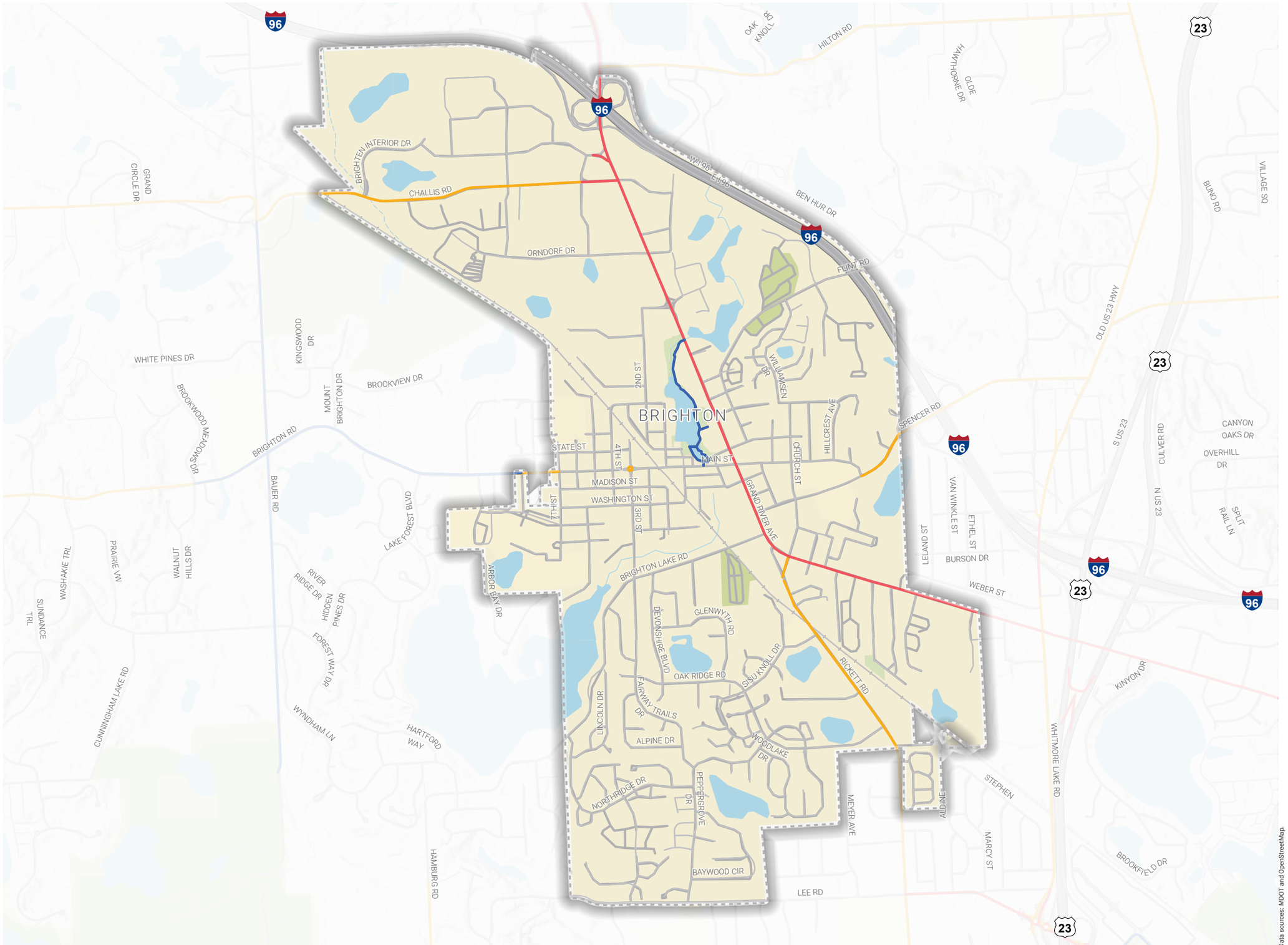
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

CITY OF CHARLOTTE

PEDESTRIAN SOFT BARRIERS

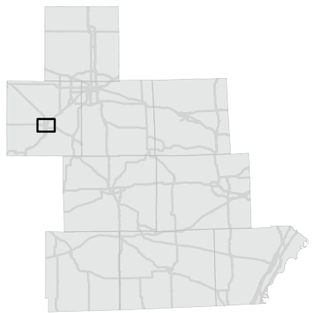
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UNIVERSITY REGION

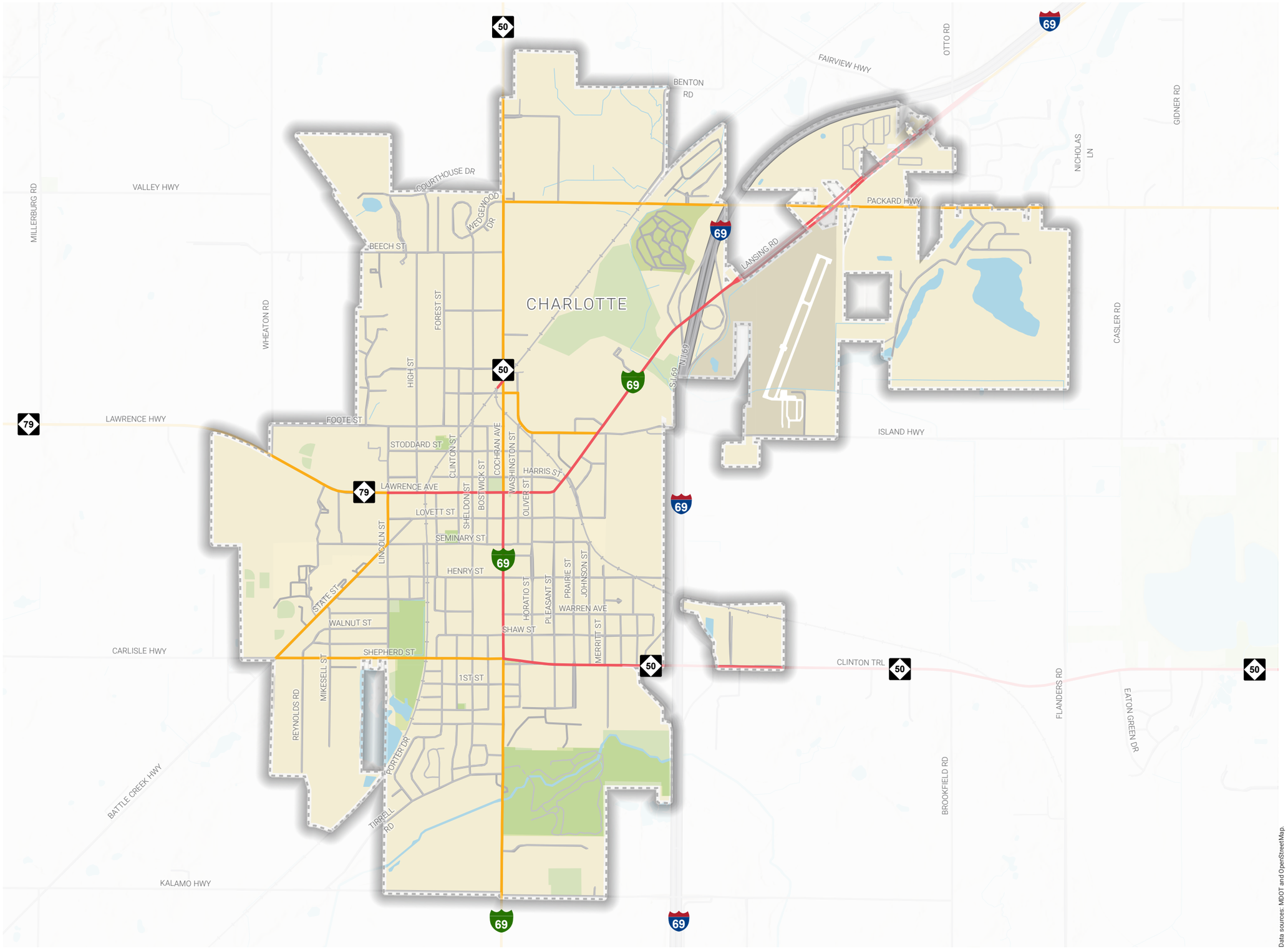


0 0.3 0.6 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CITY OF HILLSDALE

PEDESTRIAN SOFT BARRIERS

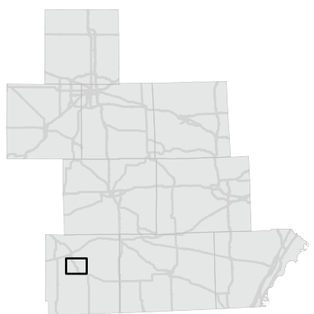
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UNIVERSITY REGION

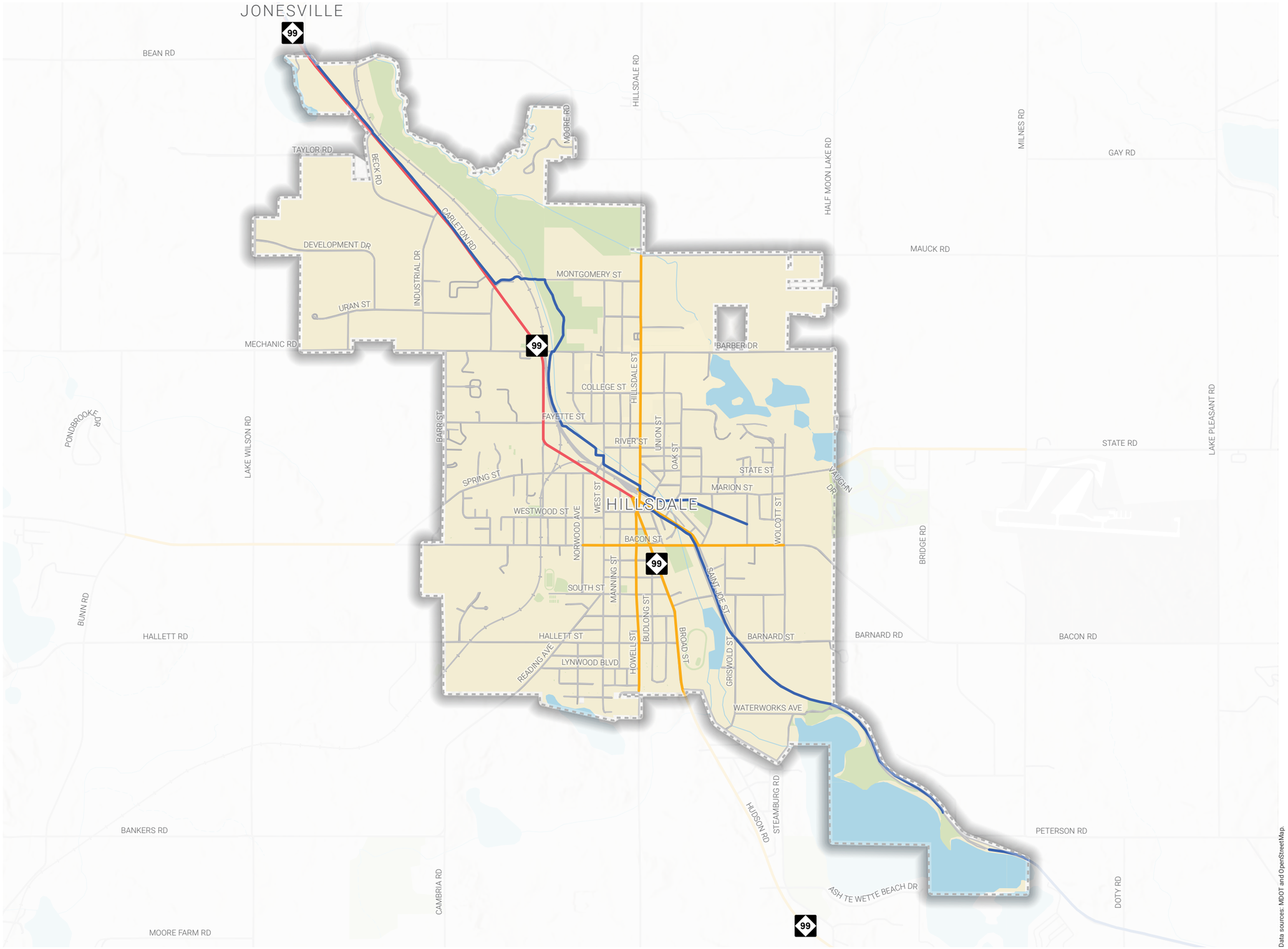


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CITY OF HOWELL

PEDESTRIAN SOFT BARRIERS

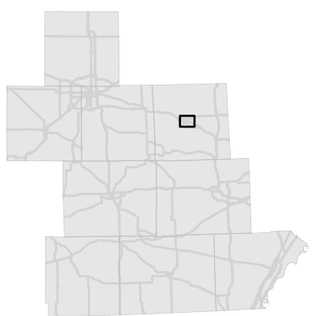
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UNIVERSITY REGION

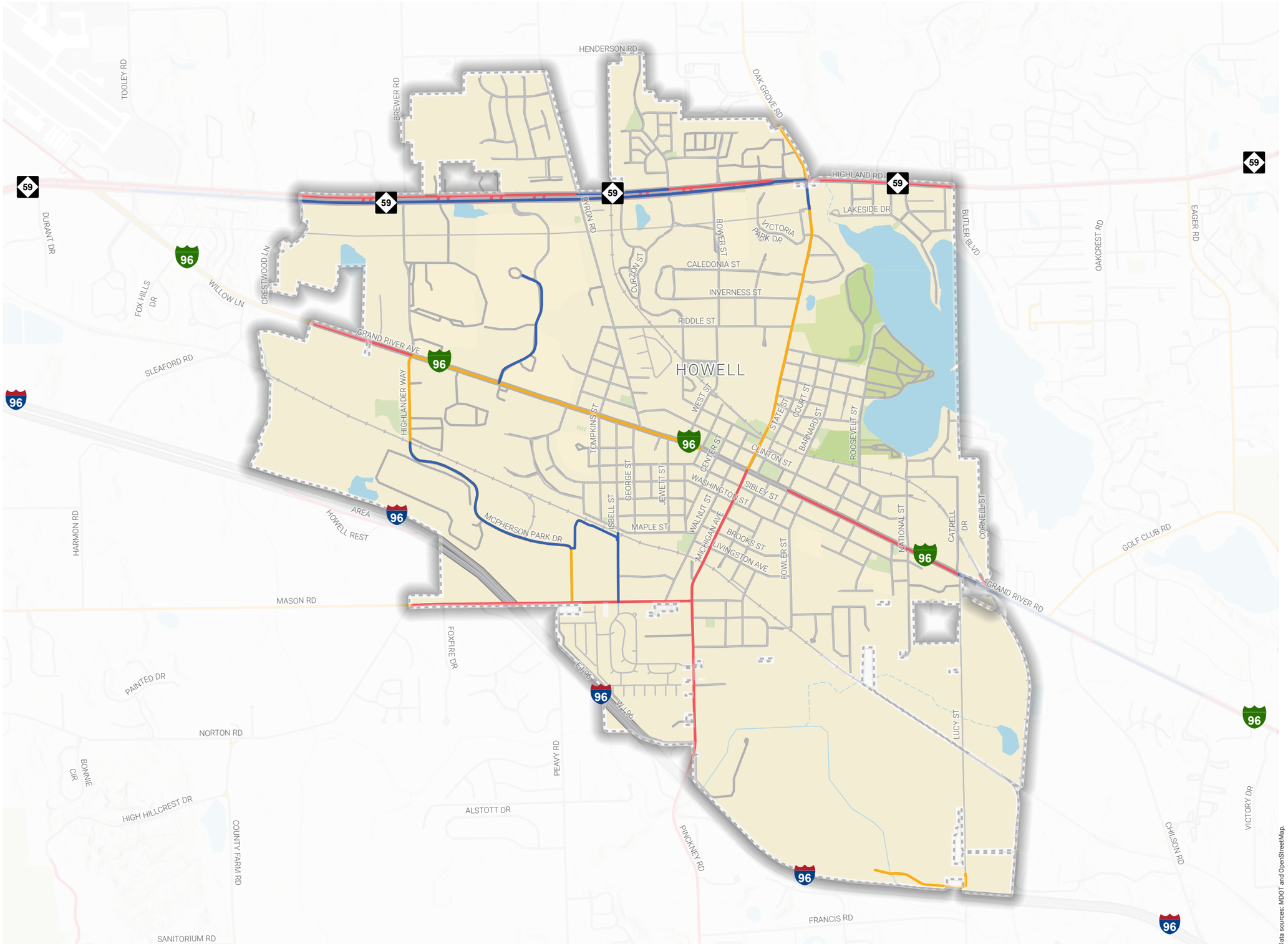


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CITY OF JACKSON

PEDESTRIAN SOFT BARRIERS

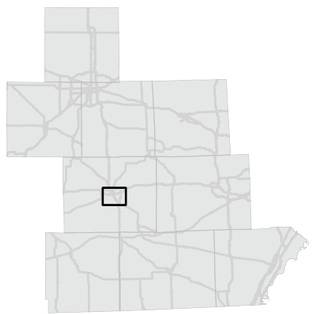
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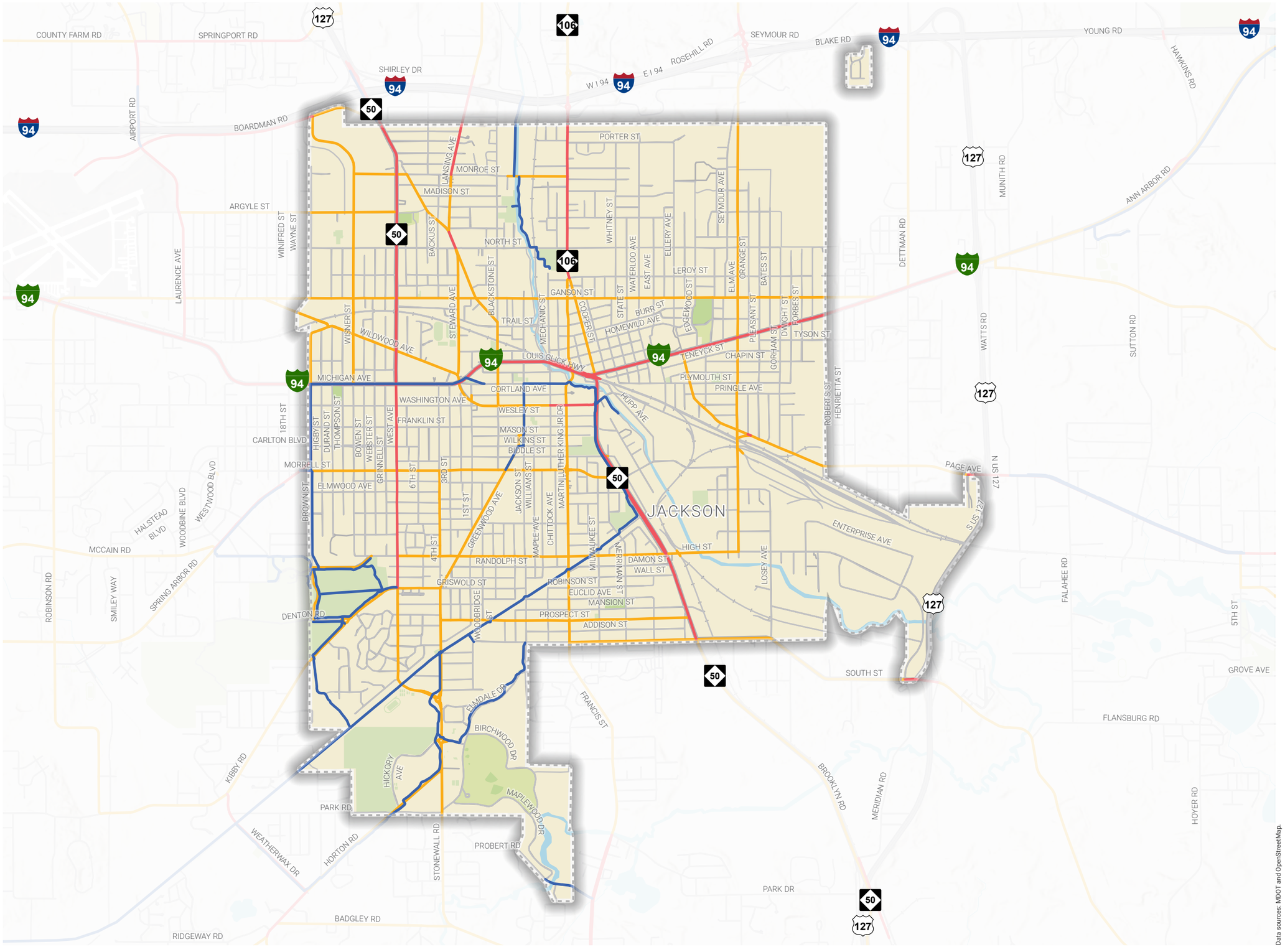


0 0.4 0.8 MILES

N

MDOT Michigan Department of Transportation

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CITY OF LITCHFIELD

PEDESTRIAN SOFT BARRIERS

LEGEND

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UNIVERSITY REGION

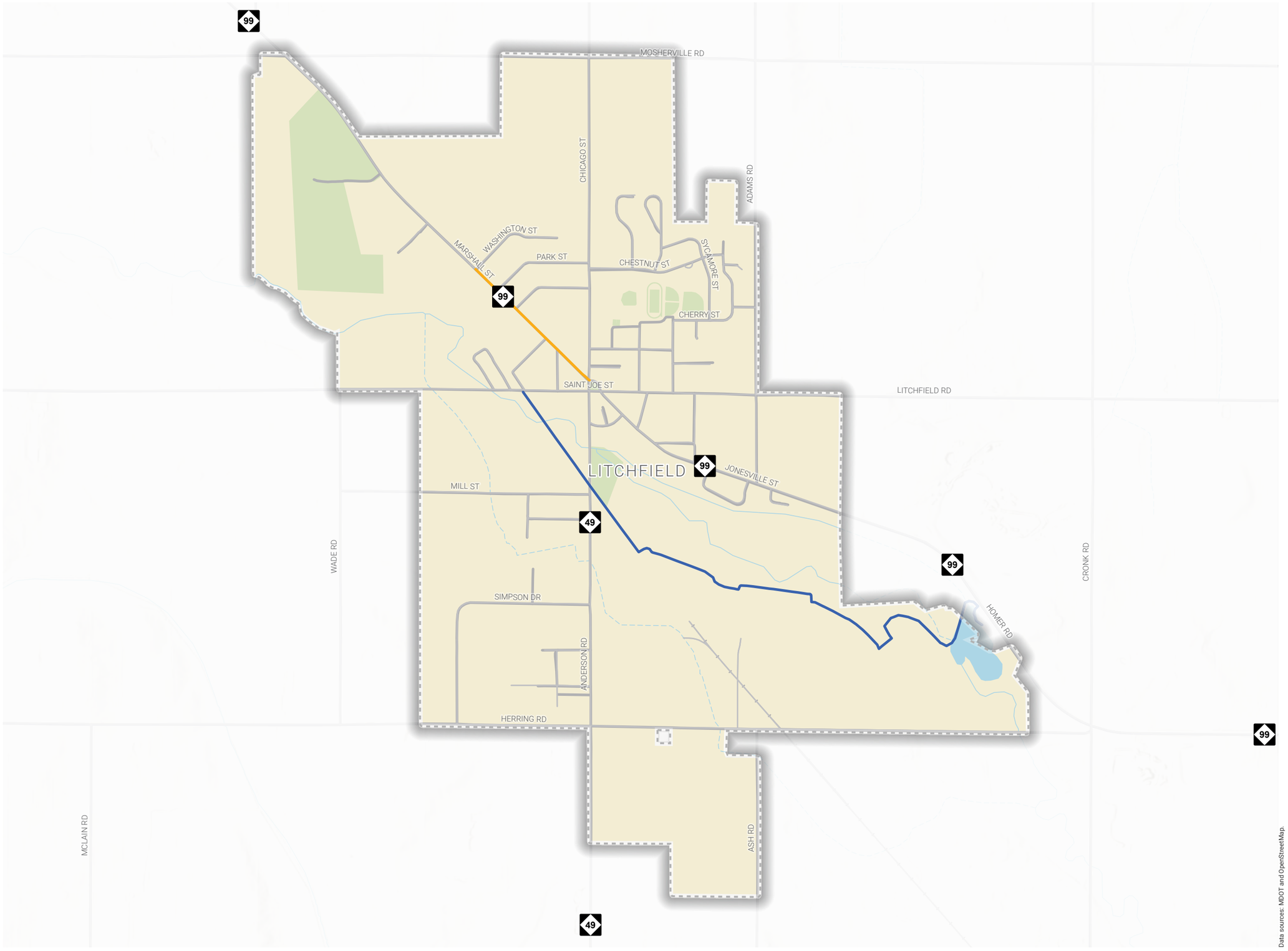


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

CITY OF MASON

PEDESTRIAN SOFT BARRIERS

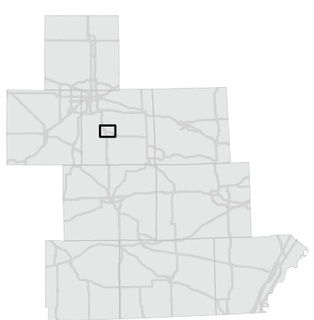
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UNIVERSITY REGION

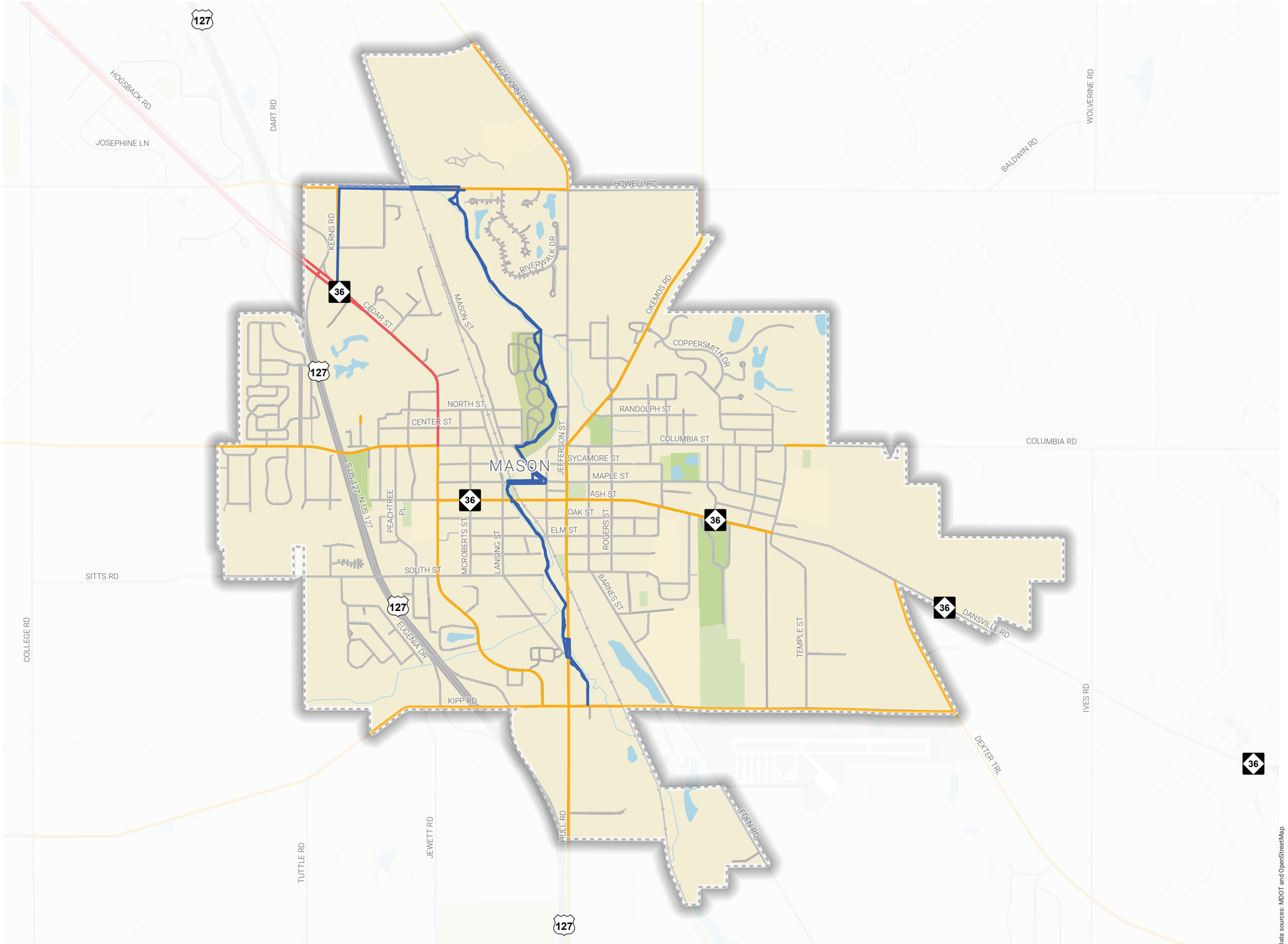


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CITY OF MILAN

PEDESTRIAN SOFT BARRIERS

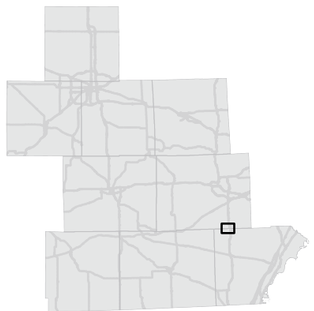
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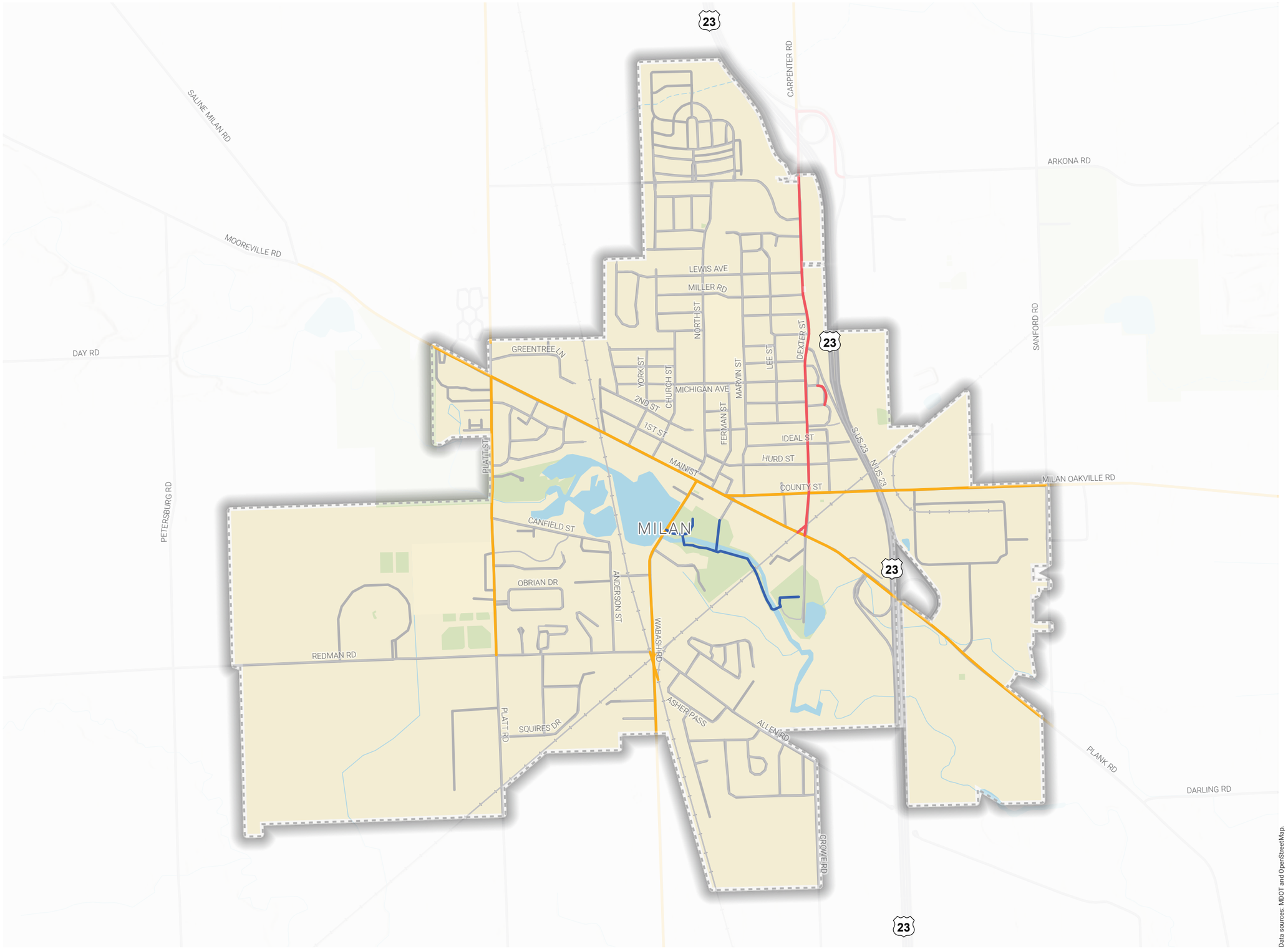


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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CITY OF MONROE

PEDESTRIAN SOFT BARRIERS

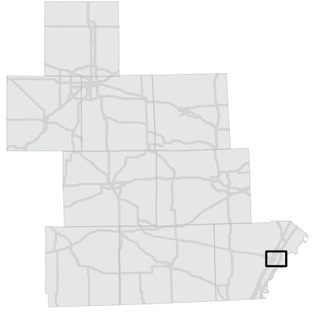
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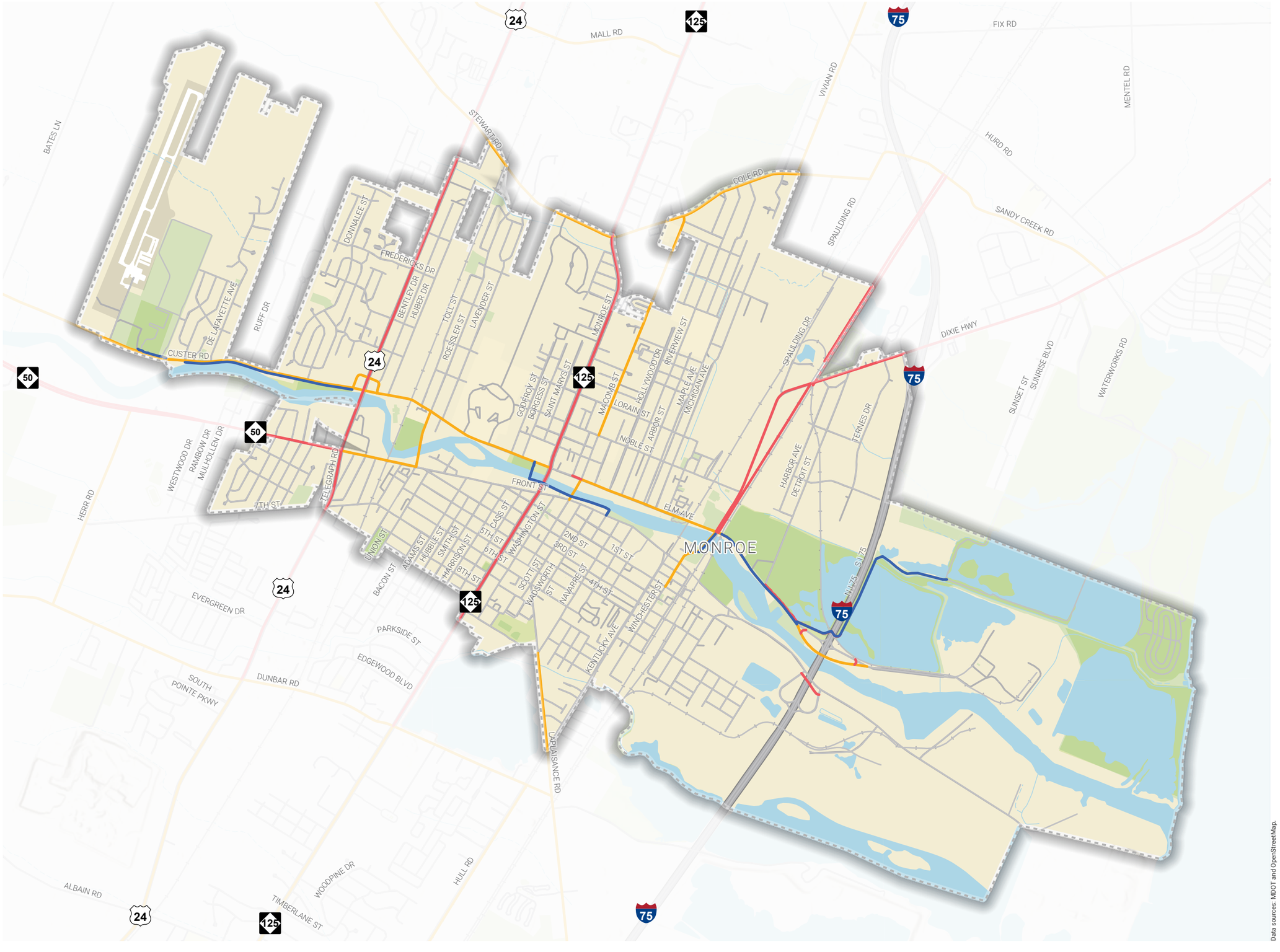


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CITY OF ST JOHNS

PEDESTRIAN SOFT BARRIERS

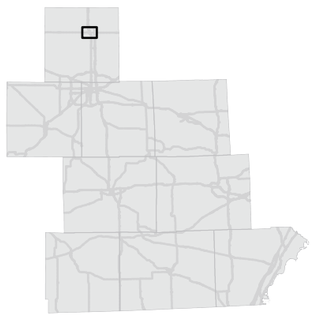
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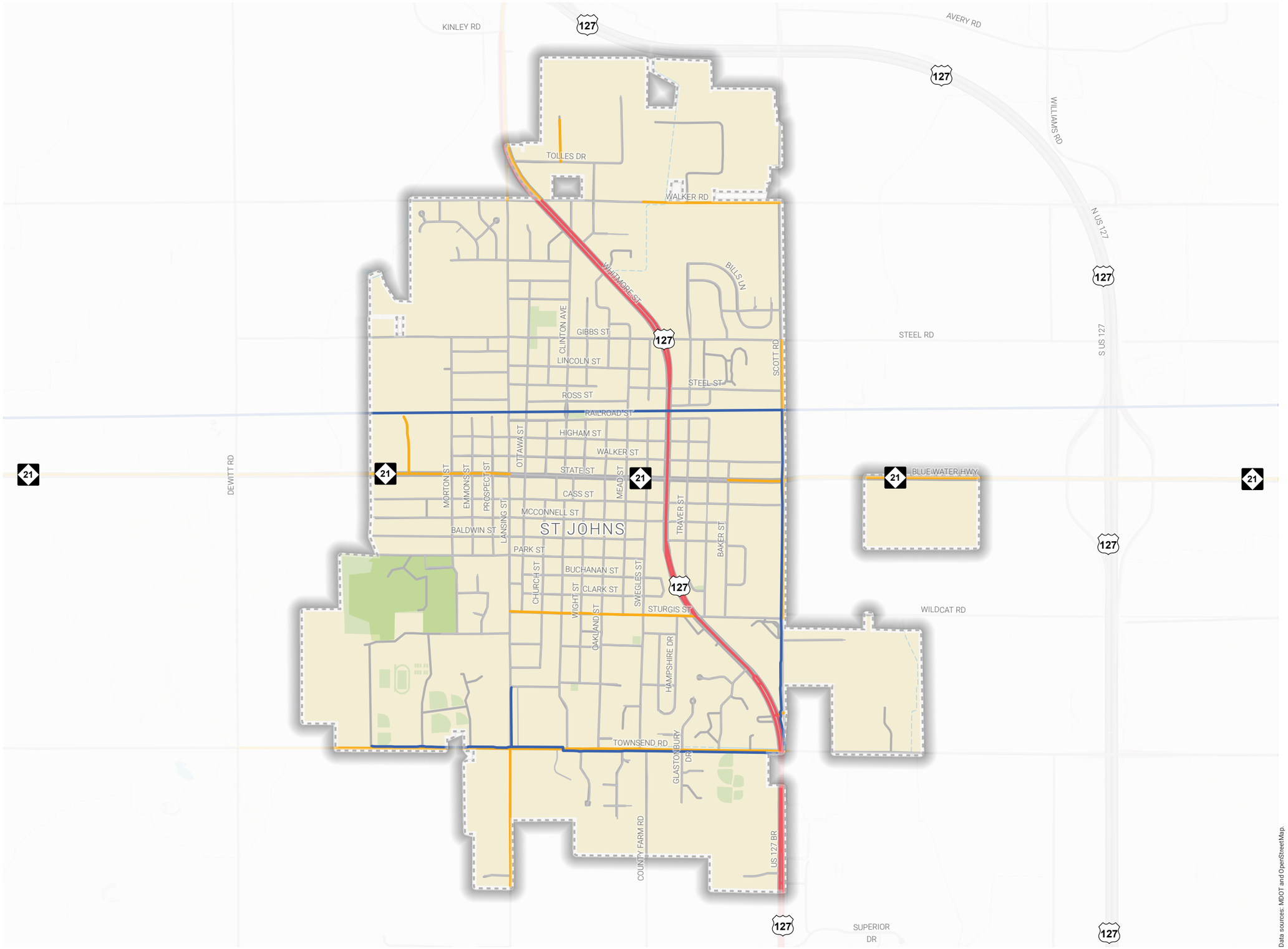


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

CITY OF TECUMSEH

PEDESTRIAN SOFT BARRIERS

LEGEND

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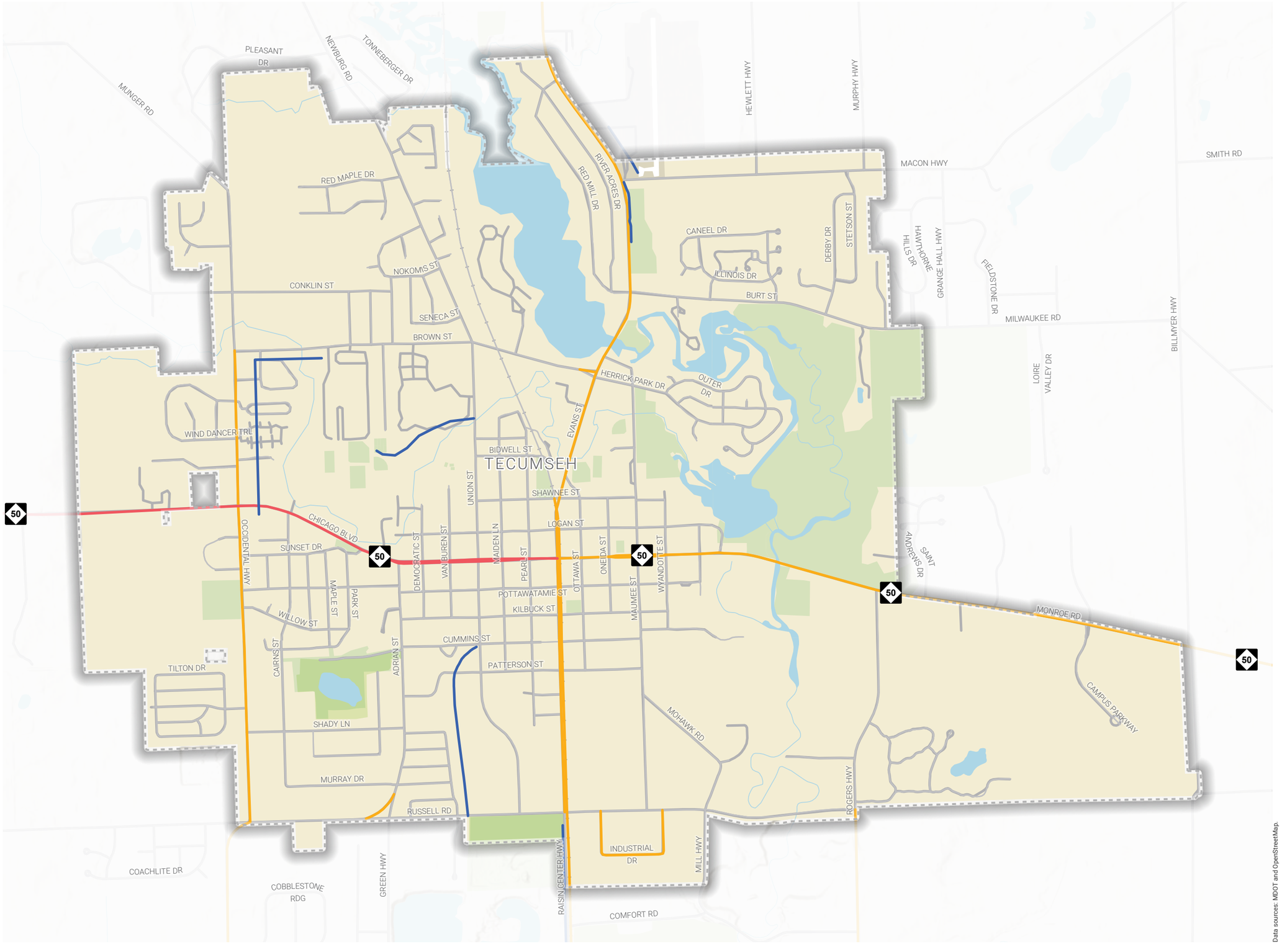


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

CITY OF YPSILANTI

PEDESTRIAN SOFT BARRIERS

LEGEND

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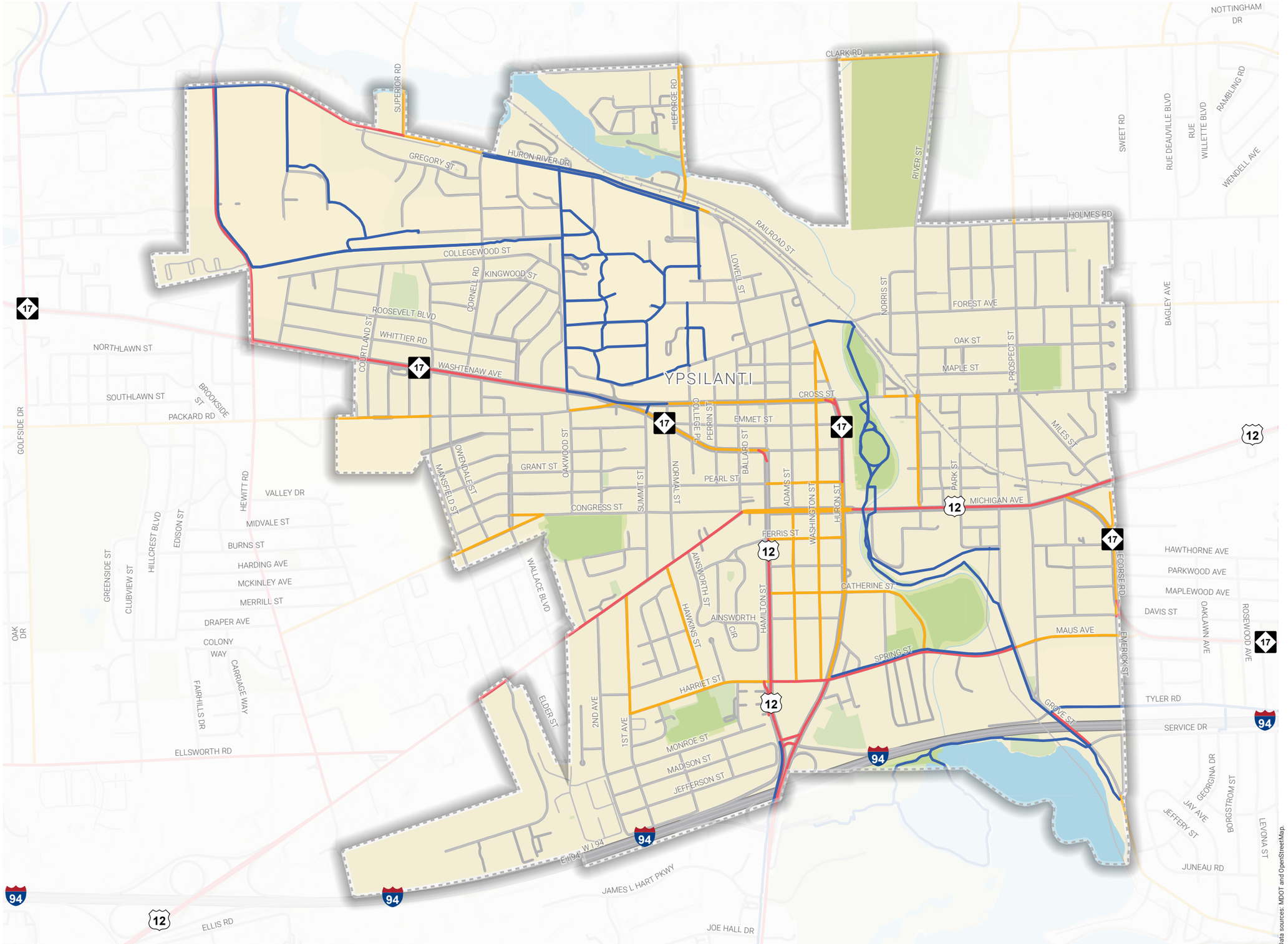


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

CLINTON COUNTY

PEDESTRIAN SOFT BARRIERS

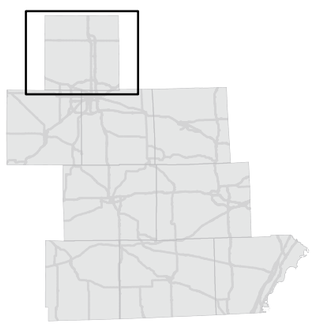
LEGEND

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UNIVERSITY REGION

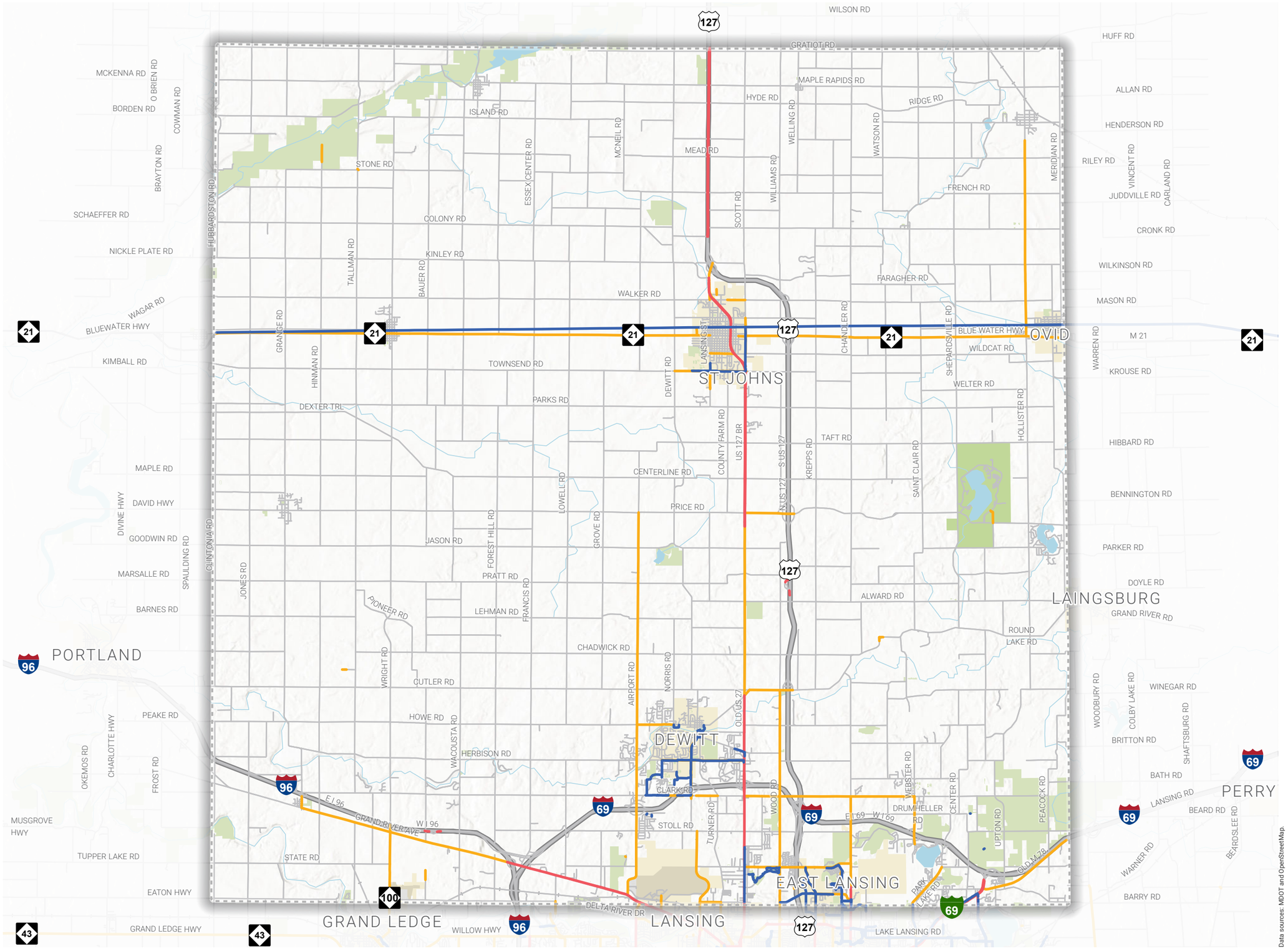


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

EATON COUNTY

PEDESTRIAN SOFT BARRIERS

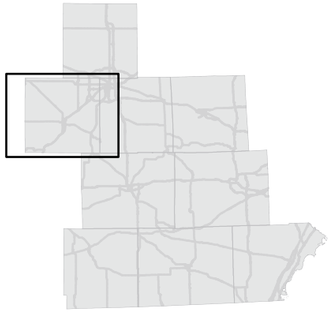
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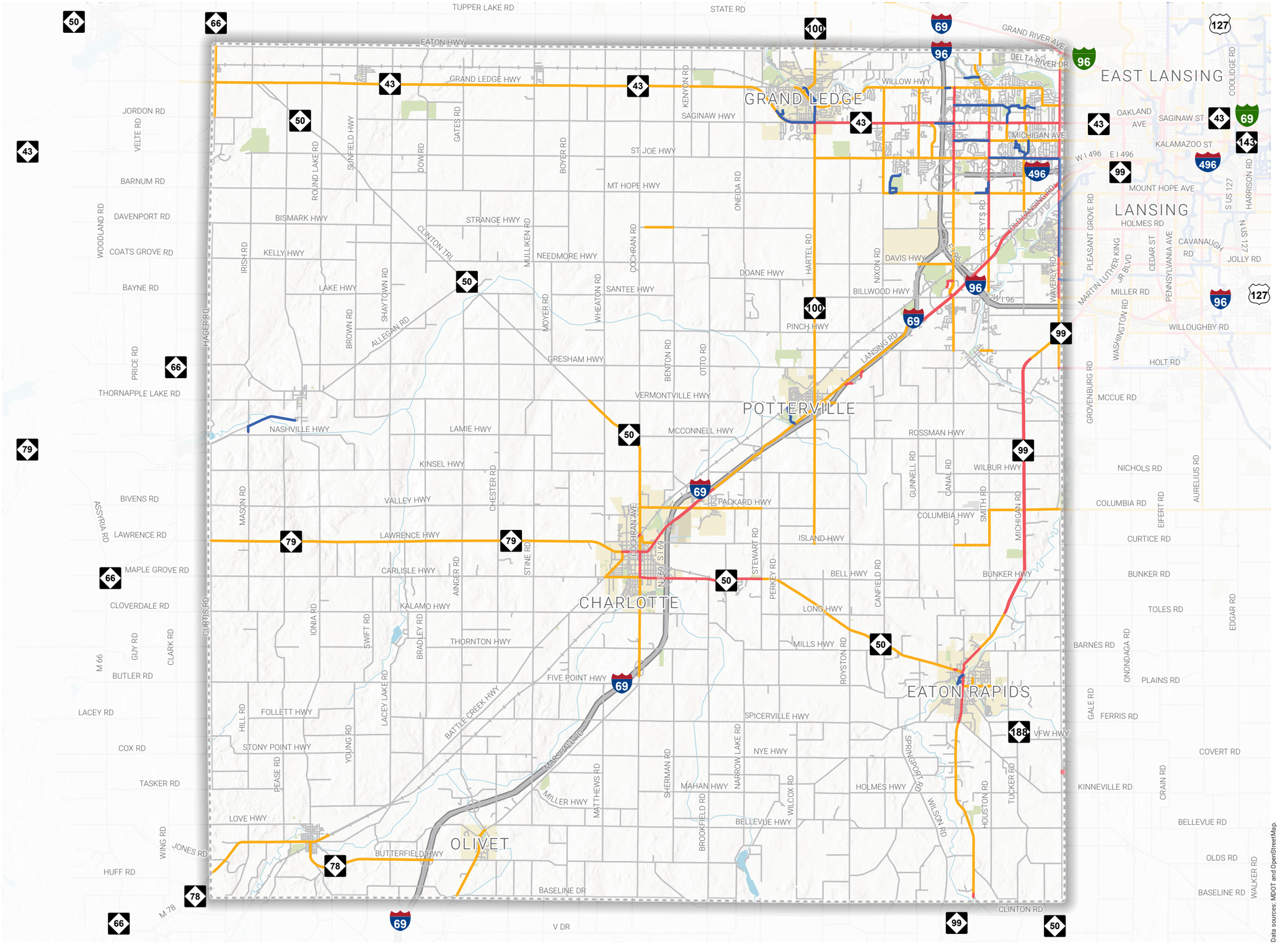
UNIVERSITY REGION



0 2 4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

GREATER LANSING

PEDESTRIAN SOFT BARRIERS

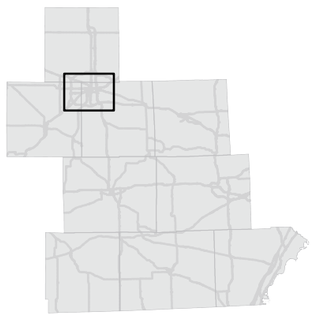
LEGEND

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UNIVERSITY REGION

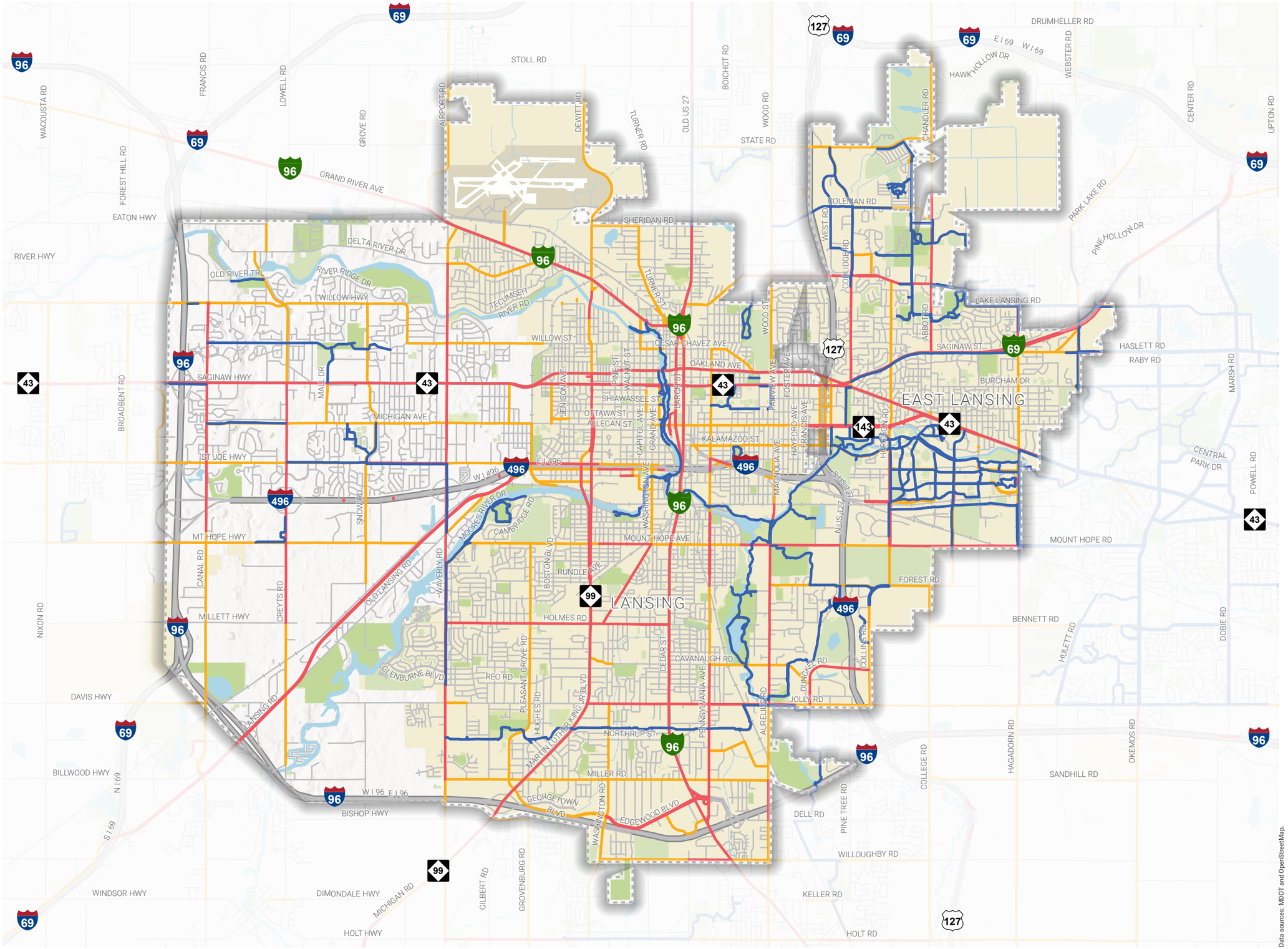


0 0.85 1.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

HILLSDALE COUNTY

PEDESTRIAN SOFT BARRIERS

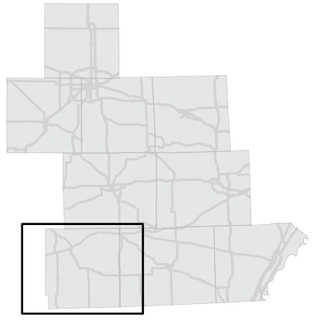
LEGEND

Pedestrian LTS (Soft Barriers Analysis)

- Major Soft Barrier
- Minor Soft Barrier
- Not a Barrier
- Shared-Use Path / Sidepath
- Parks
- Railroads
- City Boundary

This analysis identifies “soft barriers”—roadways where crossing conditions are uncomfortable for pedestrians, even if the route itself is otherwise walkable.

UNIVERSITY REGION

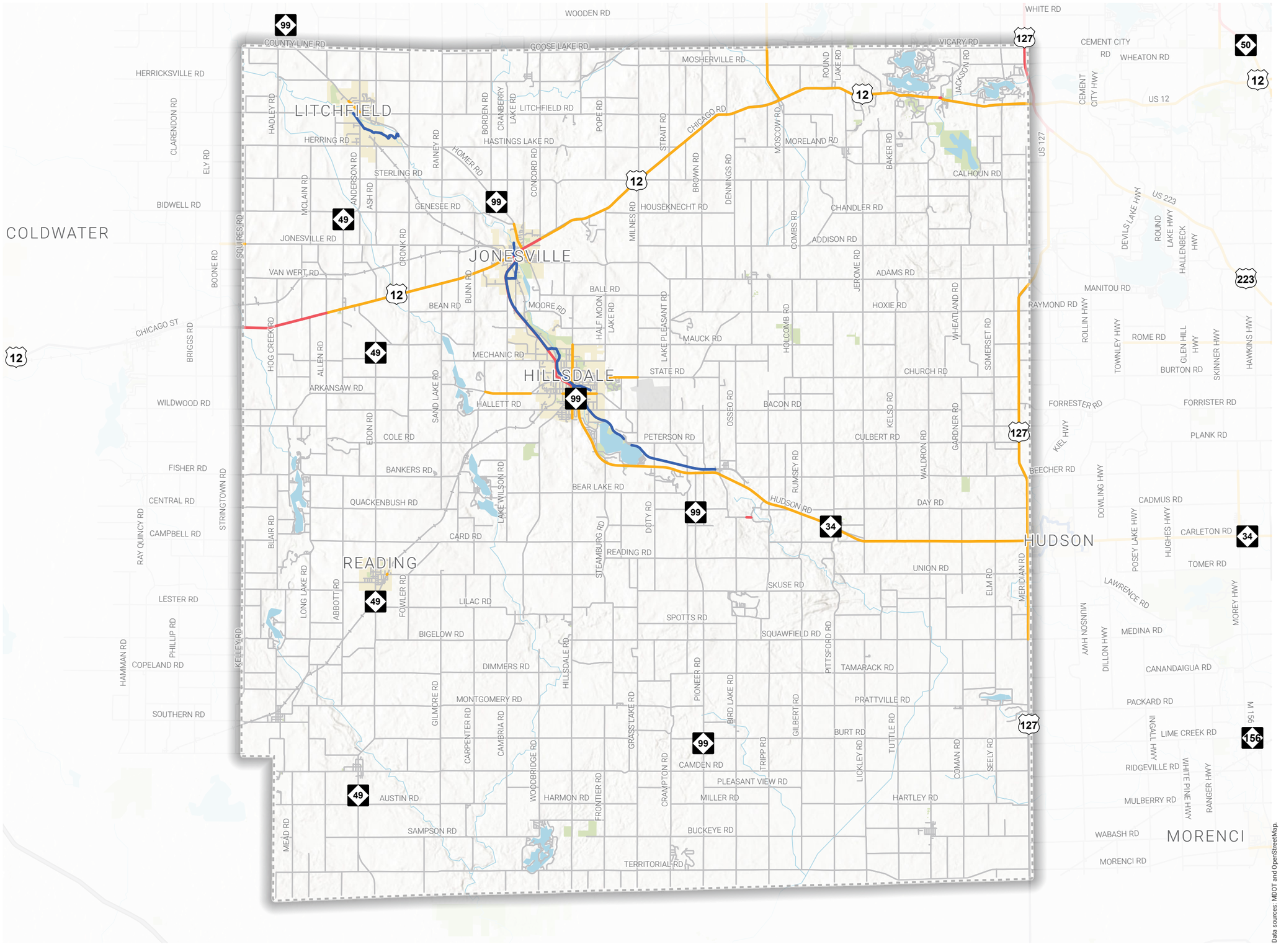


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

INGHAM COUNTY

PEDESTRIAN SOFT BARRIERS

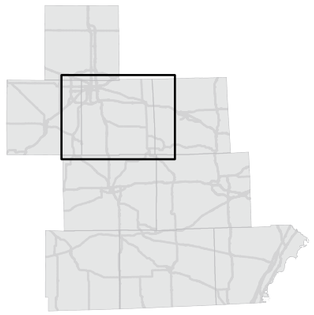
LEGEND

Pedestrian LTS (Soft Barriers Analysis)

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- Parks
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UNIVERSITY REGION

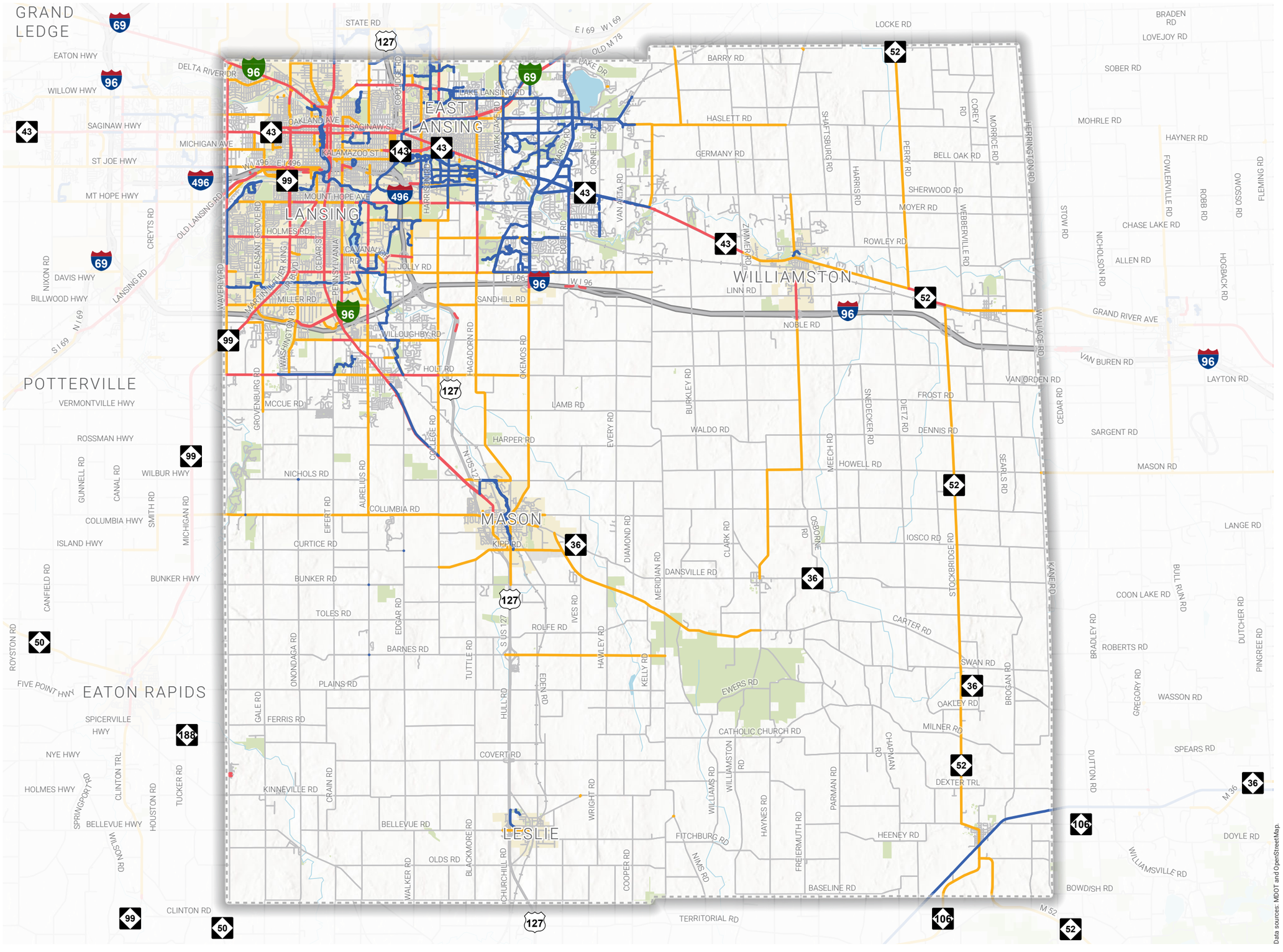


0 2 4 MILES

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MDOT Michigan Department of Transportation

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JACKSON COUNTY

PEDESTRIAN SOFT BARRIERS

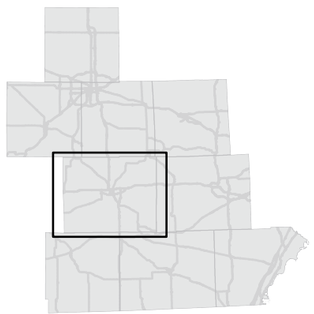
LEGEND

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UNIVERSITY REGION

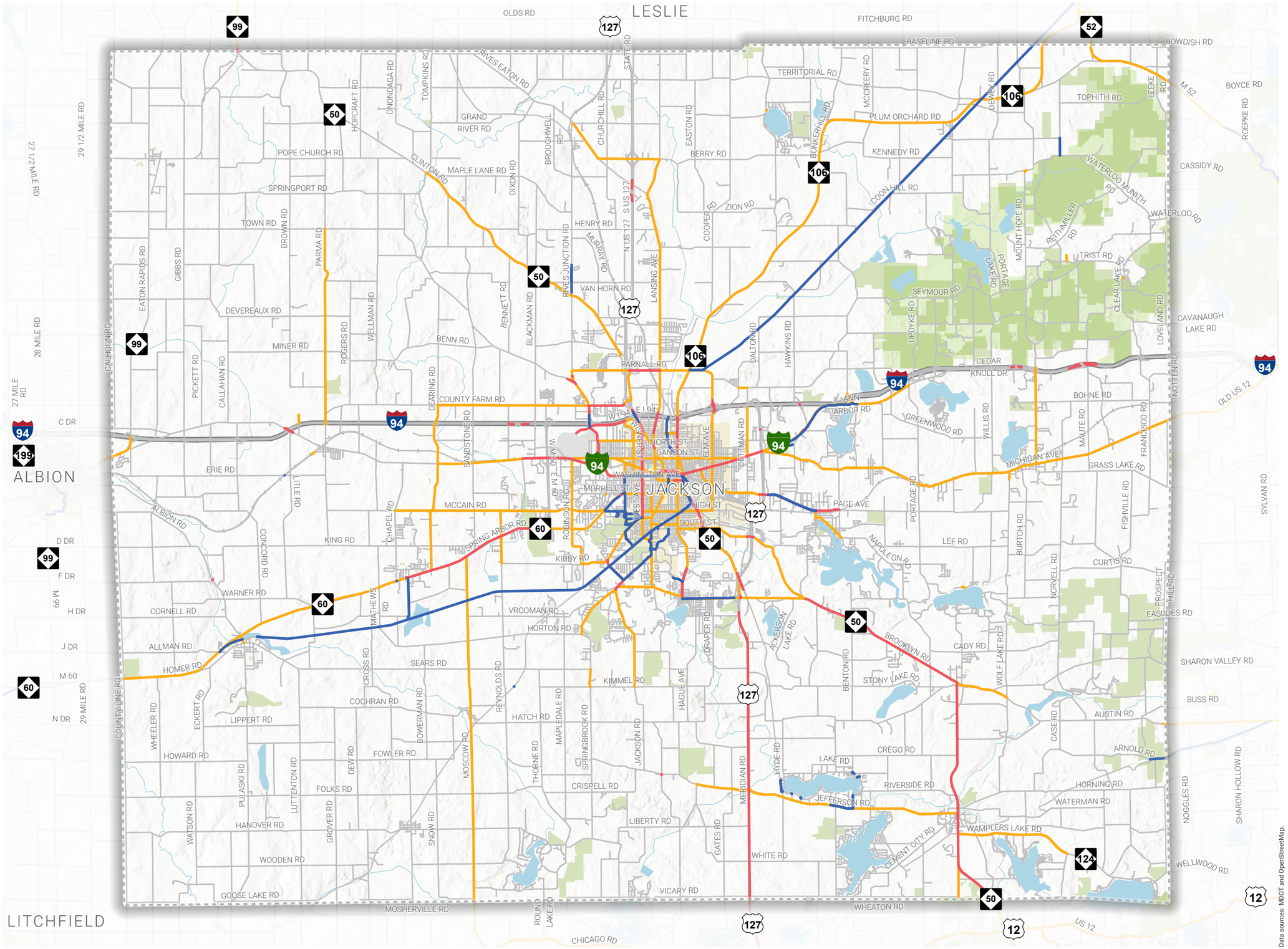


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

LENAWEE COUNTY

PEDESTRIAN SOFT BARRIERS

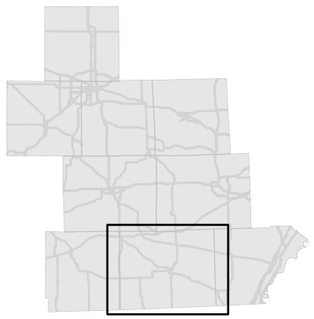
LEGEND

Pedestrian LTS (Soft Barriers Analysis)

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- Not a Barrier
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- City Boundary

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UNIVERSITY REGION



0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

LIVINGSTON COUNTY

PEDESTRIAN SOFT BARRIERS

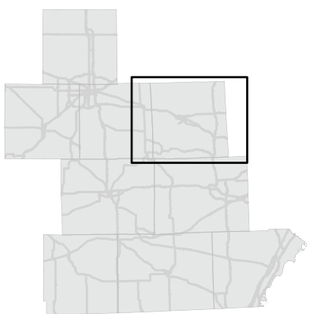
LEGEND

Pedestrian LTS (Soft Barriers Analysis)

- Major Soft Barrier
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UNIVERSITY REGION

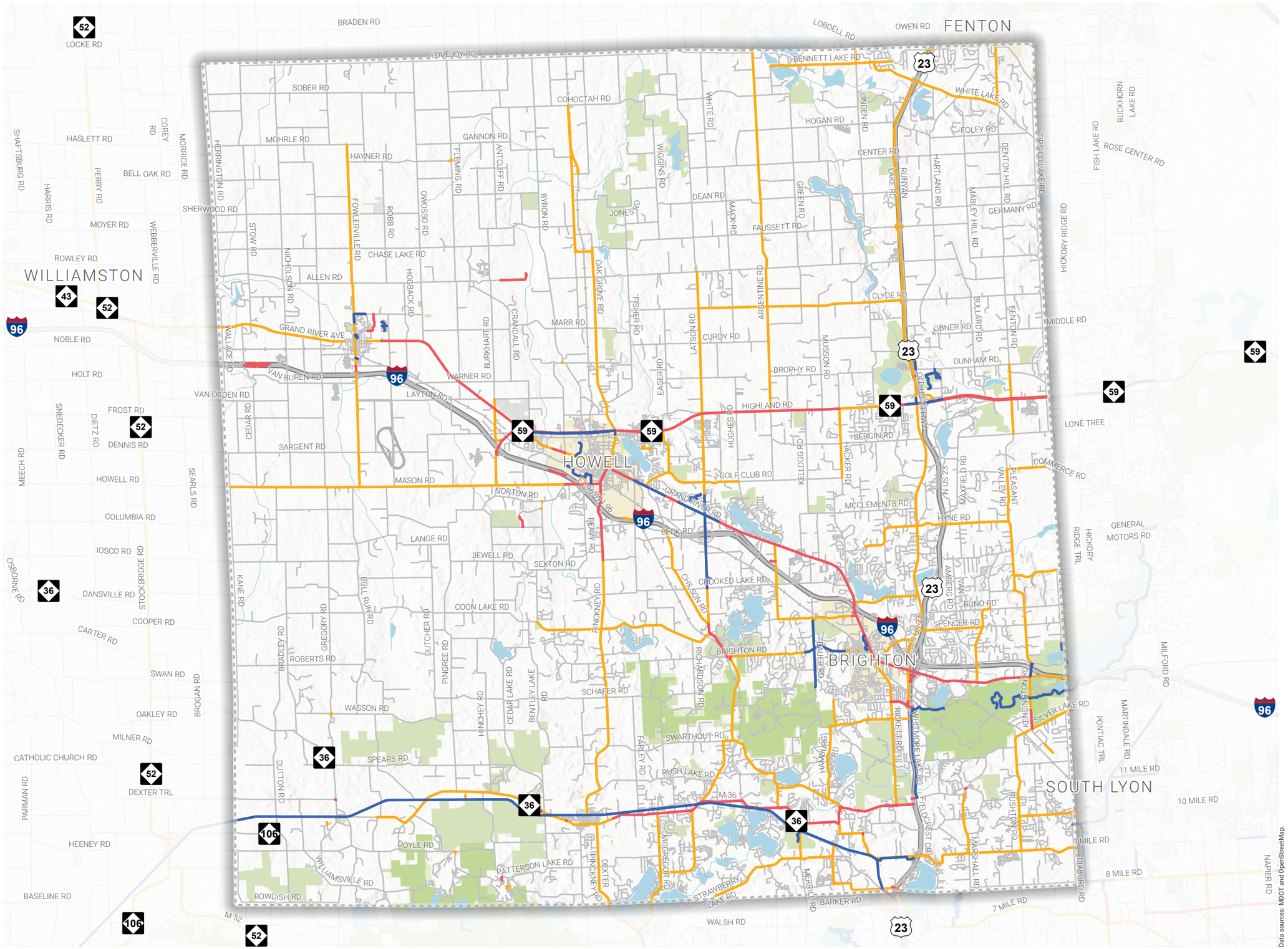


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT and OpenStreetMap.

MONROE COUNTY

PEDESTRIAN SOFT BARRIERS

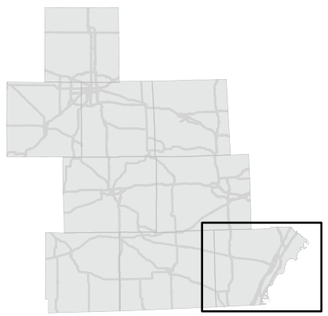
LEGEND

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UNIVERSITY REGION

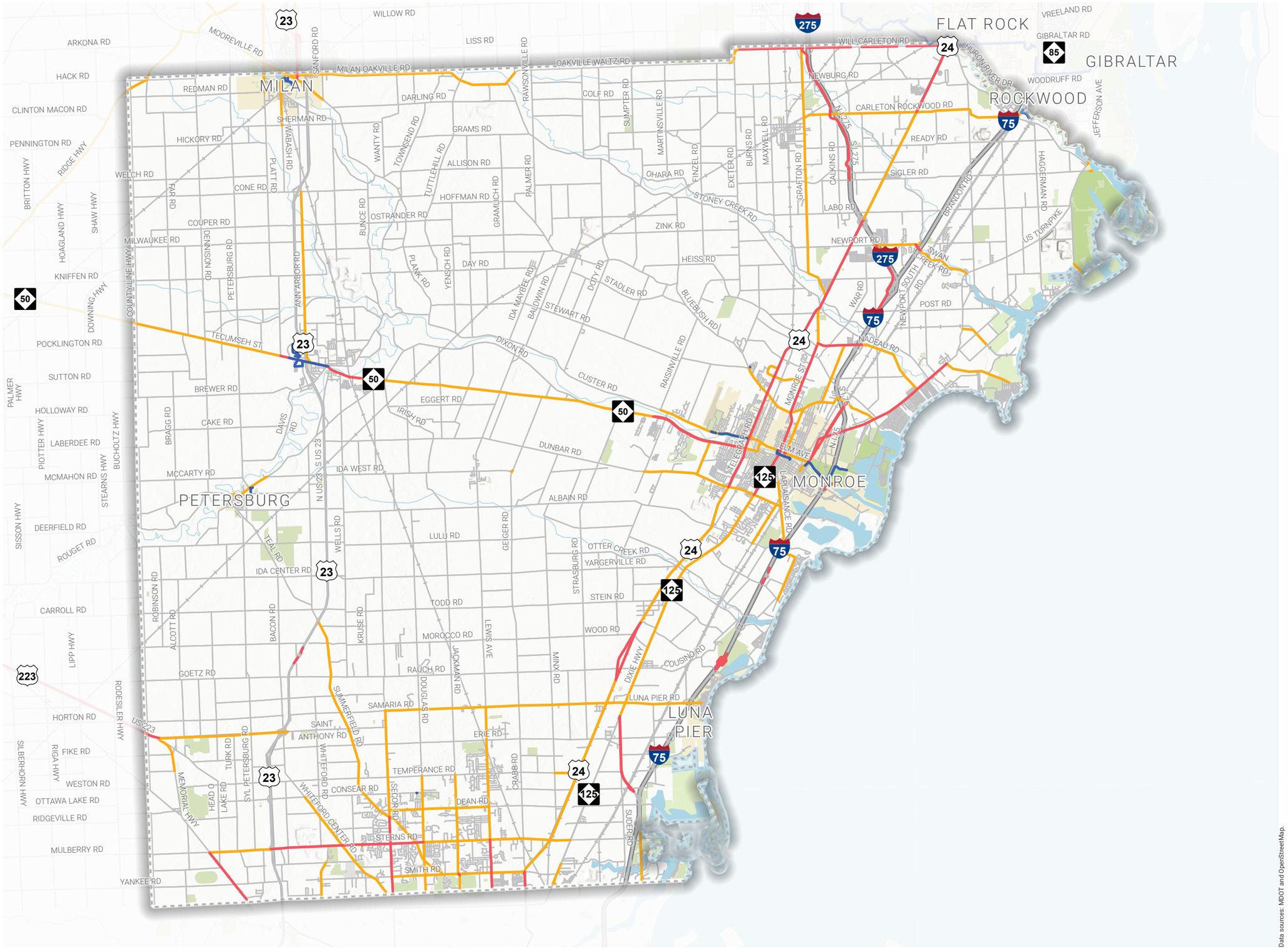


0 2 4 MILES

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MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap.

WASHTENAW COUNTY

PEDESTRIAN SOFT BARRIERS

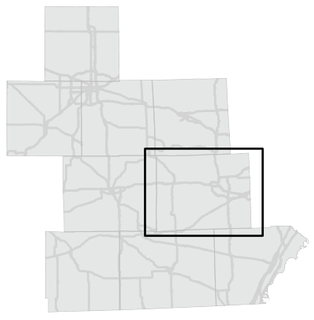
LEGEND

Pedestrian LTS (Soft Barriers Analysis)

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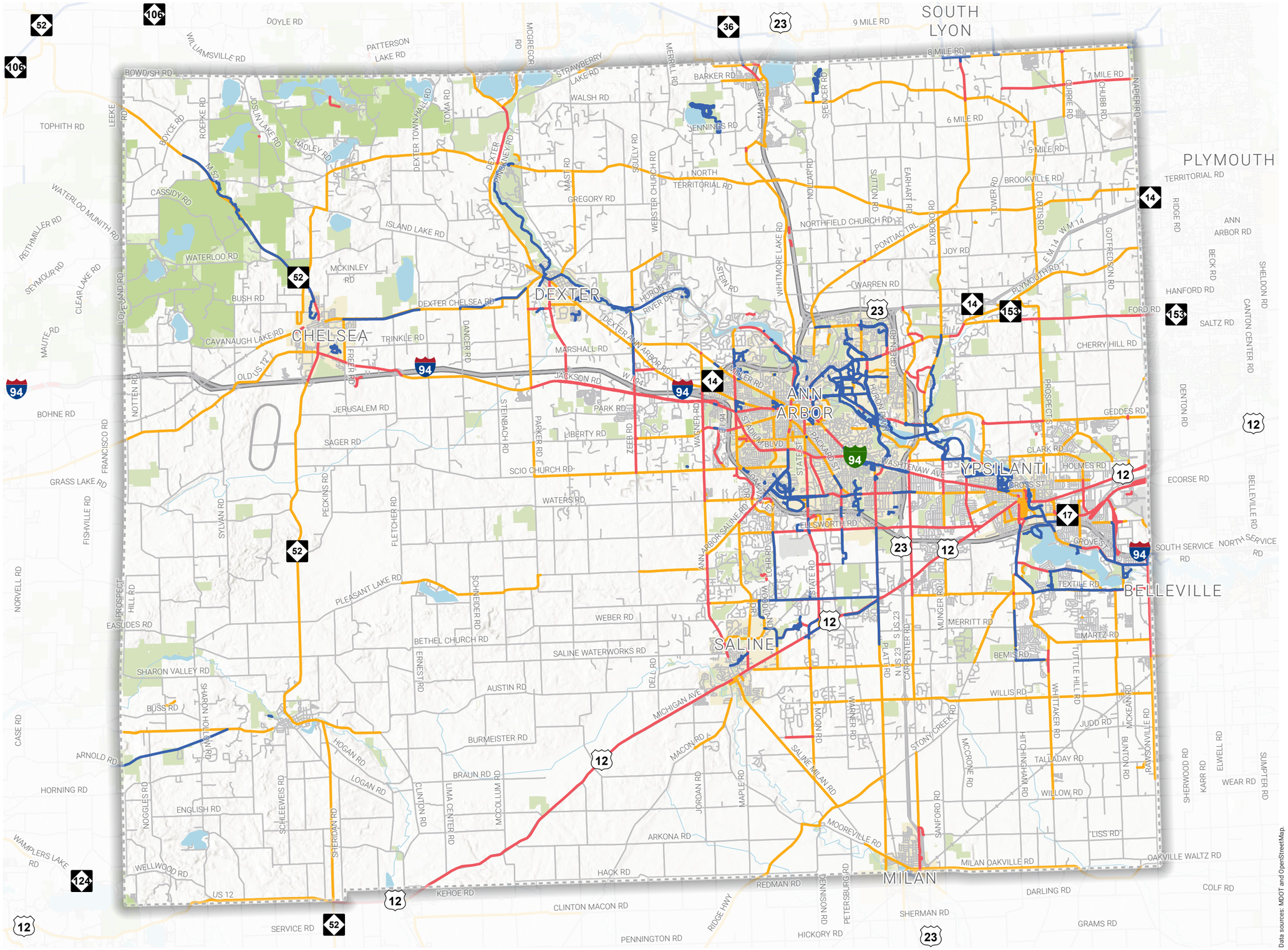


0 2 4 MILES

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MDOT Michigan Department of Transportation

alta



Data sources: MDOT and OpenStreetMap

Appendix F - Demographic Analysis

Overview and Methodology

The project team gathered the datasets below into a database at the census block group level to complete the demographic analysis. The project team compiled these variables, percentile rank[1] them relative to the study region (University Region), and then combine them through a weighted sum using the weights in Table 8. Once the index was calculated, a map of the results was generated by categorizing all the census block groups into five bins that indicate how high they score on the index.[2] Higher scores indicate areas of higher priority. Identification of priority areas were determined based on the composite score. For the purposes of this plan, block groups with a composite score in the top quintile (top 20%) were considered an area of highest need.

This process was designed and facilitated by Alta Planning + Design and may not align with similar analyses processes produced by the Michigan Department of Transportation.

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[1] Percentile ranking is a way to evaluate the relative standing of a value within a data set. A percentile rank is the percent of scores in the distribution that are less than it. For example, if Block Group A receives a 0.65 percentile rank for total population, that means that out of all the census block groups in the study area, 65% of them have a smaller total population than Census Block A.

[2] The census block groups are categorized using quartiles, which means that the distribution of their index scores is broken out into four bins comprised of an equal number of census block groups in each bin.

Equity Index Variables and Weighting

Category	Variable Name	Data Source	Variable Weight (%)	Rationale
Opportunity + Accessibility	Economic Opportunity	Opportunity Atlas	10%	Mean predicted 'Kid Family Rank' (The Opportunity Atlas' percentile measure of economic mobility) of children from all races, all genders and with parents in the 25th percentile in the national household income distribution. In other words, this variable measures a tract's economic mobility for children from lower-income families.[3]
	Zero Vehicle Households	2022 American Community Survey 5-Year Estimate	10%	The American Community Survey counts the number of households in each tract without access to a motor vehicle. These families either travel less or rely on transit, walking, or biking for transportation.
Environmental Justice	Air Quality	Environmental Justice Screen	5%	The Environmental Justice Screen data provided by the Environmental Protection Agency offers a measure of air pollution in the form of particulate matter called PM25. PM25 is often associated with motor vehicle transportation and has negative health effects for communities, particularly communities of color.

[3] More details: The measure of economic mobility (kid family rank or KFR) for each 2020 tract based on weighted values of kfr_pooled_pooled_p25 from the Opportunity Atlas using 2010 census tracts. KFR is the mean percentile rank (relative to other children born in the same year) in the national distribution of household income (i.e. own earnings and spouse's earnings) measured as mean earnings in 2014-2015 for the baseline sample.

	Canopy Coverage	Tree Equity Index	5%	The Tree Equity Index provides data on how well covered a city is by tree canopy compared to its natural land cover. Active transportation projects have the potential to increase canopy cover, which has health and air quality benefits. This data is only available in urbanized areas and is less applicable to transportation analyses in rural contexts.
Health + Safety	Coronary Heart Disease	Centers of Disease Control	5%	The Centers of Disease Control data provides a model estimate for coronary heart disease among adults over the age of 18 in each census tract. Active transportation projects can increase the opportunities for people to be physically active, thereby lowering their risk for coronary heart disease.
Affordability	Housing Cost Burden	2022 American Community Survey 5-Year Estimate	5%	Percentage of households in a census tract that are earning less than 80% of United States Department of Housing and Urban Development Area Median Family Income by county and are paying greater than 30% of their income to housing costs.[4]
Vulnerability	Percent People of Color (Non-white)	2022 American Community Survey 5-Year Estimate	20%	The American Community Survey provides racial and ethnic population data for every census block group. Transportation planning has a legacy of excluding and marginalizing people of color from power and decision-making processes, often resulting in harmful outcomes that compound existing transportation inequities.

[4] *The calculations for this are drawn from Table 8 of the Comprehensive Housing Affordability Strategy. This methodology was developed in collaboration between CEJST and HUD. To compute this variable, calculate the following: (# of Owner Occupied Units Meeting Criteria + # of Renter Occupied Units Meeting Criteria) / (Total # of Owner Occupied Units + Total # of Renter Occupied Units - # of Owner Occupied Units with HUD Area Median Family Income (HAMFI) Not Computed - # of Renter Occupied Units with HAMFI Not Computed).*

	200% Level Poverty	2022 American Community Survey 5-Year Estimate	25%	The American Community Survey provides data on the percent of the population whose household income is less than 200% of the federal poverty level. Households with lower incomes may have fewer transportation options and access to destinations than households with higher incomes. Investments in active transportation infrastructure can improve the transportation options available to lower income households, which is why it is included in this index.
	Educational Attainment	2022 American Community Survey 5-Year Estimate	10%	The American Community Survey offers a count of the number of people in each tract who have completed various levels of education. Educational attainment is closely related to income levels, which impact housing location, travel behavior and decision making which is why it is included in this index.
	Aged less than 17, more than 65	2022 American Community Survey 5-Year Estimate	5%	The American Community Survey provides population data for various age group levels in every census block group. Youth (those aged less than 17) and seniors (more than 65) are the most vulnerable users of the transportation system and therefore stand to benefit the most from active transportation investments that make the network safer and more accessible.

Demographic Analysis Maps

CITY OF ADRIAN

DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

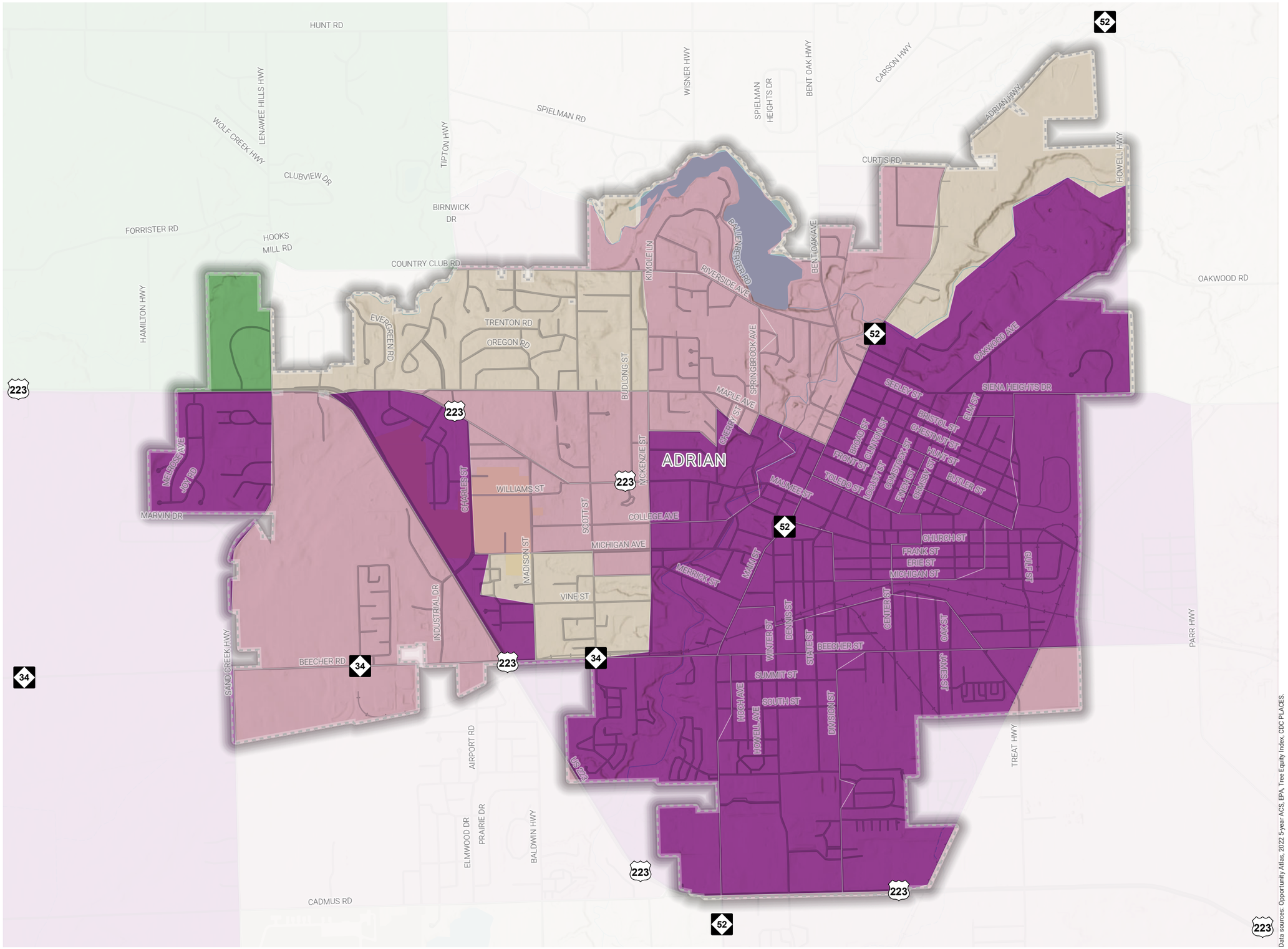


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF ANN ARBOR

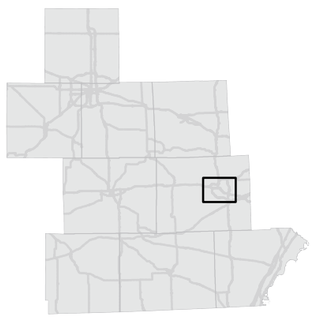
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

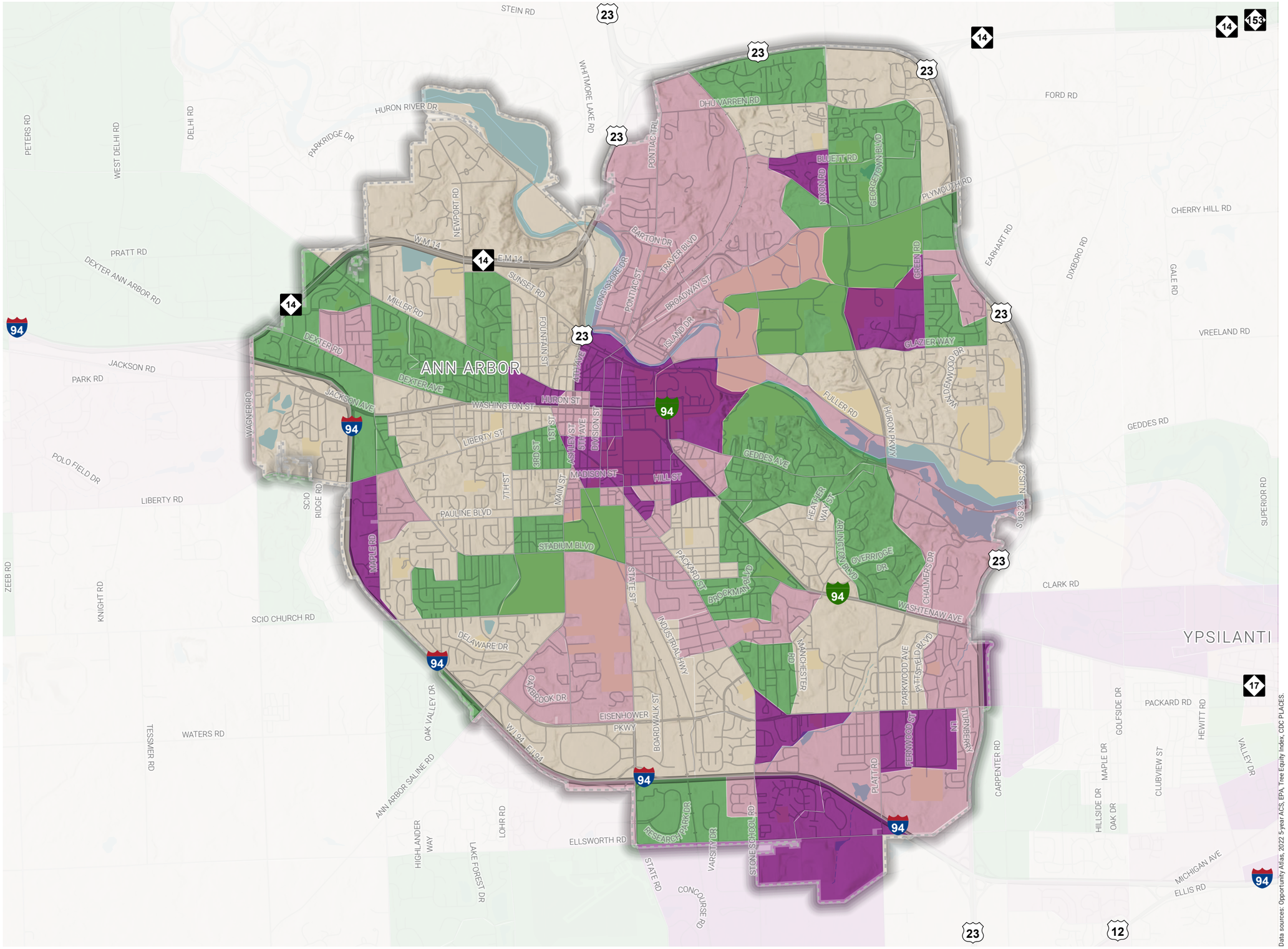


0 0.55 1.1 MILES

N

MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF BRIGHTON

DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

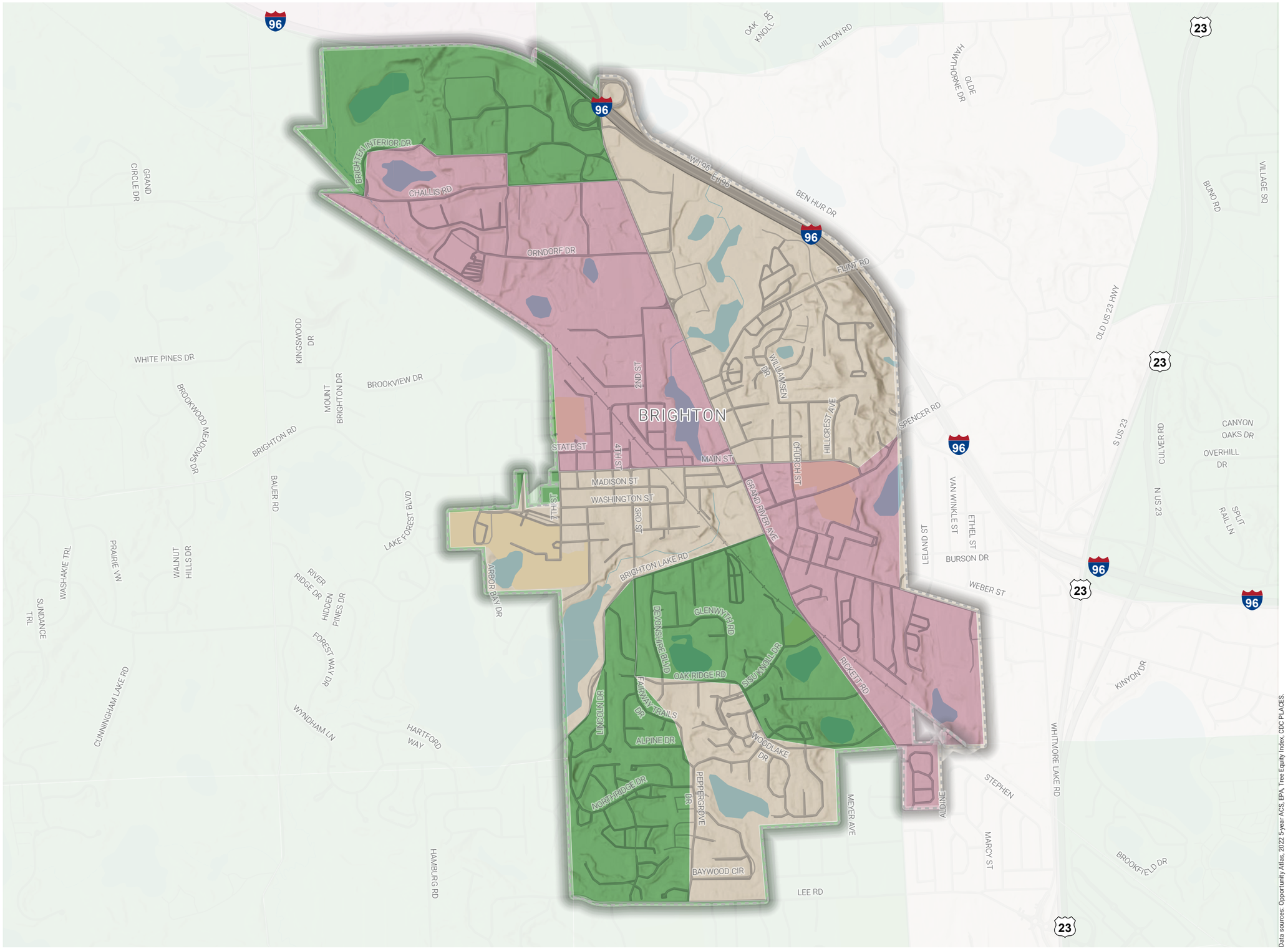


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N

MDOT Michigan Department of Transportation

alta



Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF CHARLOTTE

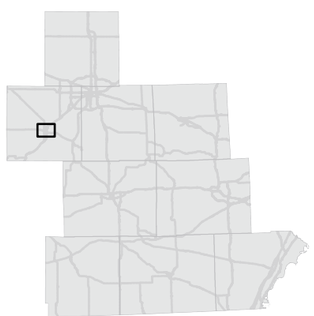
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

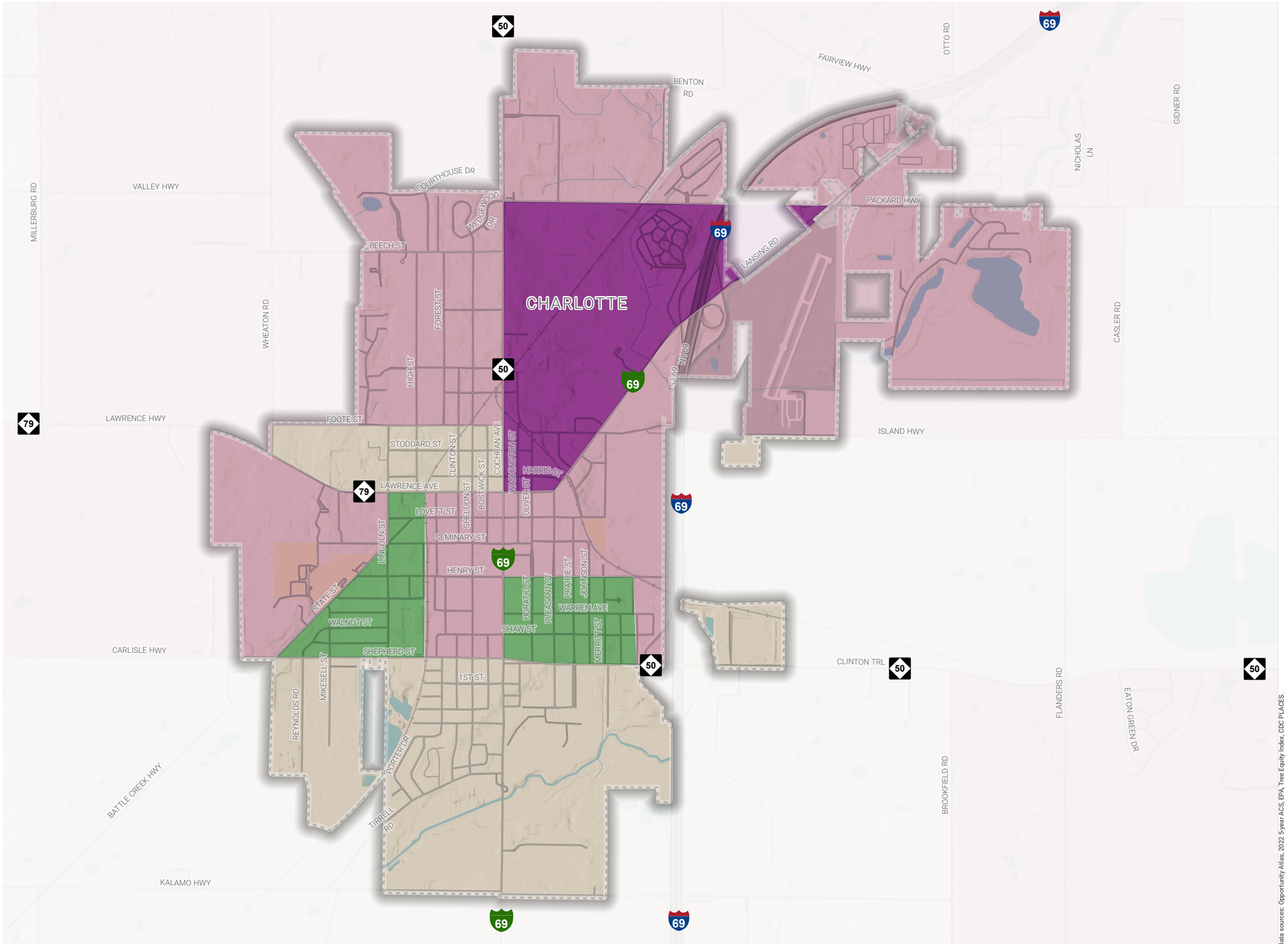


0 0.3 0.6 MILES

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MDOT Michigan Department of Transportation

alta



Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF HILLSDALE

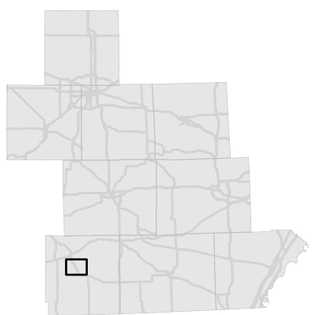
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

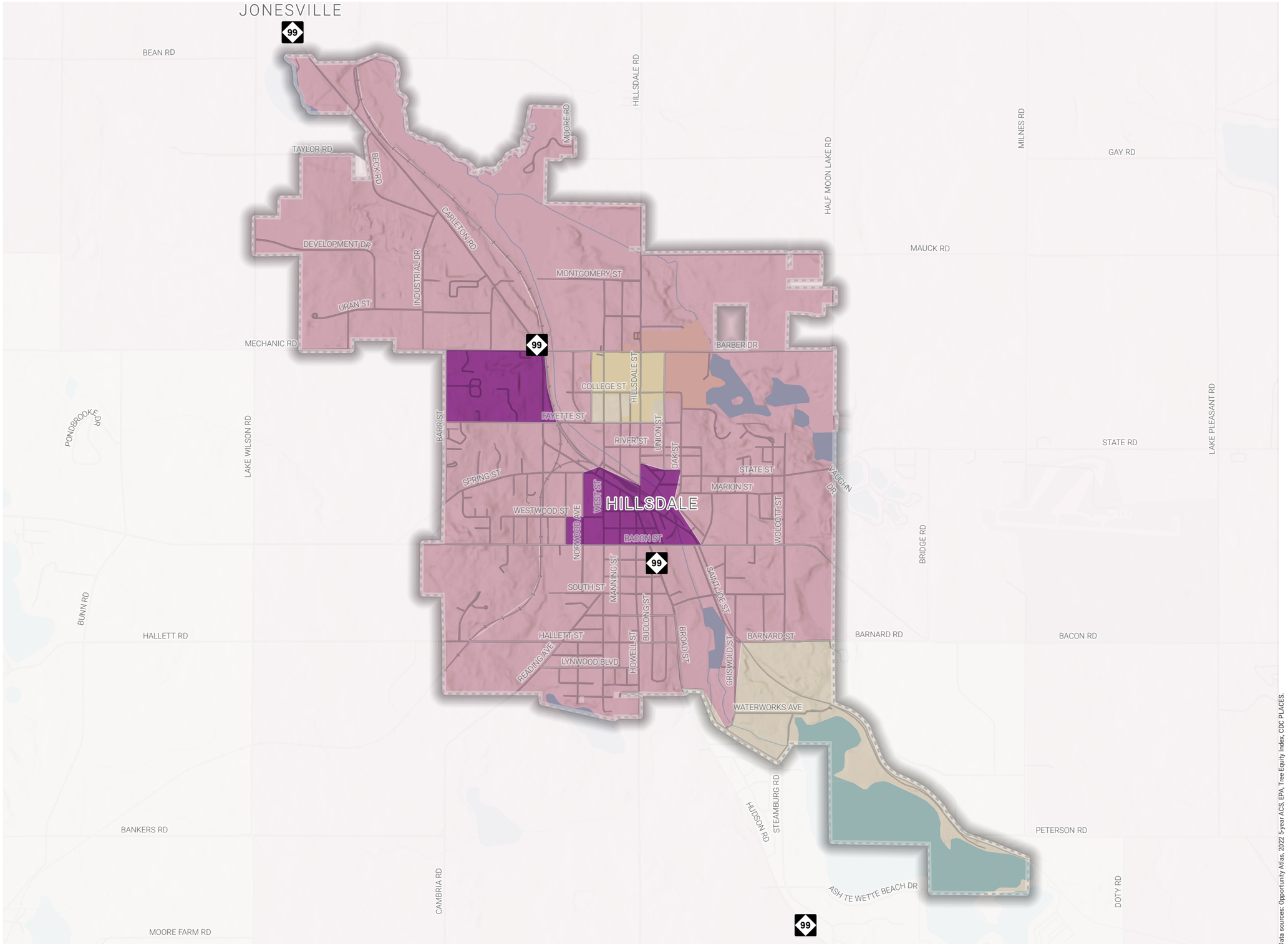


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA Tree Equity Index, CDC PLACES.

CITY OF HOWELL

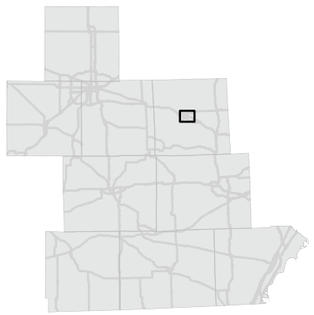
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

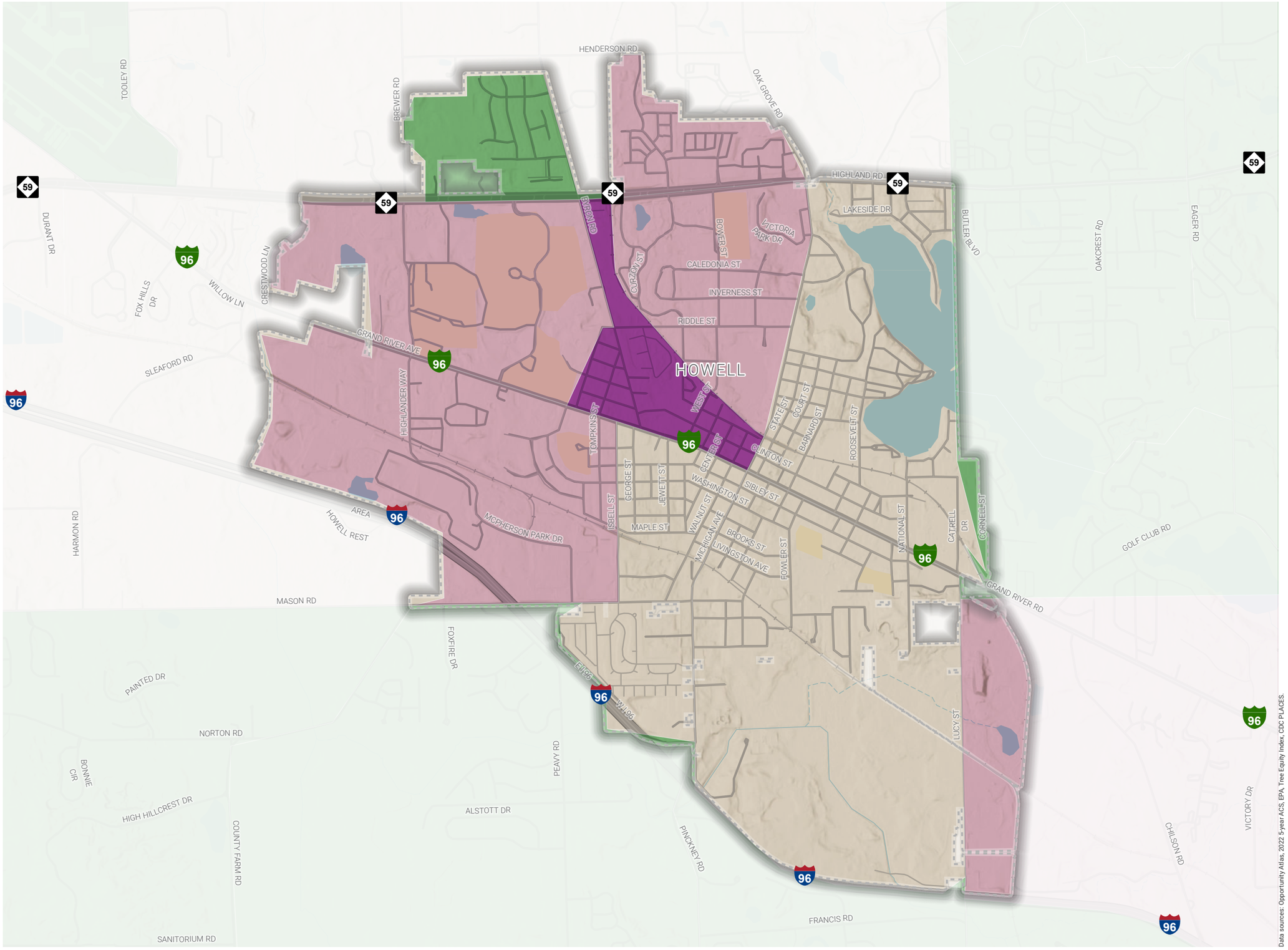


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF JACKSON

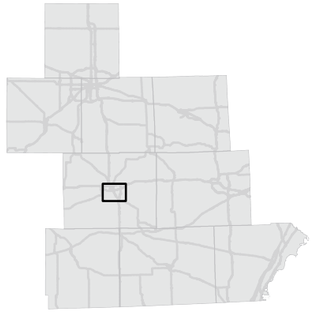
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

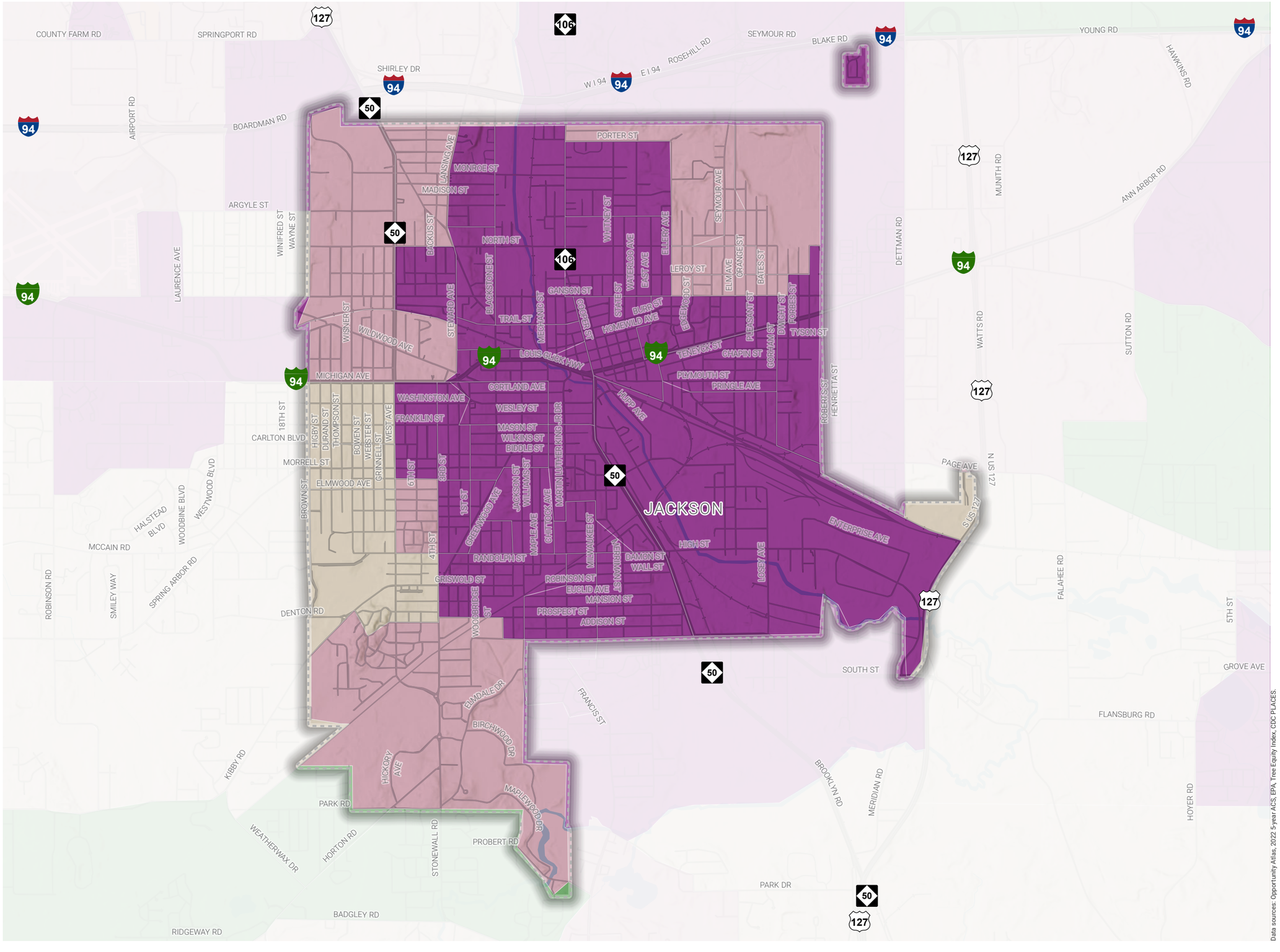


0 0.4 0.8 MILES

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MDOT Michigan Department of Transportation

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CITY OF LITCHFIELD

DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

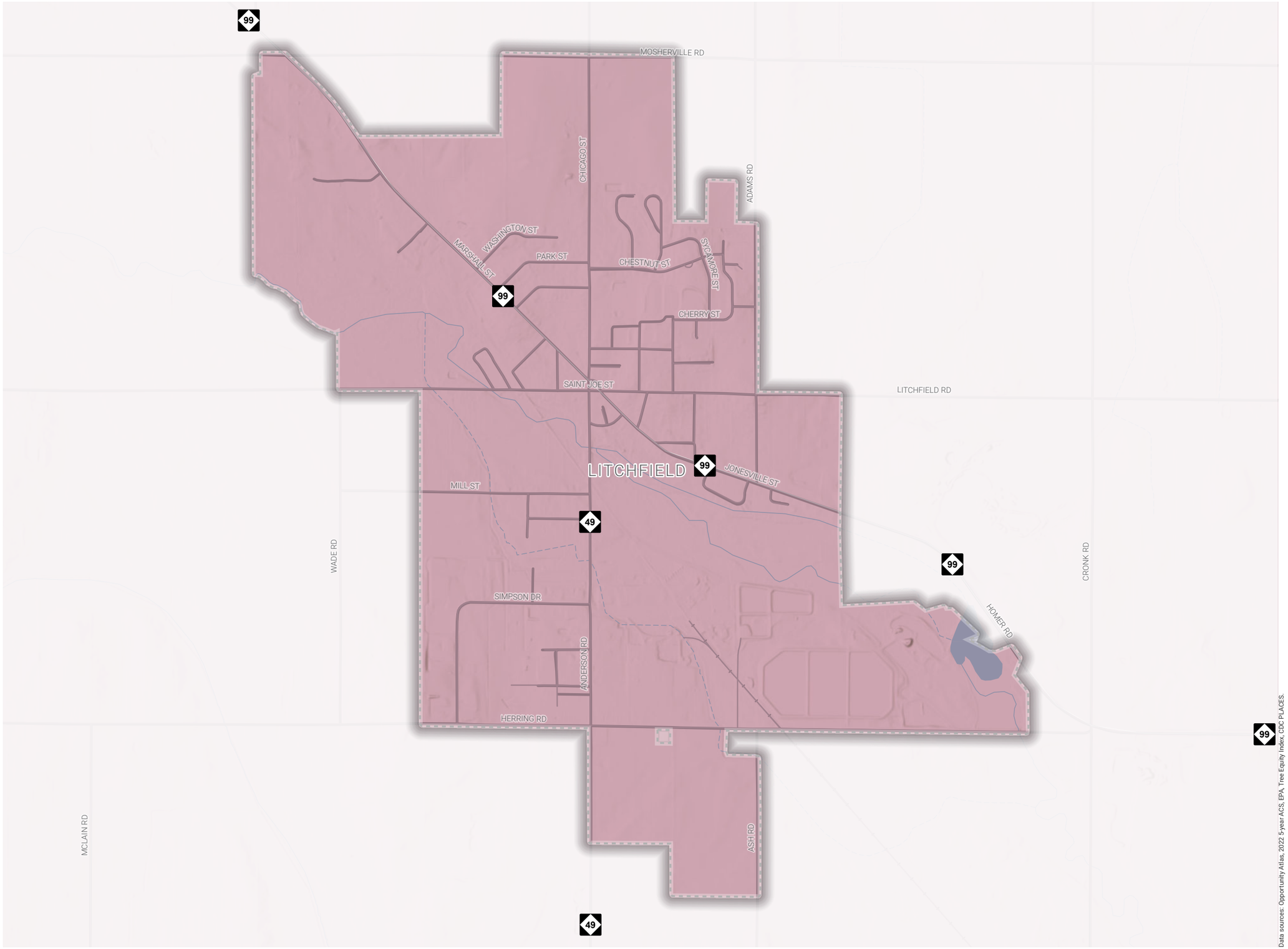


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF MASON

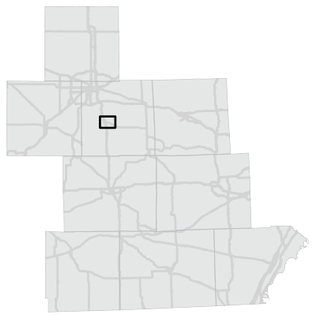
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

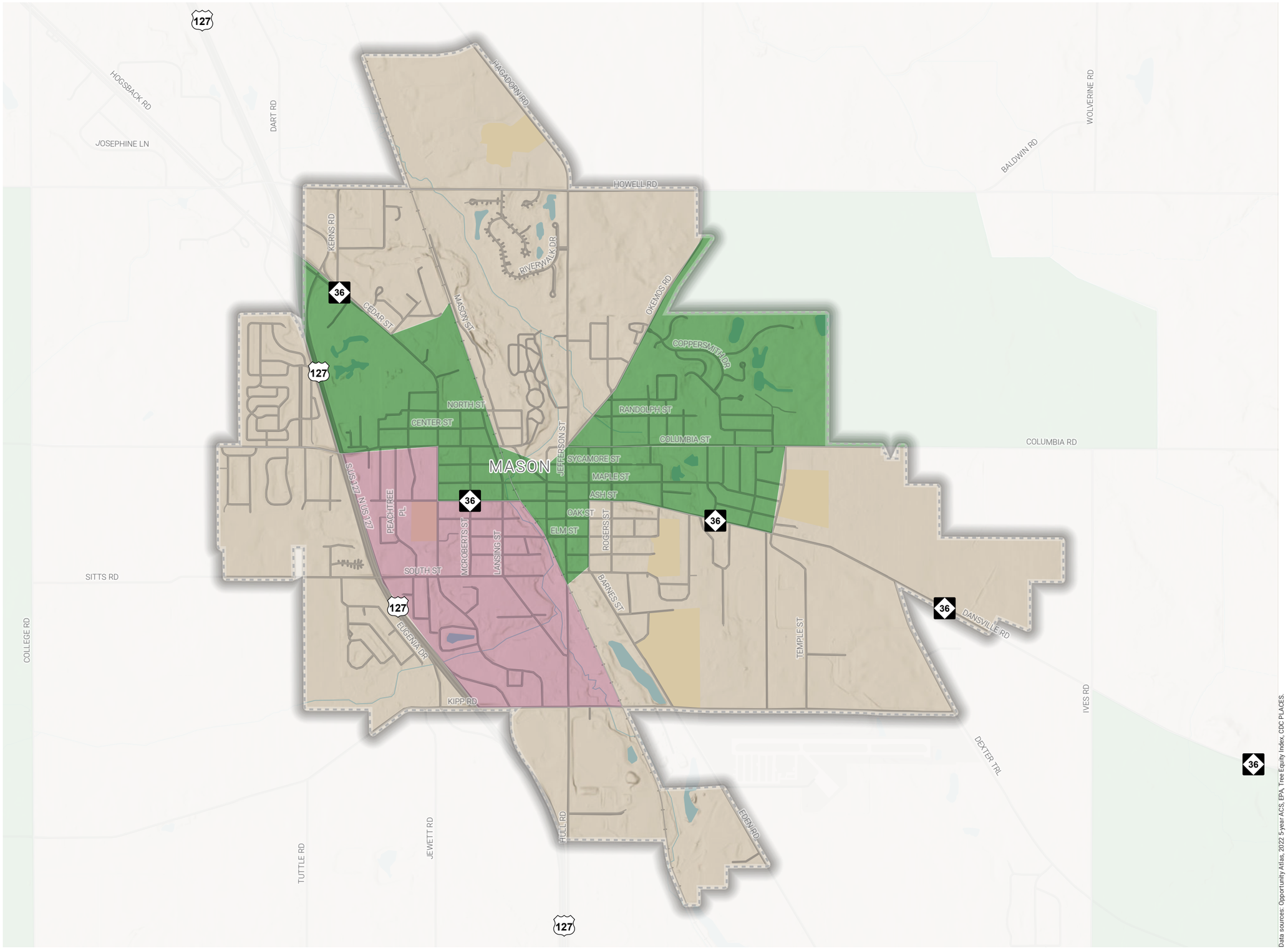


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF MILAN

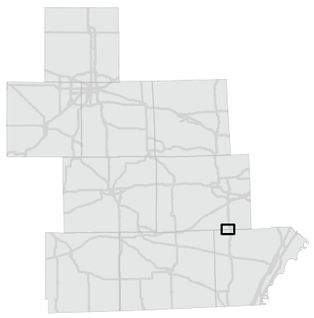
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

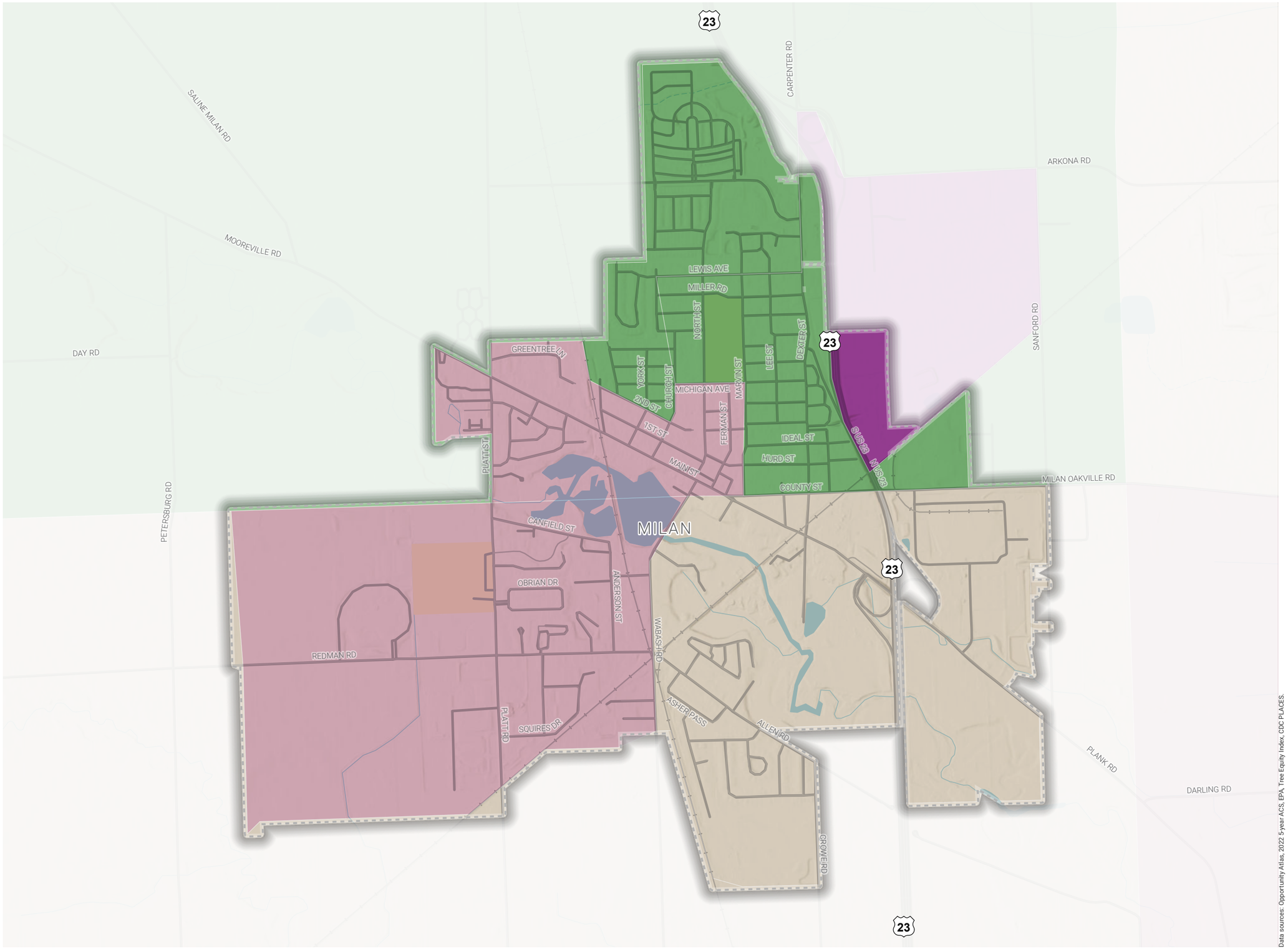


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF MONROE

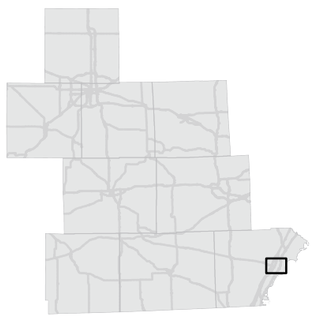
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

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- Railroads

UNIVERSITY REGION

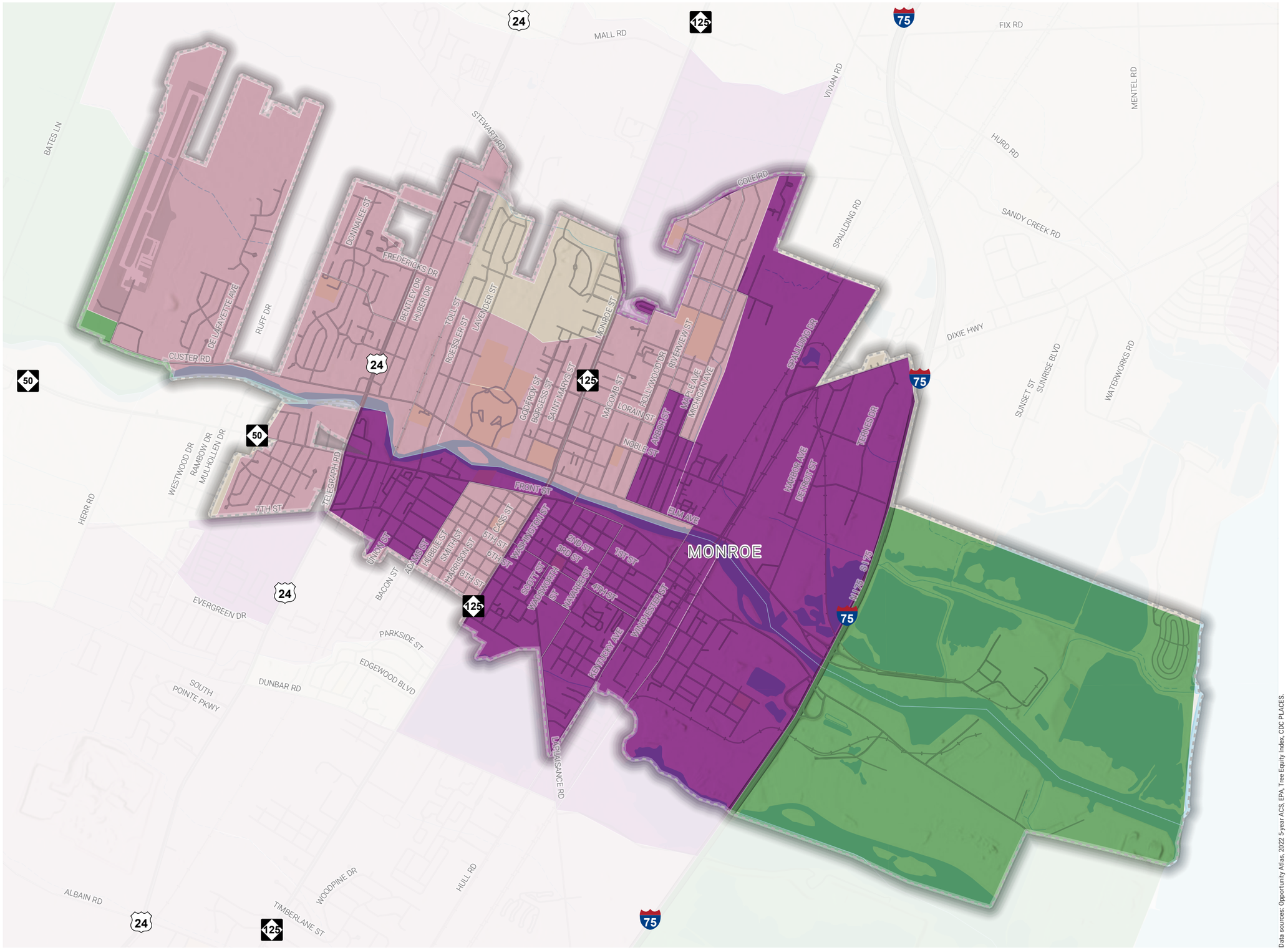


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MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF ST JOHNS

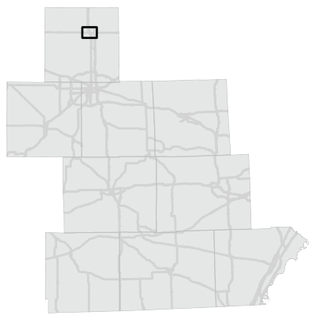
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

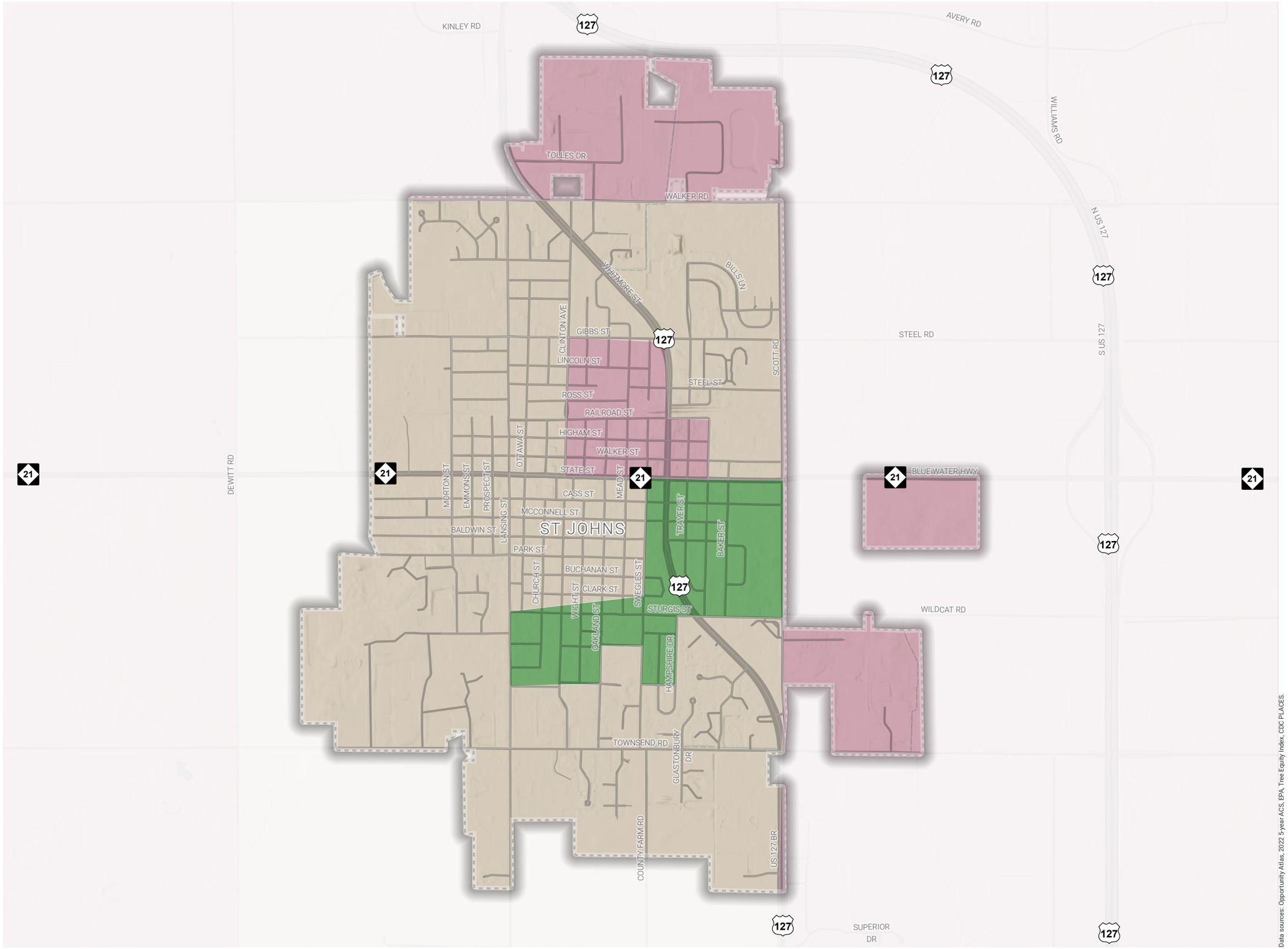


0 0.25 0.5 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CITY OF TECUMSEH

DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

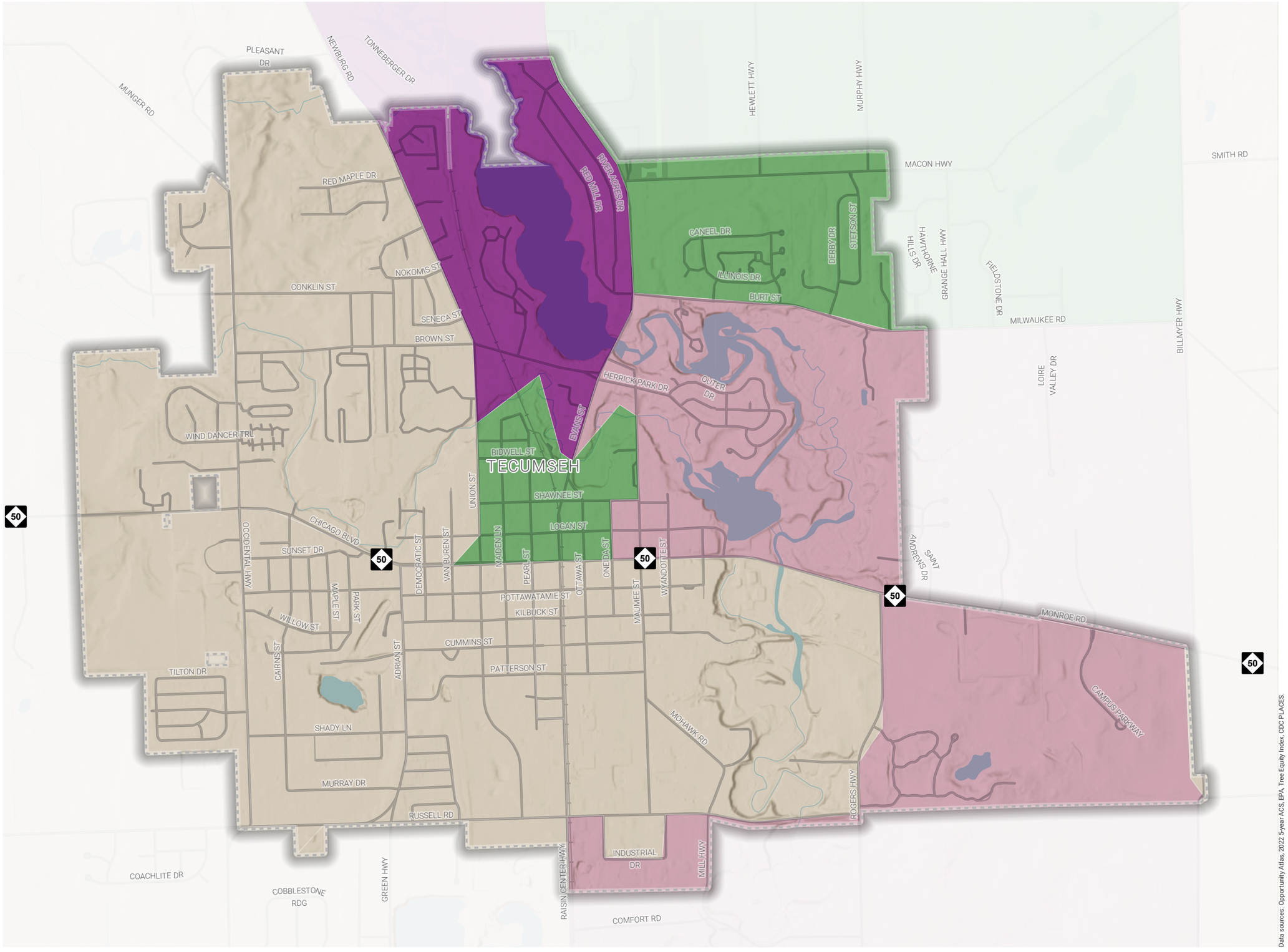
UNIVERSITY REGION



0 0.2 0.4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

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DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

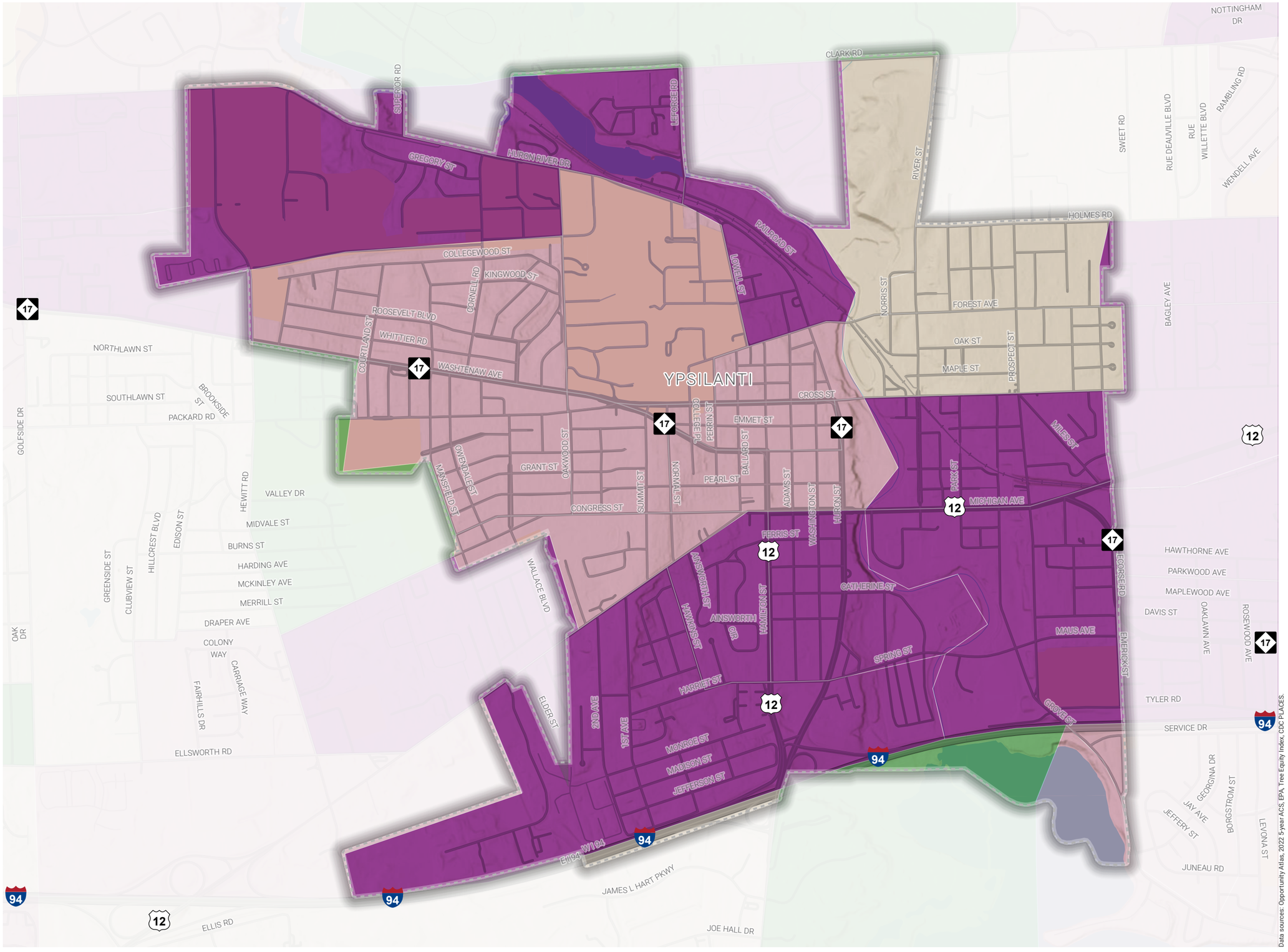


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

CLINTON COUNTY

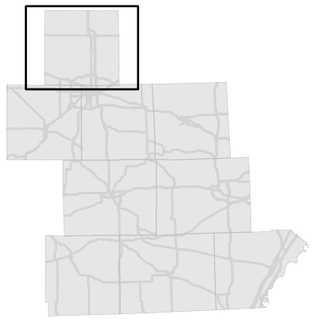
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

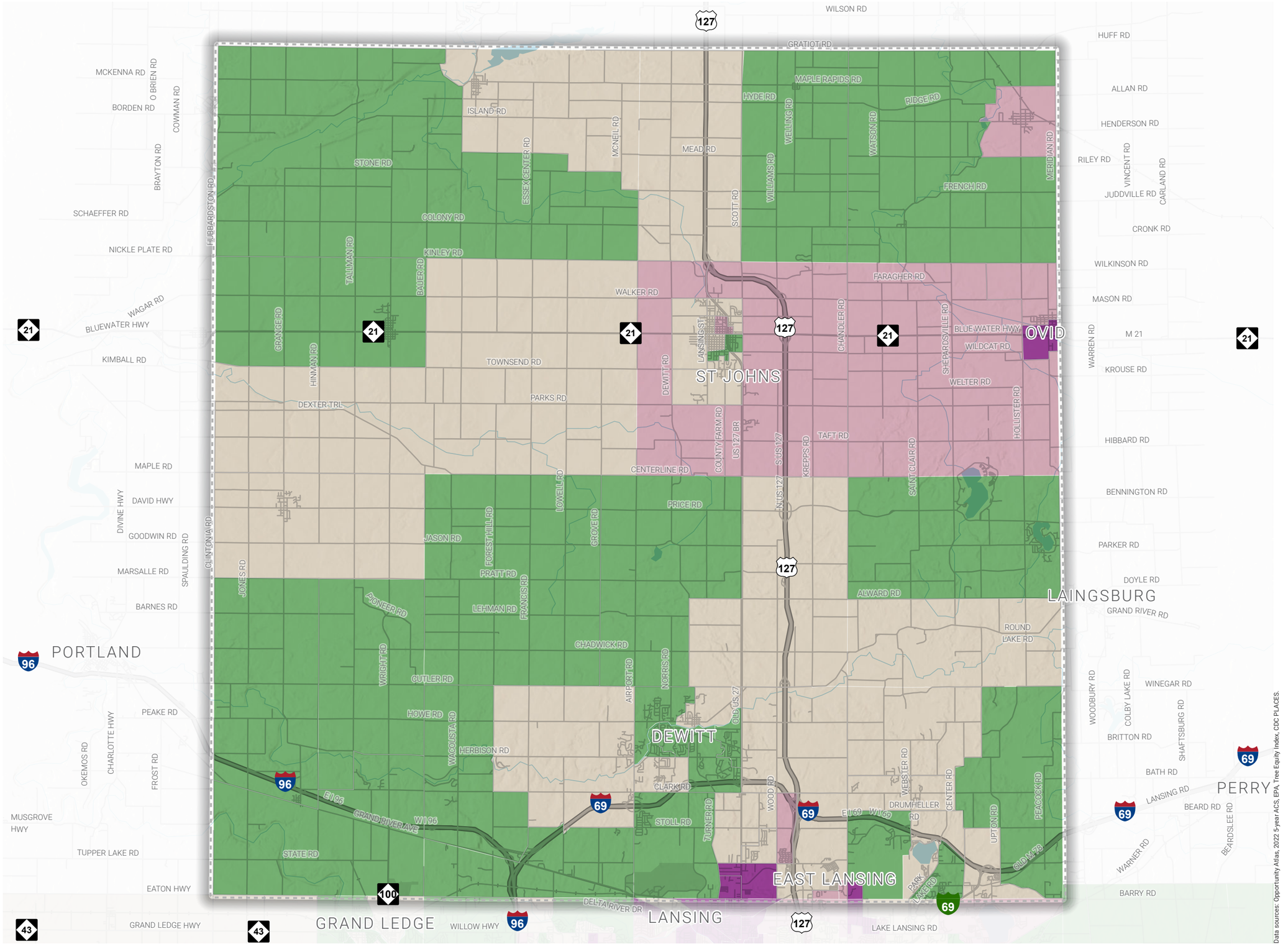


0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

EATON COUNTY

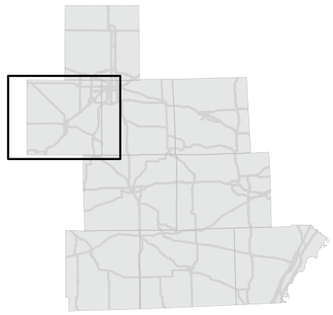
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

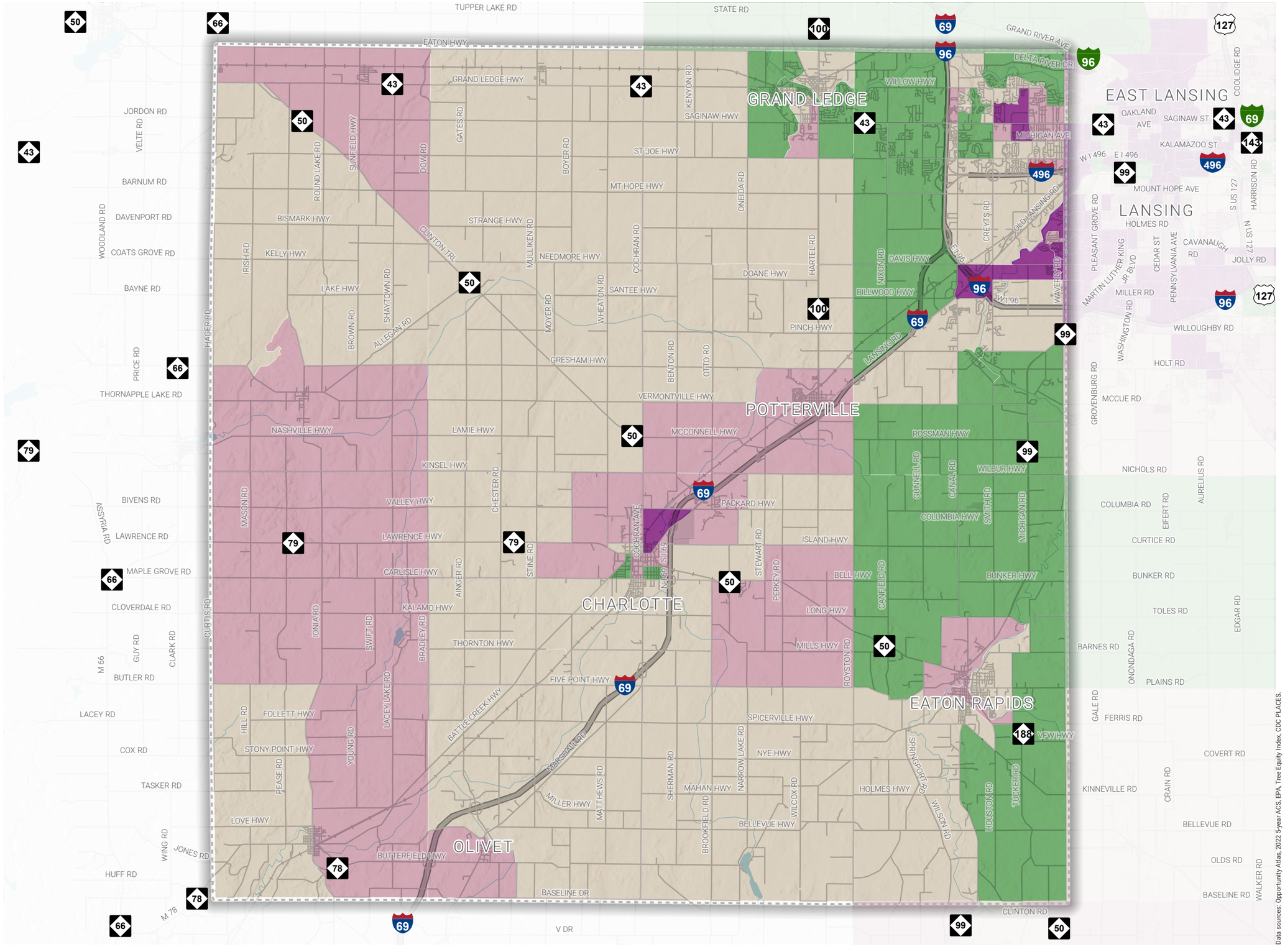


0 2 4 MILES

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GRAND LEDGE
EAST LANSING
LANSING
POTTERVILLE
CHARLOTTE
OLIVET
EATON RAPIDS
TUPPER LAKE RD
STATE RD
EATON HWY
GRAND LEDGE HWY
SAGINAW HWY
ST JOE HWY
MT HOPE HWY
BISMARK HWY
STRANGE HWY
KELLY HWY
NEEDMORE HWY
LAKE HWY
DOANE HWY
SANTEE HWY
GRESHAM HWY
VERMONTVILLE HWY
NASHVILLE HWY
LAMIE HWY
MCCONNELL HWY
KINSEL HWY
VALLEY HWY
PACKARD HWY
LAWRENCE HWY
CARLISLE HWY
KALAMO HWY
THORNTON HWY
FIVE POINT HWY
FOLLETT HWY
STONY POINT HWY
TASKER RD
LOVE HWY
BUTTERFIELD HWY
BASELINE DR
V DR
CLINTON RD
PINCH HWY
BILLWOOD HWY
DAVIS HWY
WILLOW HWY
GRAND RIVER AVE
DELTA RIVER DR
MICHIGAN AVE
MOUNT HOPE AVE
KALAMAZOO ST
OAKLAND AVE
SAGINAW ST
COOLIDGE RD
HARRISON RD
HOLMES RD
CAVANAUGH RD
JOLLY RD
MILLER RD
WILLOUGHBY RD
HOLT RD
MCCUE RD
NICHOLS RD
COLUMBIA RD
CURTICE RD
BUNKER RD
TOLES RD
BARNES RD
PLAINS RD
FERRIS RD
COVERT RD
KINNEVILLE RD
BELLEVUE RD
OLDS RD
BASELINE RD
LANSING RD
MARTIN LUTHER KING JR BLVD
WASHINGTON RD
PENNSYLVANIA AVE
CEDAR ST
PLEASANT GROVE RD
GROVENBURG RD
CREYTS RD
OLD LANSING RD
WAVERLY RD
NIXON RD
HARTEL RD
ONEIDA RD
KENYON RD
BOYER RD
MOYER RD
WHEATON RD
COCHRAN RD
MULLIKEN RD
BENTON RD
OTTO RD
GATES RD
DOW RD
SUNFIELD HWY
ROUND LAKE RD
CLINTON TRL
SHAYTOWN RD
BROWN RD
ALLEGAN RD
IRISH RD
HAGER RD
JORDON RD
VELTE RD
BARNUM RD
DAVENPORT RD
COATS GROVE RD
BAYNE RD
PRICE RD
THORNAPPLE LAKE RD
WOODLAND RD
BIVENS RD
LAWRENCE RD
MAPLE GROVE RD
CLOVERDALE RD
BUTLER RD
LACEY RD
COX RD
TASKER RD
LOVE HWY
HUFF RD
M 78
M 66
ASSYRIA RD
MASON RD
CHESTER RD
AINGER RD
STINE RD
COCHRAN AVE
NB I 69
SB I 69
STEWART RD
PERKEY RD
CANFIELD RD
ROYSTON RD
ISLAND HWY
BELL HWY
LONG HWY
MILLS HWY
BUNKER HWY
GUNNELL RD
CANAL RD
SMITH RD
MICHIGAN RD
EIFERT RD
AURELIUS RD
EDGAR RD
ONONDAGA RD
GALE RD
CRAIN RD
TUCKER RD
HOUSTON RD
WILSON RD
SPRINGPORT RD
HOLMES HWY
MAHAN HWY
NYE HWY
SPICERVILLE HWY
VFW HWY
NARROW LAKE RD
WILCOX RD
BROOKFIELD RD
SHERMAN RD
MATTHEWS RD
MILLER HWY
MARSHALL RD
BATTLE CREEK HWY
YOUNG RD
LACEY LAKE RD
PEASE RD
HILL RD
SWIFT RD
BRADLEY RD
IONIA RD
CURTIS RD
GUY RD
CLARK RD
BELLEVUE HWY
WILBUR HWY
ROSSMAN HWY
W I 496
E I 496
I 96
US 127
S US 127
N US 127
WILLOW HWY
WILWOOD HWY
WILWOOD RD
WILWOOD HWY
WILWOOD RD
WILWOOD HWY
WILWOOD RD

GREATER LANSING

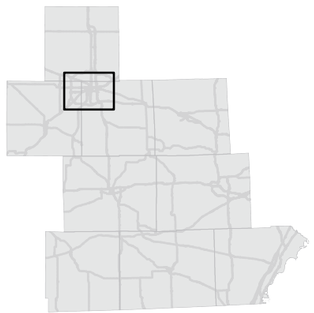
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

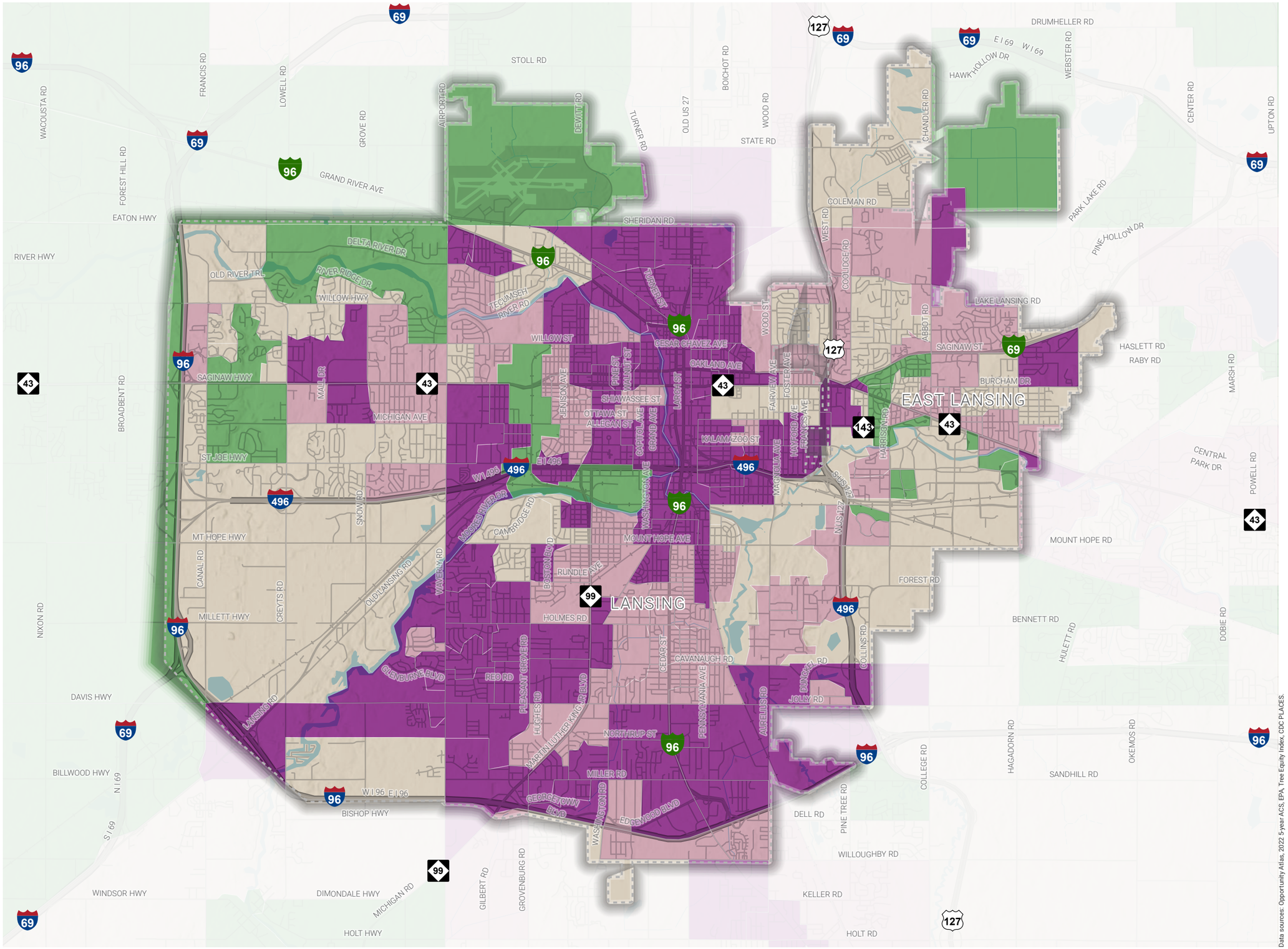


0 0.85 1.7 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA Tree Equity Index, CDC PLACES.

HILLSDALE COUNTY

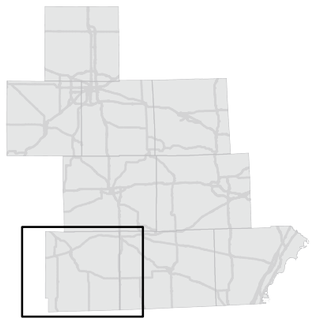
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

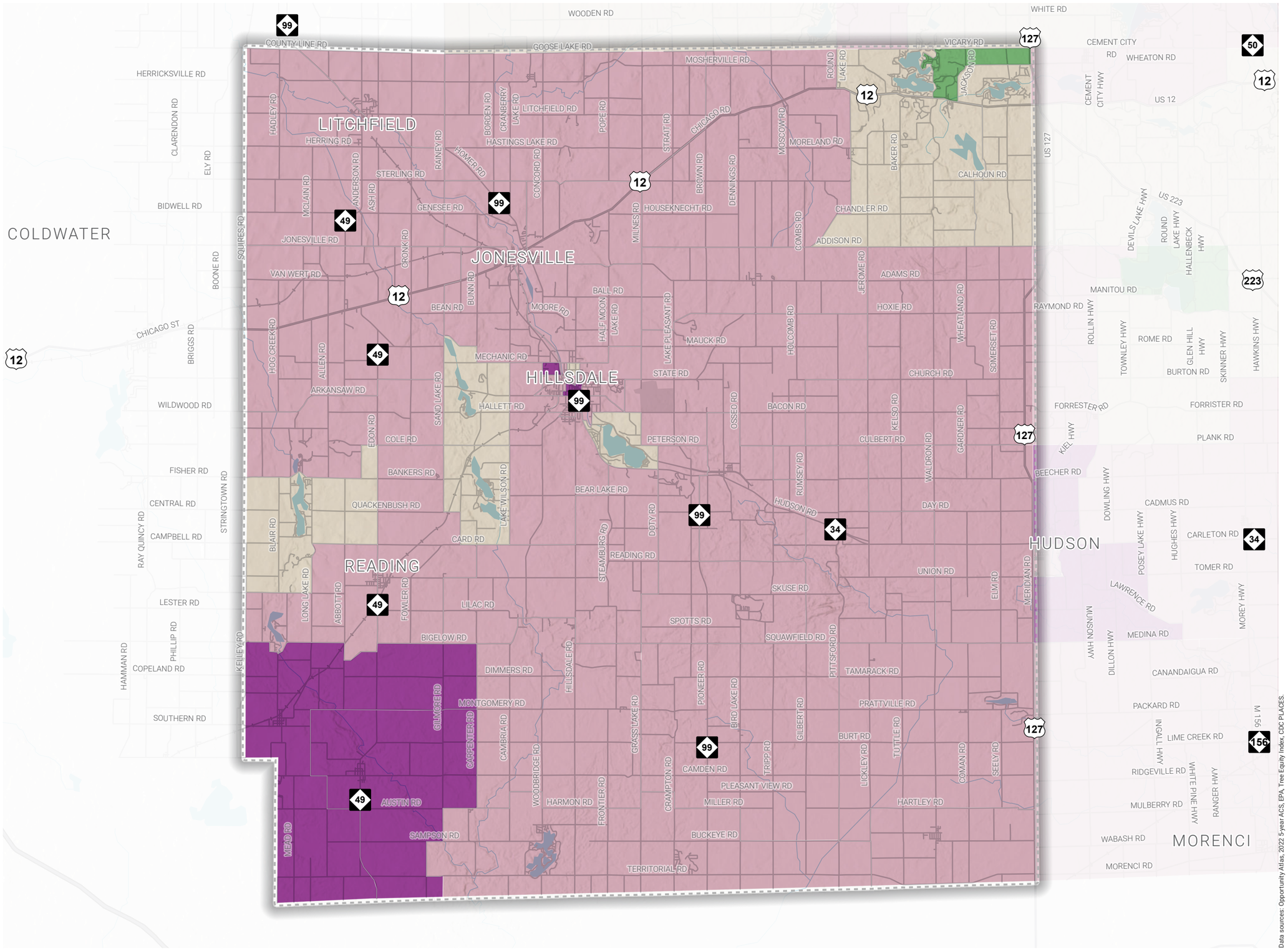


0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

INGHAM COUNTY

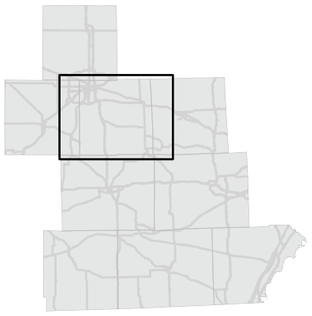
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

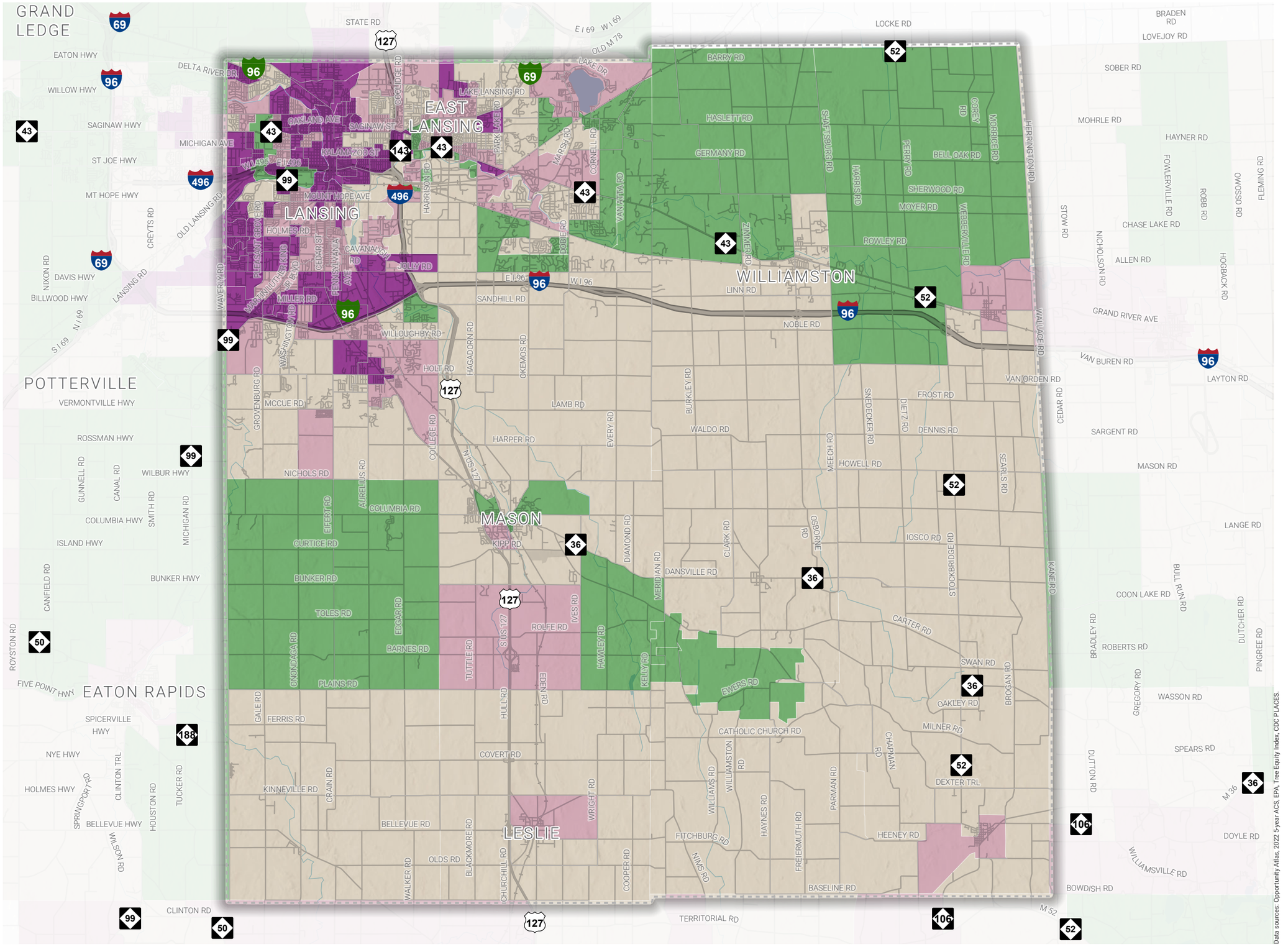


0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA Tree Equity Index, CDC PLACES.

JACKSON COUNTY

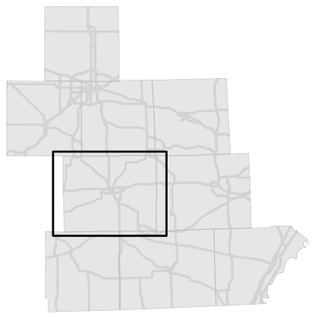
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

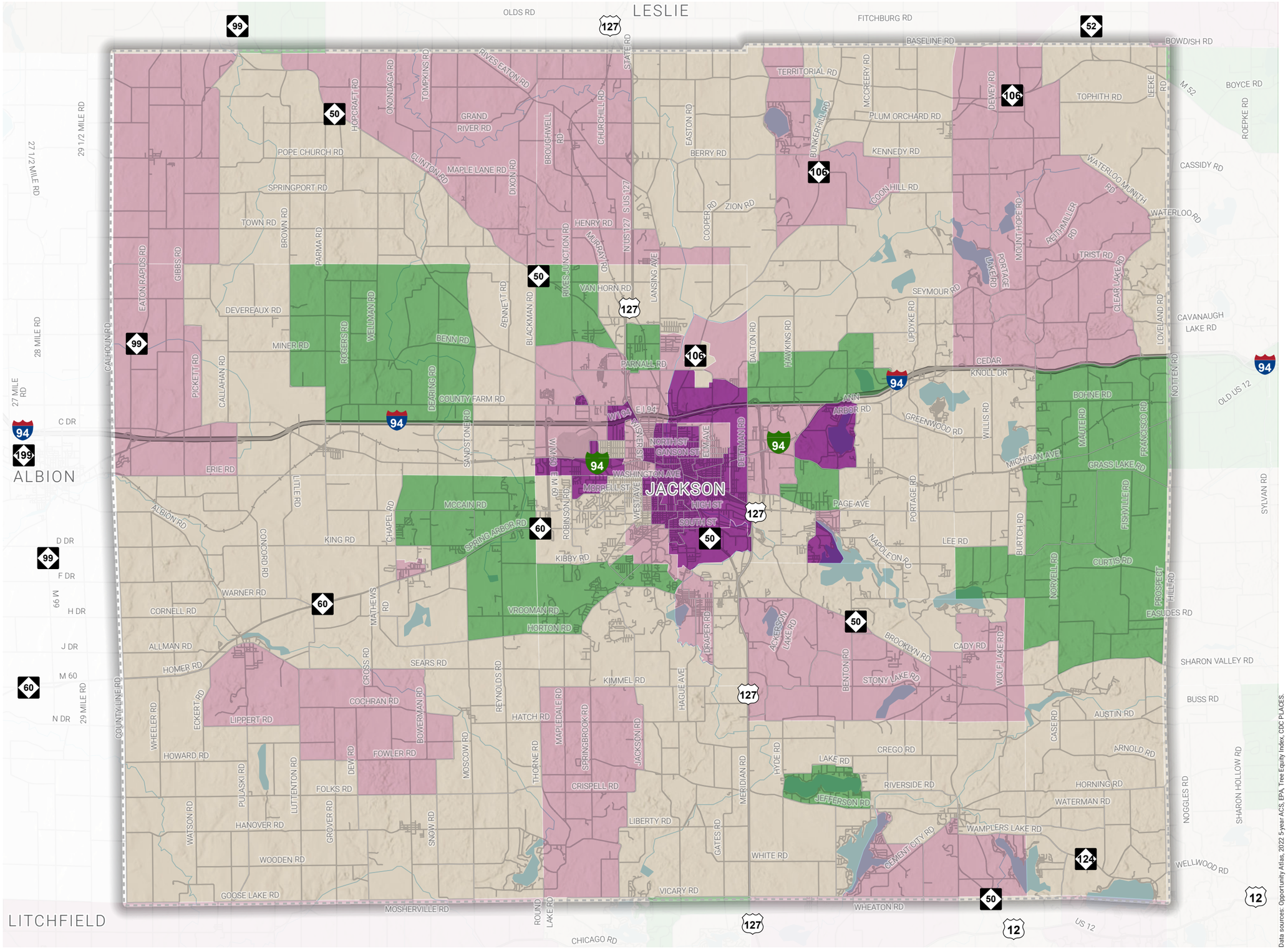


0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

LENAWEE COUNTY

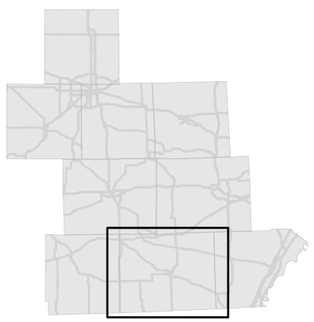
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

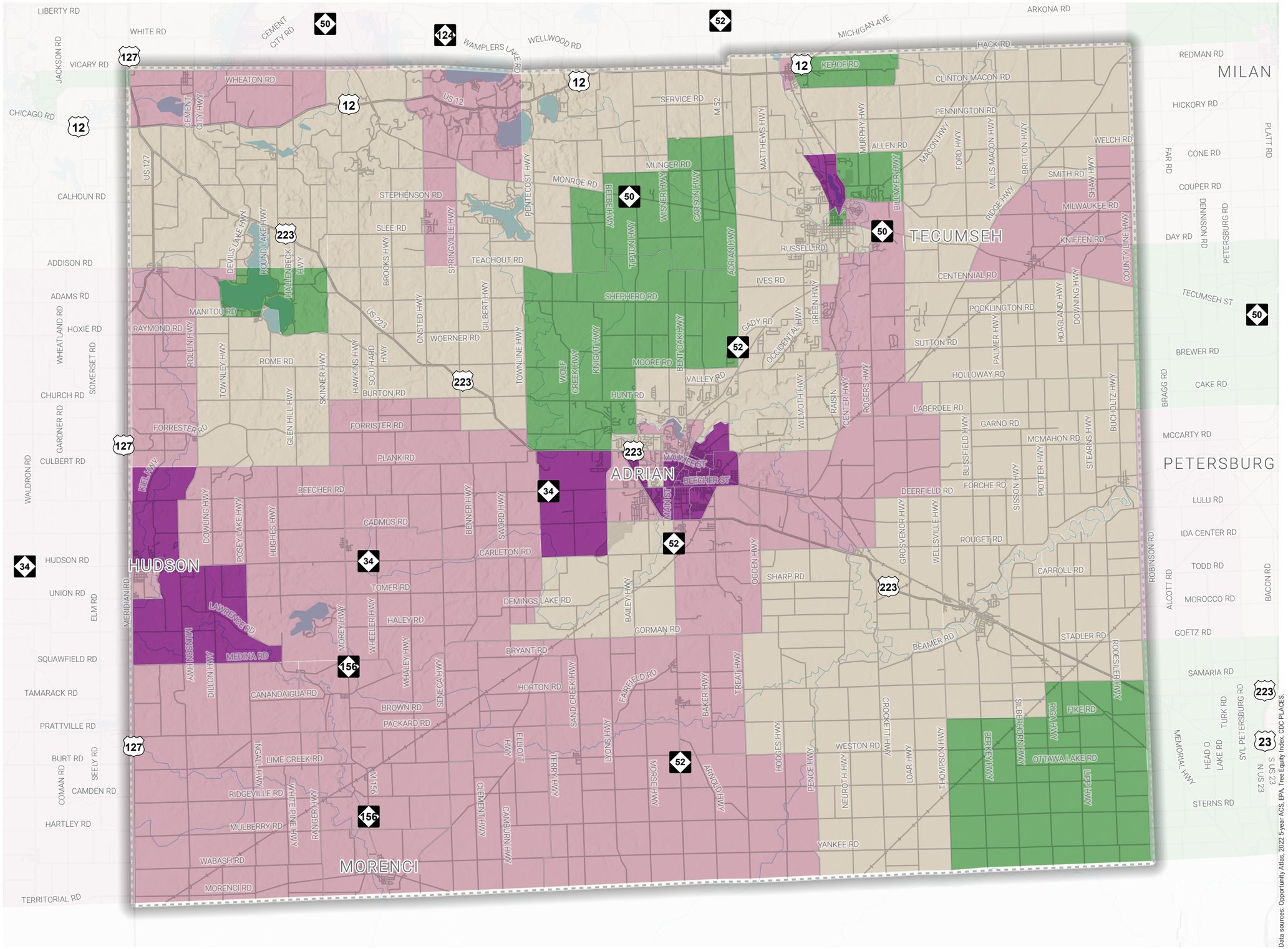


0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

LIVINGSTON COUNTY

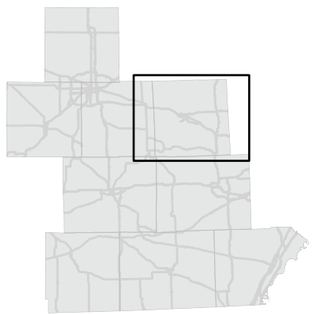
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

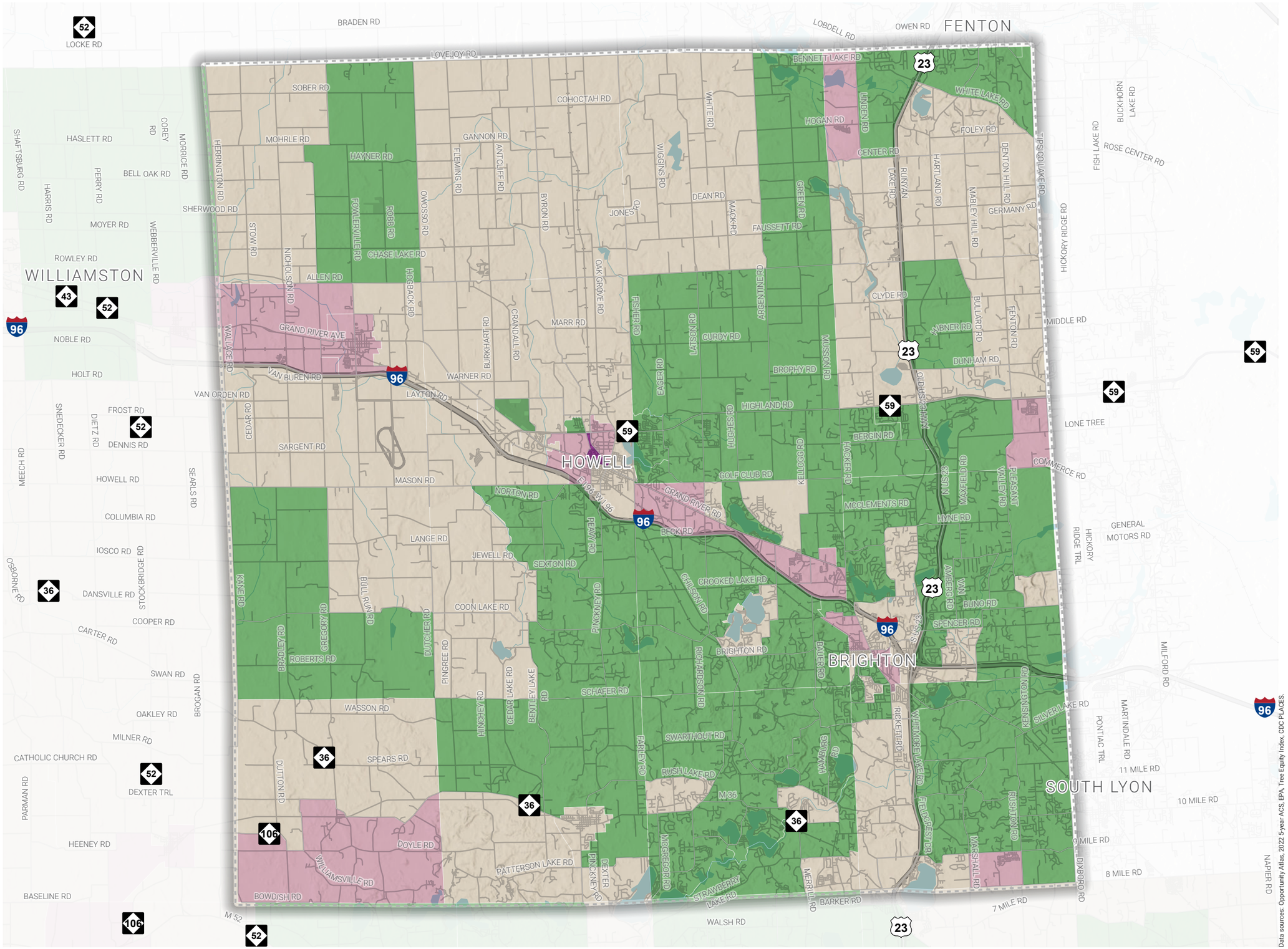
UNIVERSITY REGION



0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

MONROE COUNTY

DEMOGRAPHIC ANALYSIS

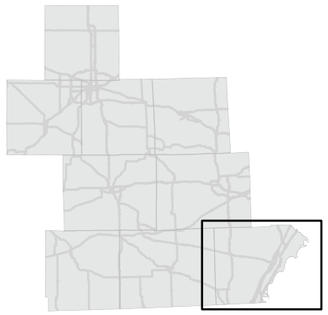
LEGEND

Demographic Need

- Higher Need
- Lower Need

Railroads

UNIVERSITY REGION

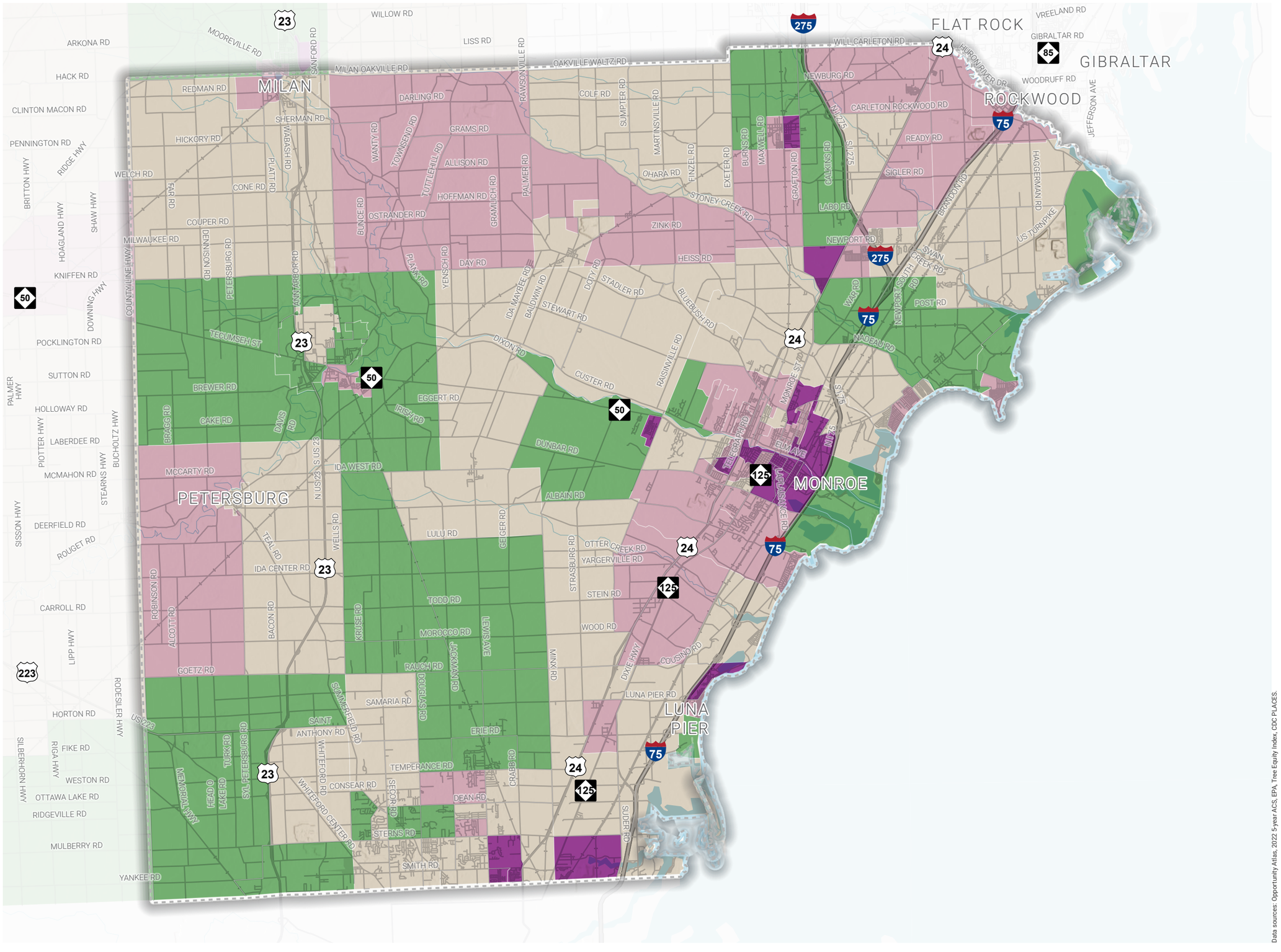


0 2 4 MILES

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Data sources: Opportunity Atlas, 2022 5-year ACS, EPA, Tree Equity Index, CDC PLACES.

WASHTENAW COUNTY

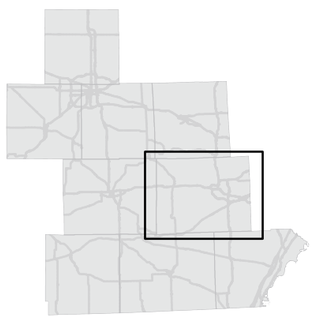
DEMOGRAPHIC ANALYSIS

LEGEND

Demographic Need

- Higher Need
- Lower Need
- Railroads

UNIVERSITY REGION

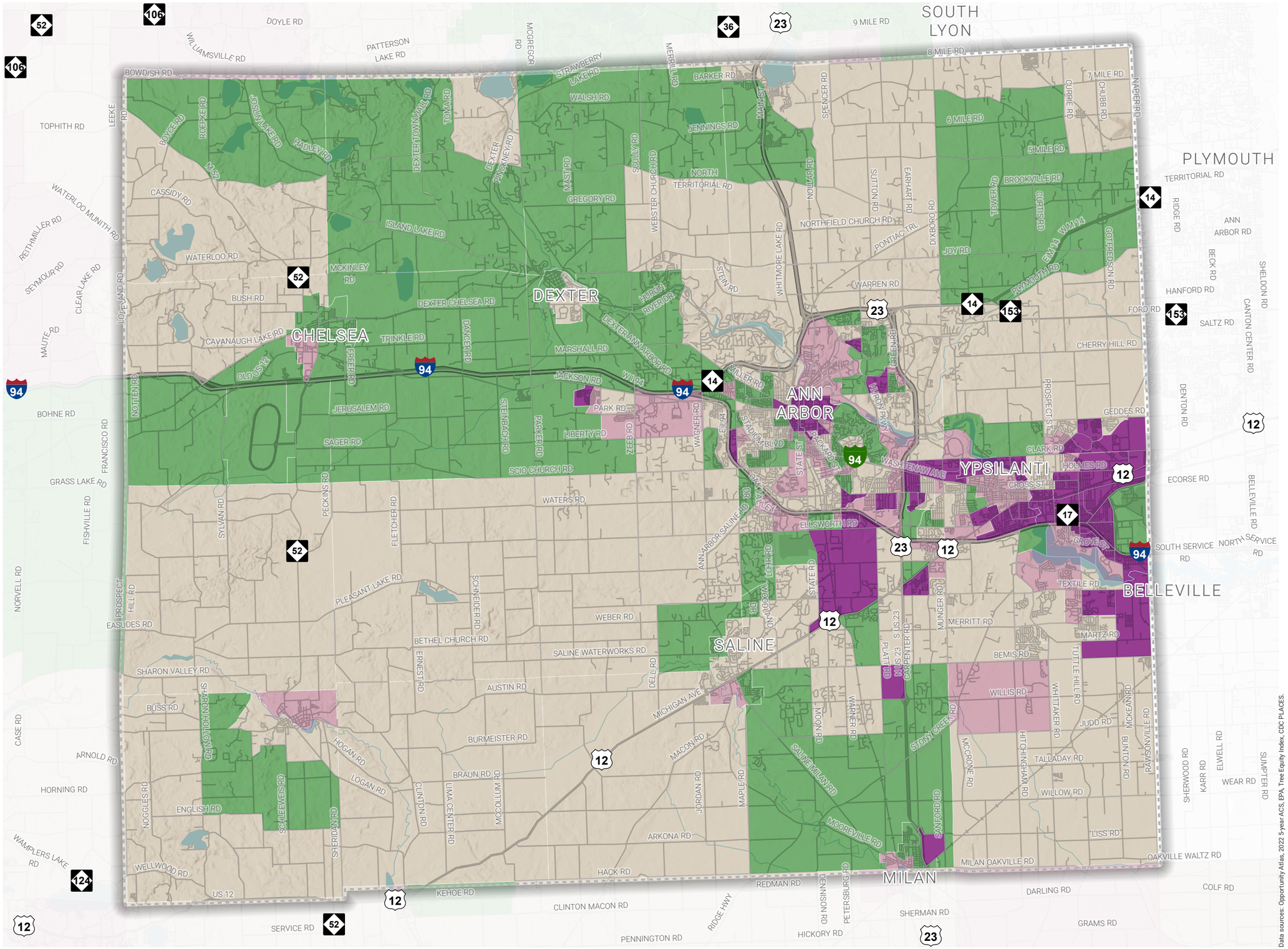


0 2 4 MILES

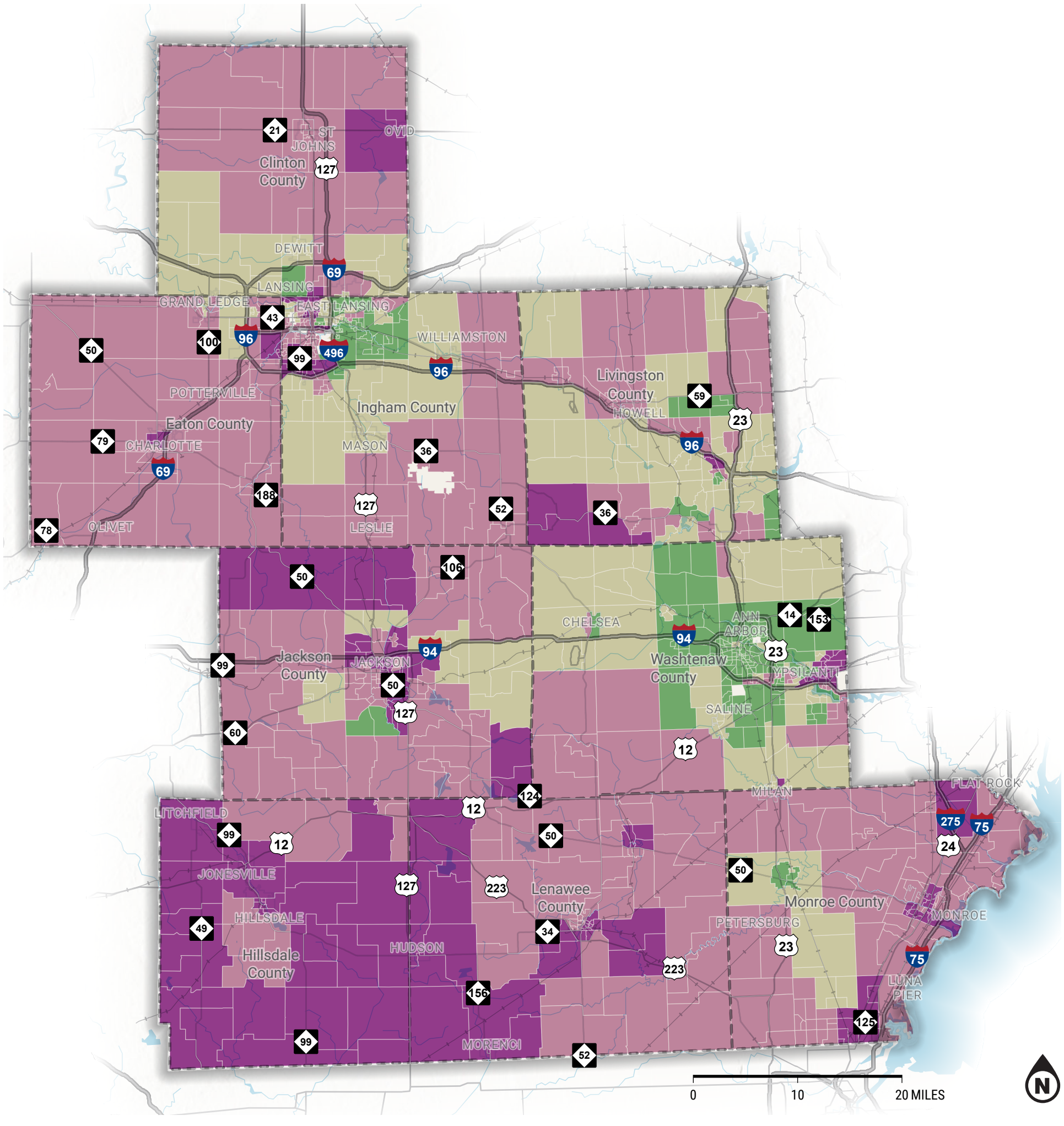
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SOUTH LYON
PLYMOUTH
ANN ARBOR
YPSILANTI
BELLEVILLE
SALINE
MILAN
DEXTER
CHELSEA
DOYLE RD
PATTERSON LAKE RD
WILLIAMSVILLE RD
9 MILE RD
8 MILE RD
7 MILE RD
6 MILE RD
5 MILE RD
TOPHITH RD
BOWDISH RD
STRAWBERRY LAKE RD
WALSH RD
BARKER RD
JENNINGS RD
NORTH TERRITORIAL RD
NORTHFIELD CHURCH RD
WARREN RD
JOY RD
PONTIAC TRL
TERRITORIAL RD
BROOKVILLE RD
PLYMOUTH RD
CHERRY HILL RD
FORD RD
SALTZ RD
HANFORD RD
GEDDES RD
CLARK RD
HOLMES RD
TEXTILE RD
MERRITT RD
BEMIS RD
WILLIS RD
JUDD RD
TALLADAY RD
WILLOW RD
LISS RD
OAKVILLE WALTZ RD
MILAN OAKVILLE RD
DARLING RD
COLF RD
GRAMS RD
SHERMAN RD
HICKORY RD
PENNINGTON RD
CLINTON MACON RD
REDMAN RD
KEHOE RD
SERVICE RD
HACK RD
ARKONA RD
WATERS RD
SCIO CHURCH RD
PARK RD
LIBERTY RD
JACKSON RD
MARSHALL RD
DEXTER CHELSEA RD
TRINKLE RD
CAVANAUGH LAKE RD
OLD US 12
BUSH RD
MCKINLEY RD
ISLAND LAKE RD
GREGORY RD
CASSIDY RD
WATERLOO RD
WATERLOO MUNITH RD
BOHNE RD
JERUSALEM RD
SAGER RD
GRASS LAKE RD
FISHVILLE RD
NORVELL RD
PROSPECT HILL RD
EASUDES RD
PLEASANT LAKE RD
SHARON VALLEY RD
BUSS RD
CASE RD
ARNOLD RD
HORNING RD
ENGLISH RD
WELLWOOD RD
WAMPLERS LAKE RD
US 12
BRAUN RD
BURMEISTER RD
AUSTIN RD
SALINE WATERWORKS RD
BETHEL CHURCH RD
WEBER RD
MICHIGAN AVE
MACON RD
SALINE MILAN RD
MOORESVILLE RD
STONY CREEK RD
ELLSWORTH RD
STADIUM BLVD
WASHTENAW AVE
GREEN RD
PROSPECT ST
HURON PKWY
GROVE ST
SOUTH SERVICE RD
NORTH SERVICE RD
ANN ARBOR RD
BECK RD
RIDGE RD
SHELDON RD
CANTON CENTER RD
DENTON RD
BELLEVILLE RD
ECORSE RD
WEAR RD
SUMPTER RD
KARR RD
ELWELL RD
SHERWOOD RD
MCKEAN RD
RAWSONVILLE RD
BUNTON RD
WHITTAKER RD
TUTTLE HILL RD
MARTZ RD
CURRIE RD
CHUBB RD
NAPIER RD
GOTTFREDSON RD
DIXBORO RD
EARHART RD
SUTTON RD
SPENCER RD
MAIN ST
NOWLAND RD
WHITMORE LAKE RD
STEIN RD
HURON RIVER DR
DEXTER ANN ARBOR RD
WILLIAMSTON RD
MILLER RD
WAGNER RD
I-94
ZEEB RD
PARKER RD
STEINBACH RD
DANCER RD
GREER RD
NOTTEN RD
LOWELL RD
CLEAR LAKE RD
SEYMOUR RD
MAUTE RD
REITHMILLER RD
LEEKE RD
BOYCE RD
ROEPKE RD
JOSLIN LAKE RD
HADLEY RD
M-52
DEXTER TOWNHALL RD
TOMAR RD
DEXTER PINCKNEY RD
WEST RD
SCULLY RD
WEBSTER CHURCH RD
NOWLAND RD
MAIN ST
SPENCER RD
NOLLAR RD
SUTTON RD
EARHART RD
DIXBORO RD
TOWER RD
CURTIS RD
WM 14
GOTTFREDSON RD
RIDGE RD
ANN ARBOR RD
BECK RD
SHELDON RD
CANTON CENTER RD
DENTON RD
BELLEVILLE RD
SOUTH SERVICE RD
NORTH SERVIC

UNIVERSITY REGION
ACTIVE TRANSPORTATION PLAN
DEMOGRAPHIC ANALYSIS



Percent Adults With Mobility Challenges

Higher Share

Lower Share

Railroads

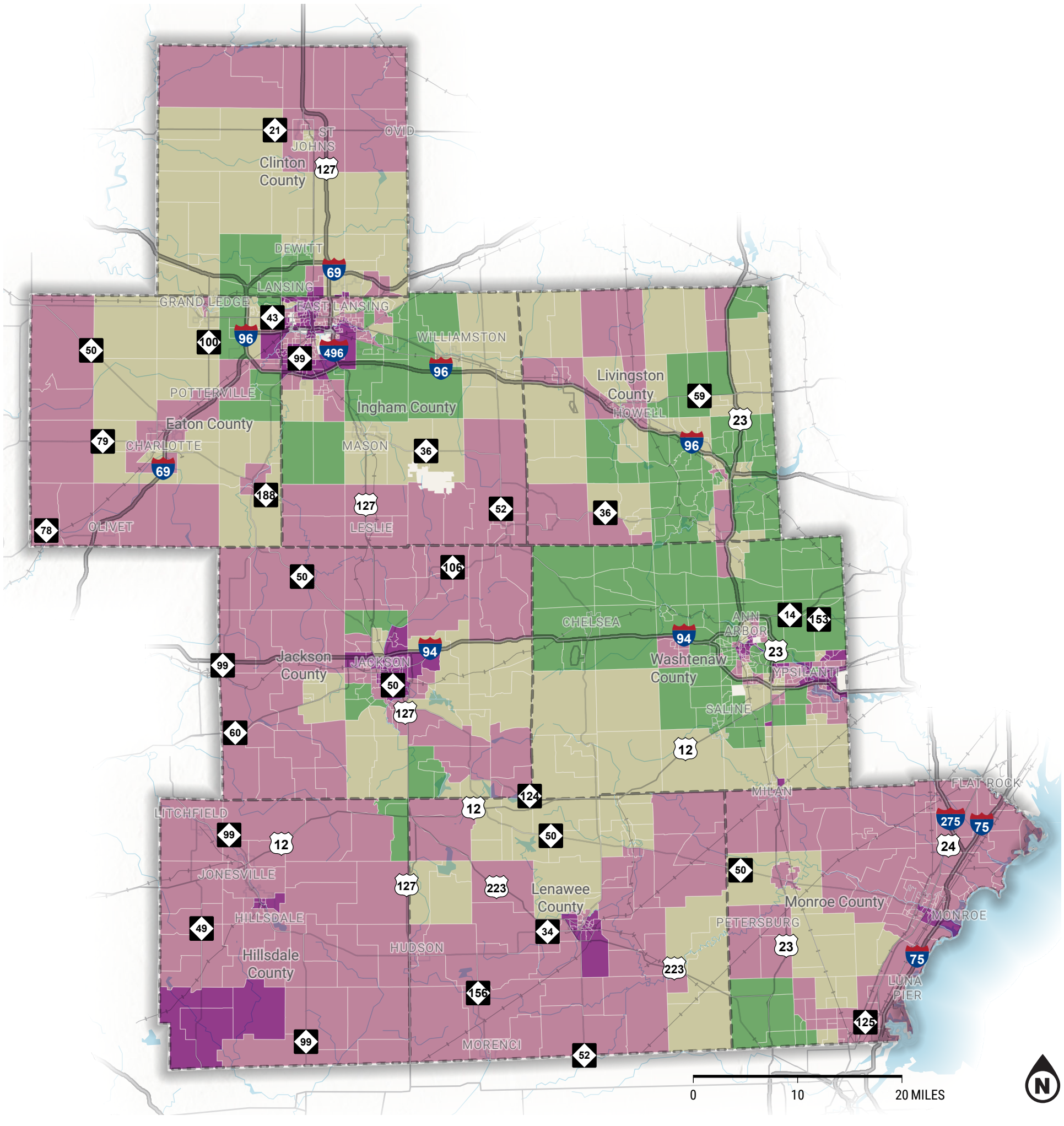
University Region

Source: 2024 CDC Places Data

MDOT Michigan Department of Transportation

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UNIVERSITY REGION
ACTIVE TRANSPORTATION PLAN
DEMOGRAPHIC ANALYSIS



Percent Adults Who Lack of Reliable Transportation

Higher Share

Lower Share

Railroads

University Region

Source: 2024 CDC Places Data

MDOT Michigan Department of Transportation

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Appendix G – Demand Analysis

Overview

The Live, Work, Play tool can be used to assess both existing and suppressed demand for active transportation. This suppressed demand, known as *latent demand,* comprises trips that are not or cannot be taken because a key factor—like safe, comfortable, and connected infrastructure—are missing. By creating a composite heat map that considers both the location of trip *generators*, such as where people live and work, and trip *attractors*, such as schools and retail establishments where people learn and play, it is possible to develop a generalized picture of existing and latent demand across an area. The resulting, generalized picture of demand can be used on its own or combined with other more detailed transportation data, such as information about areas with high concentrations of short trips, to identify network gaps along existing transportation desire lines and locations that will immediately benefit from more infrastructure.

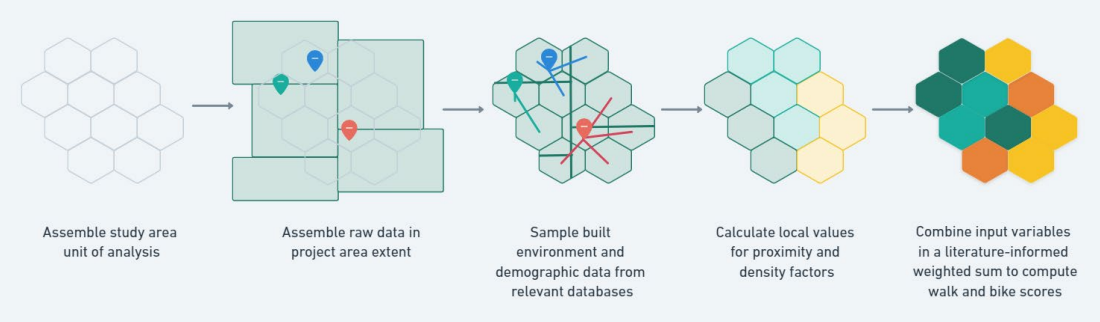
Methodology

The Live, Work, Play tool estimates the latent travel demand for both walking and biking within a study area and is built on 14 variables (shown in Table 9, later in this appendix) that collectively define suitable conditions for walking or biking trips. These factors are grouped into the following categories:

- **Built environment factors**, such as intersection density and existing walking and biking infrastructure
- **Proximity to trip attractors and generators**, like schools, parks, home, and job locations
- **Existing demographic or trip-making patterns**, including areas and corridors that already support concentrations of short trips that could be served by walking and biking

Data for these variables is generally pulled from national standardized databases, though it may be supplemented with locally provided data. The figure below illustrates the overall Live, Work, Play scoring process, from assembling the study area unit of analysis and data to computing final walk and bike scores.

Live, Work, Play Scoring Process



Each indicator is associated with the hex grid using one of the techniques described below:

- **Proportional average**: Data is aggregated based on the average value of the underlying data within each hex grid cell, weighted by percent coverage.
- **Proximity**: Data is aggregated based on the distance from the centroid of the hex grid to the nearest feature. If a network dataset is provided, distance is network-based using walking or biking distance calculations. Otherwise, distance is reported as Euclidean (straight-line).
- **Kernel density sampling**: Data is aggregated based on the average weighted density of features within each hex grid cell. Weighting allows for greater importance to be placed on different types of features.

After the score for each indicator has been associated with the hex grid, scores are percentile ranked and normalized so all scores range from 0–1. Proximity measures are scored based on the distance in miles according to the classifications in the Live, Work, Play Inputs and Assumptions table below, shown at the end of this appendix**.**

Finally, a local, composited demand index score for each hex grid cell is calculated through the application of weights shown in the Live, Work, Play Inputs and Assumptions Table. Higher values indicate more demand for walking or biking, and lower scores indicate less demand for walking and biking. As mentioned previously, the results of the Live, Work, Play tool are unique to each geographic area, meaning analysis results from two independent geographies may not be directly comparable.

Live, Work, Play Inputs and Assumptions

Variable	Source	Spatial Treatment	Notes and Assumptions	Walk Score Weight	Bike Score Weight
Built Environment Factors					
Intersection Density	Smart Location Database (EPA, 2021) D3B	Proportional average	Weighted street intersection density, where an intersection includes locations where three or more network links meet at a single point and at least one is a non-auto-oriented facility.[1] Higher intersection density is often used as an indicator of increased walkability, and this variable is included in the National Walkability Index (EPA, 2021) and is reported at the census block group level.	10%	0%
Bike Facility Density (quality adjusted)	OpenStreetMap, with an option to substitute with local data	Kernel density sampling	Each polygon in the demand surface is assigned the average value of a weighted bike facility density raster that indicates the proximity and quality of bike facilities. The kernel density bandwidth is 1/4 mile, and weights are applied as follows: 1 – shared road or equivalent; 5 – bike lane (unprotected) or equivalent; 10 – protected bike lane,	0%	15%

Variable	Source	Spatial Treatment	Notes and Assumptions	Walk Score Weight	Bike Score Weight
			shared-use path, or equivalent.		
Proximity to Trip Attractors and Generators					
Proximity to Transit Stops	National Transit Map Stops (BTS, 2022)	Distance to nearest feature	Contains voluntarily submitted General Transit Feed (GTFS) Specification data for stops along fixed-route services. Walking and biking often serve as first-last mile connectors for transit trips.	10%	5%
Proximity to Entertainment	OpenStreetMap	Distance to nearest feature	Locations tagged as cinema, community center, planetarium, nightclub, theater, social center, conference center, arts center, fast food, food court, restaurant, cafe, bar, pub, aquarium, attraction, museum, theme park, or zoo in OpenStreetMap. These serve as trip generators and may increase trip-making activity in the vicinity.	5%	5%
Proximity to Grocery Stores	OpenStreetMap	Distance to nearest feature	Locations tagged as supermarket, general, convenience, grocery, or greengrocer in OpenStreetMap. These serve as trip generators and may increase trip-making activity in the vicinity.	5%	5%

Variable	Source	Spatial Treatment	Notes and Assumptions	Walk Score Weight	Bike Score Weight
Proximity to Parks	OpenStreetMap	Distance to nearest feature	Locations tagged as parks in OpenStreetMap. These serve as trip generators and may increase trip-making activity in the vicinity.	10%	10%
Proximity to Schools	Homeland Infrastructure Foundation-Level Data (HIFLD)	Distance to nearest feature	Centroid points of public and private elementary and secondary school campuses for the 2019–2020 school year. These serve as trip generators and may increase trip-making activity in the vicinity.	10%	10%
Demographic and Trip-Making Behavior					
Employment Mix	Smart Location Database (EPA, 2021), D2B_E8MIXA	Proportional average	Eight-tier employment entropy is used as a proxy for measuring the diversity of land uses present in a certain area. Increased land use diversity is associated with increased walkability, and this variable is included in the National Walkability Index (EPA, 2021) and is reported at the census block group level.	5%	5%
Employment + Housing Mix	Smart Location Database (EPA, 2021), D2A_EPHHM	Proportional average	Employment and household entropy is another proxy for measuring land use mix. Higher values indicate a greater diversity of land uses, which is associated with increased	5%	5%

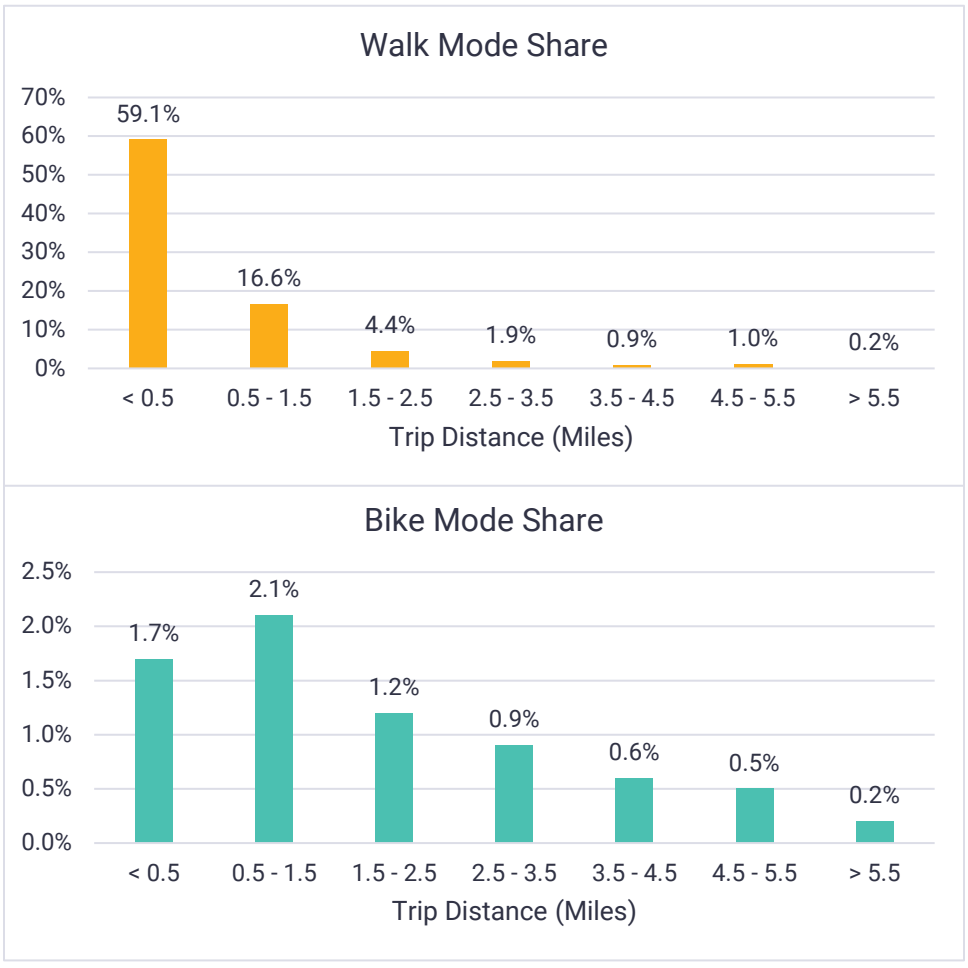
Variable	Source	Spatial Treatment	Notes and Assumptions	Walk Score Weight	Bike Score Weight
			walkability. This variable is included in the National Walkability Index (EPA, 2021) and is reported at the census block group level.		
Housing Unit Density	Smart Location Database (EPA, 2021), D1A	Proportional average	Gross residential density on unprotected land,[2] measured as housing units per acre and reported at the census block group level. Increased housing unit density generally indicates more people living in an area, and thus more trip-making activity.	5%	5%
Job Density	Smart Location Database (EPA, 2021), D1C	Proportional average	Gross employment density on unprotected land,[2] measured as jobs per acre and reported at the census block group level. Increased job density generally indicates more people working or shopping in an area, and thus more trip-making activity.	5%	5%
Percent Zero Vehicle Households	Smart Location Database (EPA, 2021), Pct_AO0	Proportional average	Percent of zero-car households in the census block group. Households without vehicles available are more likely to walk or bike for their primary trip mode.	15%	15%
Walk/Bike Mode	2020 5-Year American	Proportional average	Percentage of workers aged 16 or over who	5%	5%

Variable	Source	Spatial Treatment	Notes and Assumptions	Walk Score Weight	Bike Score Weight
Commute Split	Community Survey (ACS)		commuted to work via walking or biking, respectively, reported at the census tract level for the workers' home locations.		
Short Trip Making	Replica Places	Proportional average	The percentage of modeled person trips with destinations in the study area that are less than 1 mile or less than 3 miles. This is used to estimate trips that could reasonably be converted to walking or biking modes, respectively. Data is modeled for a typical travel weekday during fall 2019.	10%	10%
1. *Auto-oriented facilities* are defined as (1) any controlled access highway, tollway, highway ramp, or other facility on which automobiles are allowed but pedestrians are restricted; (2) any link with speeds 55 mph or higher; (3) any one-way link with speeds between 41 and 54 mph; or (4) any link with four or more travel lanes in a single direction (EPA, 2021). 2. *Unprotected land* is land available for existing or future development.					

The proximity bands outlined in Walking and Biking Proximity Bands table below are informed by typical walking and biking trip distances, as observed in the 2017 National Household Travel Survey (ORNL, n.d.). In general, both walking and biking mode shares decline with increasing trip distances, but the shapes and thresholds are different for each form of active transportation.

Walking and Biking Proximity Bands

Walking Proximity Bands	Points	Biking Proximity Bands	Points
< 1/8th mile	1	< 1/4th mile	0.85
1/8th – 1/4th mile	0.9	1/4th – 1 mile	1
1/4th – 1/2 mile	0.6	1 – 2 miles	0.75
1/2 – 3/4th mile	0.3	2 – 3 miles	0.5
3/4th – 1 mile	0.1	3 – 6 miles	0.25
> 1 mile	0	> 6 miles	0



US Mode Shares for Walking (top) and Bicycling (bottom) by Trip Distance, 2017 National Household Travel Survey Estimated Person Trips (ORNL, n.d.)

Limitations

This methodology is informed by key pieces of literature across the US and internationally to inform the considerations for this analysis, but it does have the following limitations:

- The results are a relative index rather than an absolute estimate of trips that can be unlocked. Further analysis would be required to provide absolute estimates, including calibration to an appropriate local dataset via regression modeling.
- The index does not consider all potentially relevant factors to latent travel demand, such as weather, slopes, and barriers to bicycle and pedestrian activity.
- The analysis is subject to edge effects from the sampling of census geographies and omitted data in OpenStreetMap, given the volunteer nature of the database.

Works Consulted

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Pedestrian Demand Maps

CITY OF ADRIAN

DEMAND ANALYSIS

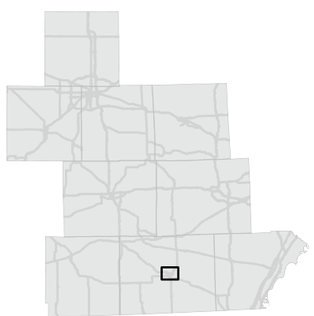
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

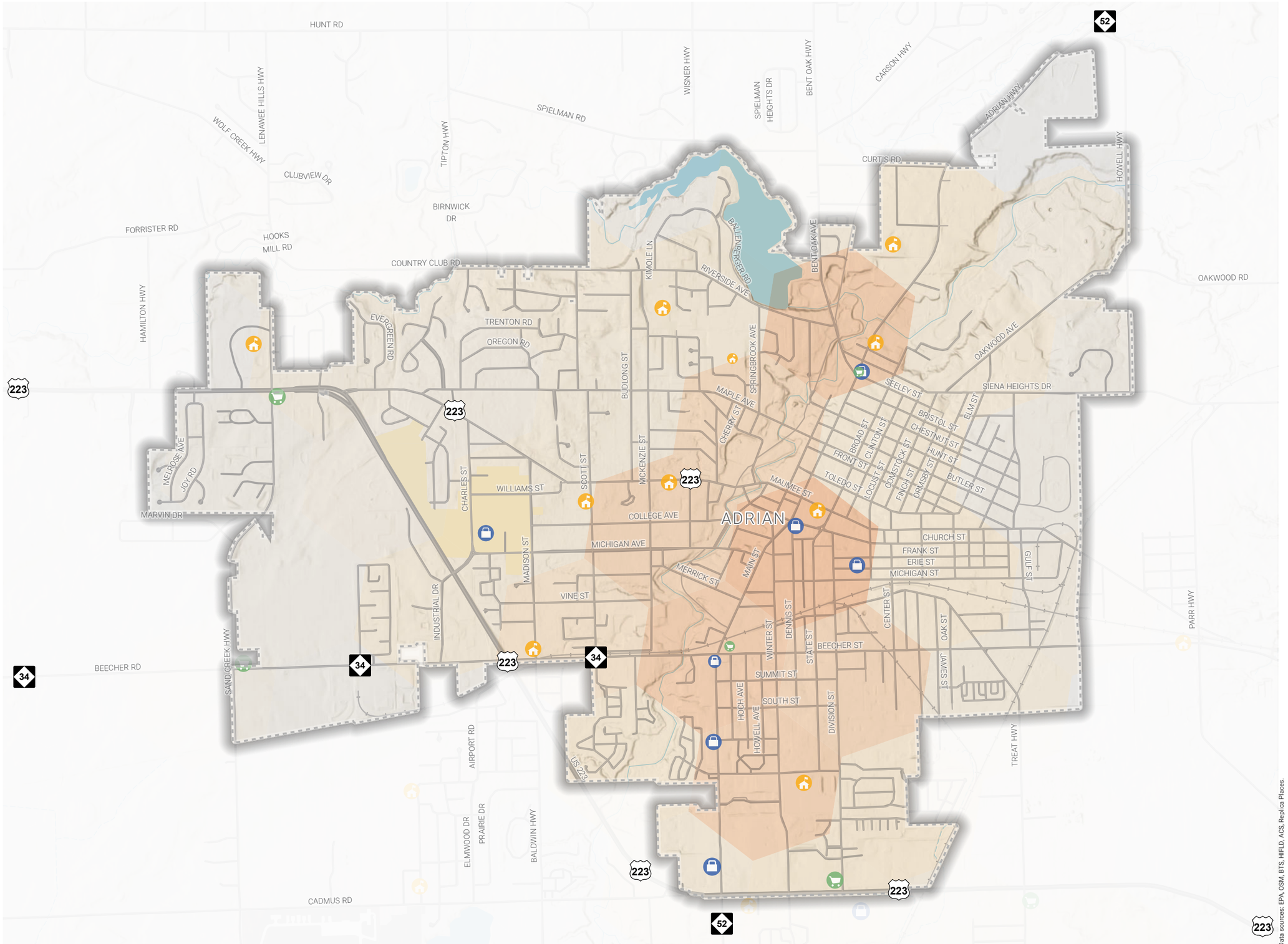


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF ANN ARBOR

DEMAND ANALYSIS

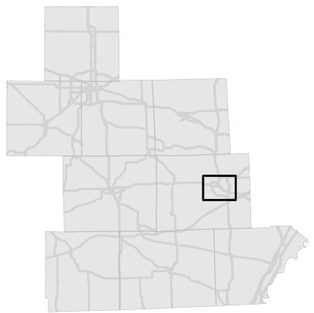
LEGEND

- Schools
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- Low Walk Demand
- Railroads

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UNIVERSITY REGION

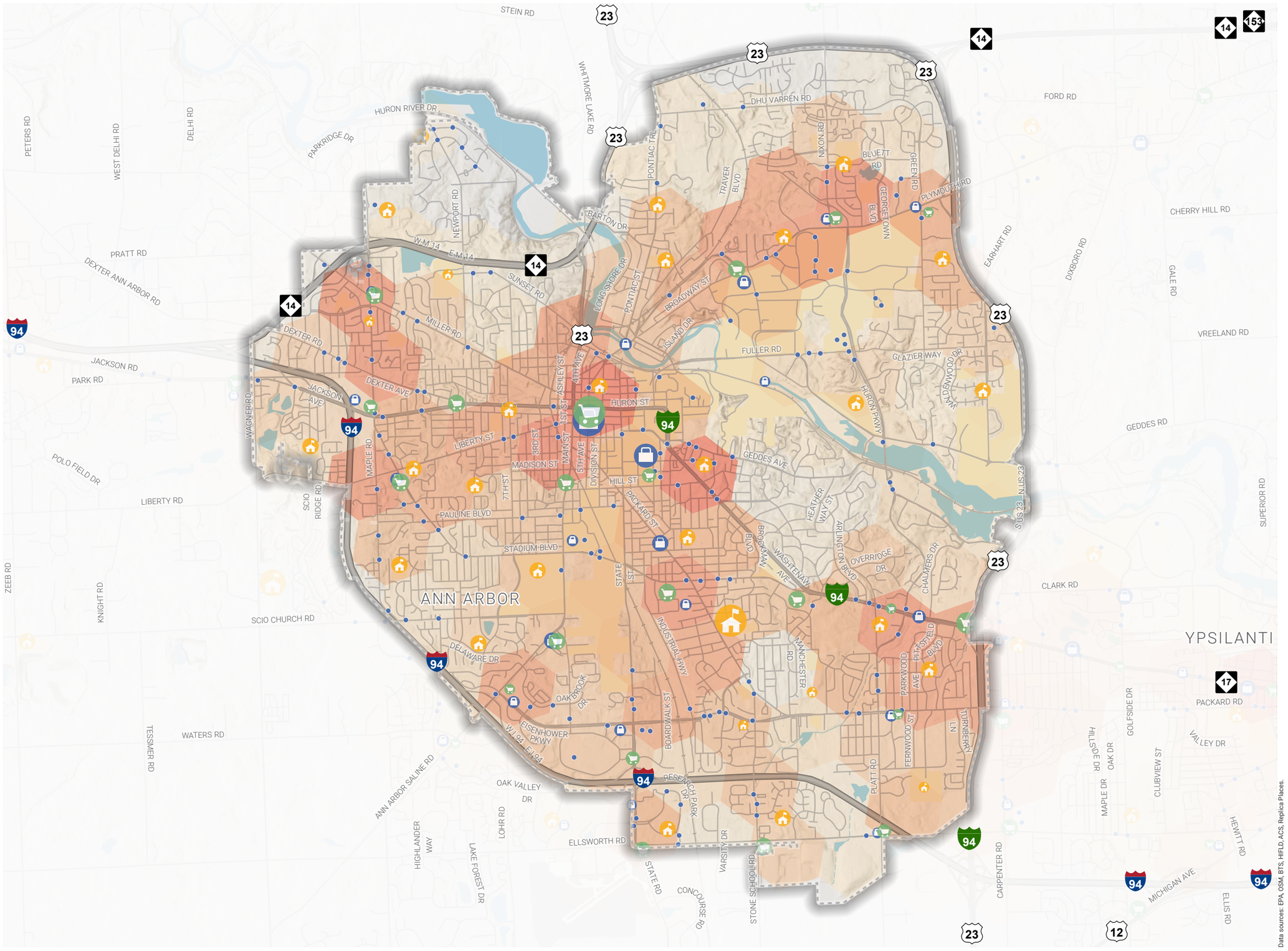


0 0.55 1.1 MILES

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF BRIGHTON

DEMAND ANALYSIS

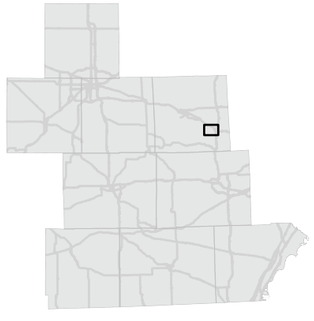
LEGEND

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- Low Walk Demand
- Railroads

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UNIVERSITY REGION

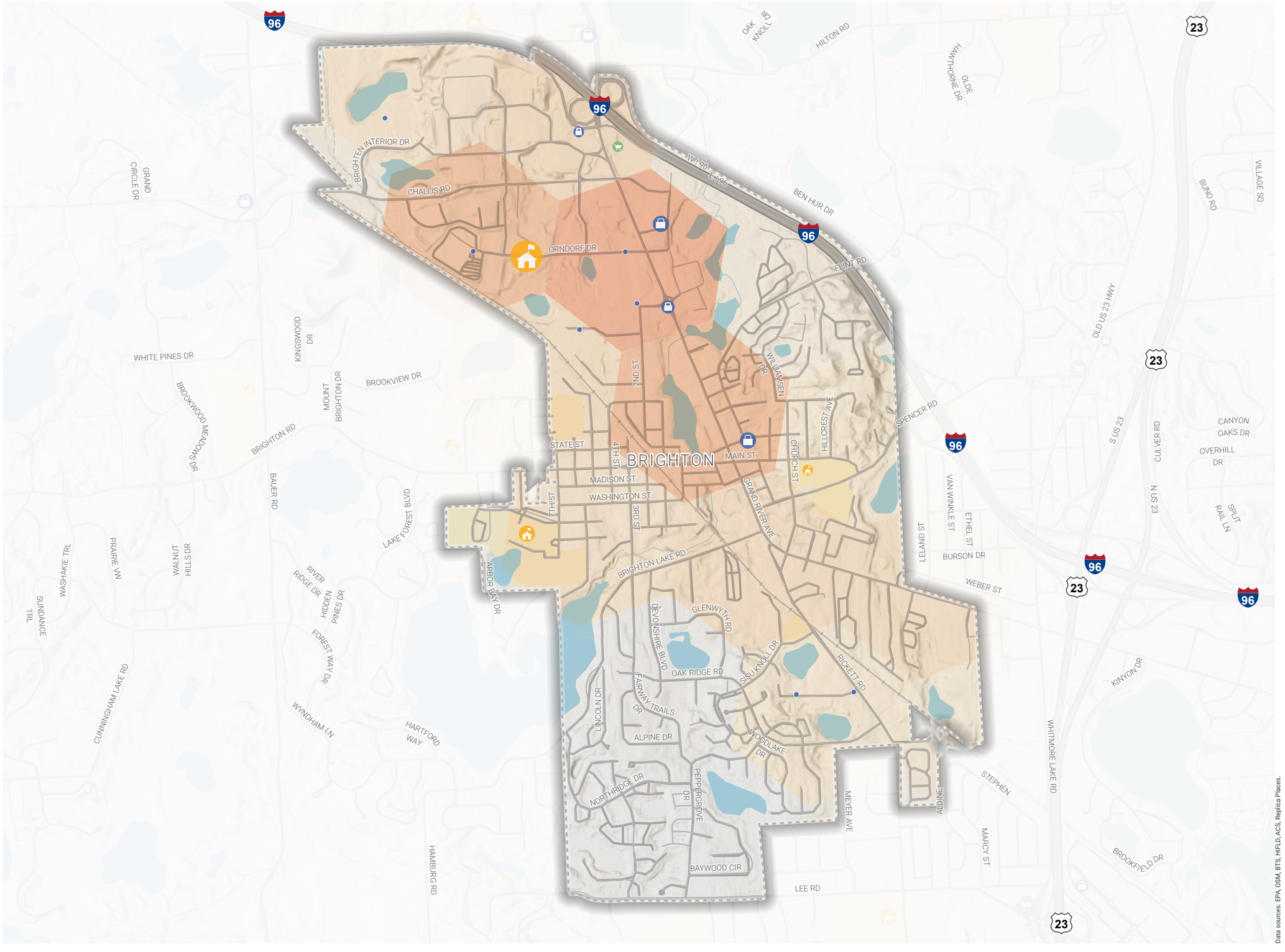


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF CHARLOTTE

DEMAND ANALYSIS

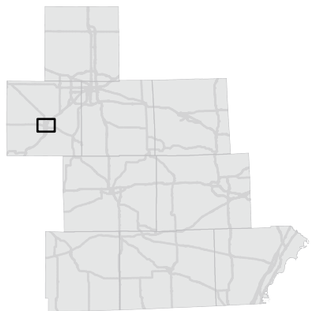
LEGEND

- Schools
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- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

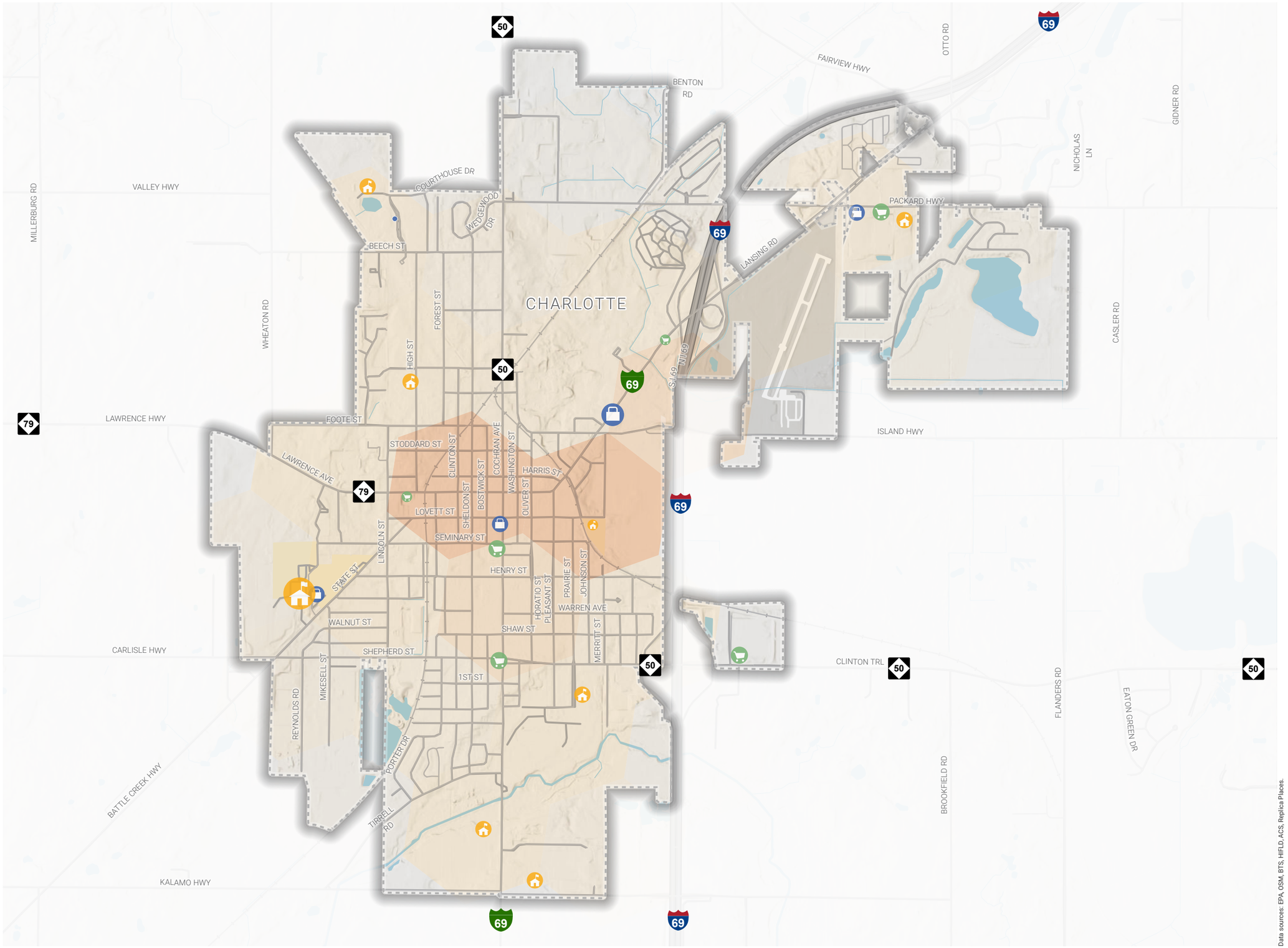


0 0.3 0.6 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF HILLSDALE

DEMAND ANALYSIS

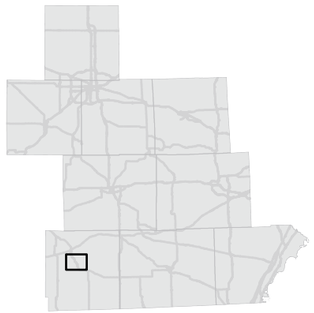
LEGEND

- Schools
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- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

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UNIVERSITY REGION

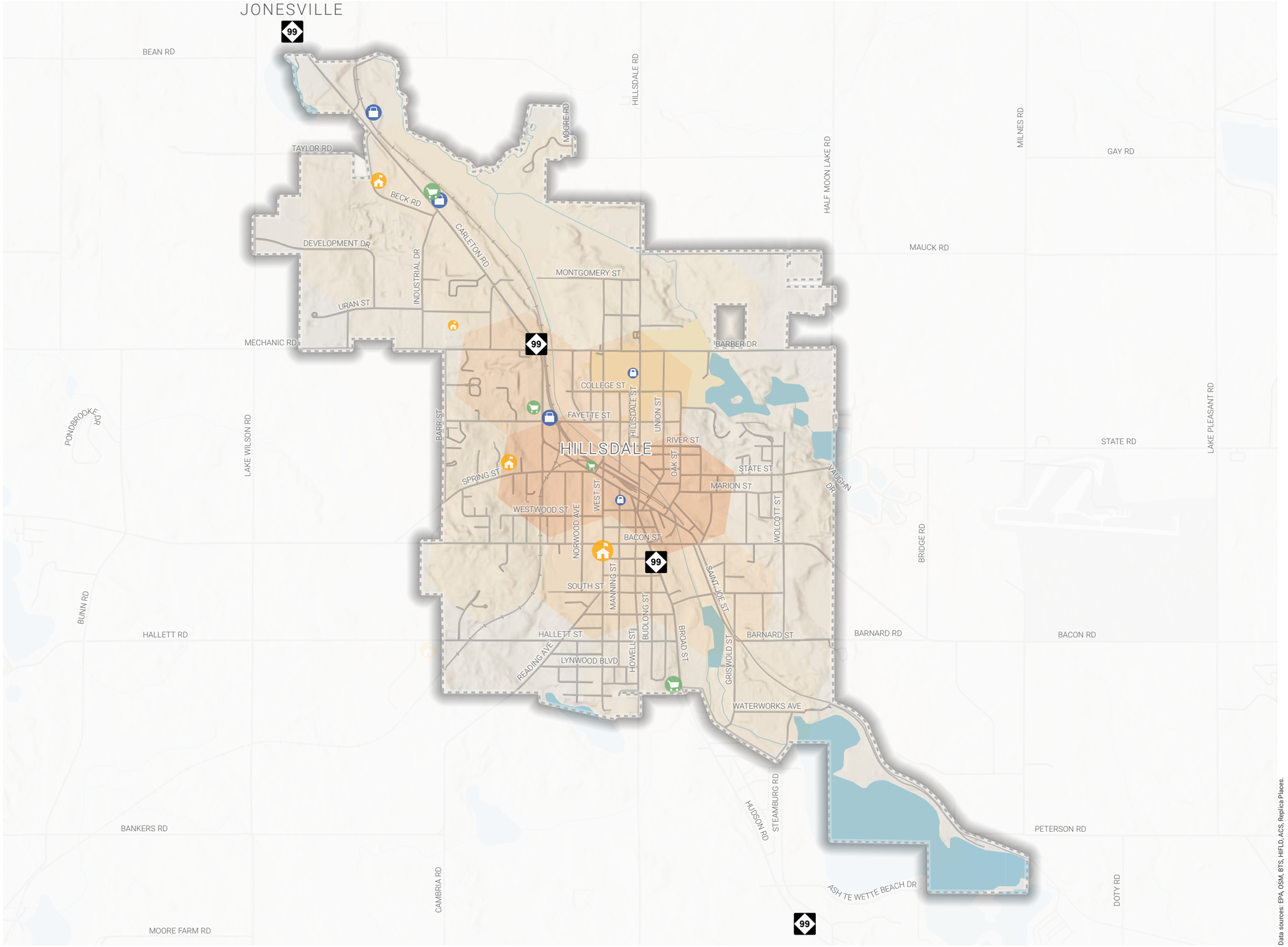


0 0.35 0.7 MILES

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF HOWELL

DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

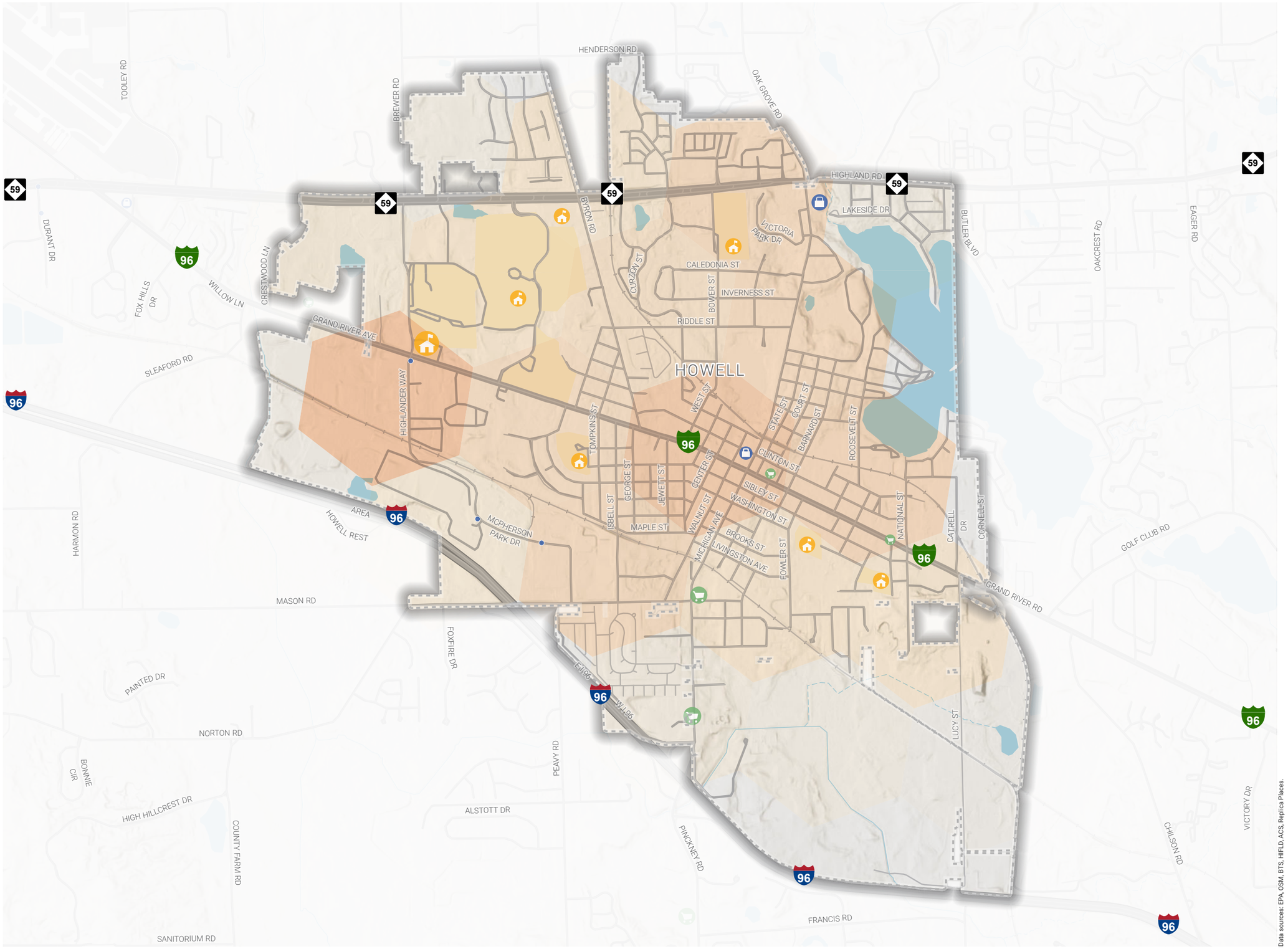


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF JACKSON

DEMAND ANALYSIS

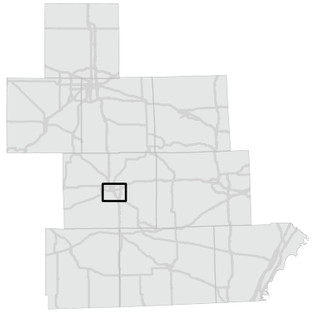
LEGEND

- Schools
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- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

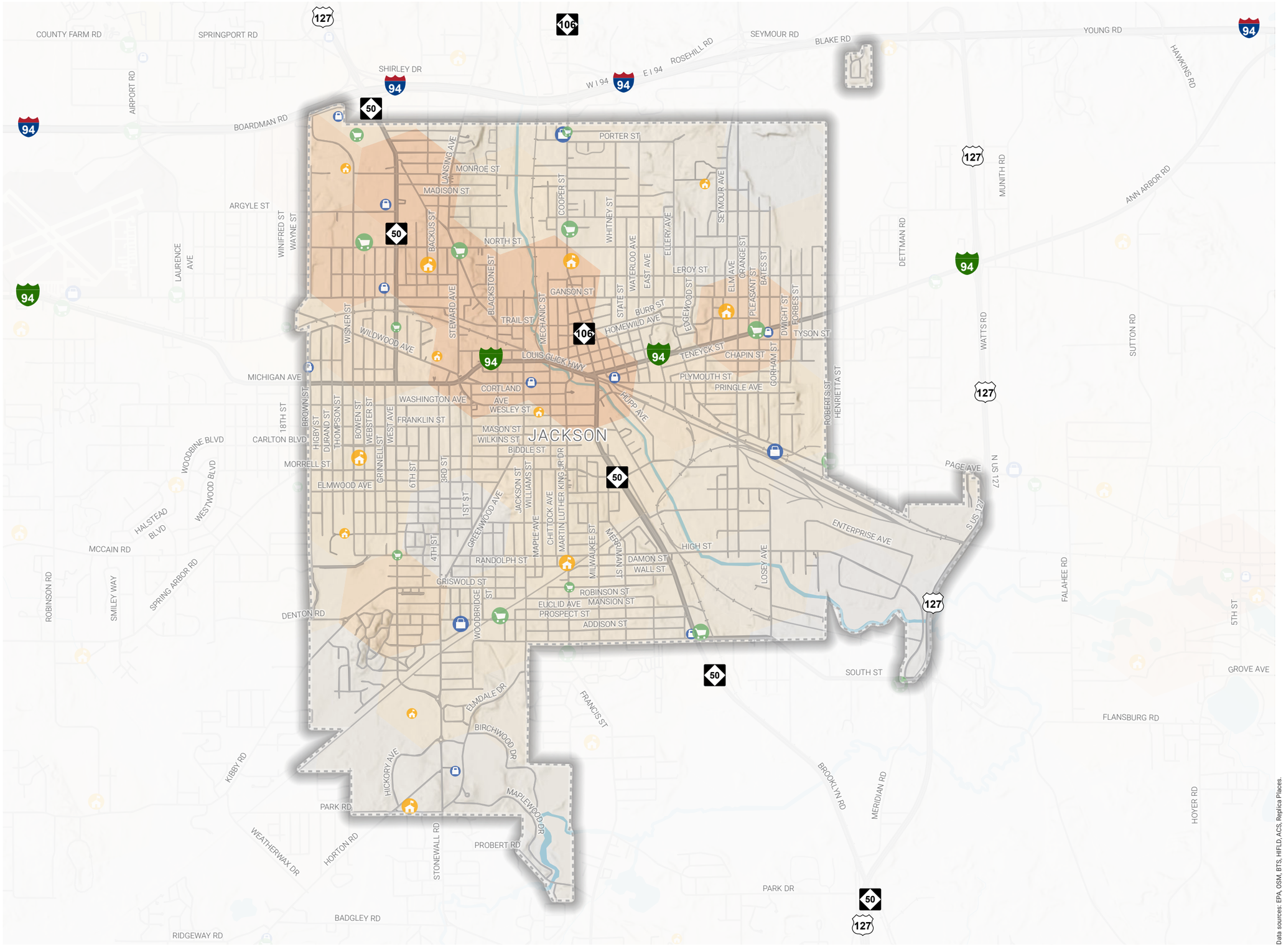


0 0.4 0.8 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF LITCHFIELD

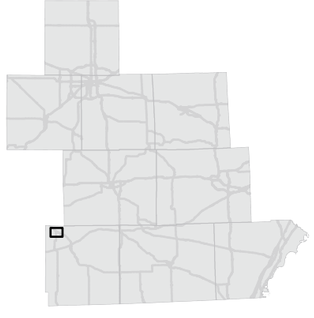
DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops
- High Walk Demand
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- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

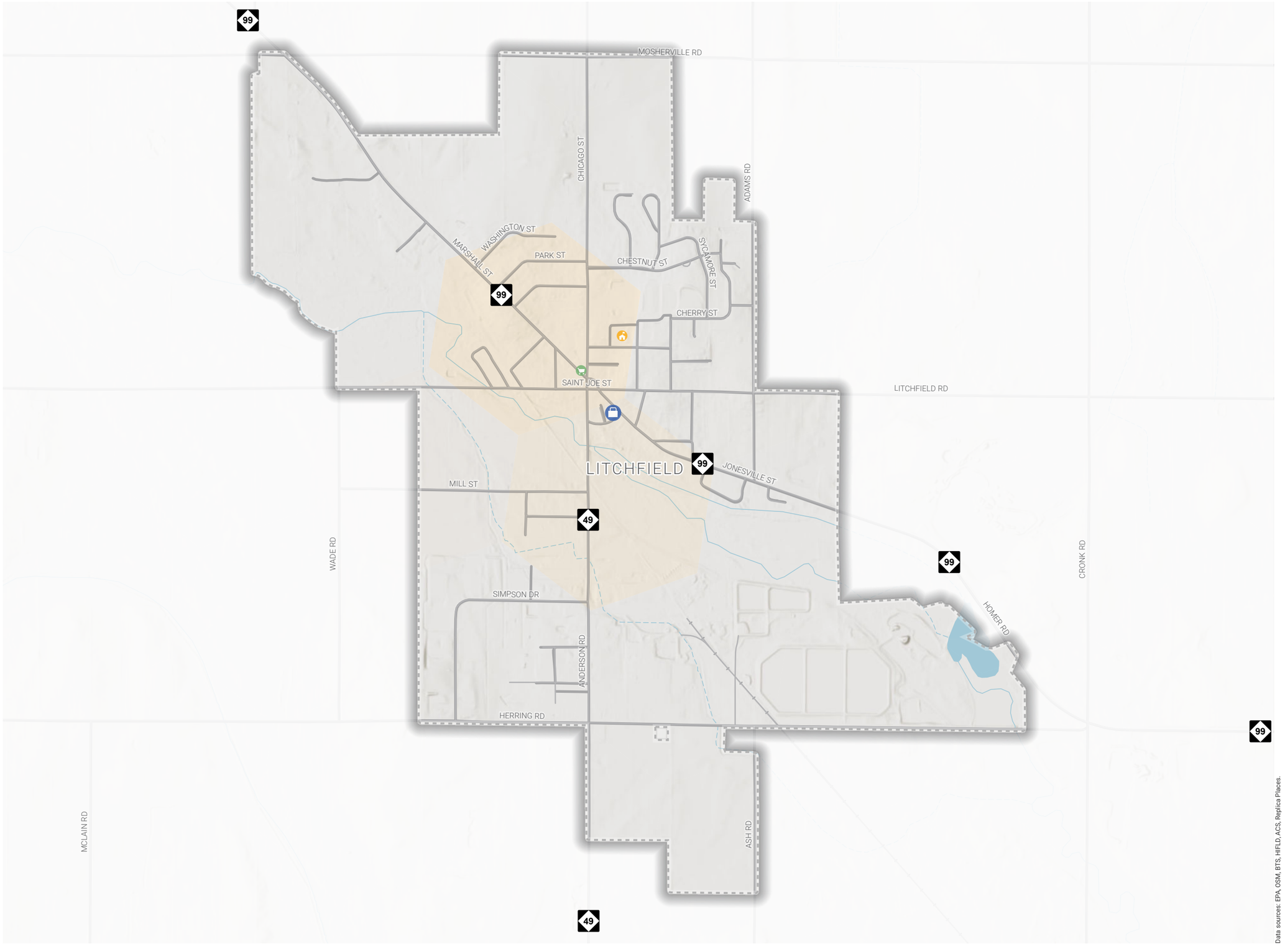


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF MASON

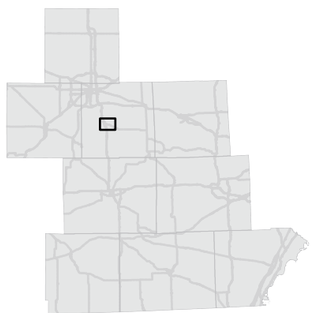
DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops
- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

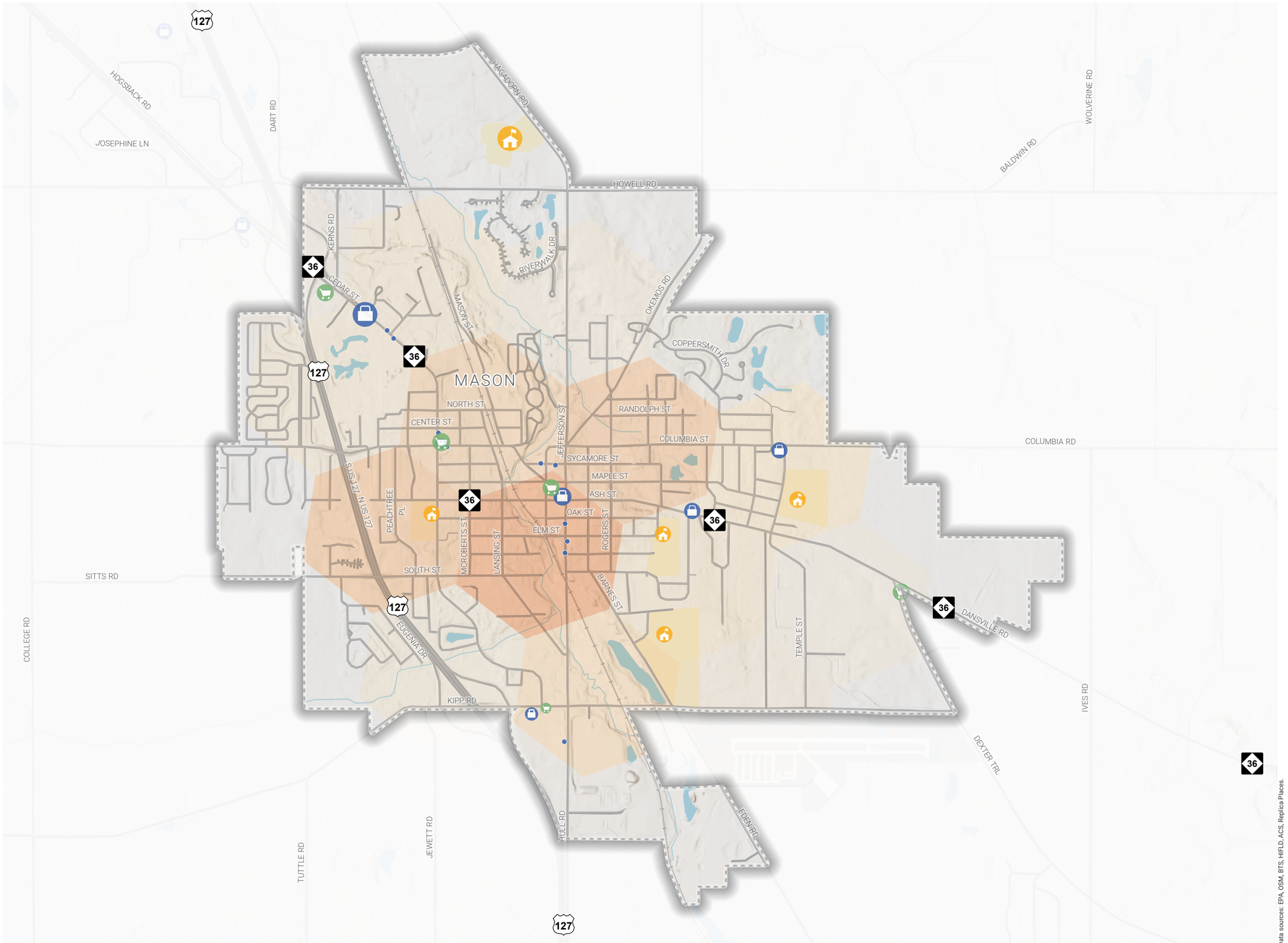
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF MILAN

DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

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UNIVERSITY REGION

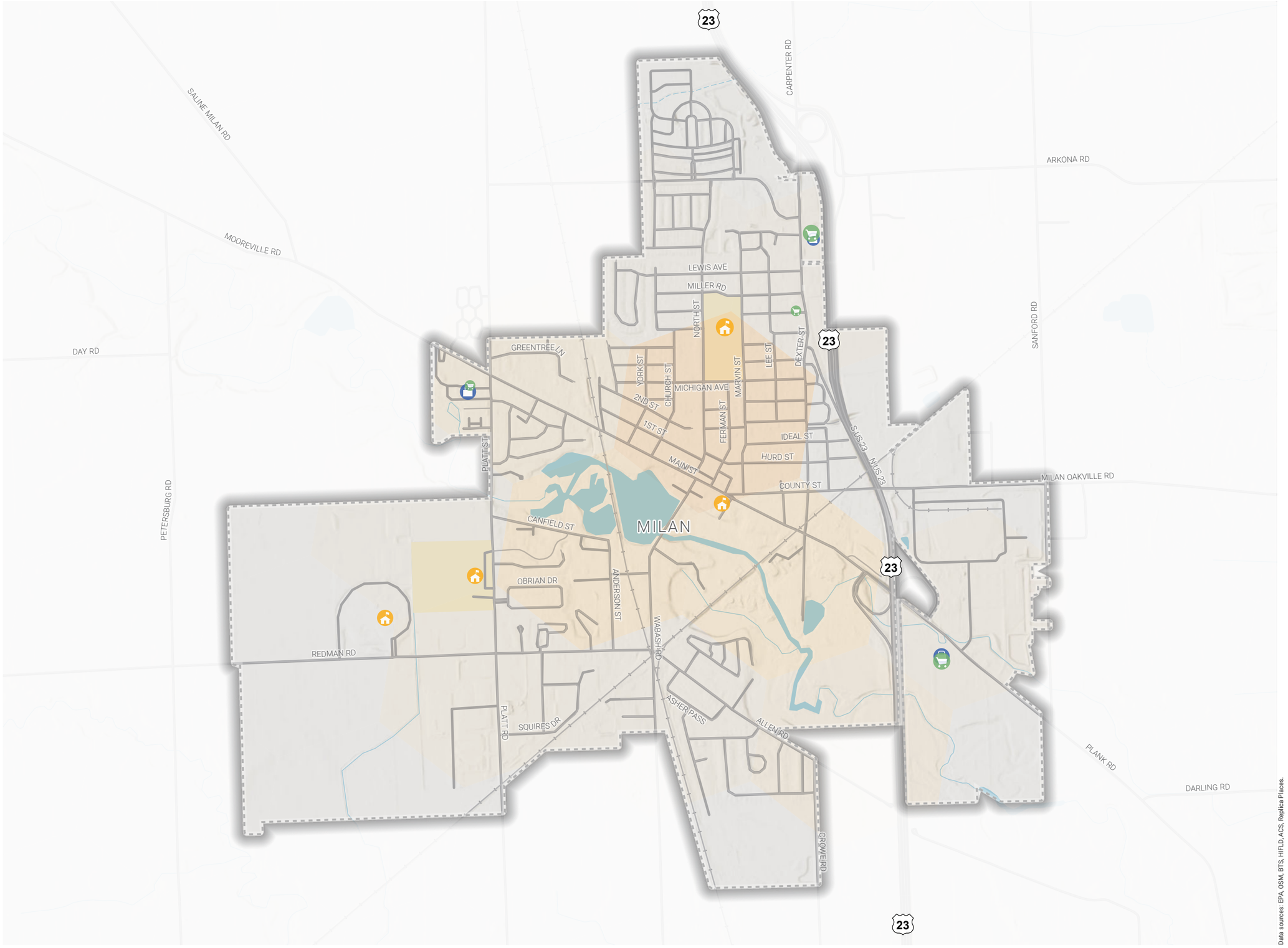


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF MONROE

DEMAND ANALYSIS

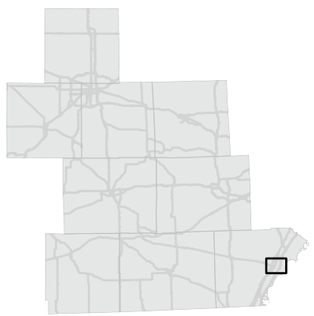
LEGEND

- Schools
- Entertainment Sites
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- Bus Stops

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- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

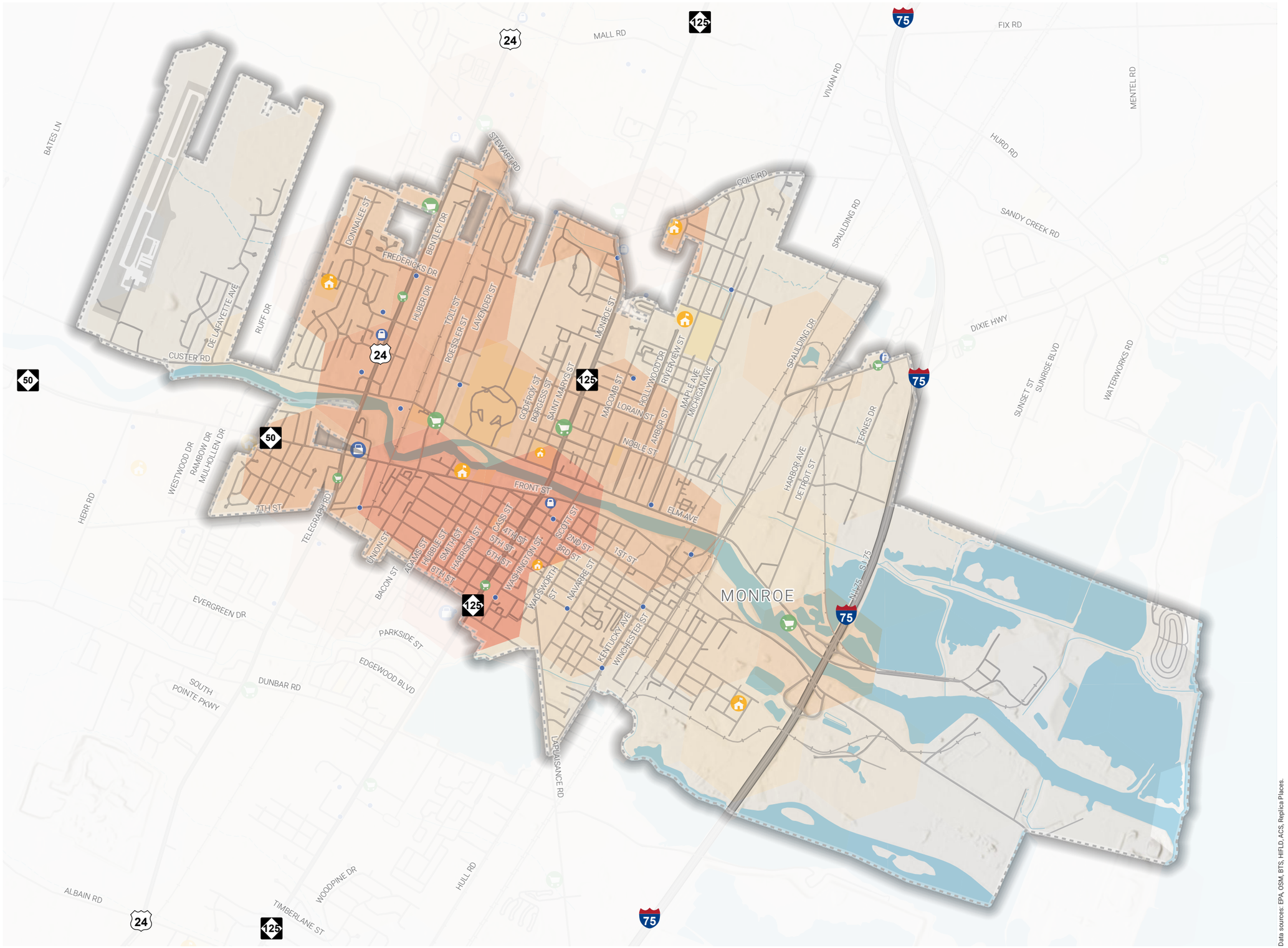


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF ST JOHNS

DEMAND ANALYSIS

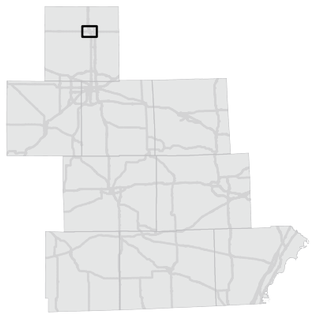
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

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- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

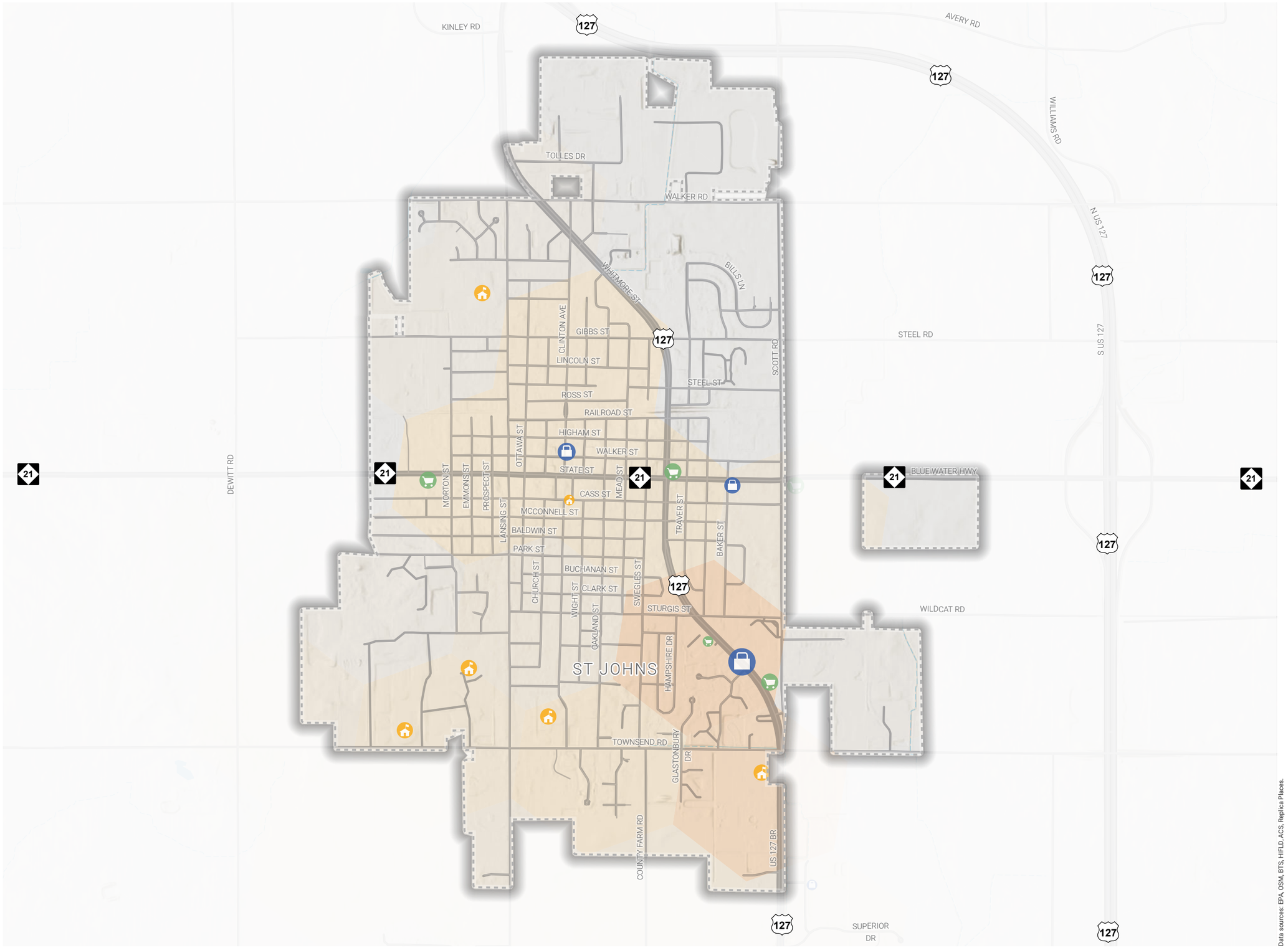


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF TECUMSEH

DEMAND ANALYSIS

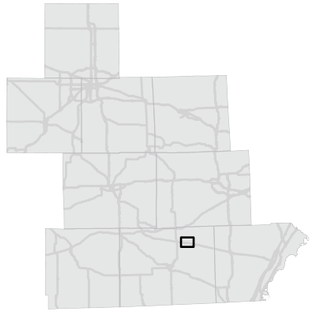
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

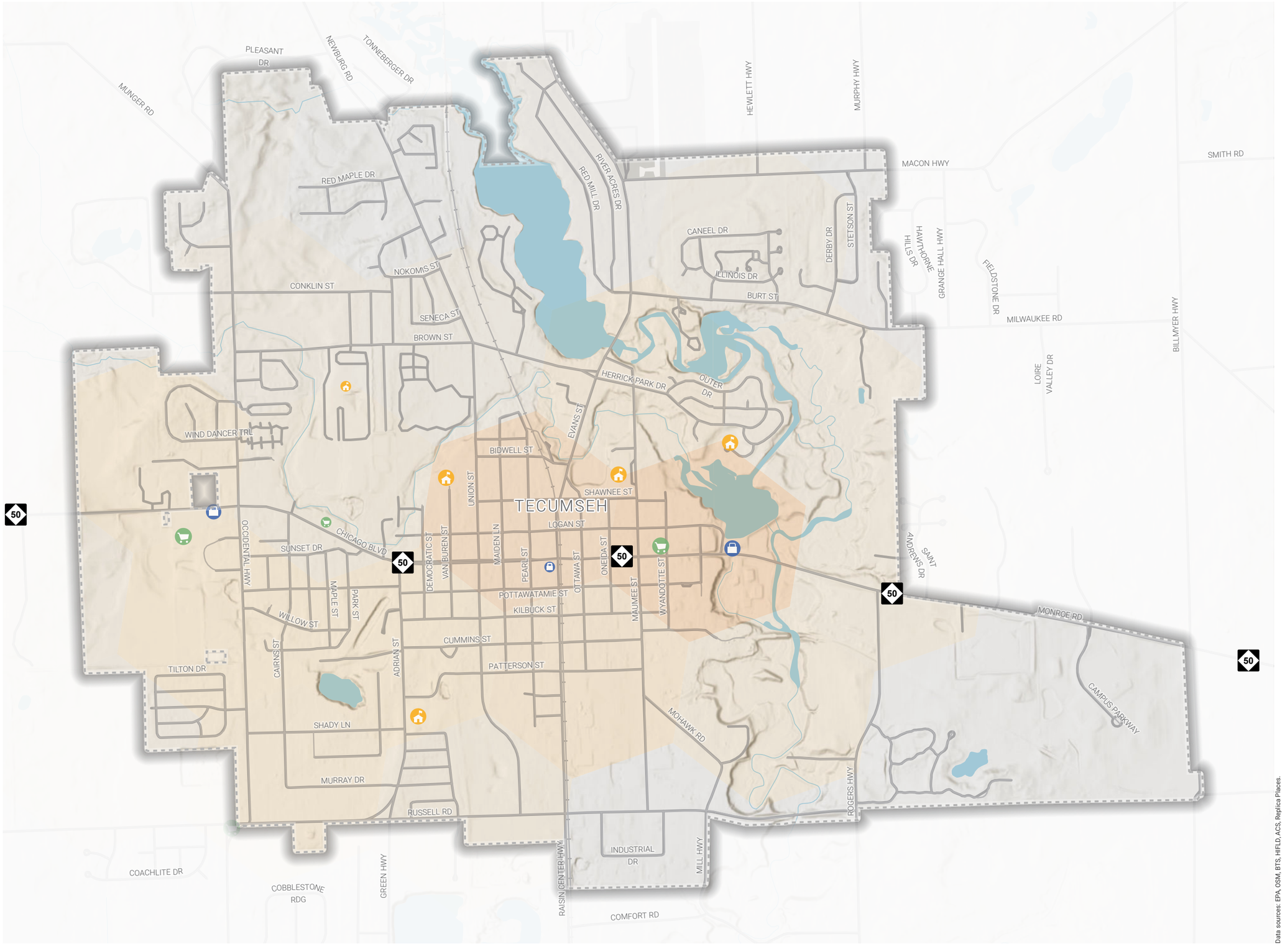


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF YPSILANTI

DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

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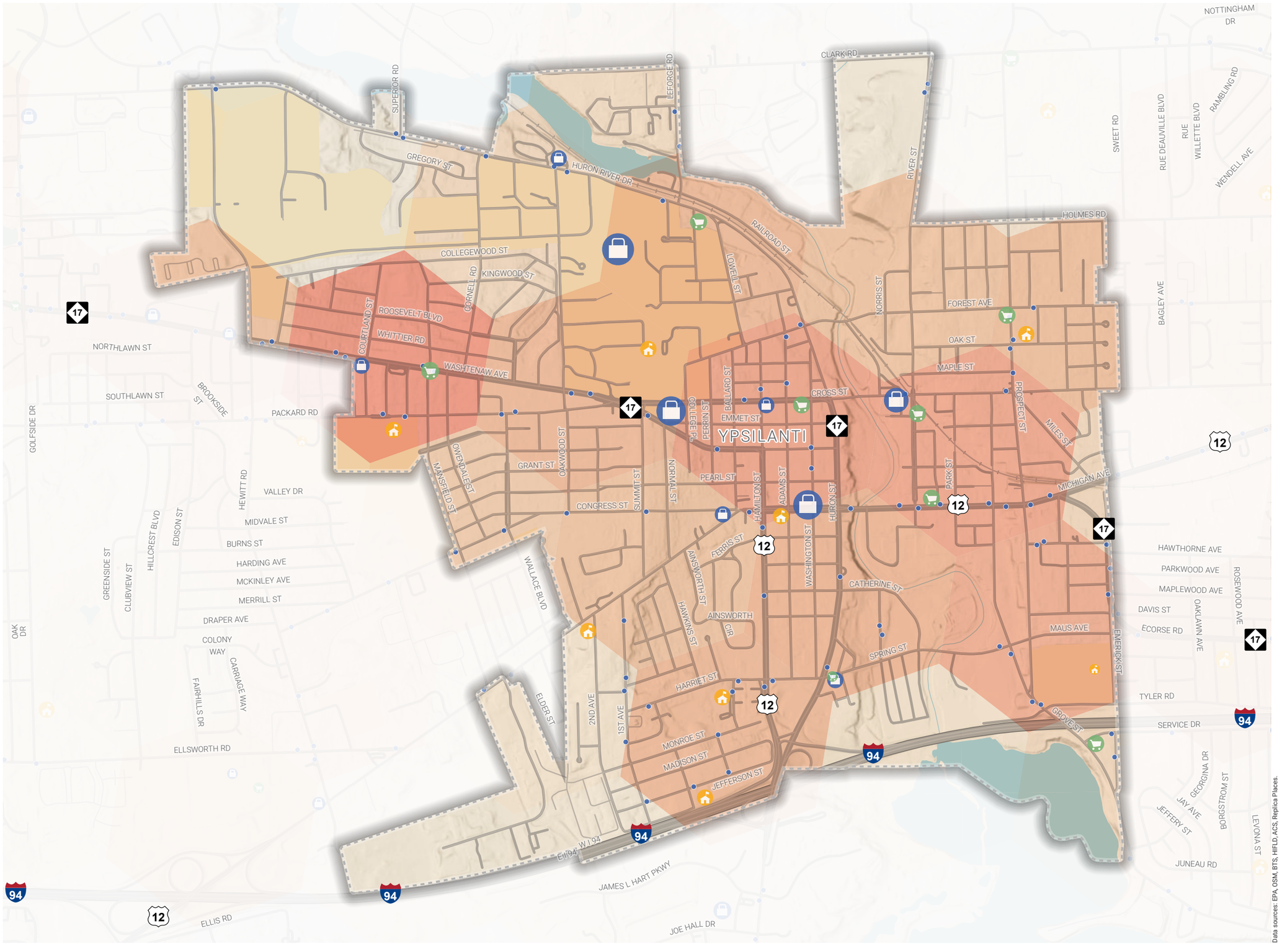
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CLINTON COUNTY

DEMAND ANALYSIS

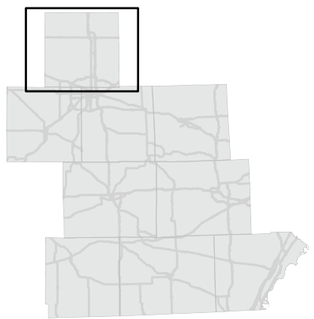
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

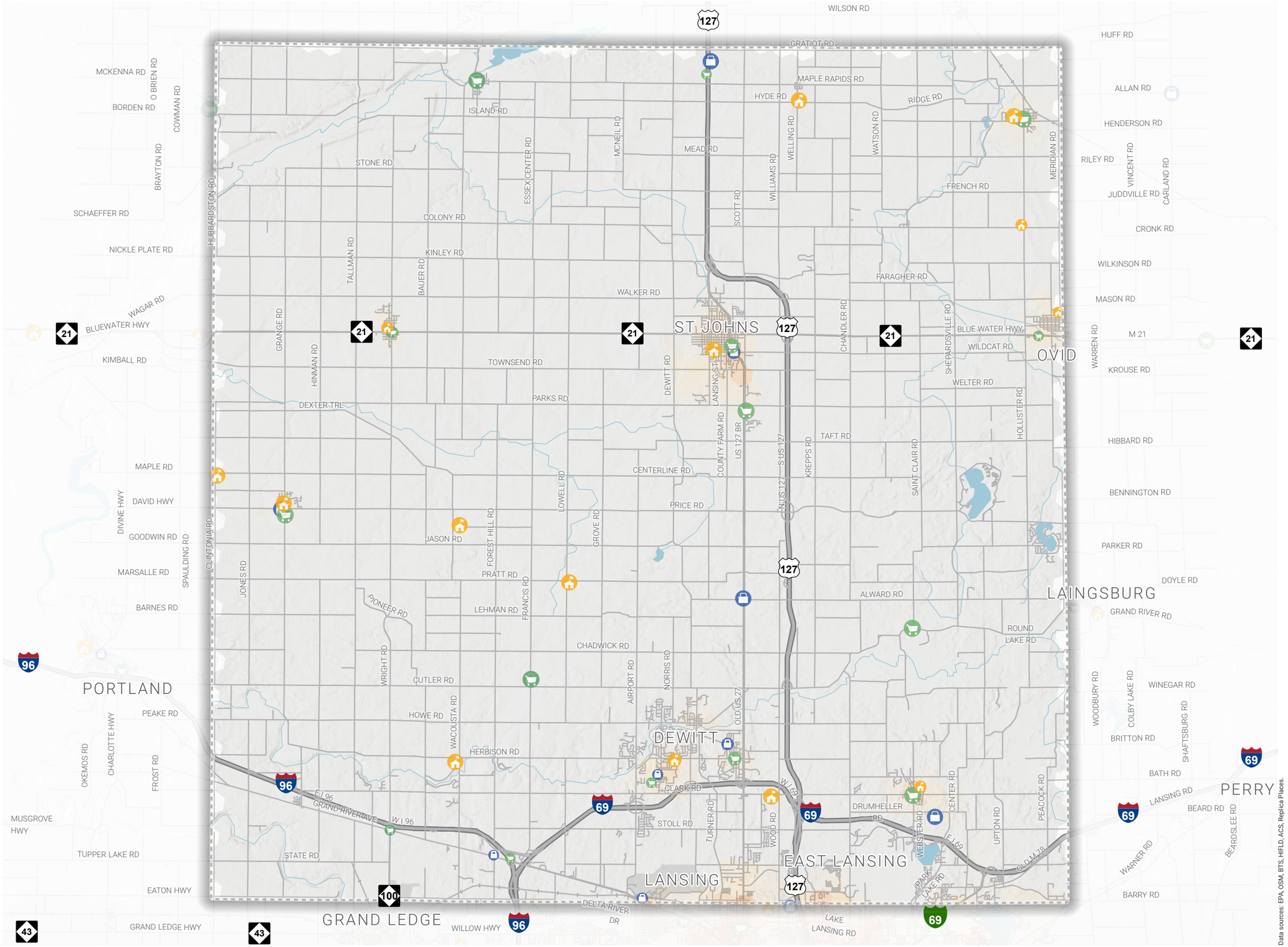


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

EATON COUNTY

DEMAND ANALYSIS

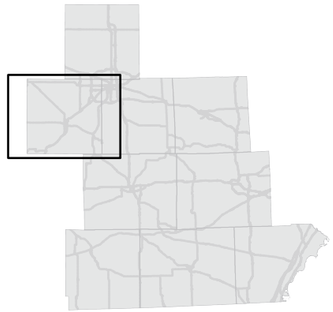
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

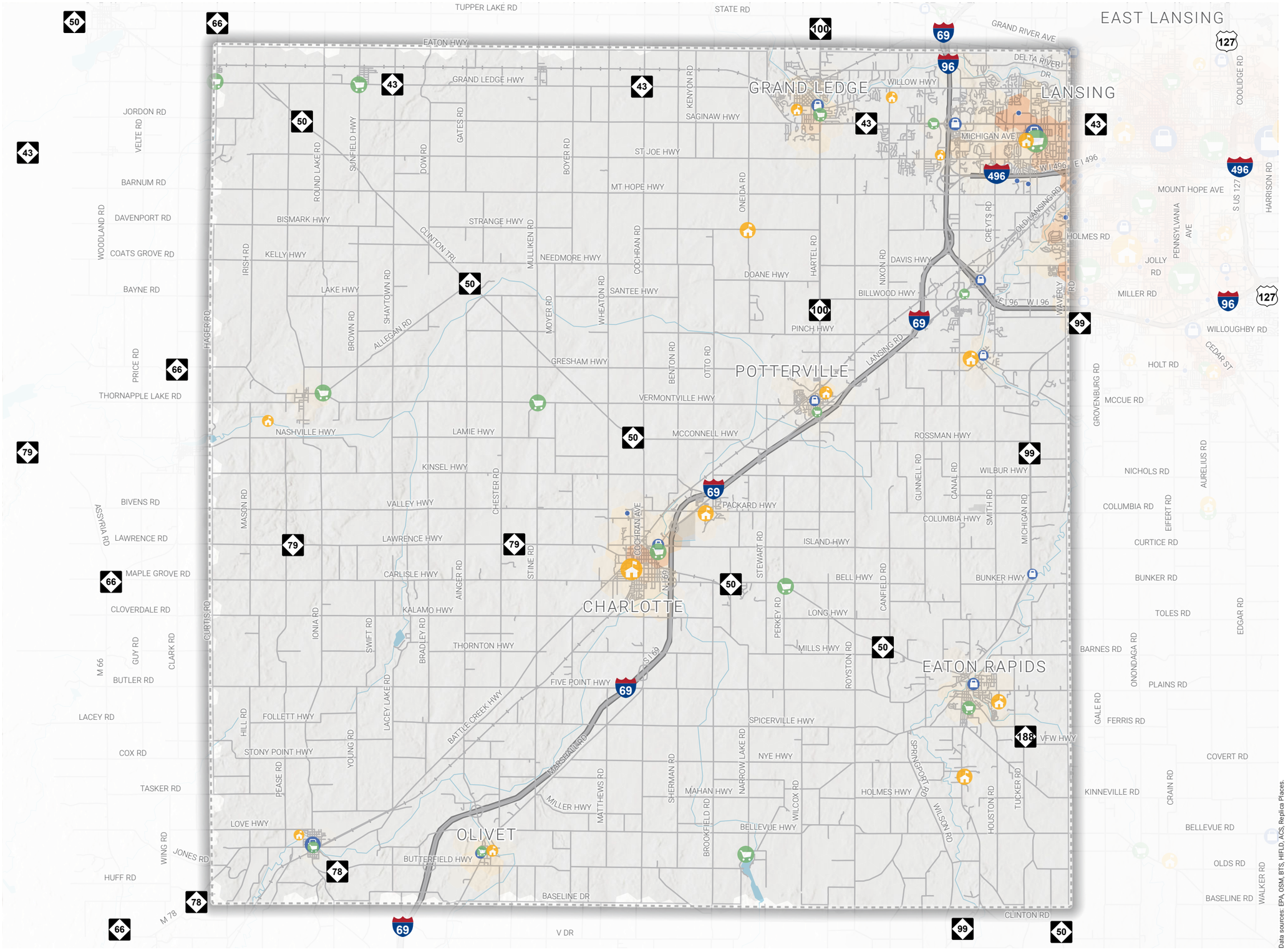


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

GREATER LANSING

DEMAND ANALYSIS

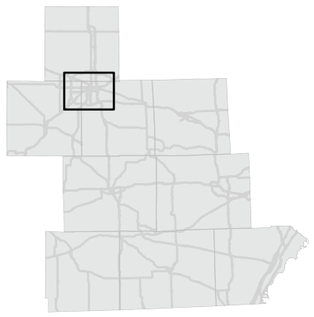
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

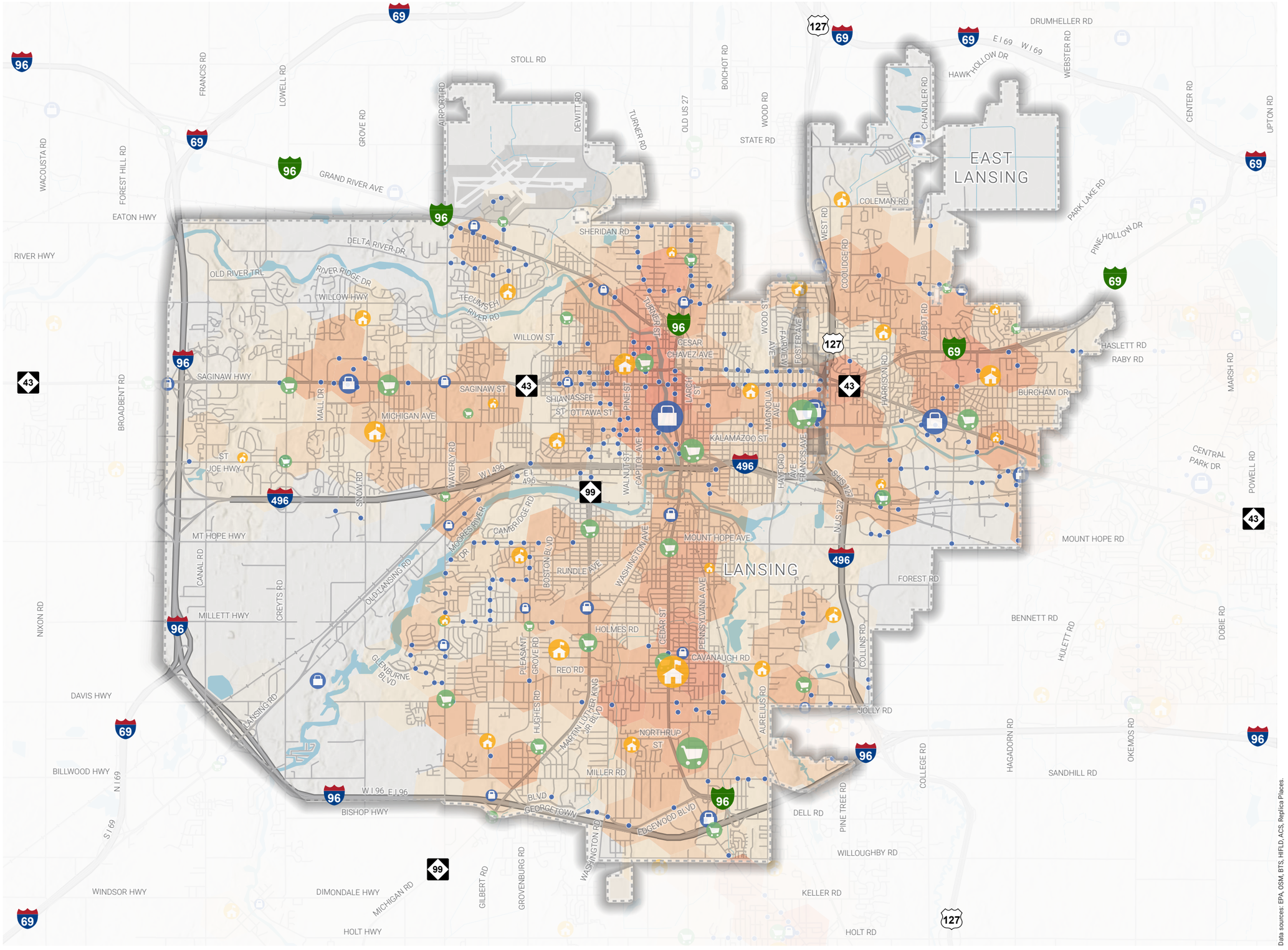


0 0.85 1.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

HILLSDALE COUNTY

DEMAND ANALYSIS

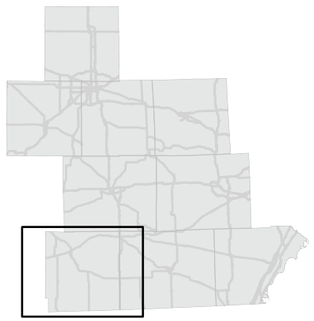
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

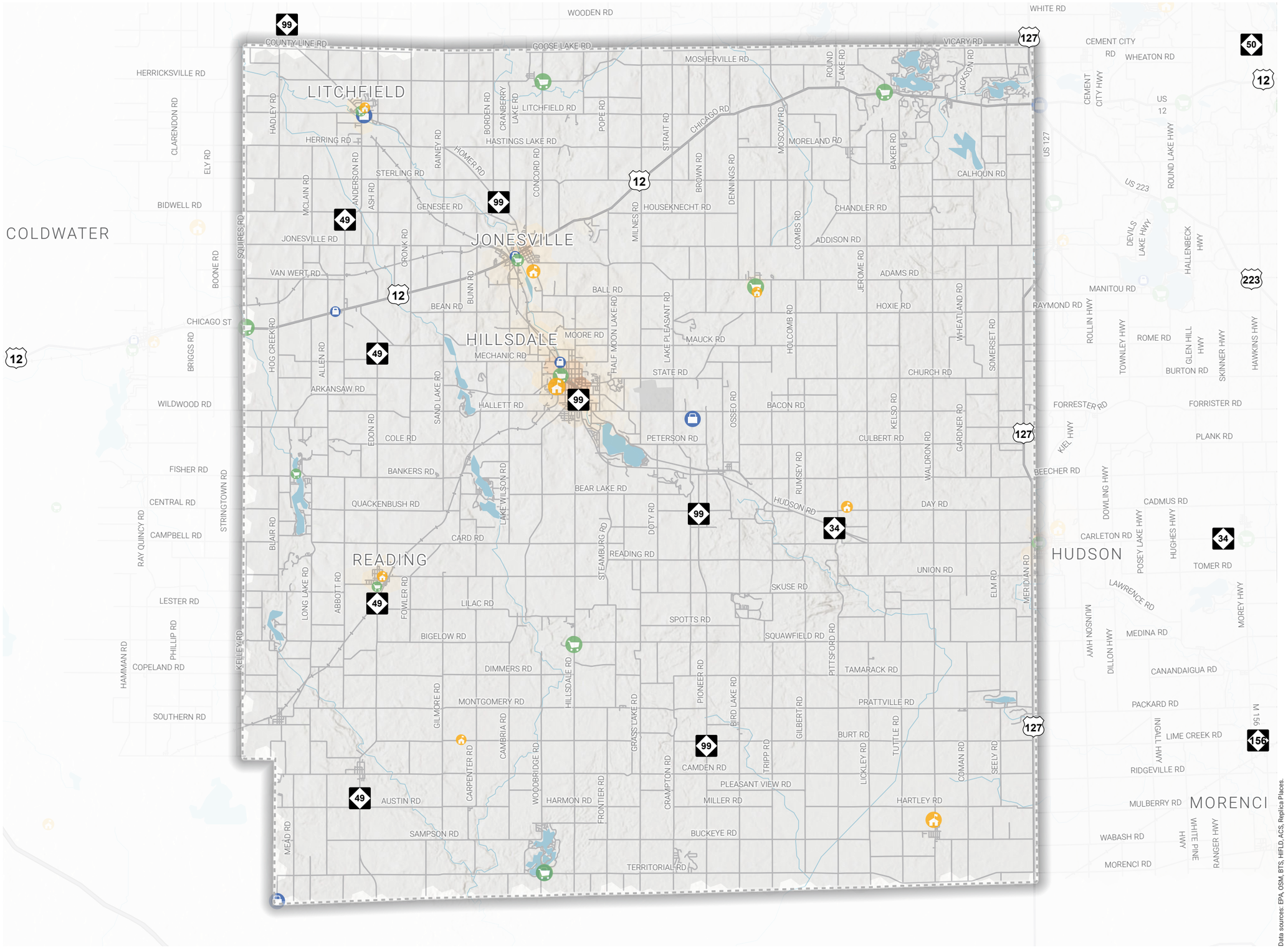


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

INGHAM COUNTY

DEMAND ANALYSIS

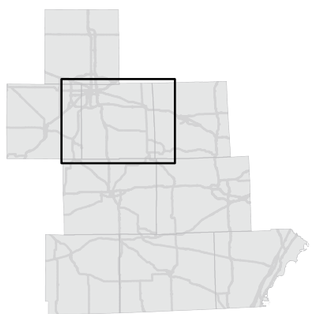
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

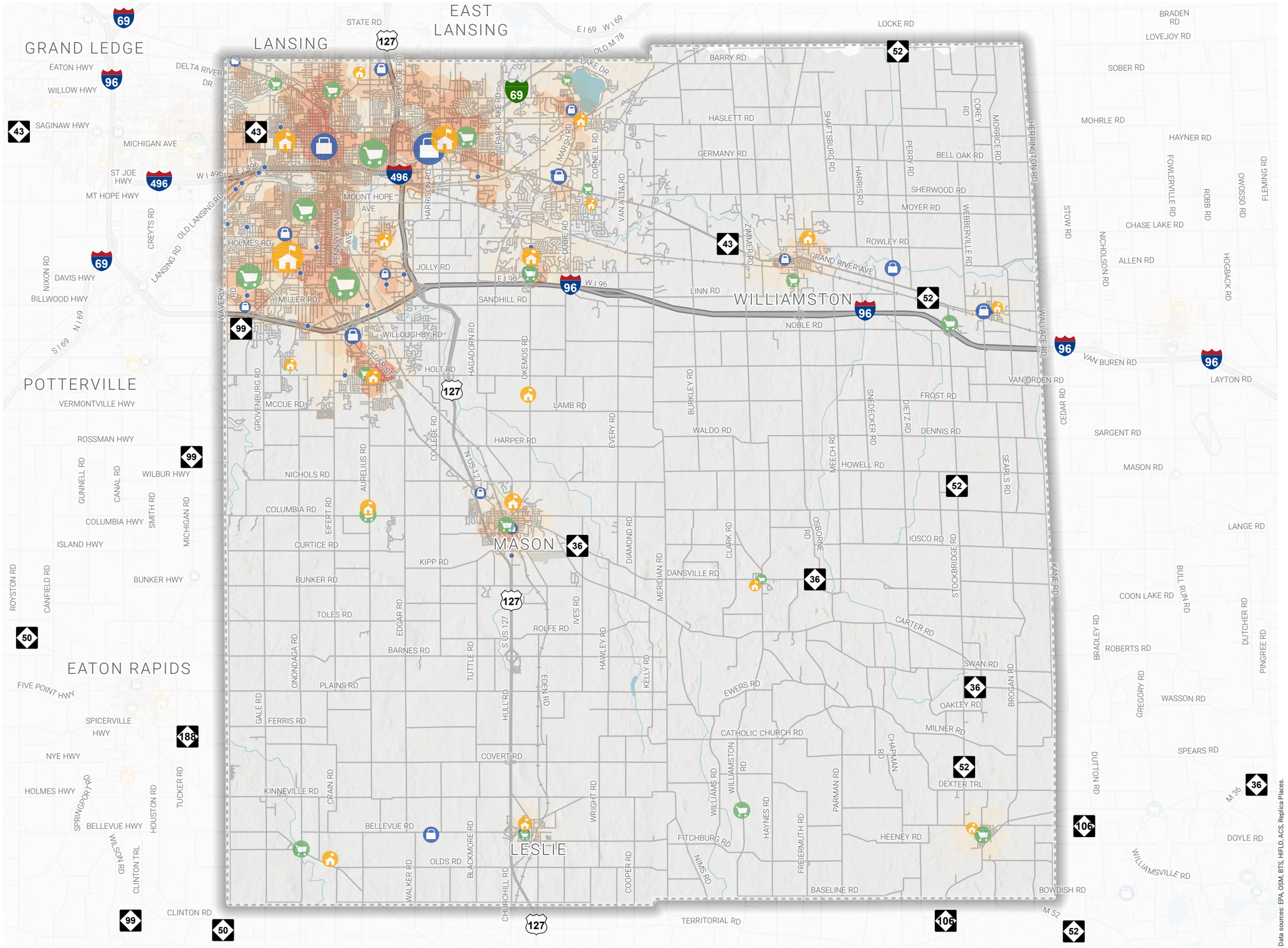


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

JACKSON COUNTY

DEMAND ANALYSIS

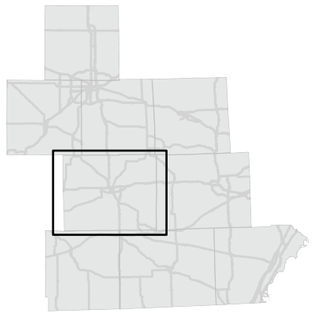
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

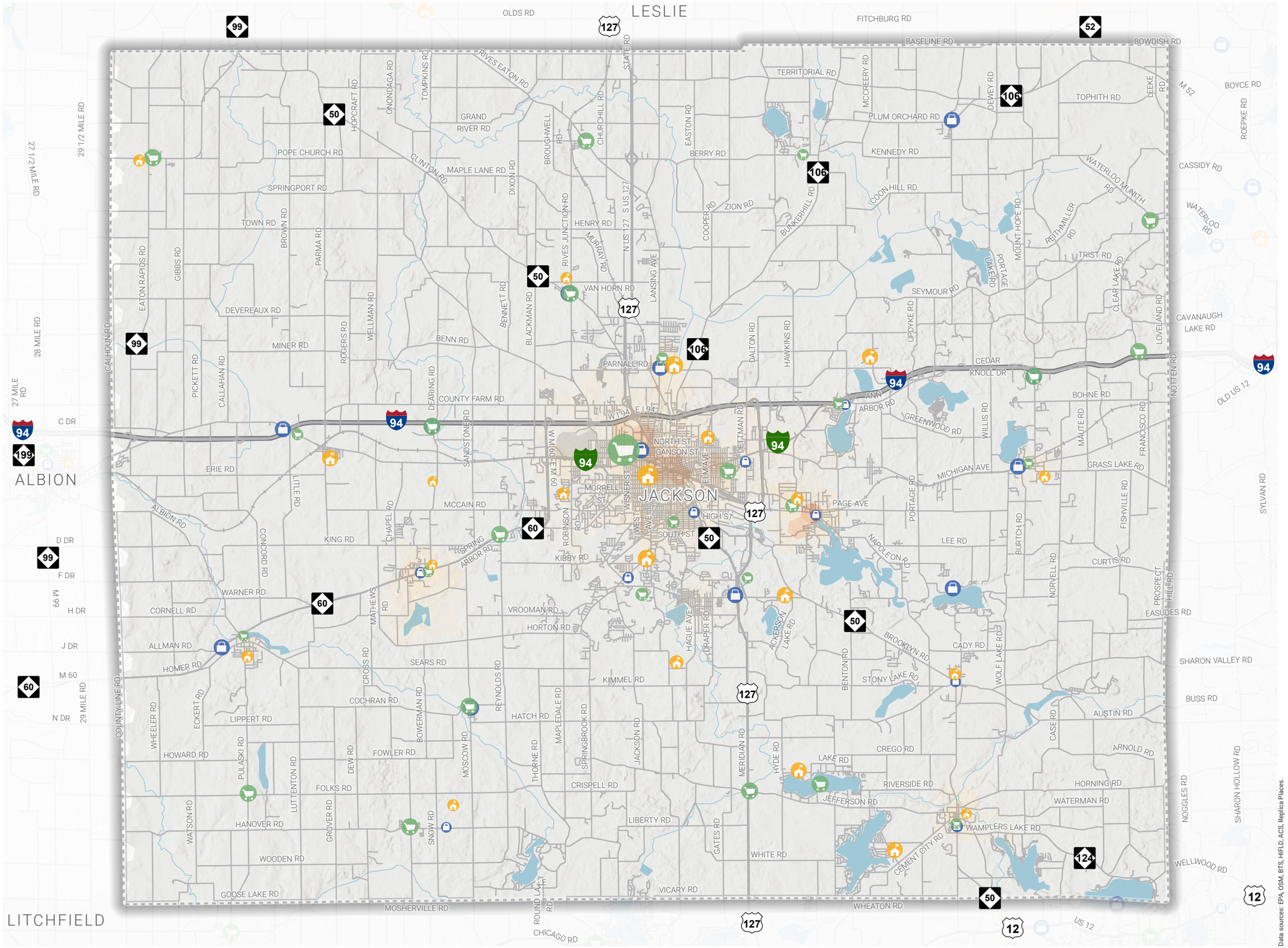


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

LENAWEE COUNTY

DEMAND ANALYSIS

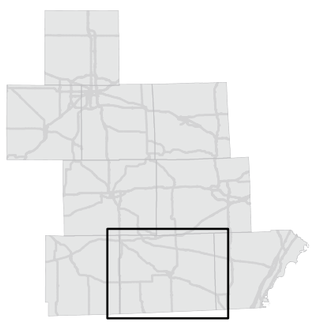
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

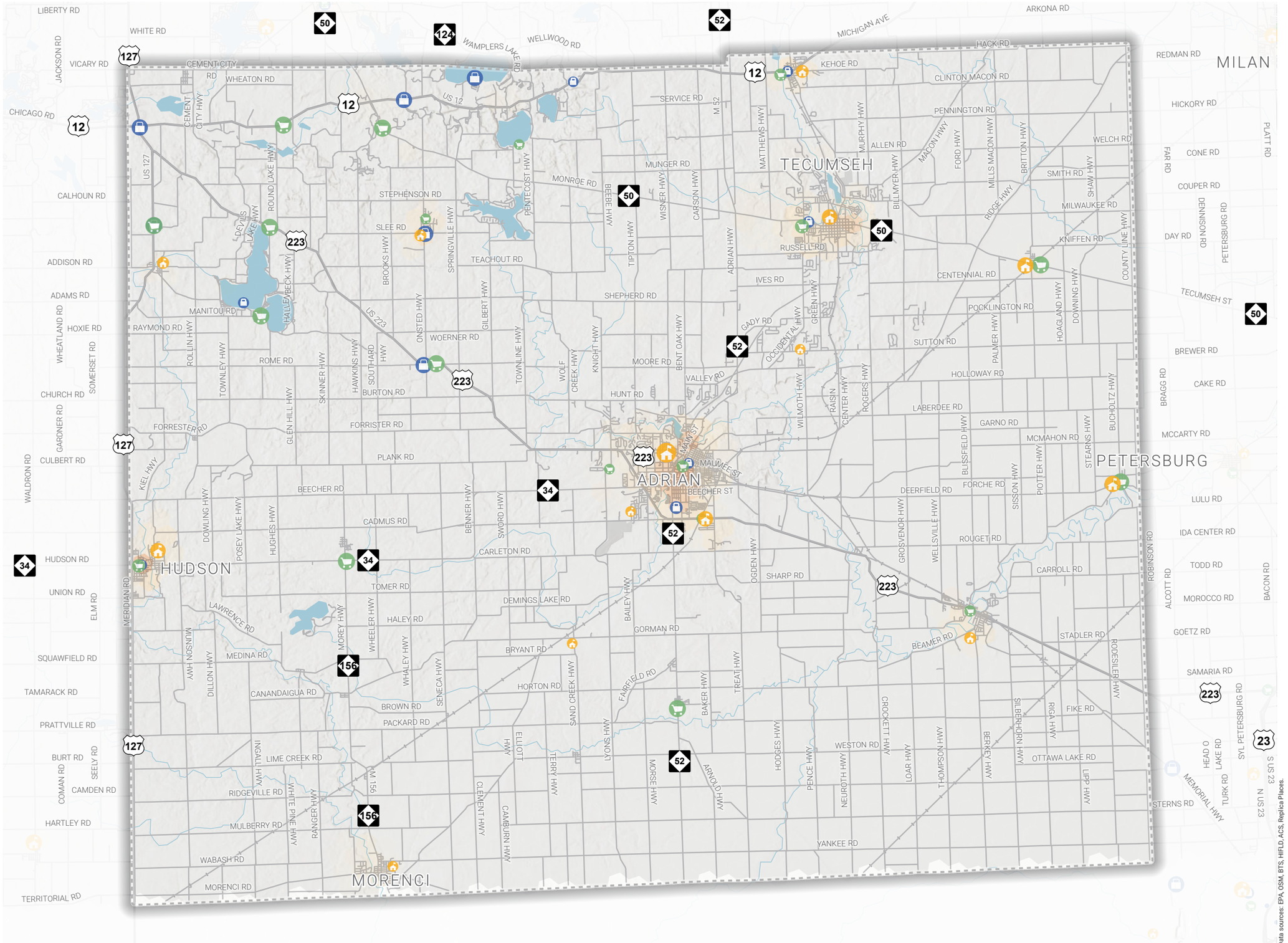


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

LIVINGSTON COUNTY

DEMAND ANALYSIS

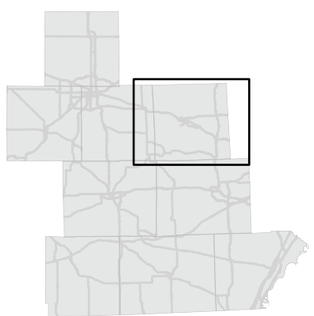
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

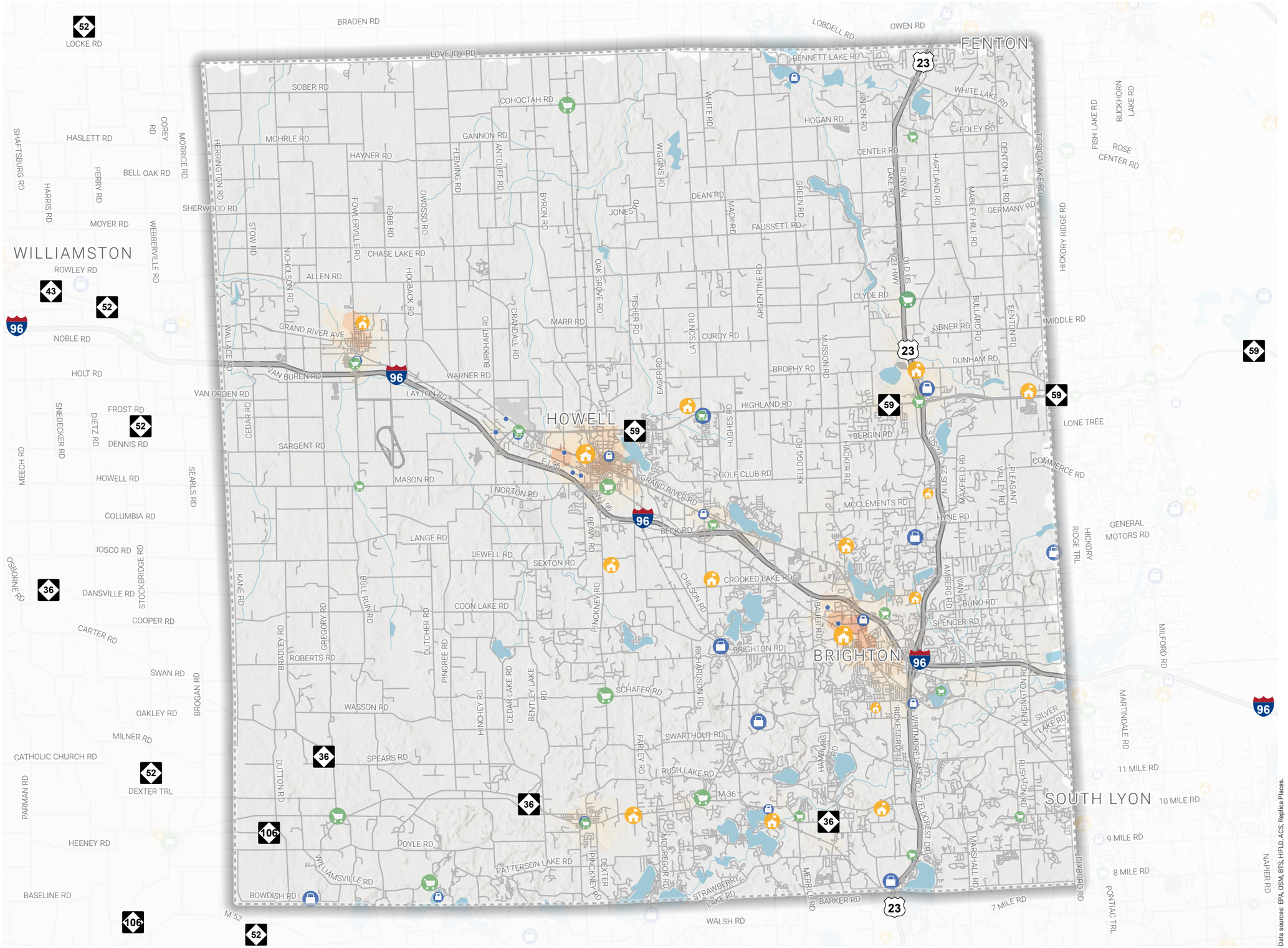


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

MONROE COUNTY

DEMAND ANALYSIS

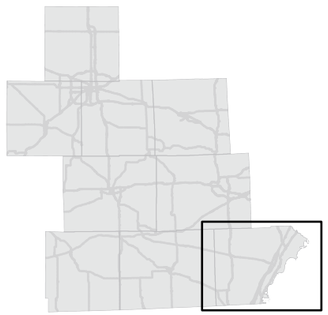
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

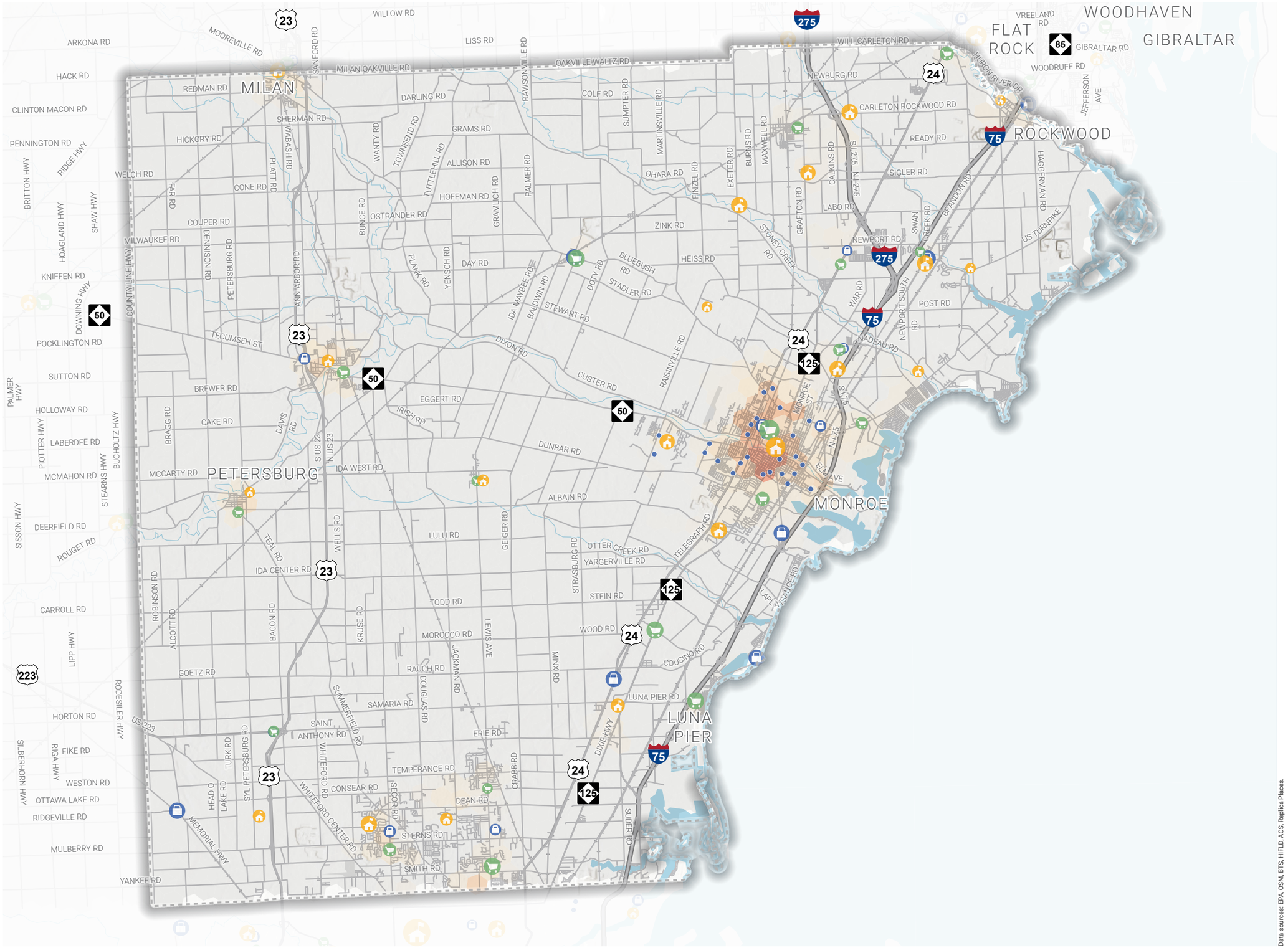


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

WASHTENAW COUNTY

DEMAND ANALYSIS

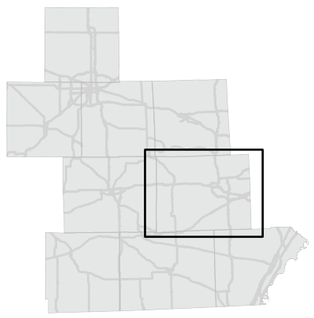
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Walk Demand
- Low Walk Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

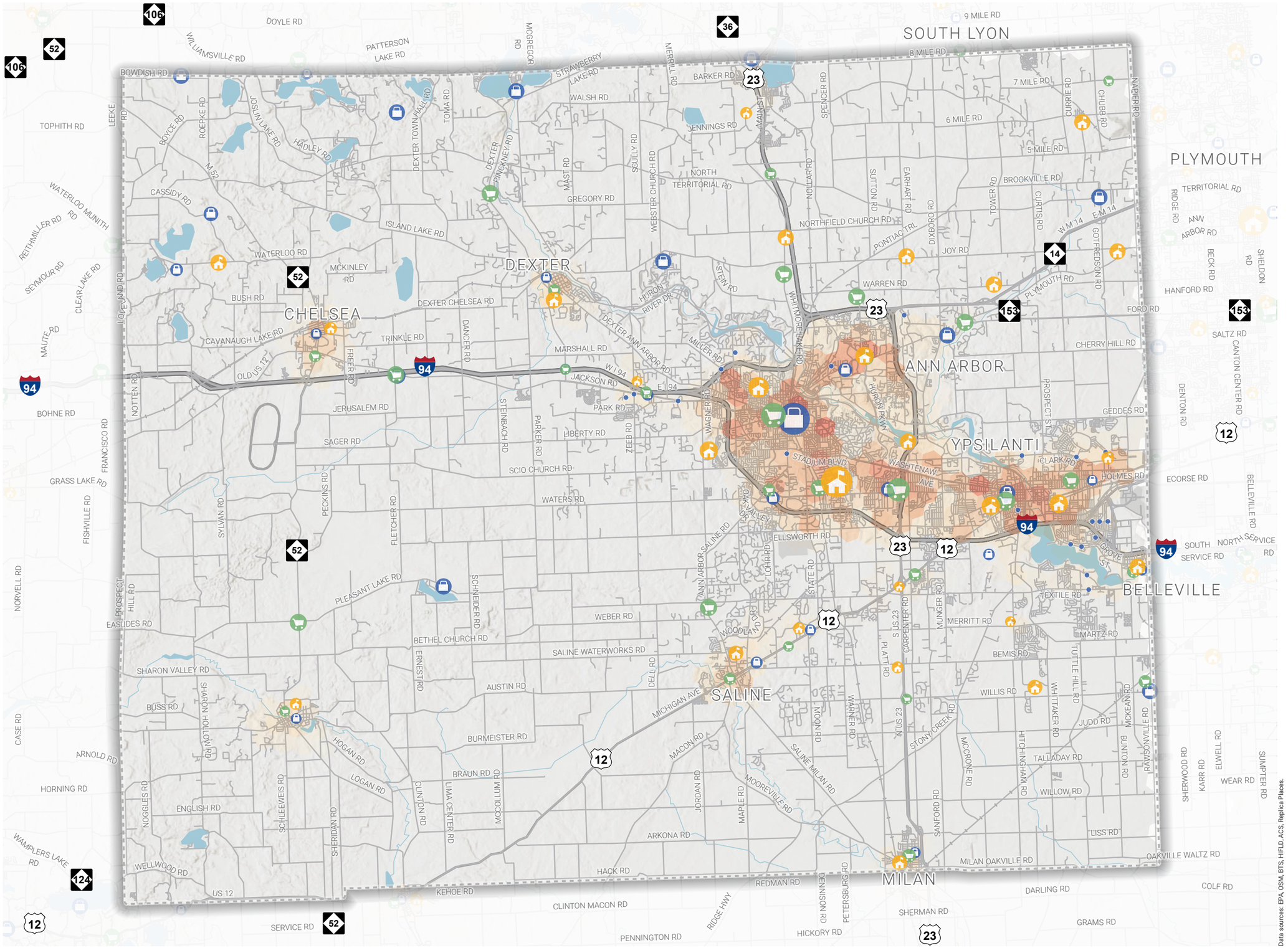


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

Bicycle Demand Maps

CITY OF ADRIAN

DEMAND ANALYSIS

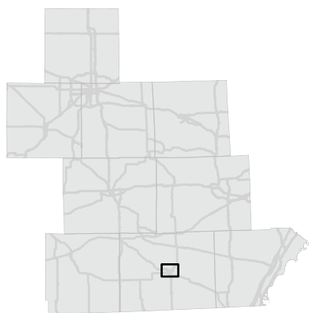
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

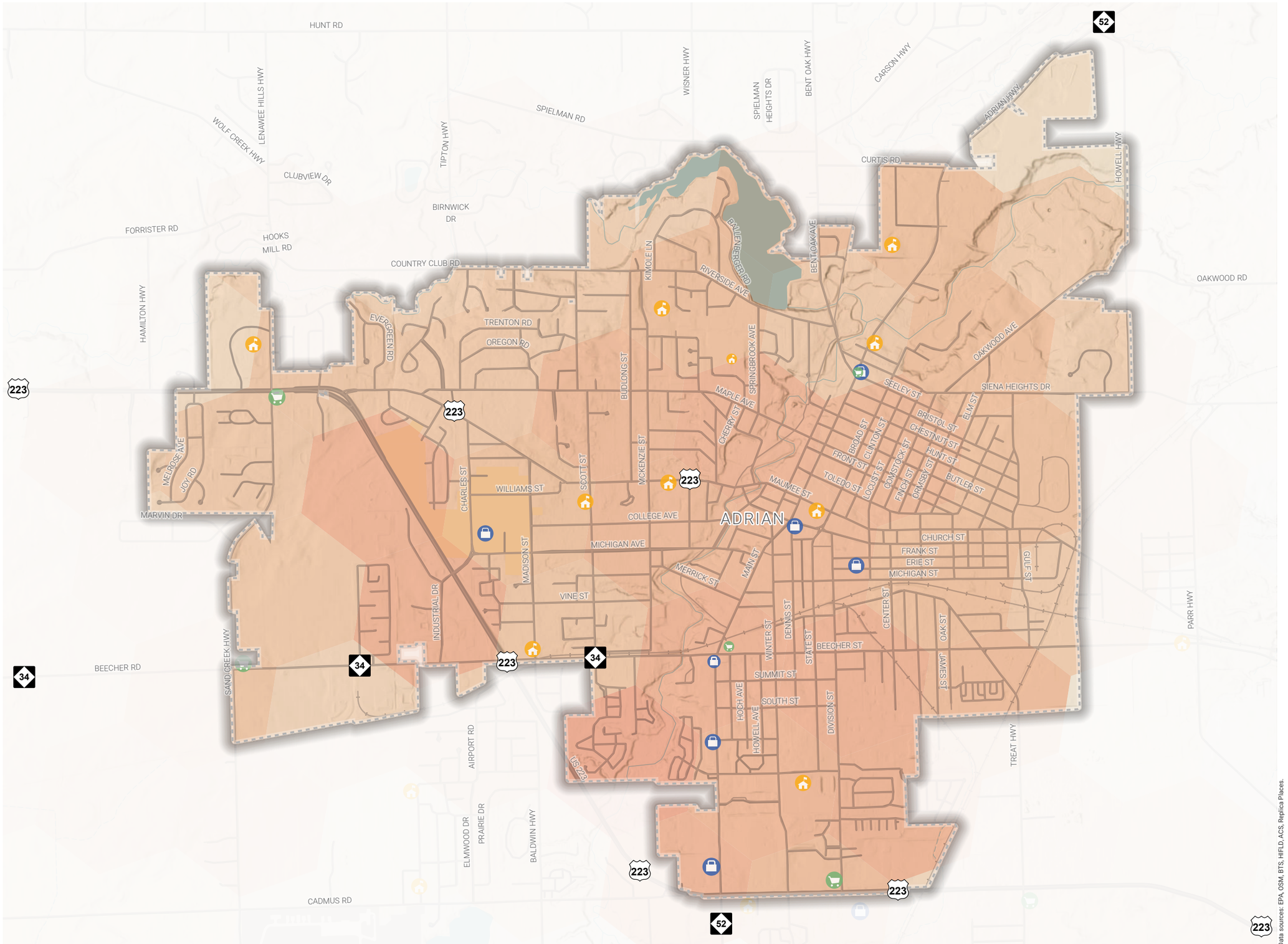
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF ANN ARBOR

DEMAND ANALYSIS

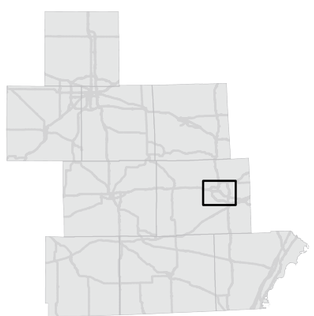
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

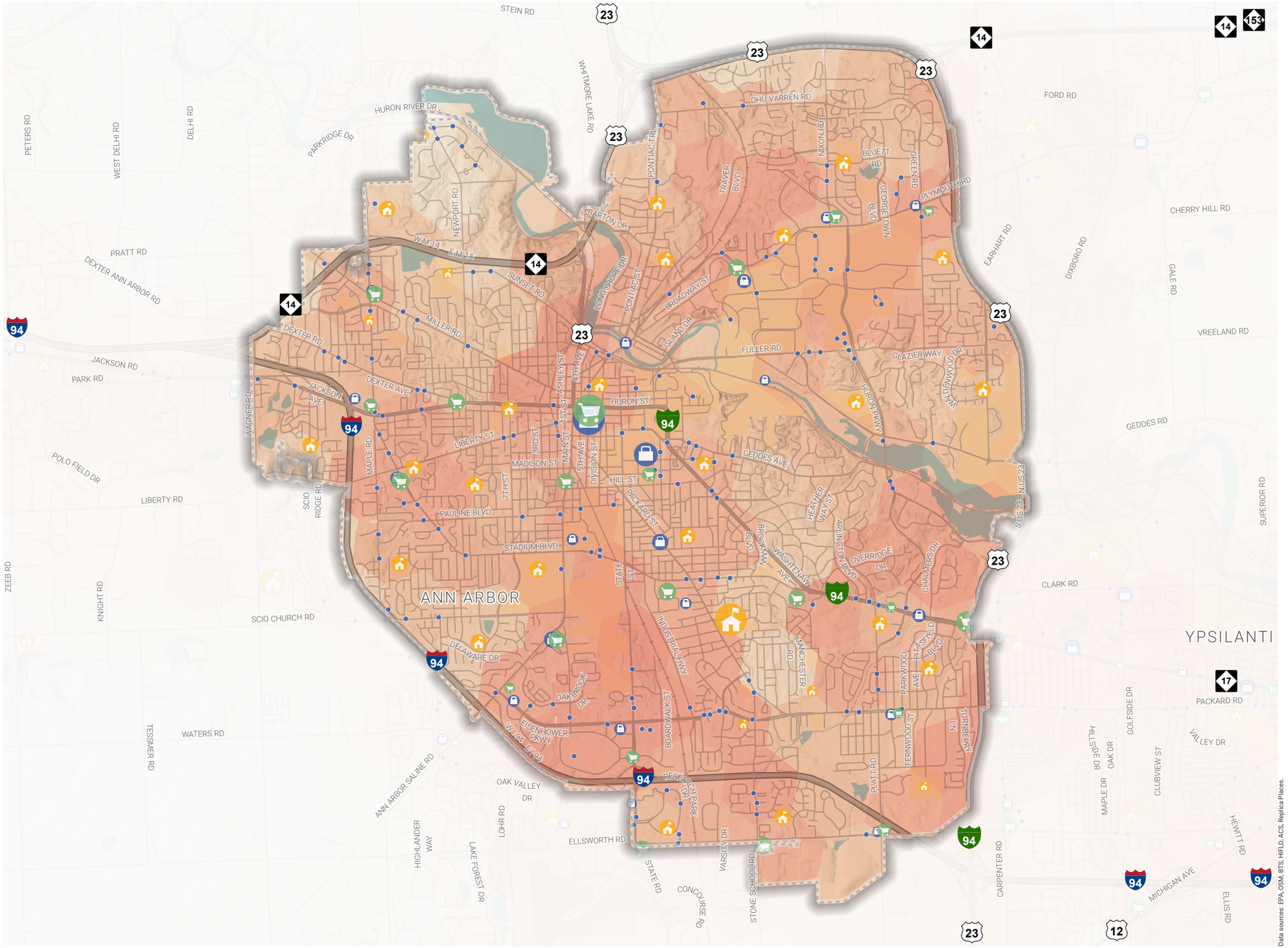


0 0.55 1.1 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF BRIGHTON

DEMAND ANALYSIS

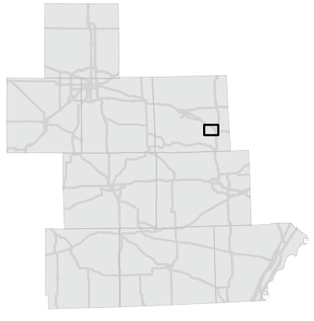
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

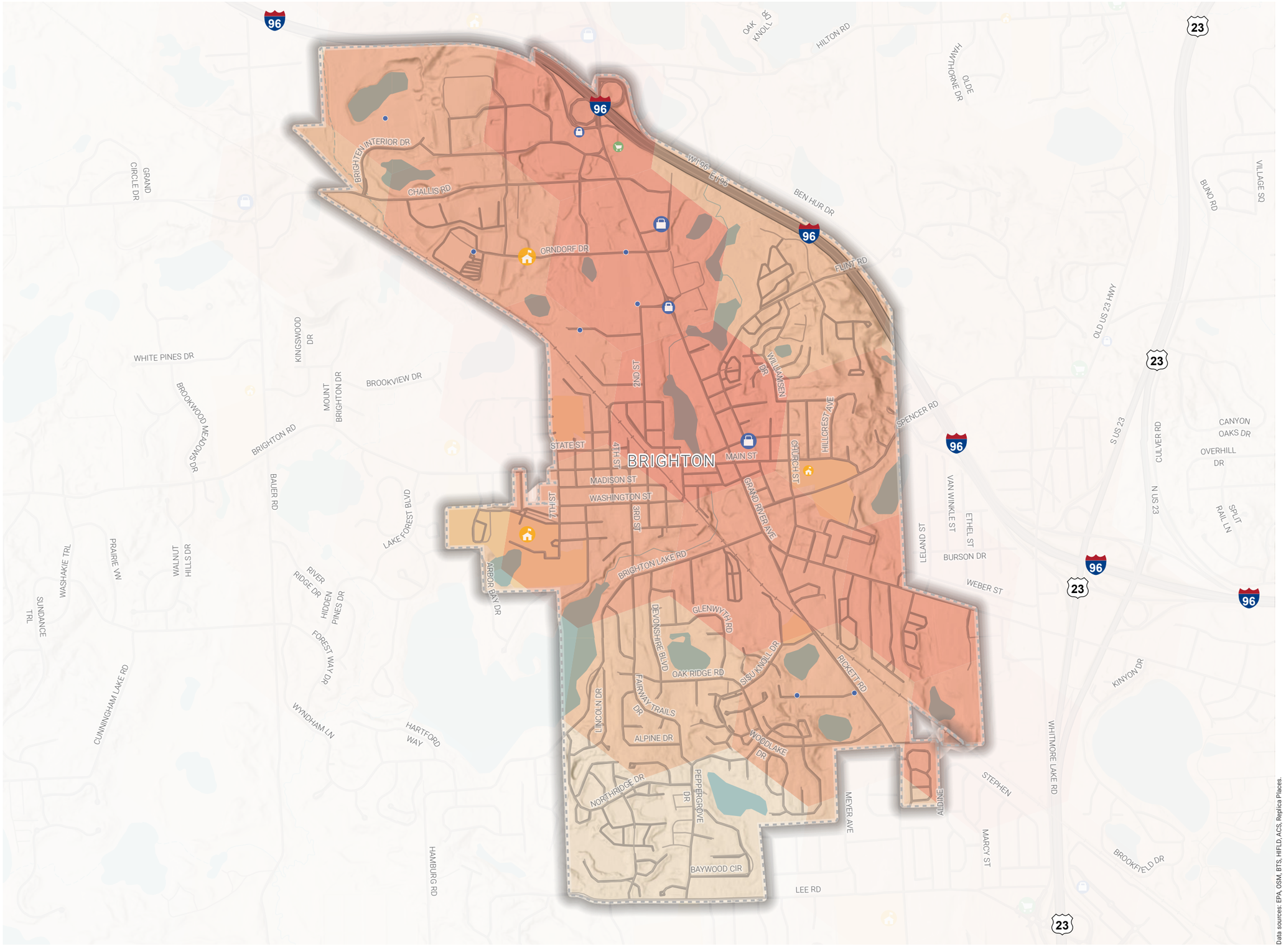


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF CHARLOTTE

DEMAND ANALYSIS

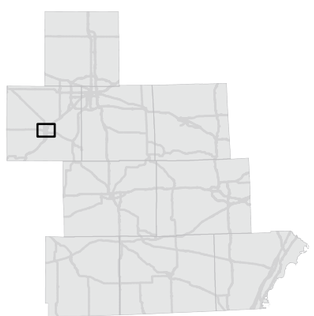
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

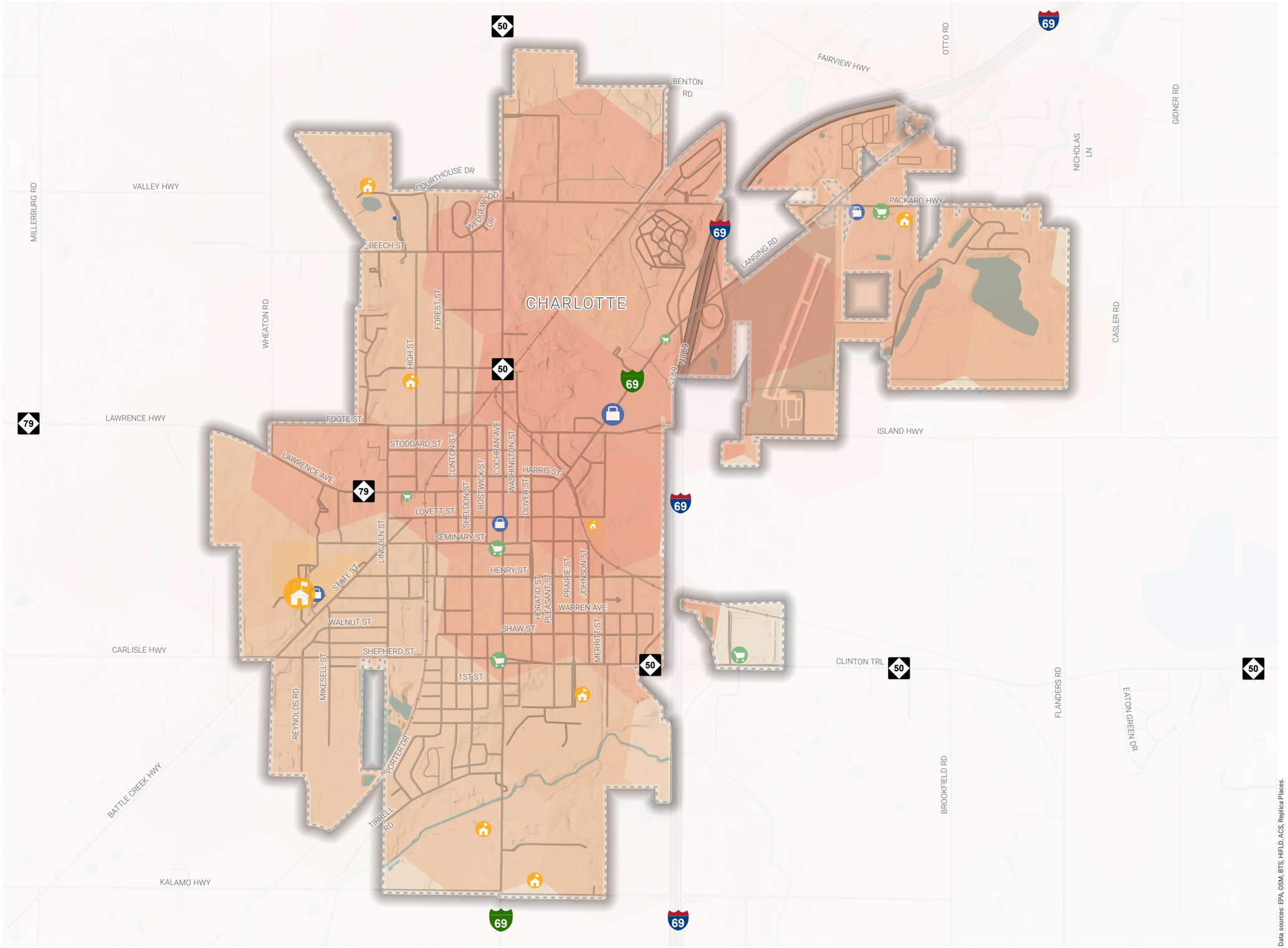


0 0.3 0.6 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF HILLSDALE

DEMAND ANALYSIS

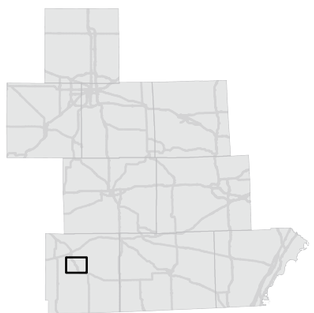
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

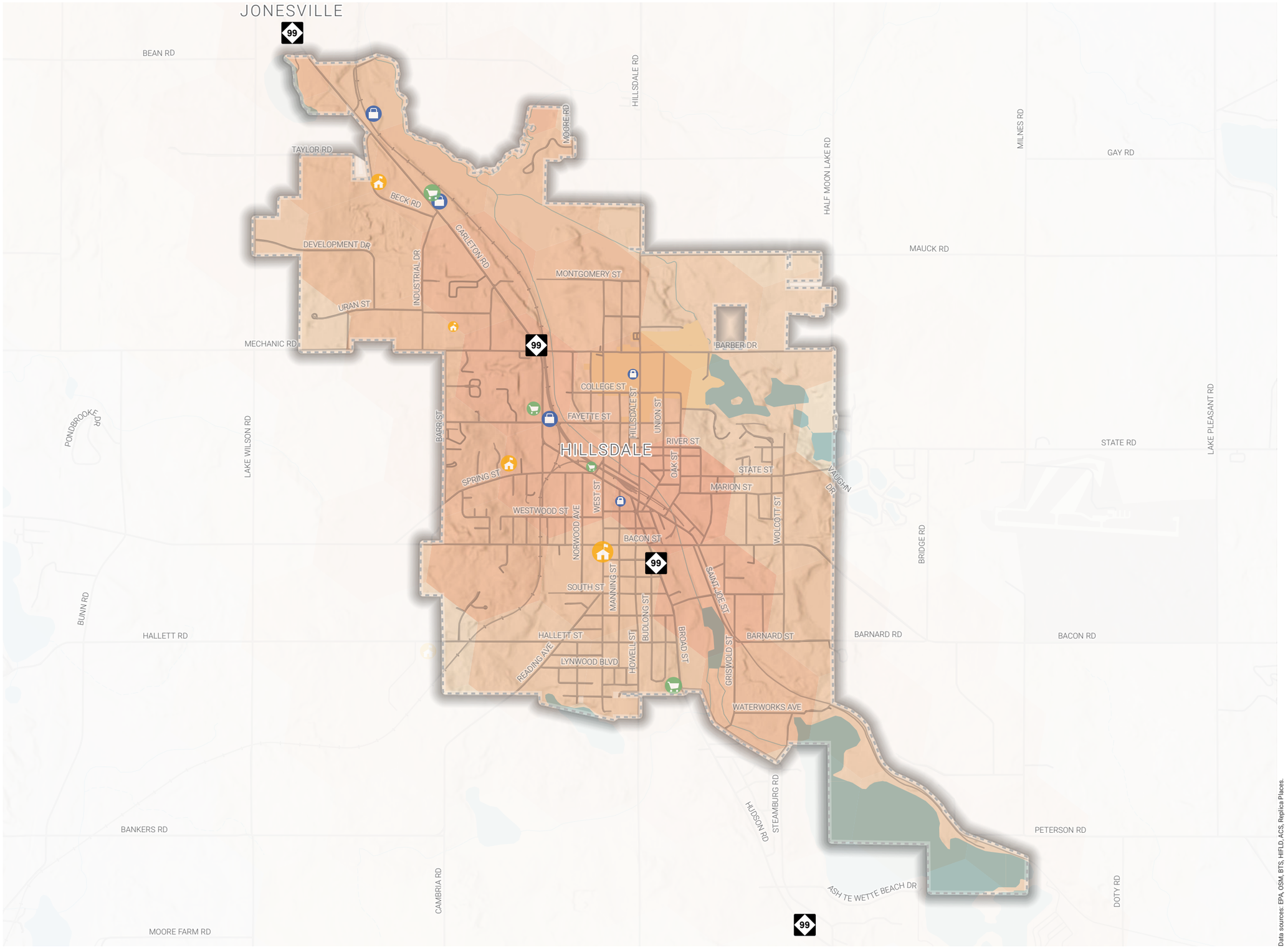


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF HOWELL

DEMAND ANALYSIS

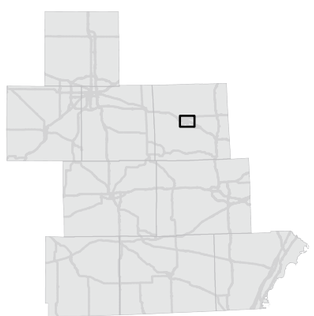
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

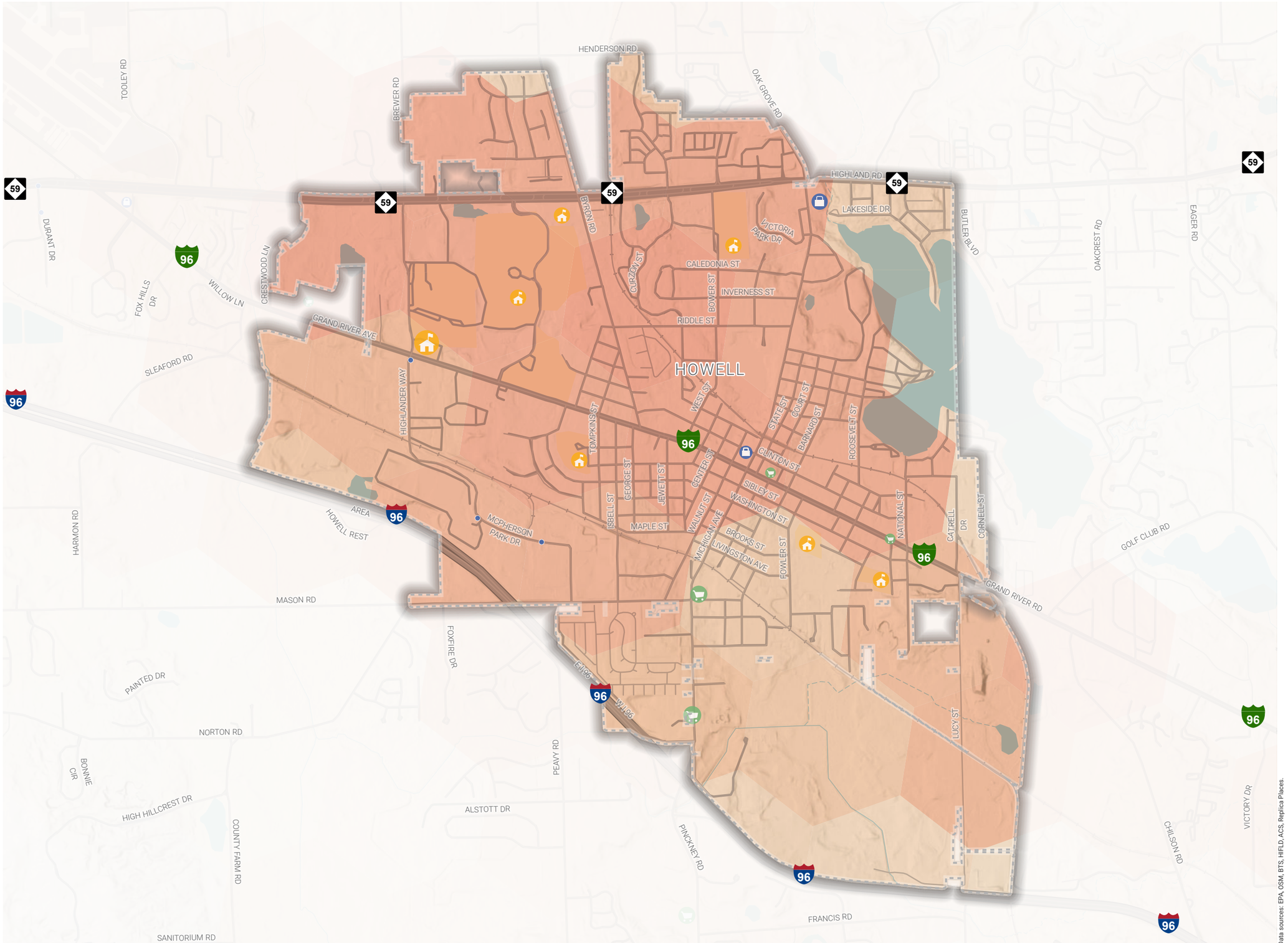


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF JACKSON

DEMAND ANALYSIS

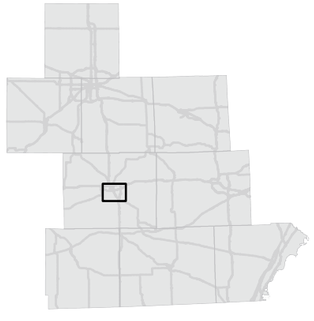
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

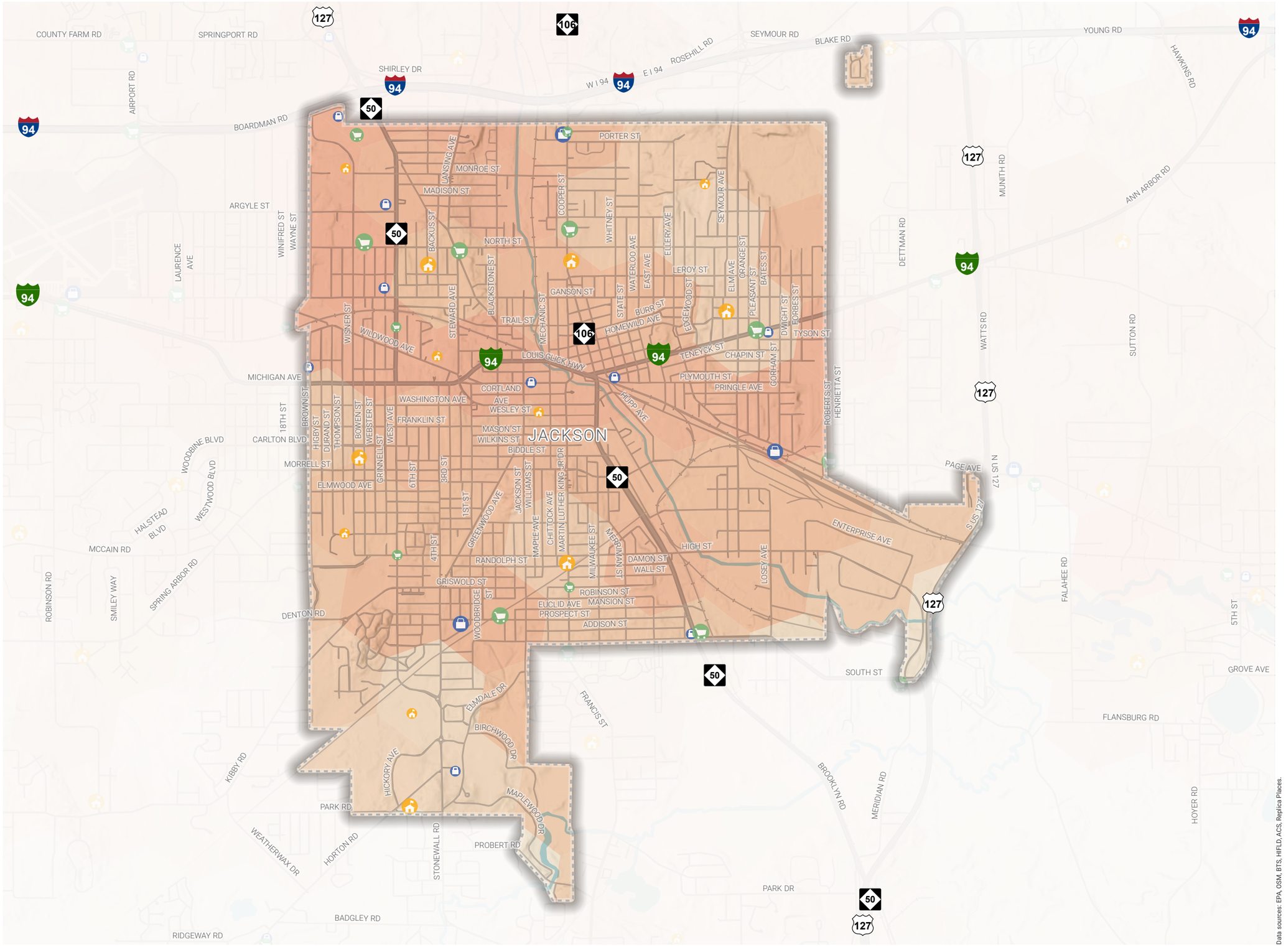


0 0.4 0.8 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF LITCHFIELD

DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

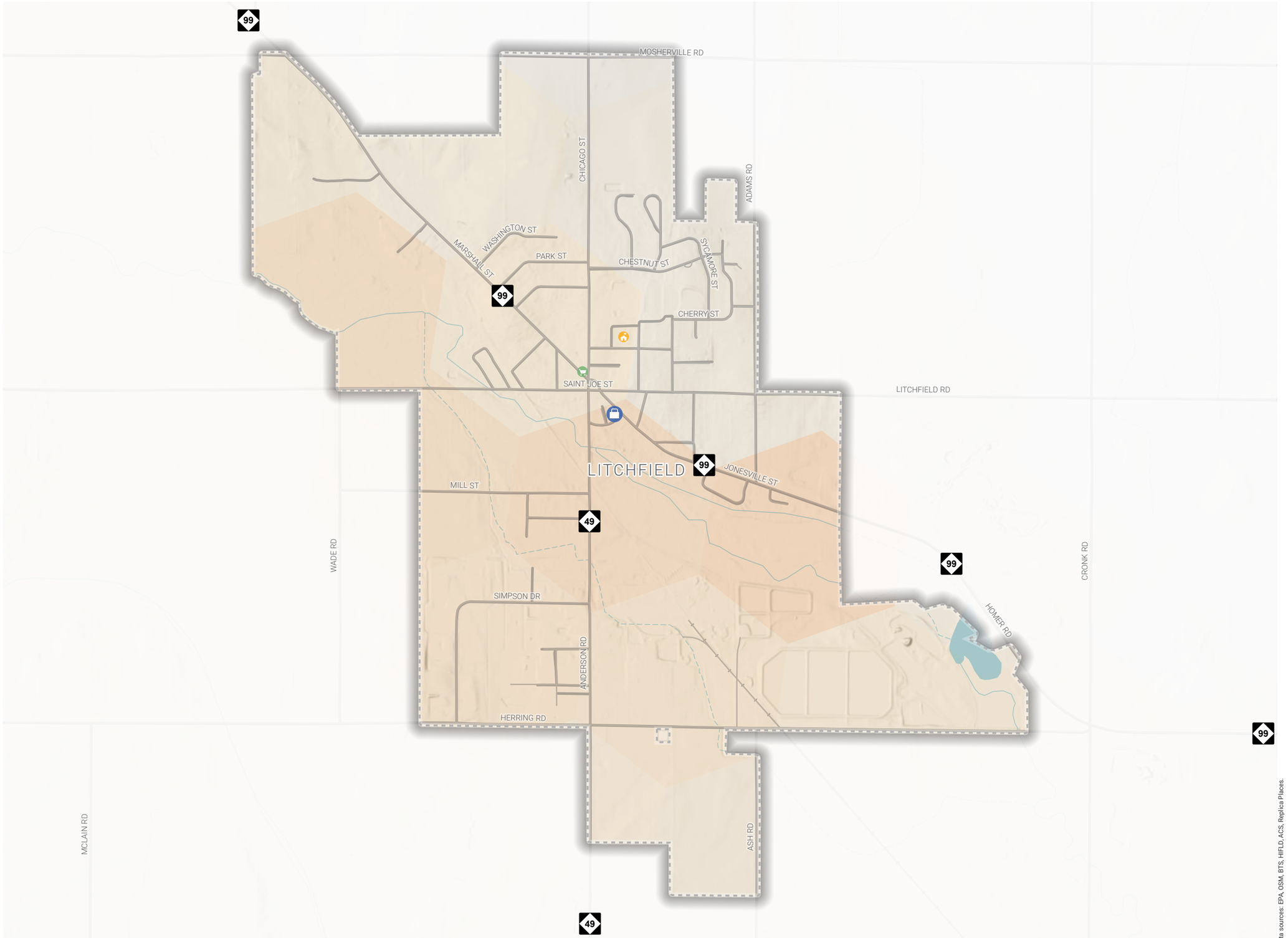


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF MASON

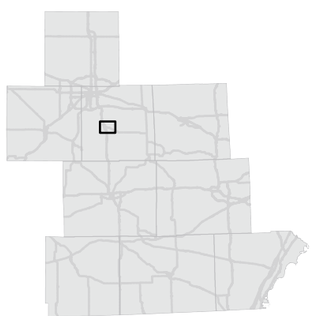
DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops
- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

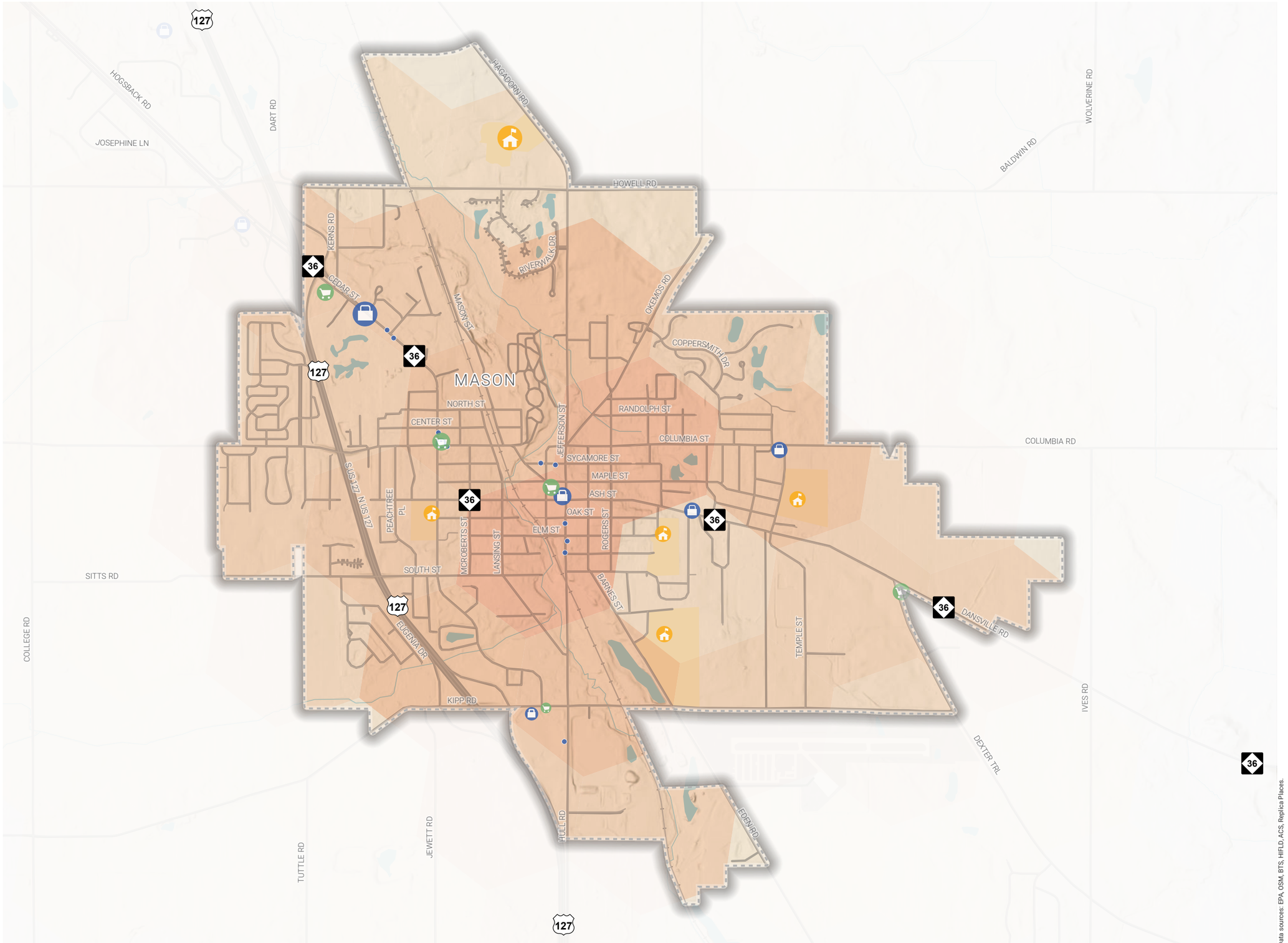


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF MILAN

DEMAND ANALYSIS

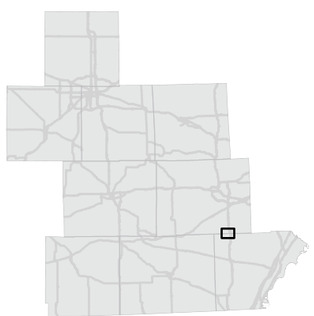
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

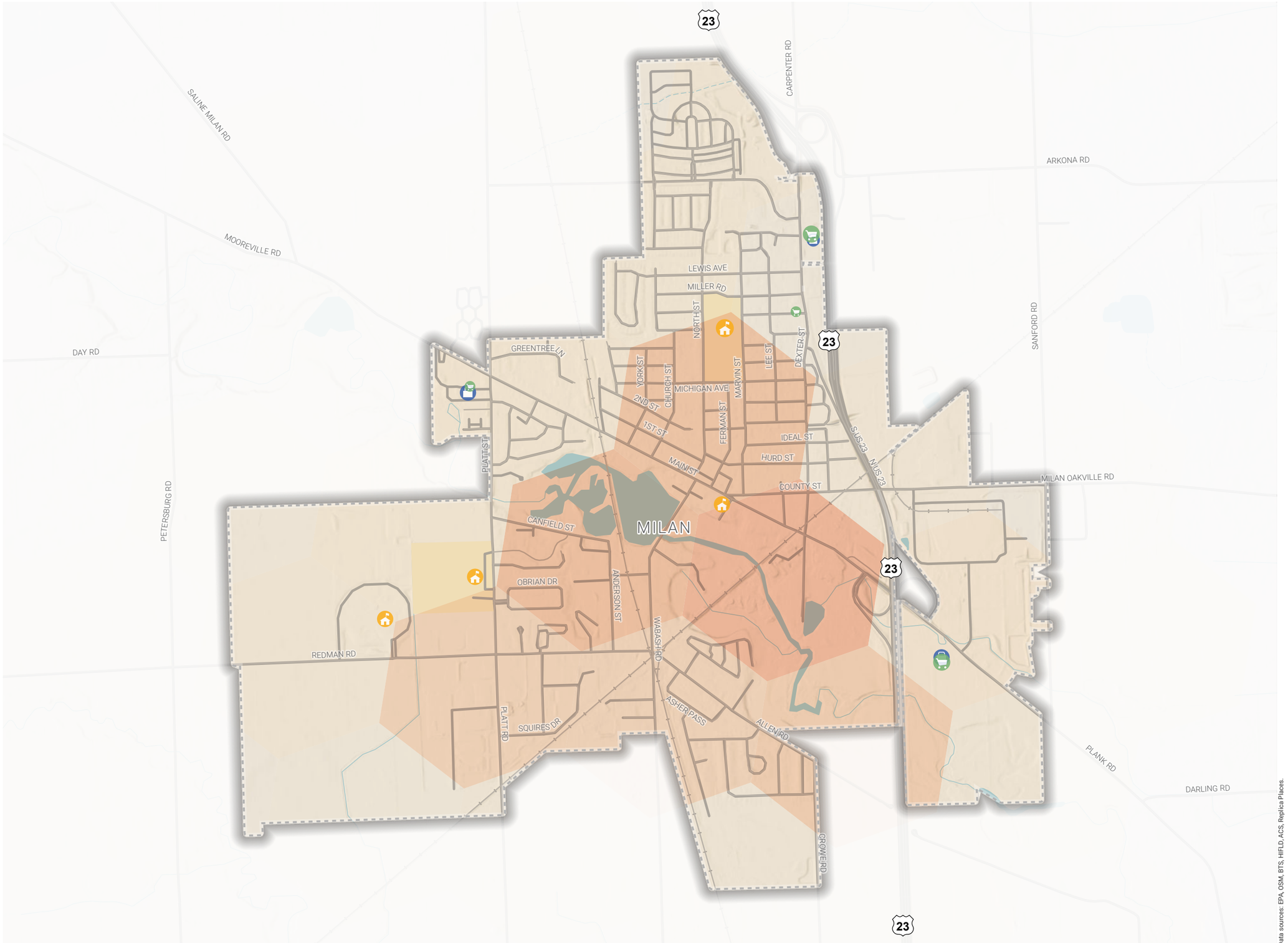


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF MONROE

DEMAND ANALYSIS

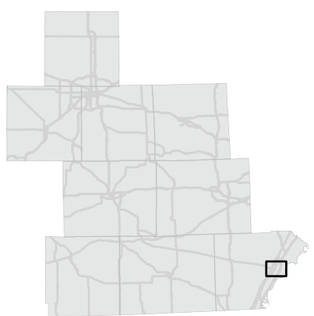
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

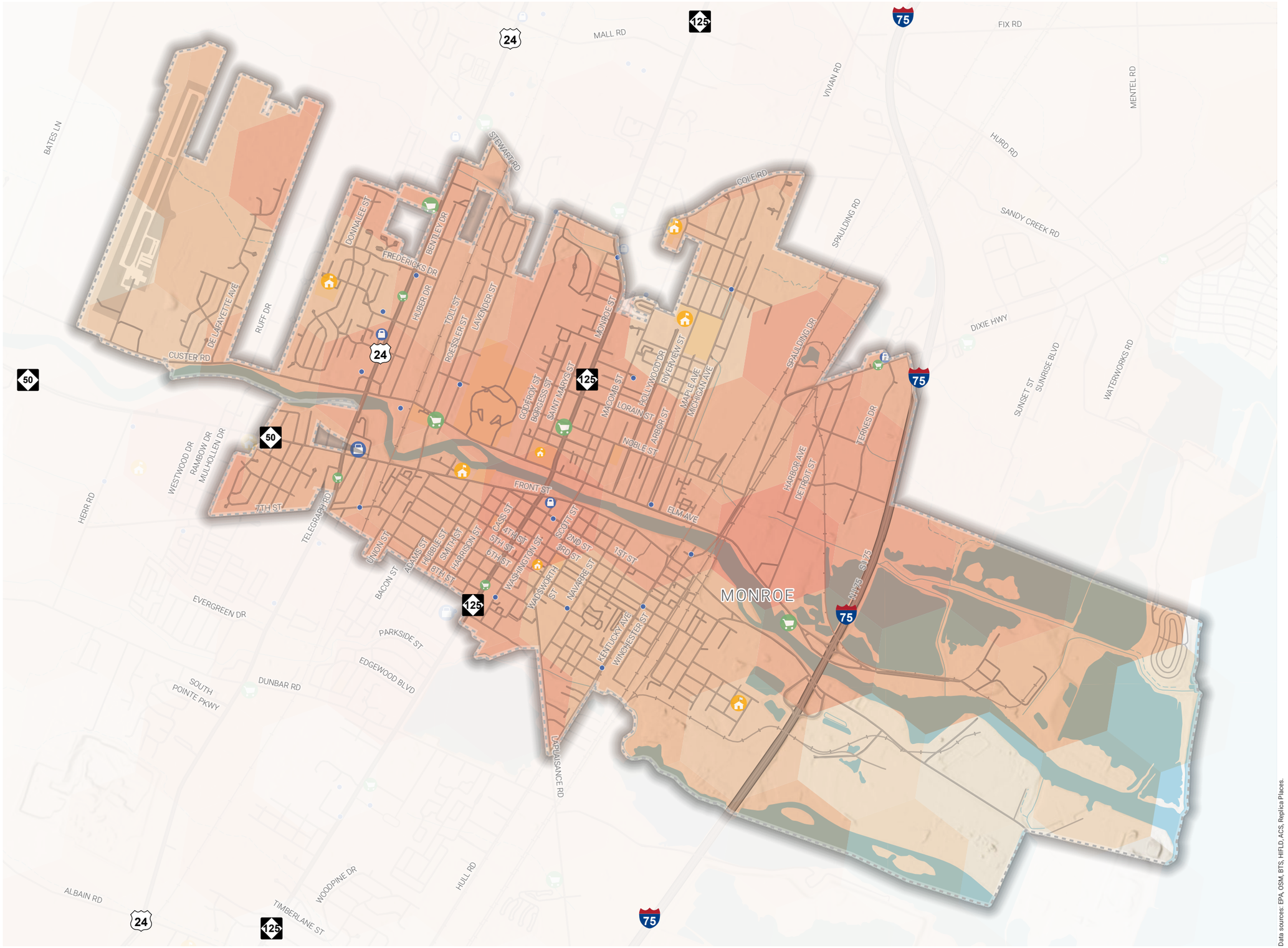


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF ST JOHNS

DEMAND ANALYSIS

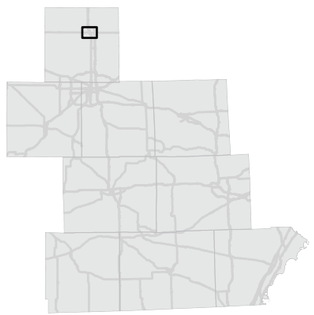
LEGEND

- Schools
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- Railroads

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UNIVERSITY REGION

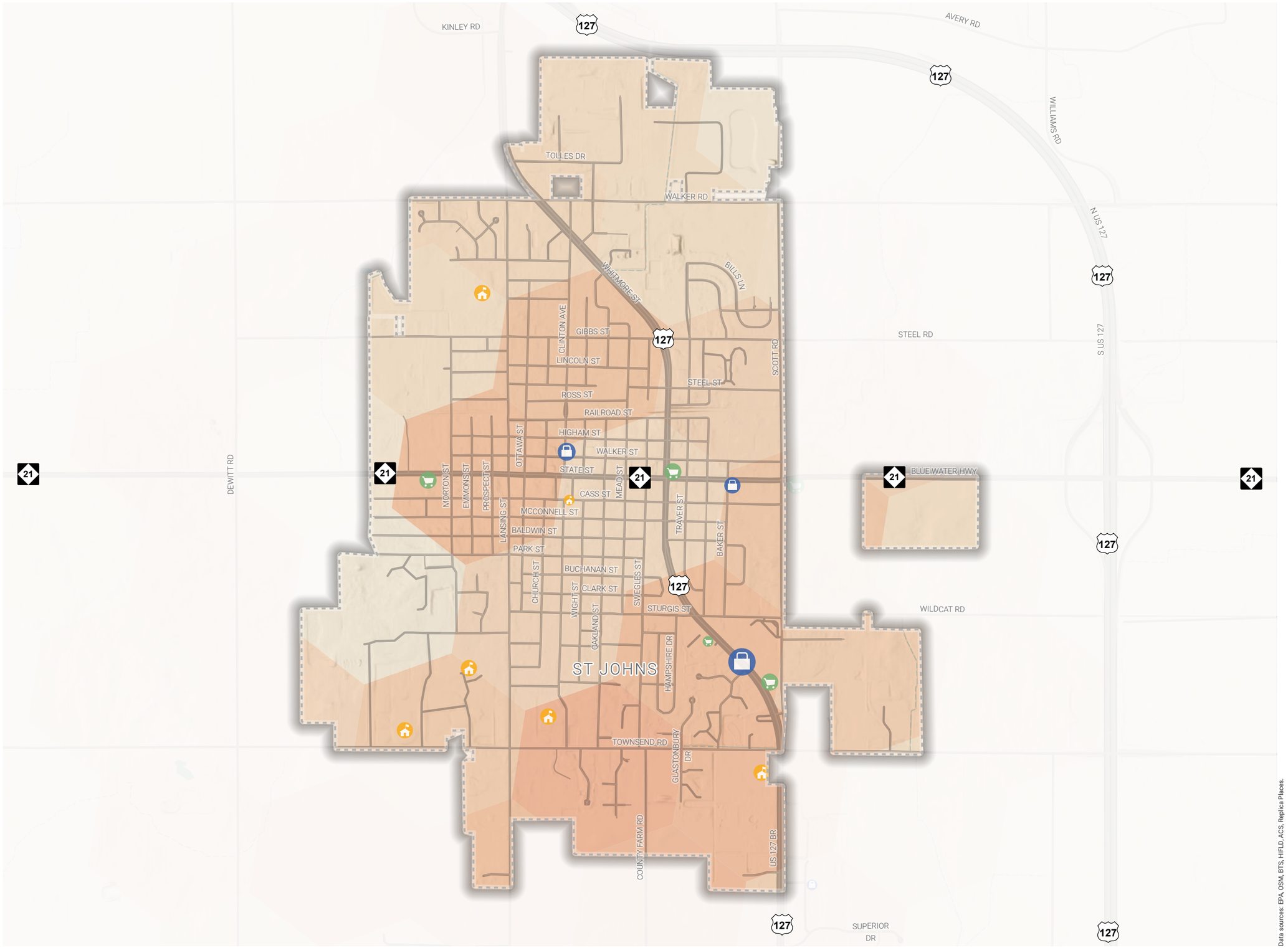


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF TECUMSEH

DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

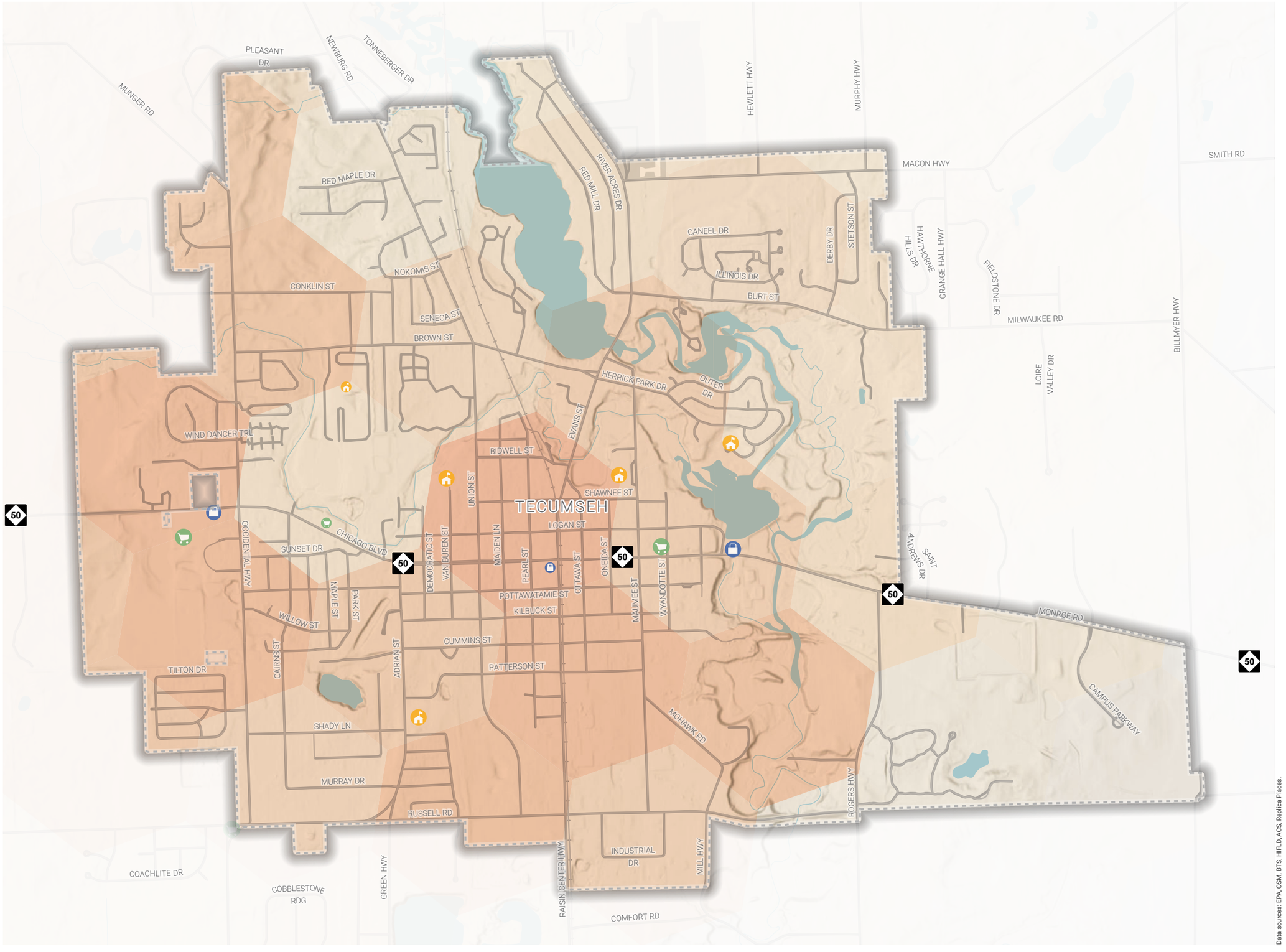
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CITY OF YPSILANTI

DEMAND ANALYSIS

LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

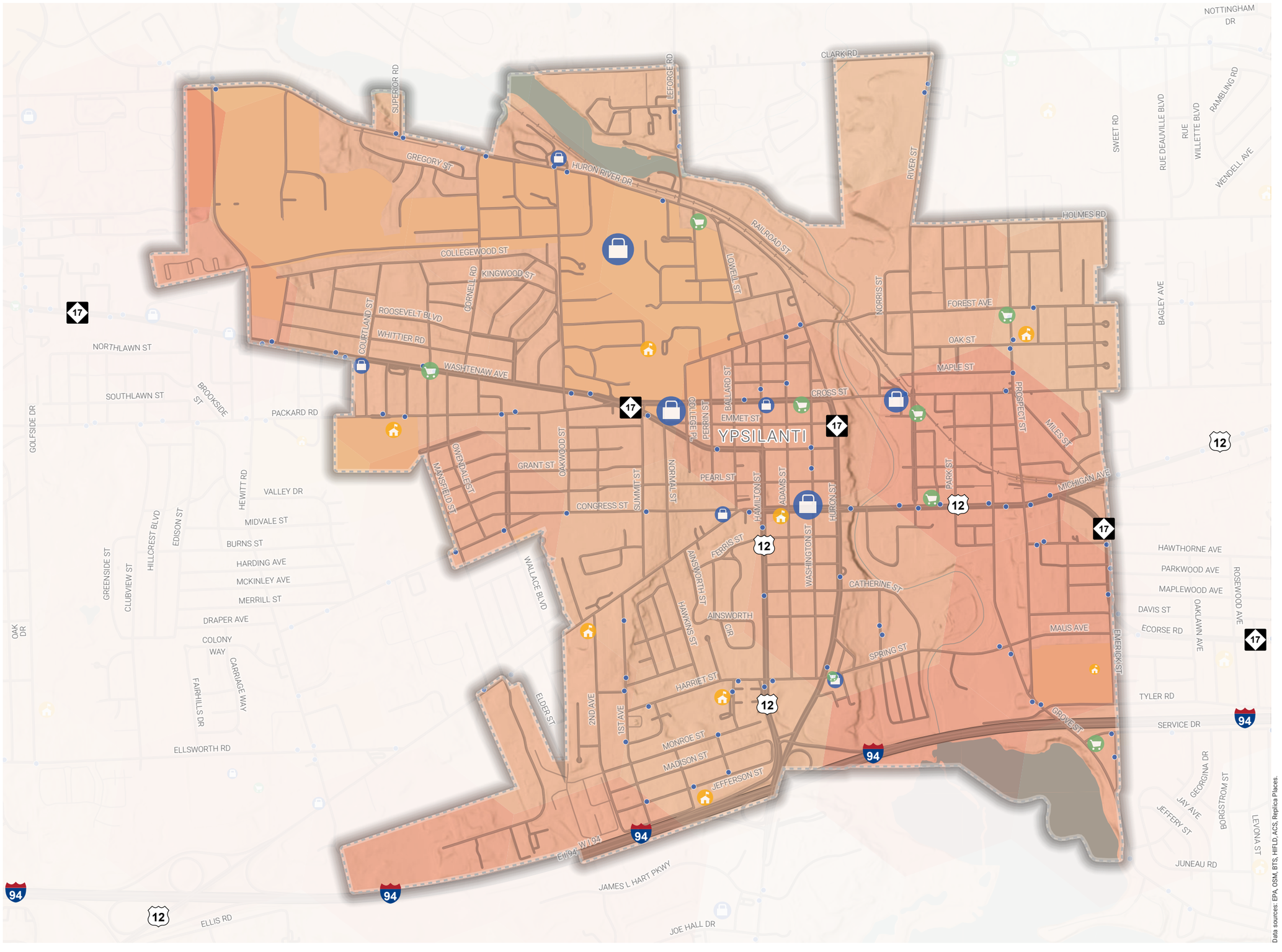


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

CLINTON COUNTY

DEMAND ANALYSIS

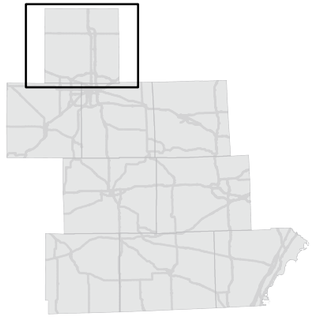
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

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- Railroads

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UNIVERSITY REGION

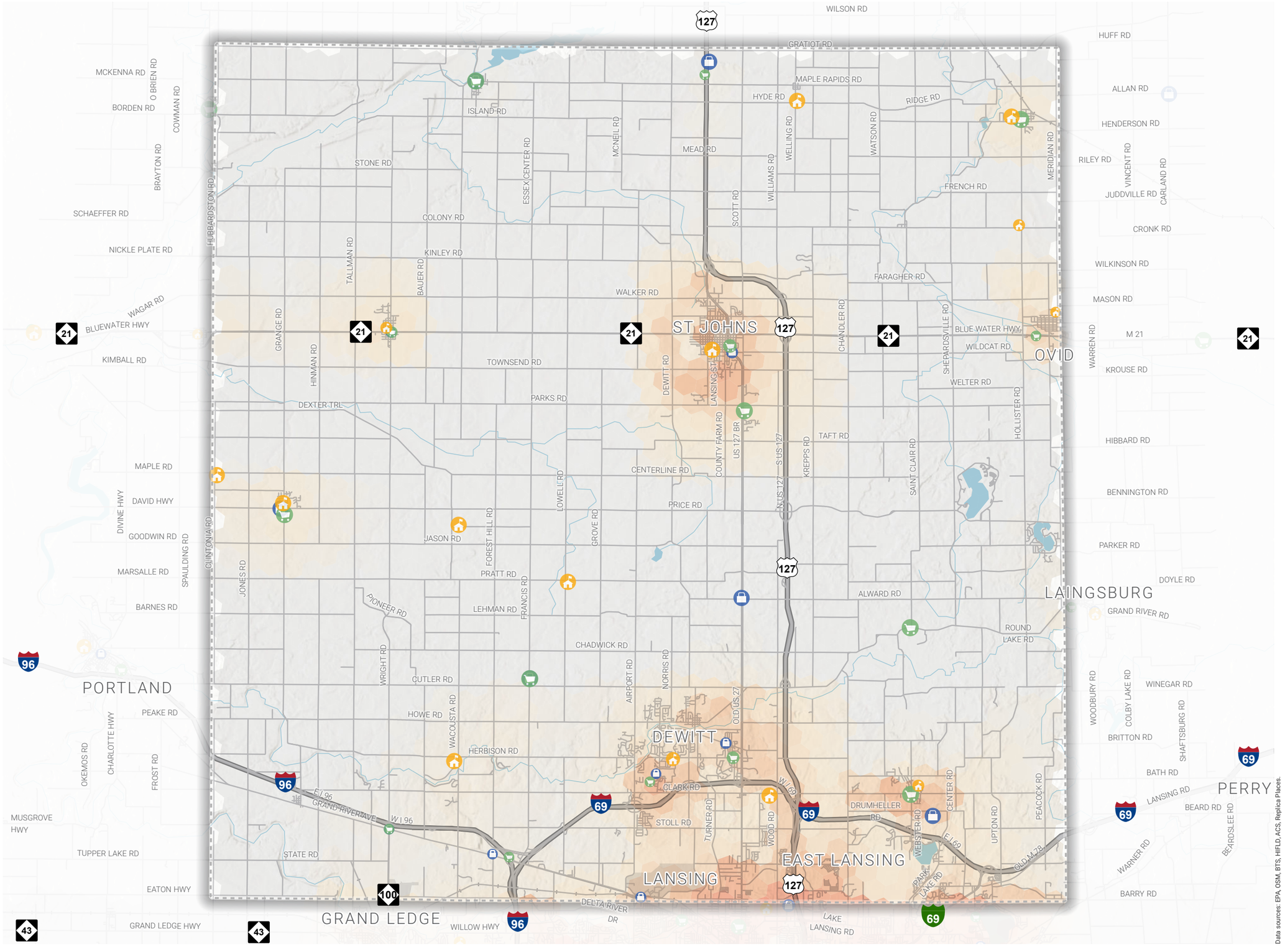


0 2 4 MILES

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MDOT Michigan Department of Transportation

alta



Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

EATON COUNTY

DEMAND ANALYSIS

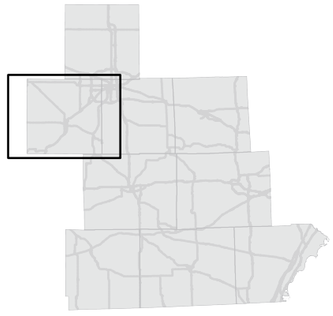
LEGEND

- Schools
- Entertainment Sites
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- Bus Stops

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- Railroads

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UNIVERSITY REGION

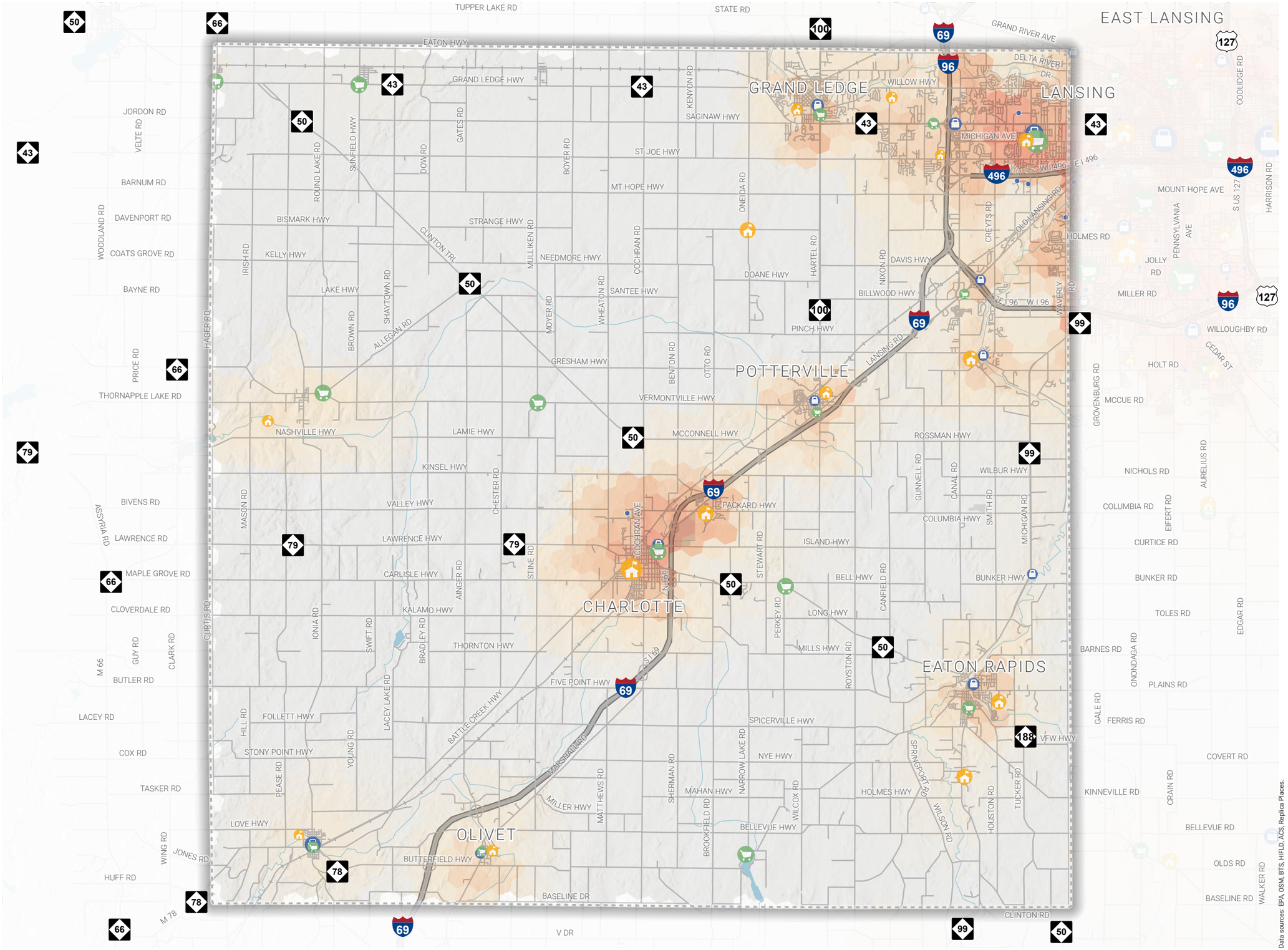


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

GREATER LANSING

DEMAND ANALYSIS

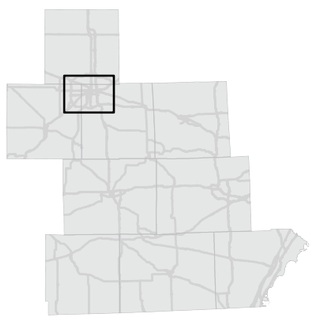
LEGEND

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UNIVERSITY REGION

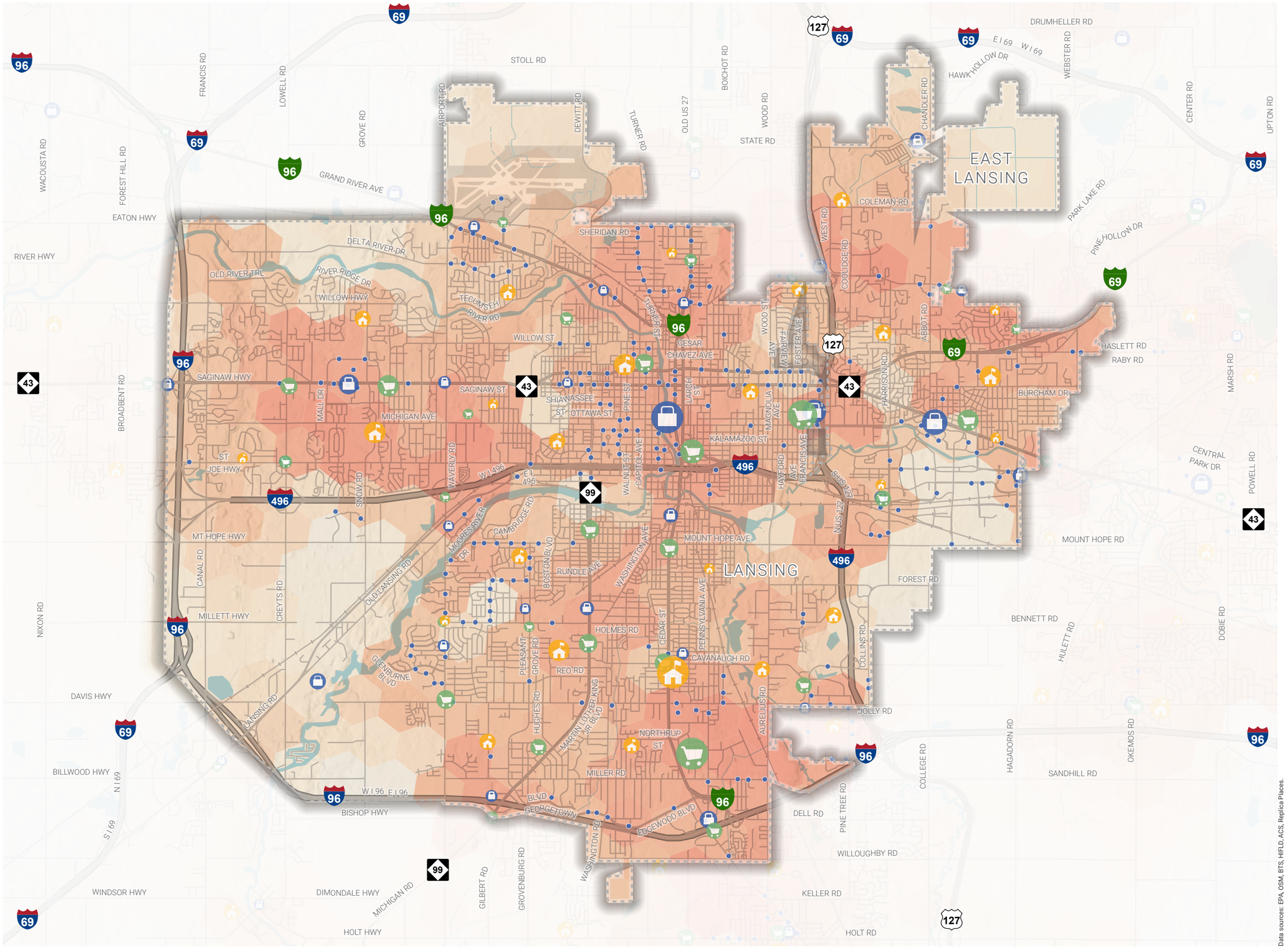


0 0.85 1.7 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

HILLSDALE COUNTY

DEMAND ANALYSIS

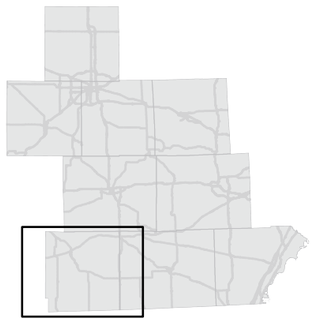
LEGEND

- Schools
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- Grocery Stores
- Bus Stops

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- Low Bike Demand
- Railroads

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UNIVERSITY REGION

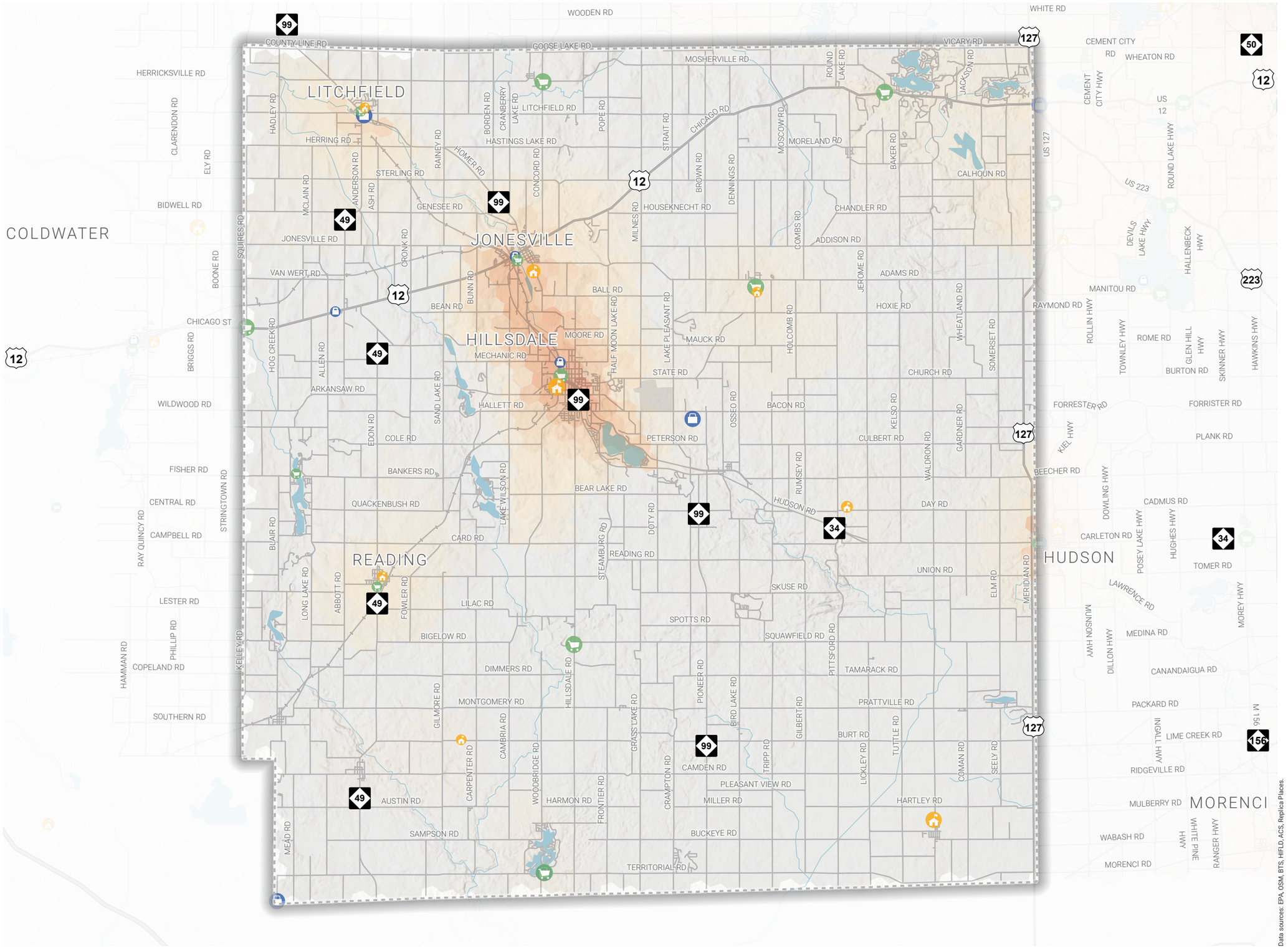


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

INGHAM COUNTY

DEMAND ANALYSIS

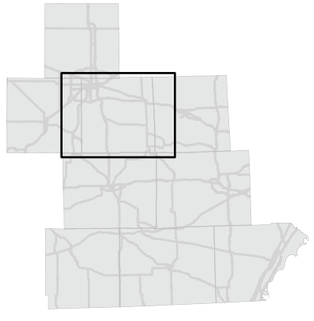
LEGEND

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- Railroads

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UNIVERSITY REGION

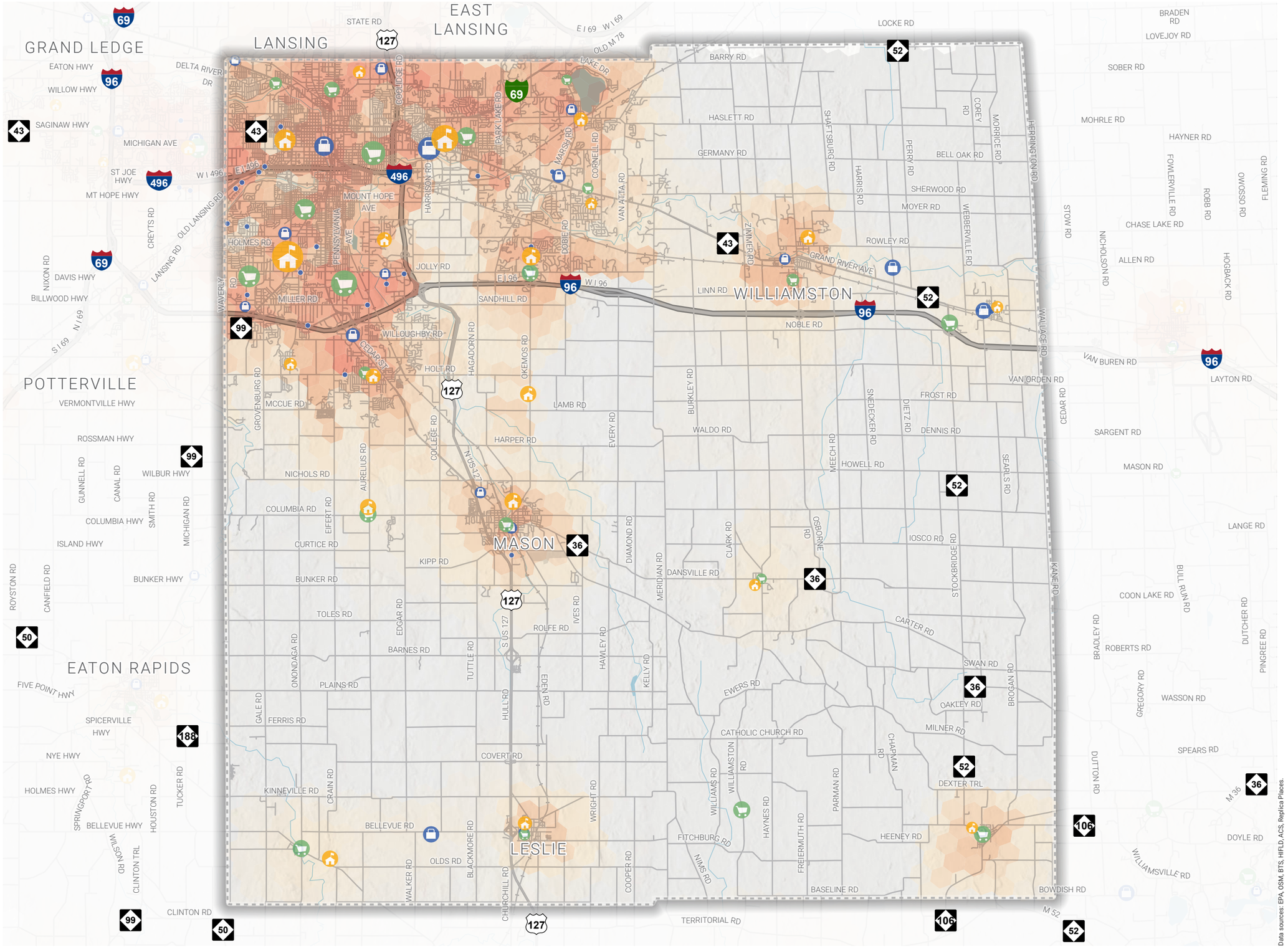


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

JACKSON COUNTY

DEMAND ANALYSIS

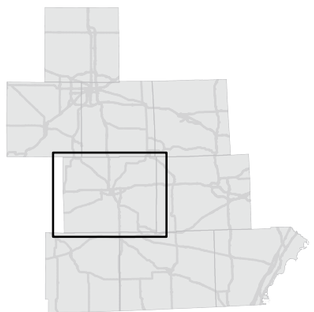
LEGEND

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- Low Bike Demand
- Railroads

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UNIVERSITY REGION

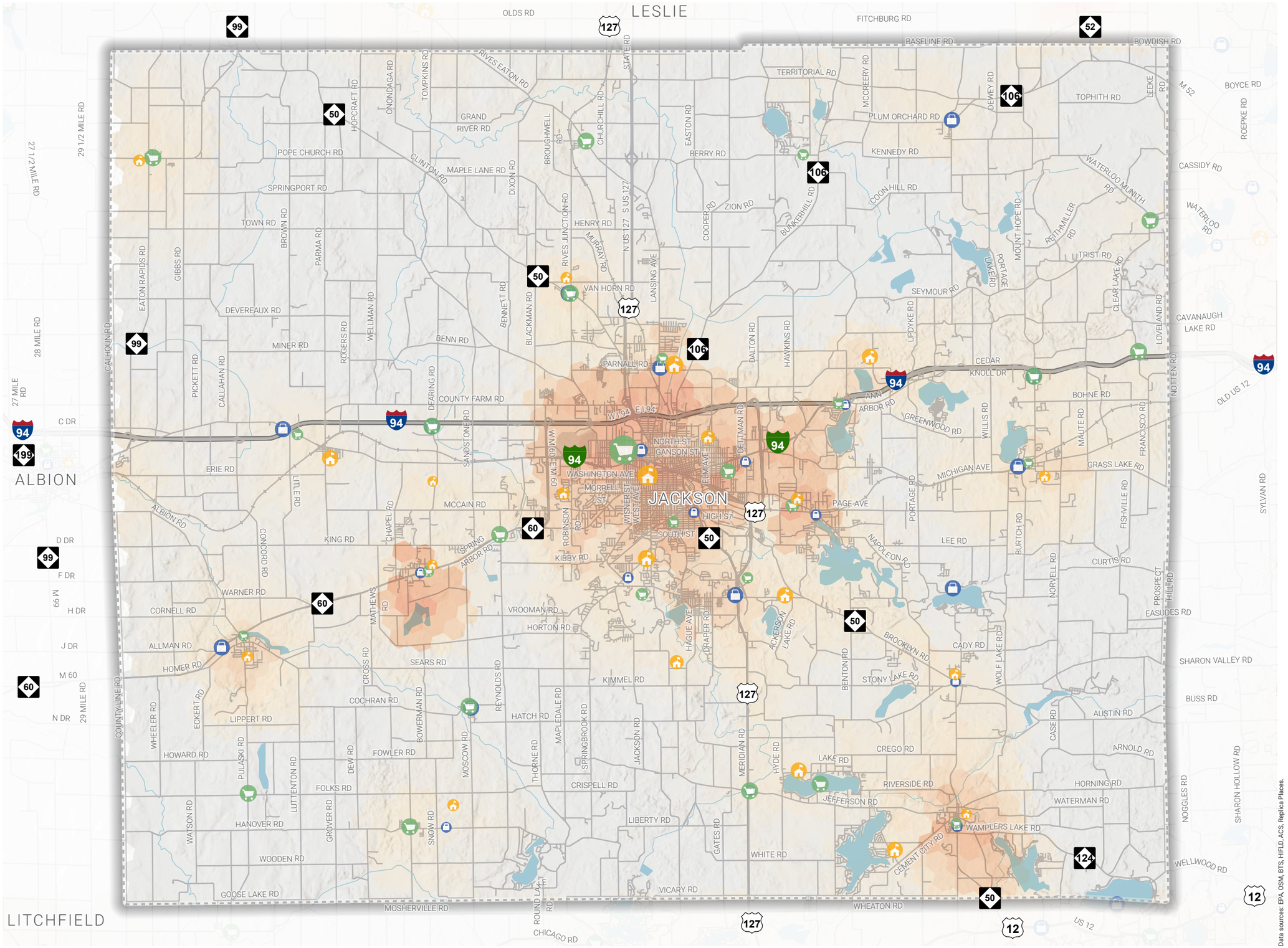


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

LENAWEE COUNTY

DEMAND ANALYSIS

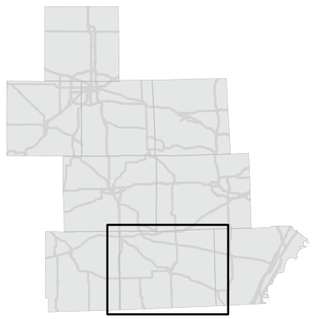
LEGEND

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- Railroads

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UNIVERSITY REGION

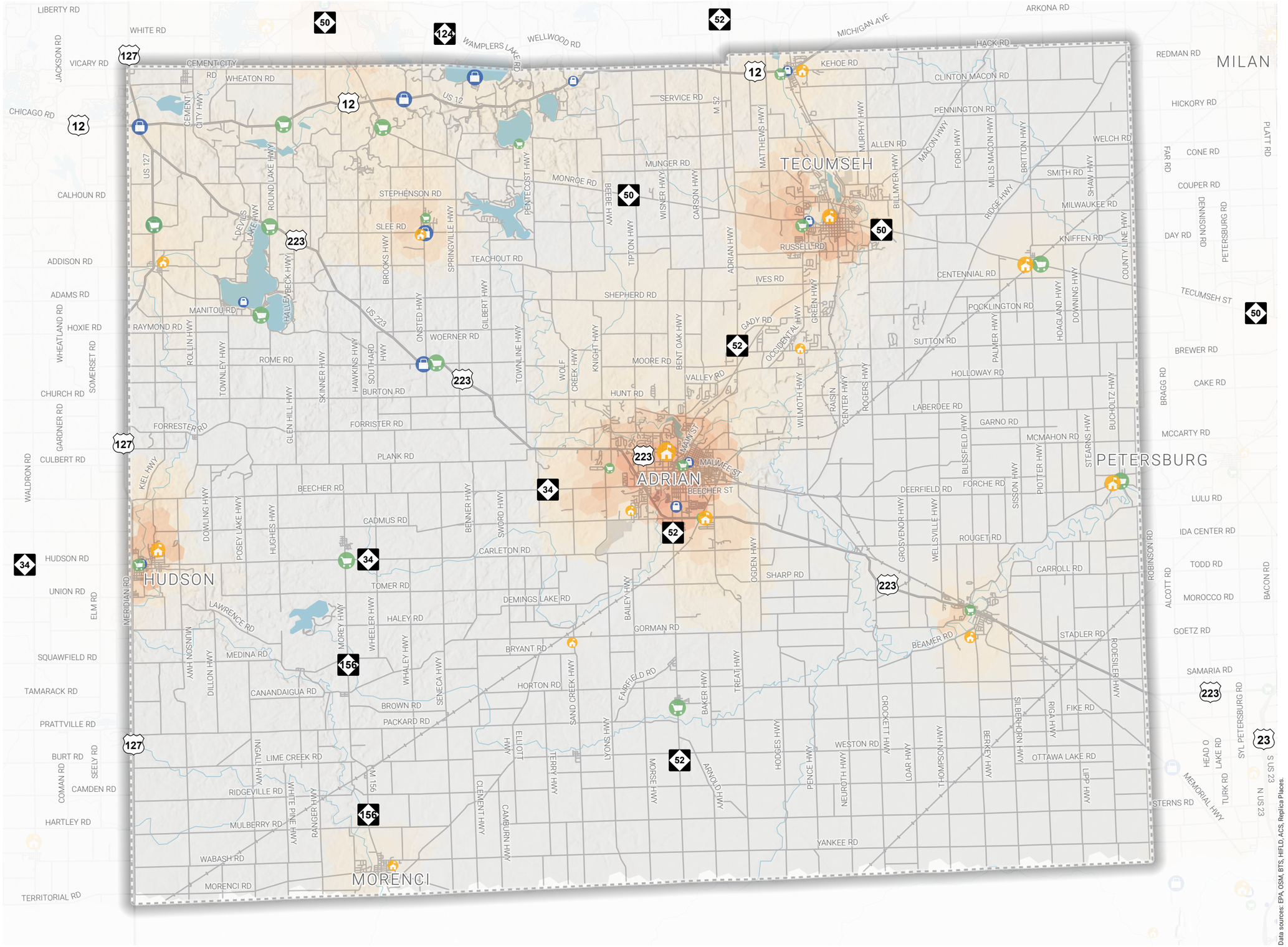


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

LIVINGSTON COUNTY

DEMAND ANALYSIS

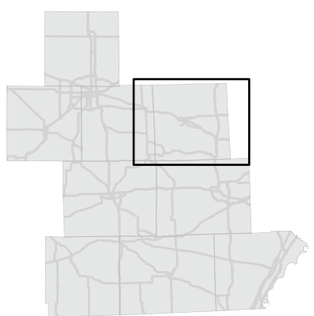
LEGEND

- Schools
- Entertainment Sites
- Grocery Stores
- Bus Stops

- High Bike Demand
- Low Bike Demand
- Railroads

Larger symbols indicate a larger cluster of locations in that area

UNIVERSITY REGION

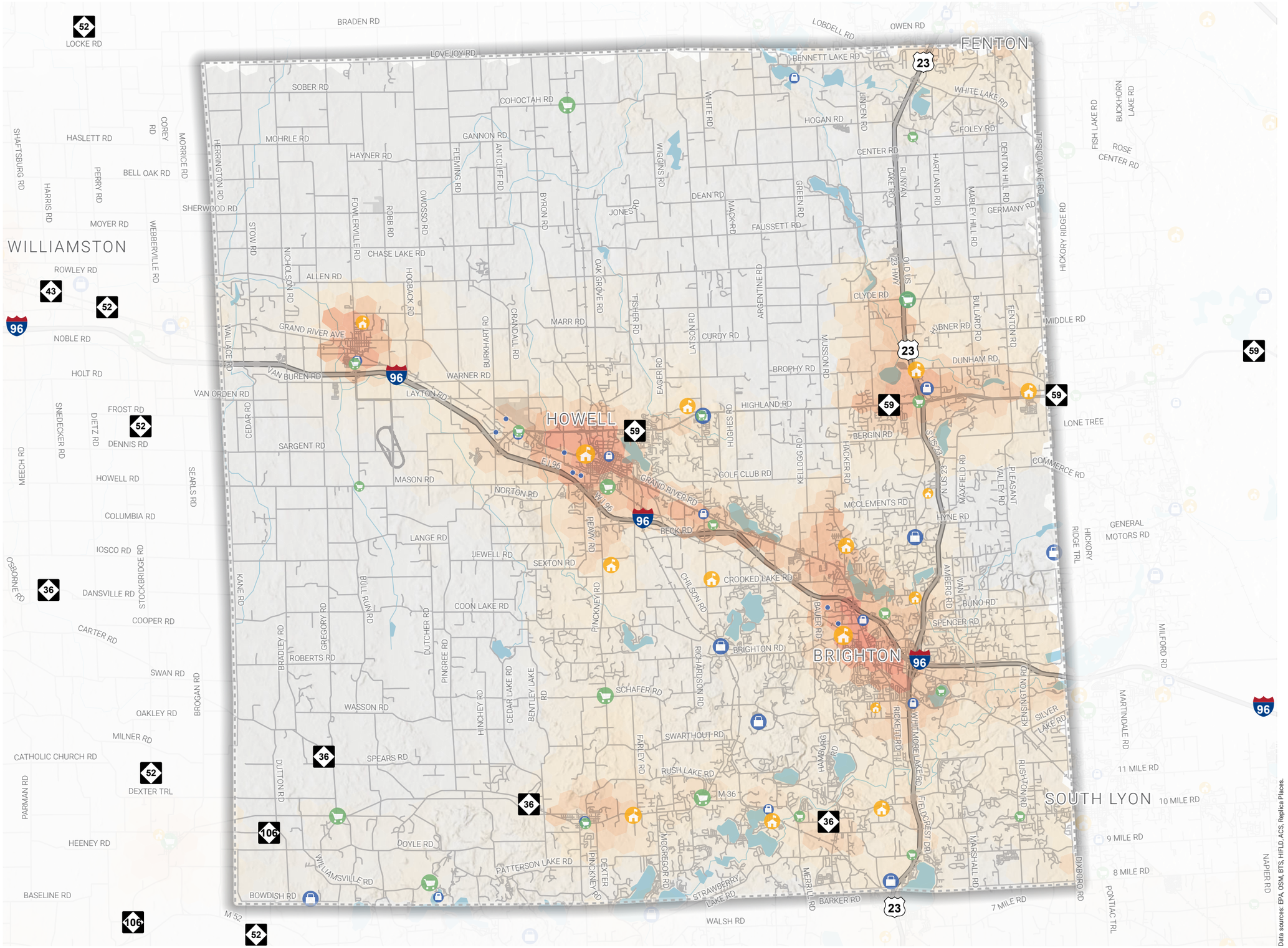


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

MONROE COUNTY

DEMAND ANALYSIS

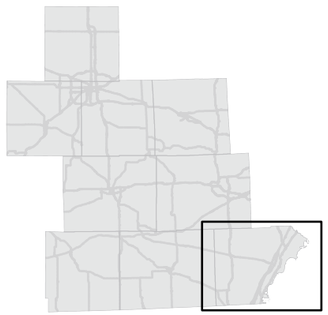
LEGEND

- Schools
- Entertainment Sites
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- Railroads

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UNIVERSITY REGION

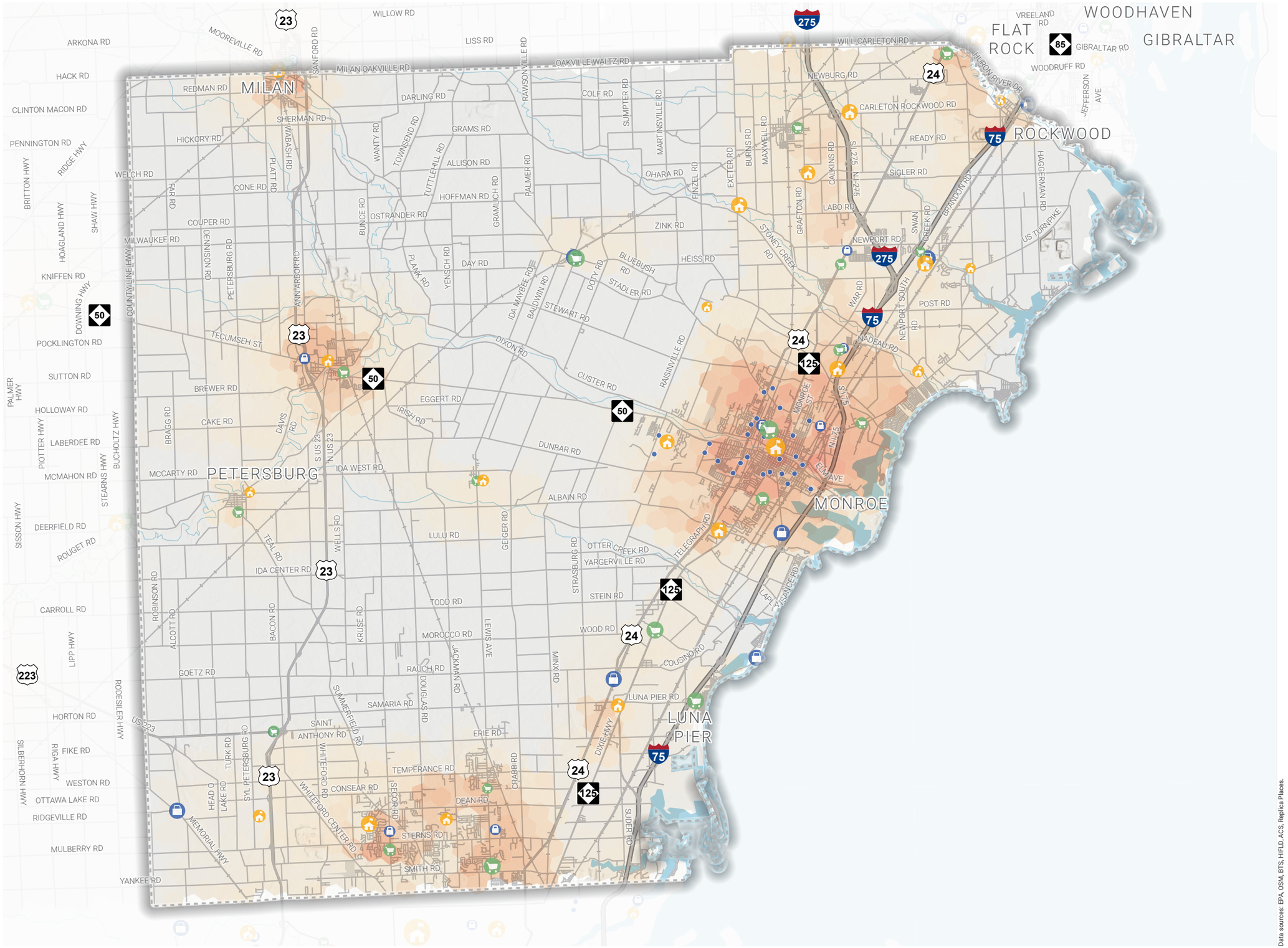


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

WASHTENAW COUNTY

DEMAND ANALYSIS

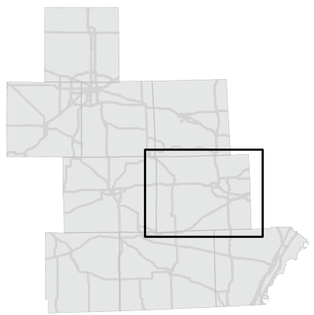
LEGEND

- Schools
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- Bus Stops

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- Low Bike Demand
- Railroads

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UNIVERSITY REGION

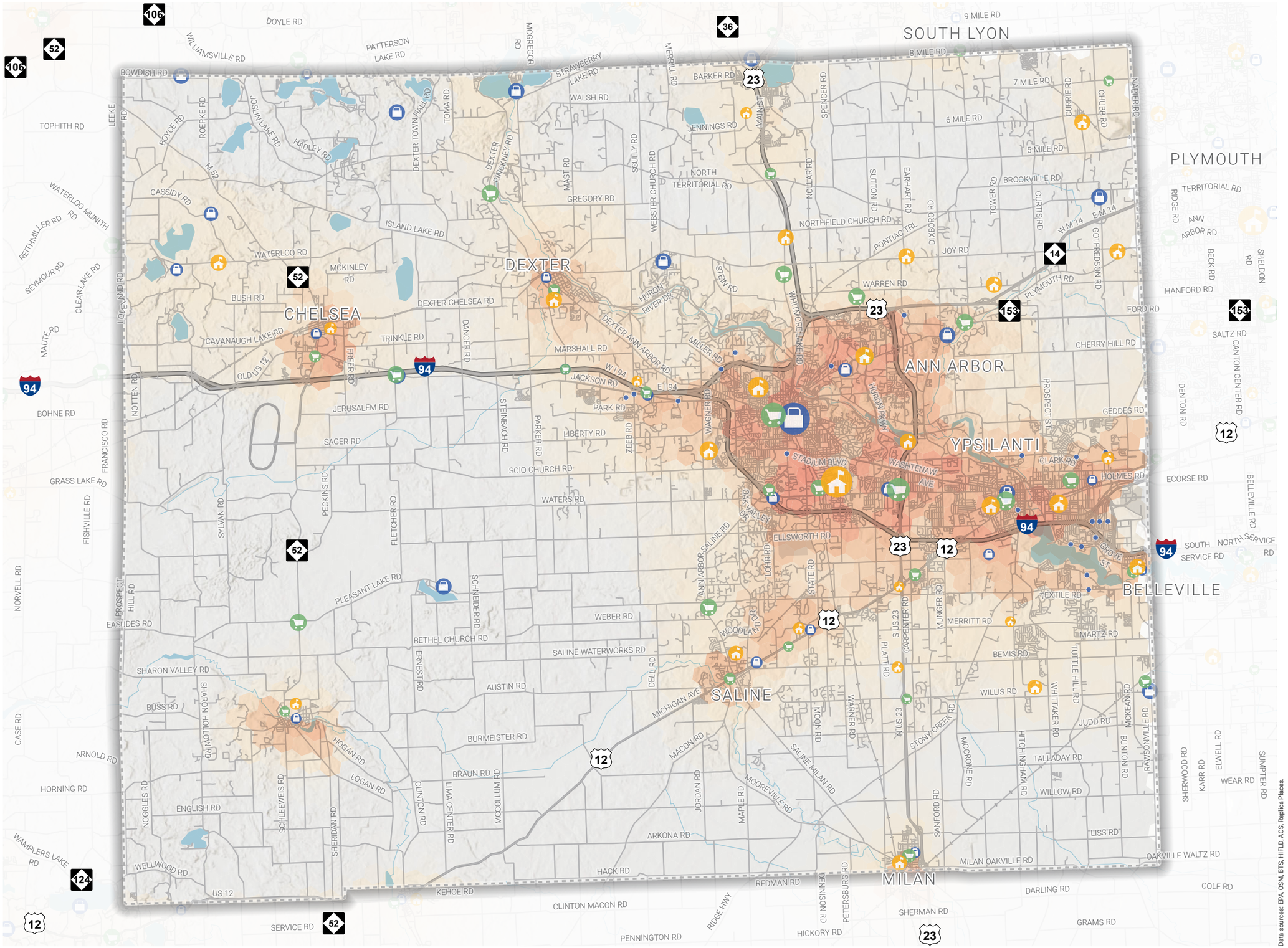


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: EPA, OSM, BTS, HIFLD, ACS, Replica Places.

Appendix H – Crash Analysis

Overview

To help the University Region focus its resources on the most needed improvements to the transportation network that supports people walking and bicycling, this analysis prioritizes crashes that resulted in someone being killed or seriously injured (KSI). This crash analysis accomplishes this by producing a severity-weighted crash index. A severity-weighted crash index helps to show which roadways have seen the most crashes with the worst outcomes on a per-mile basis. This analysis will consider only crashes within the University Region. The methodology for creating a severity index or severity score is outlined in the following section.

Methodology

The Severity-Weighted Crash index requires two data sets, each filtered to the specifications below:

1. **Crash Data**
    - Five-year crash data (2017 through 2021) of all pedestrian and bicycle collisions within the region, provided by MDOT.

2. **Prepared Roadway Data**
    - Street centerline network for the University Region.

The project team will use the steps to process the roadway data**:**

1. **Consolidate dual-carriage (divided) roadways so that split roads are represented as one line.** We will use ArcGIS Pro's Merge Divided Roadways. Key attributes related to Name and Functional Classification will be preserved in the study network, but other centerline attributes on collapsed roadways might not be retained. These can be associated back to the network later if required.
2. **Use the "Dissolve" tool to merge road segments based on road name and functional class.** This eliminates arbitrary splits in the spatial data so that roads can be split into even-length segments.
3. **Divide centerlines into ½ mile segments on city owned roads and 1-mile segments elsewhere.** Shorter segments are appropriate in urban areas where crashes happen more frequently and allow for more granularity in pinpointing high-injury corridors. Longer segments in are more appropriate in rural areas where crashes are sparser. Segment-level crash data will be normalized for segment length, but not by traffic volumes. Crash counts will also be reported per segment.

The following steps will be used to prepare the crash data:

1. **Weight each crash based on the most serious injury sustained by any individual involved in the crash.** This effectively prioritizes areas where more serious crashes are occurring to identify areas where the most serious injuries can be reduced. These proportions are based on the ratio of the average cost to society from fatal and serious crashes compared to minor injury crashes. Using this ratio avoids overweighting fatal crashes that occur as isolated events so that the severity score can represent roadways with patterns of severe crashes. [1]

    i. Fatal injury: 4
    ii. Minor or major injury: 1
    iii. Property damage only: 0.5

2. **Snap all crashes within 200 feet of the street centerline network to a prepared network segment.** This distance accounts for a margin of error in crash coordinates. It also captures crashes on dual carriage roadways that occur far from the now-consolidated centerline (such as wide highways) but is not large enough to capture crashes that occurred in parking lots adjacent to roadways.

The following steps will join the collisions to the road centerline and score each segment appropriately:

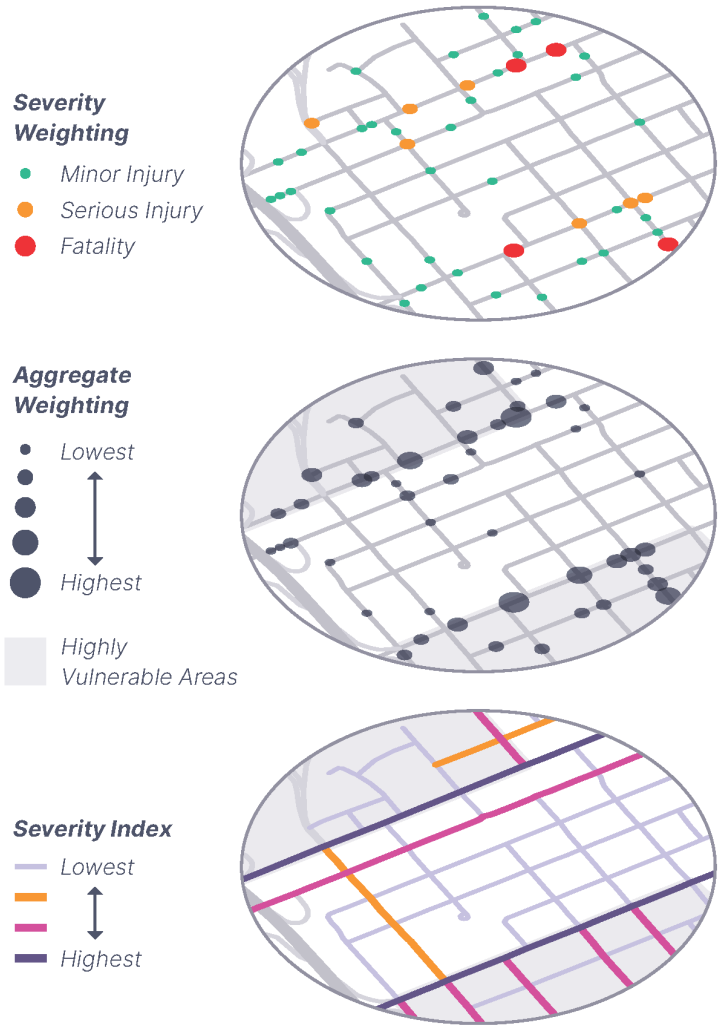
1. **Spatially join the crash layer to the split road network.**
2. **Calculate the summed collision weight for rolling road segment for bicycle and pedestrian severity scores.** This sums the weight of crashes on each segment to reflect total crash severity on each segment.

---

[1] There are many calculations of average cost of severe and fatal crashes. The ratio shown here is based off of the FHWA's Crash Costs for Safety Analysis (Harmon et al, 2018), table 17. The weights shown here are proportional to the average of the square root of costs to society of each crash type compared to the baseline of minor-injury crashes. Source: https://safety.fhwa.dot.gov/hsip/docs/fhwasa17071.pdf.

Alta Civic Analytics Explainer

Severity Index Process



Severity Weighting

One goal of **collision analysis** is to identify an improvable subset of a community's streets that address the majority of collisions where a victim is Killed or Severely Injured (KSI). To achieve this, KSI collisions are assigned higher scores so they have more "weight" relative to collisions with less tragic outcomes.

Other Considerations

These scores can also be modified to include other considerations such as whether collisions involve vulnerable road users (bicyclists and pedestrians) or occur in socially vulnerable communities. These factors can be directly incorporated into the weights associated with each collision.

Severity Index

After weights are developed, they are associated to the network, aggregated, and normalized so that we can understand the relative intensities of collisions of concern.*

Pedestrian Crash Maps

CITY OF ADRIAN

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

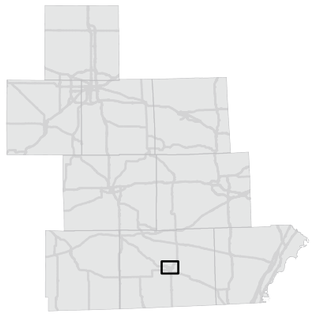
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

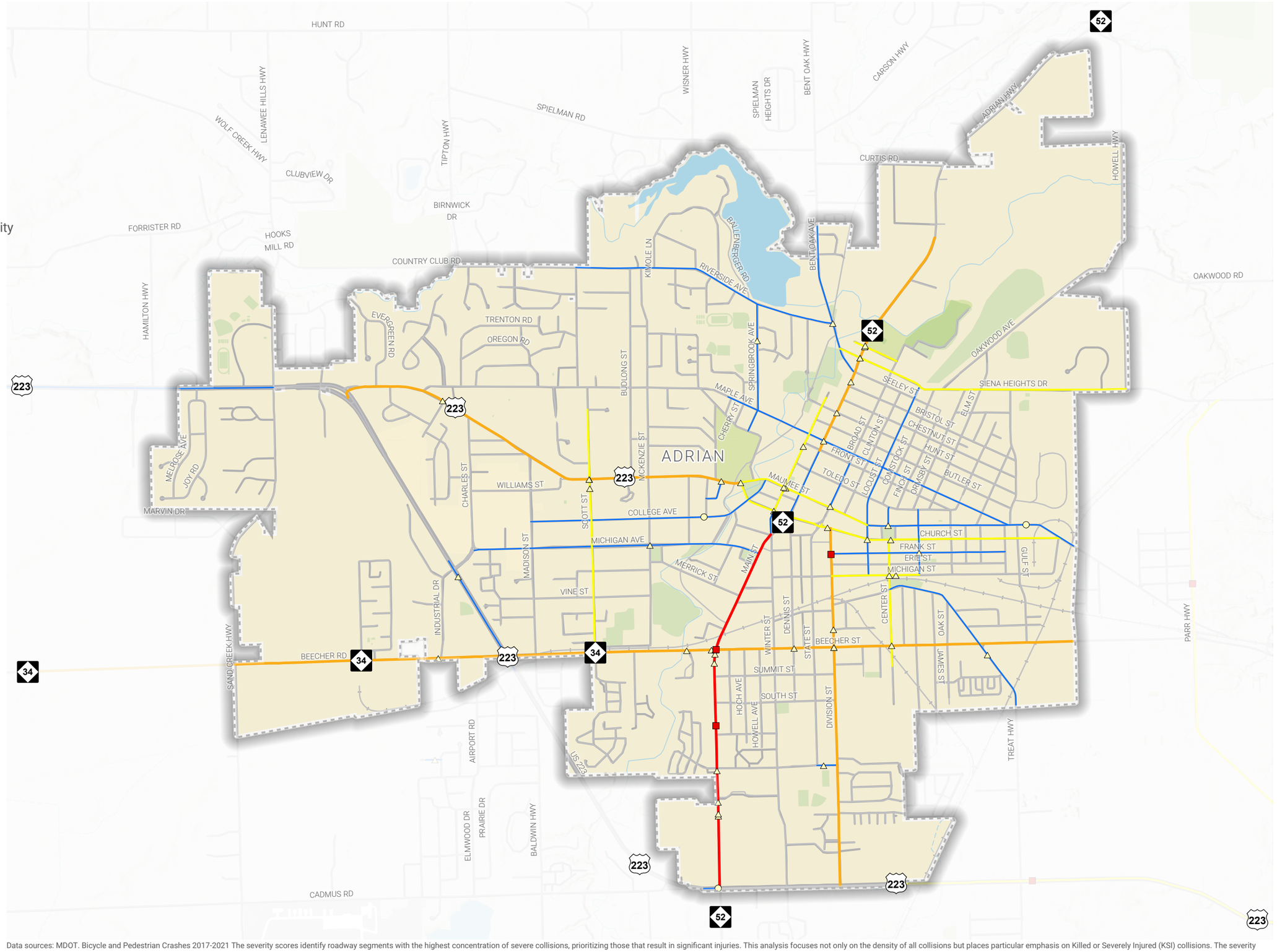


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF ANN ARBOR

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

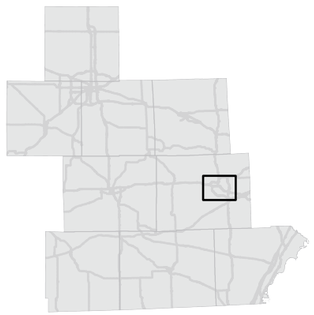
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
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- Railroads
- City Boundary

UNIVERSITY REGION

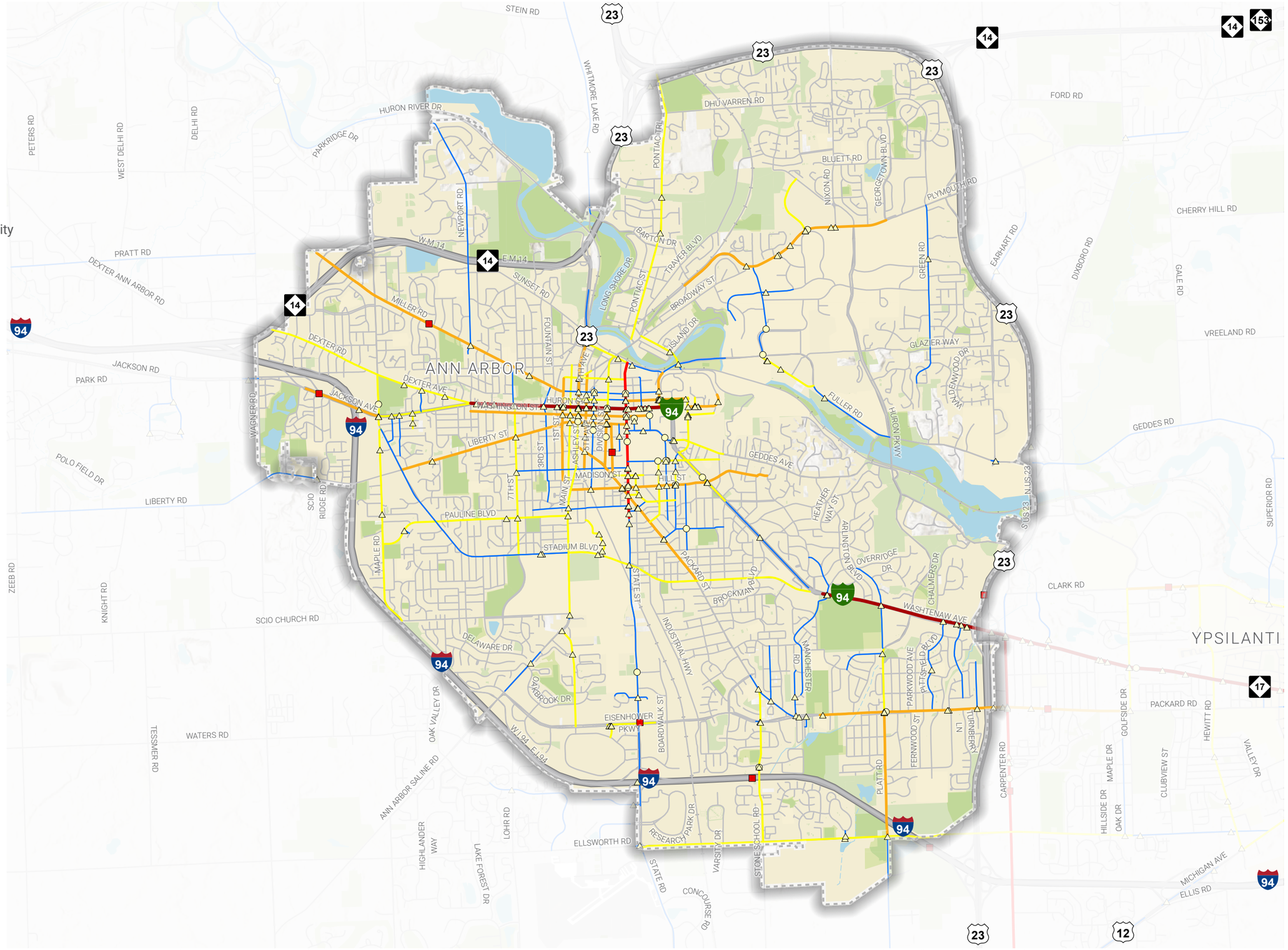


0 0.55 1.1 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF BRIGHTON

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

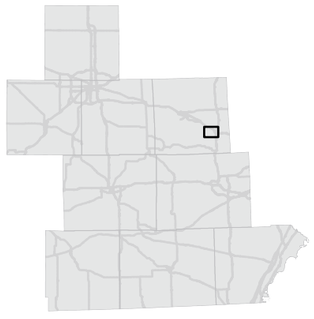
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

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- City Boundary

UNIVERSITY REGION

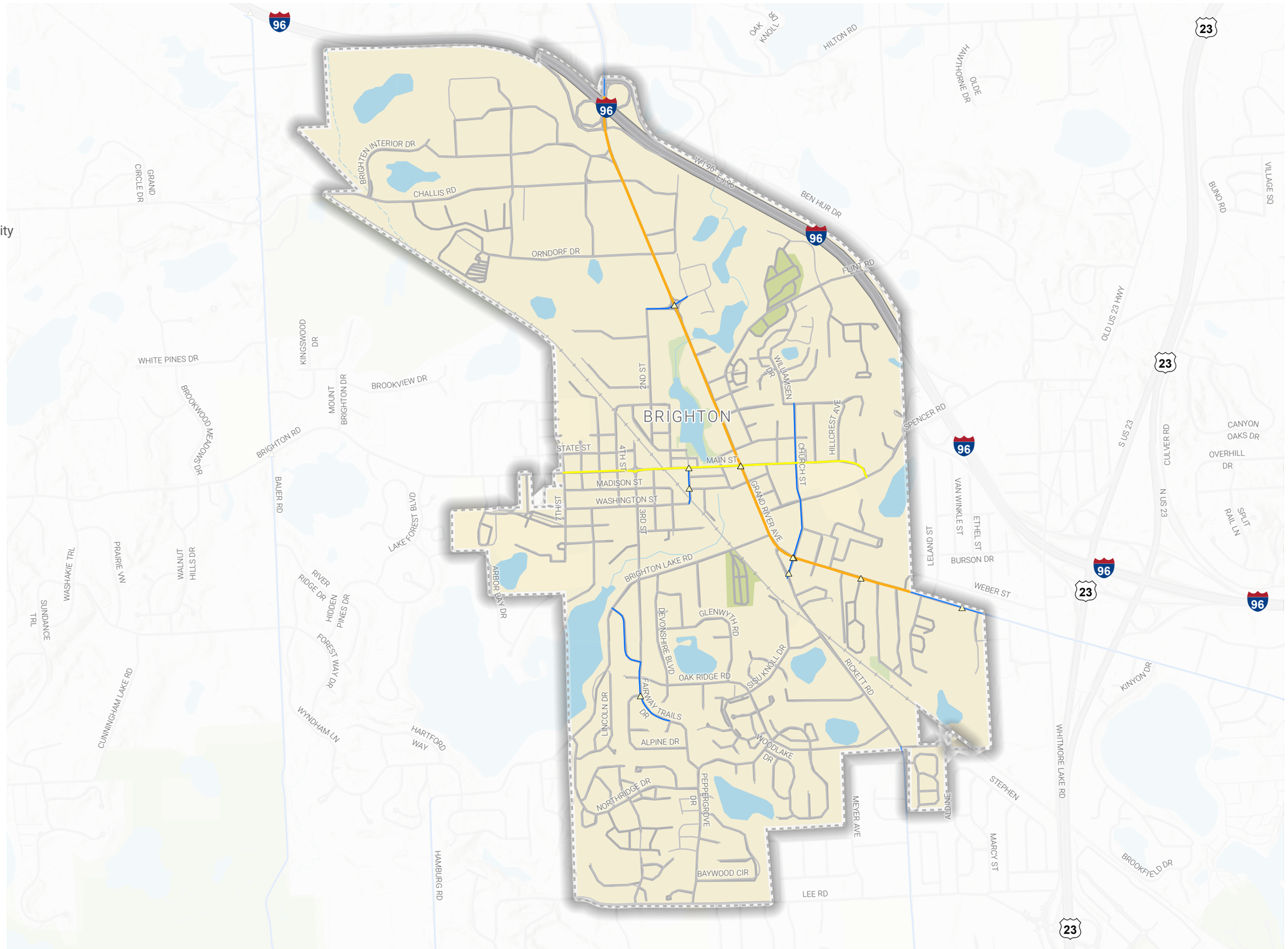


0 0.2 0.4 MILES



Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF CHARLOTTE

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

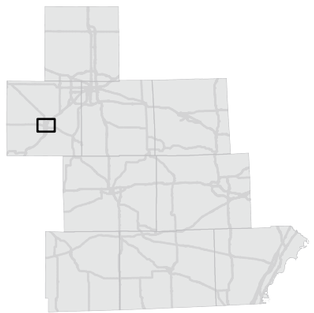
Pedestrian Crashes 2017-2021 by severity

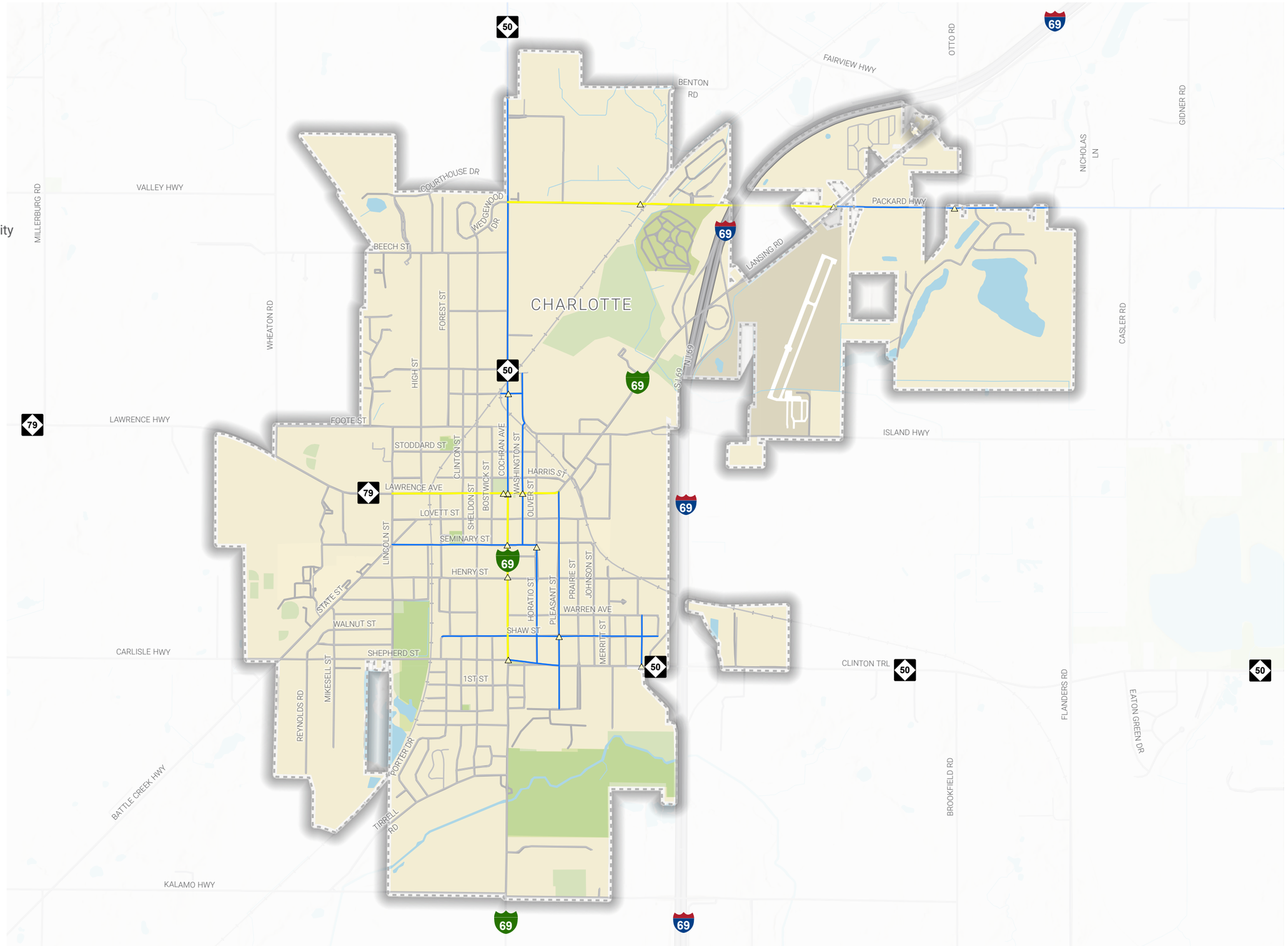
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION





0 0.3 0.6 MILES

N

MDOT Michigan Department of Transportation

alta

Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF HILLSDALE

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

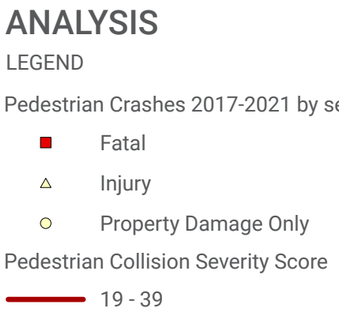
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

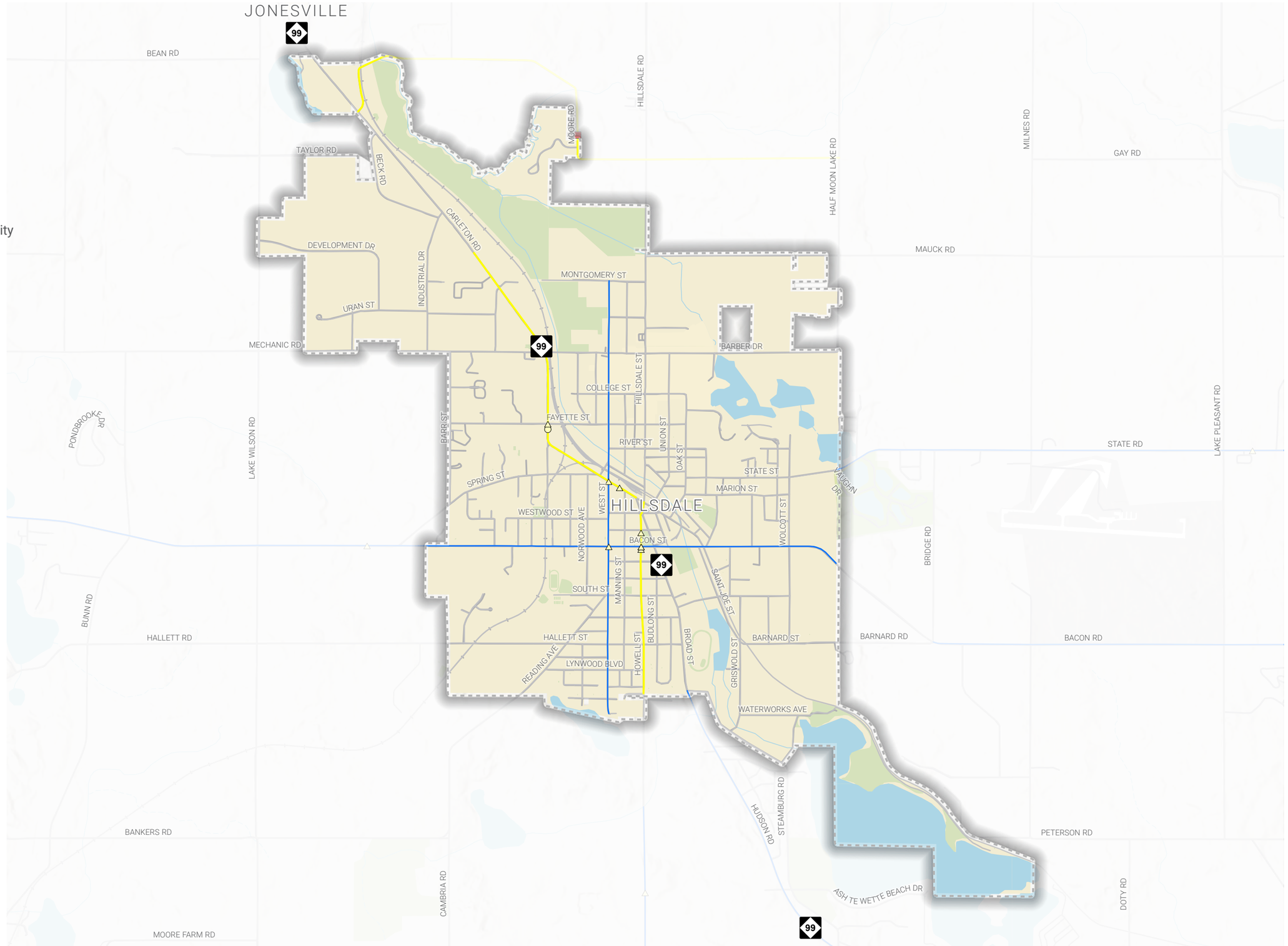


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF HOWELL

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

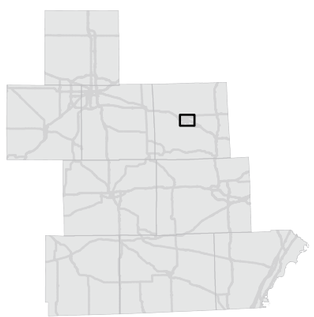
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

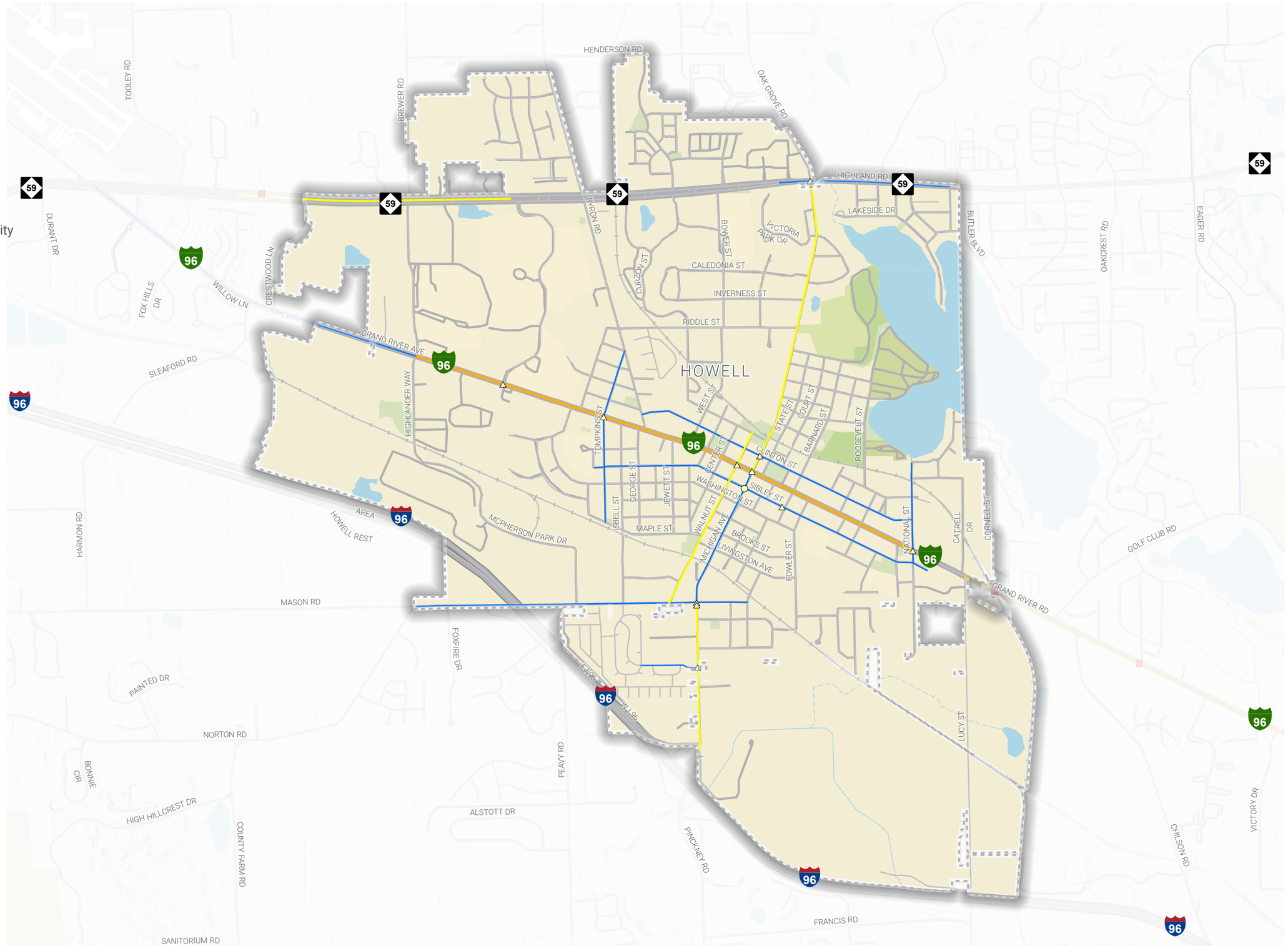
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF JACKSON

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

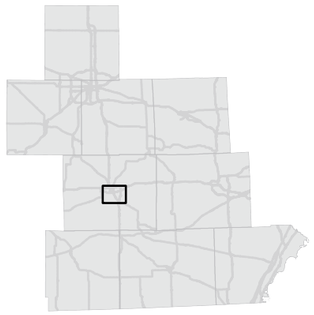
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

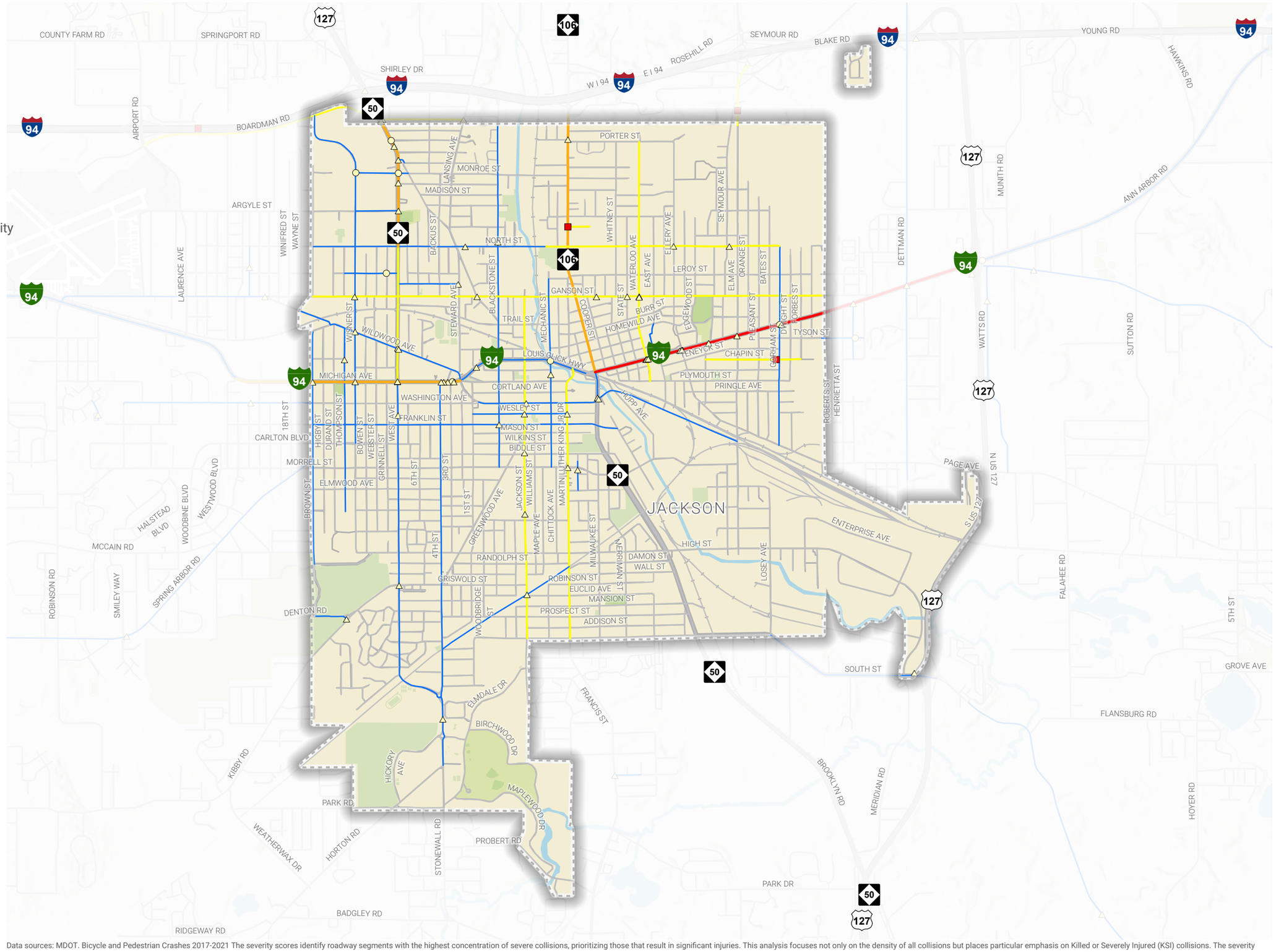


0 0.4 0.8 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF LITCHFIELD

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

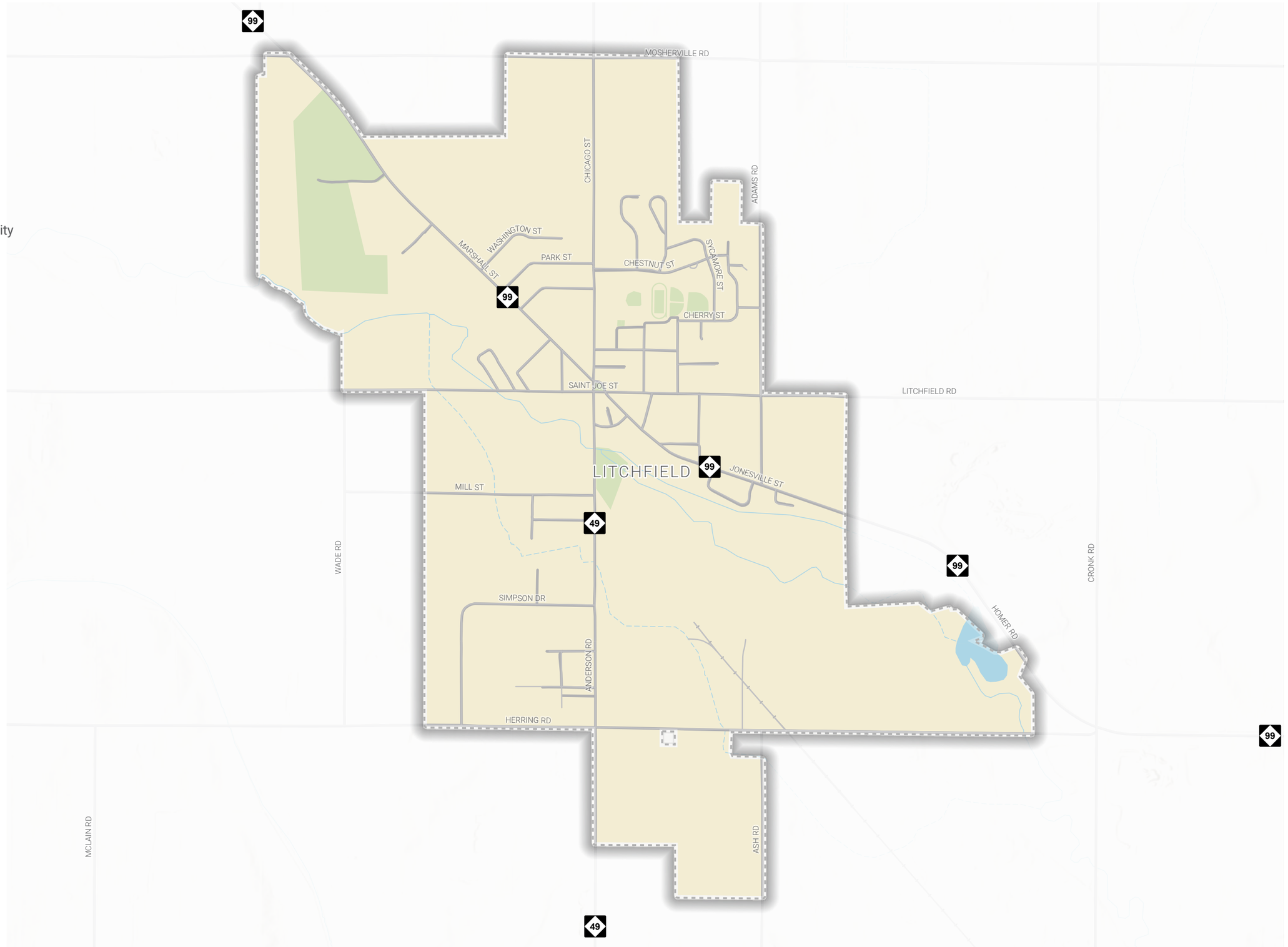


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF MASON

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

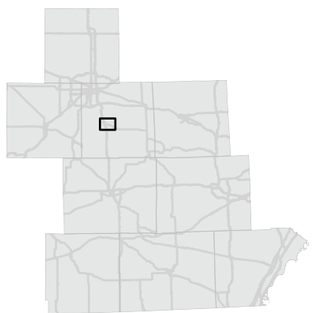
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

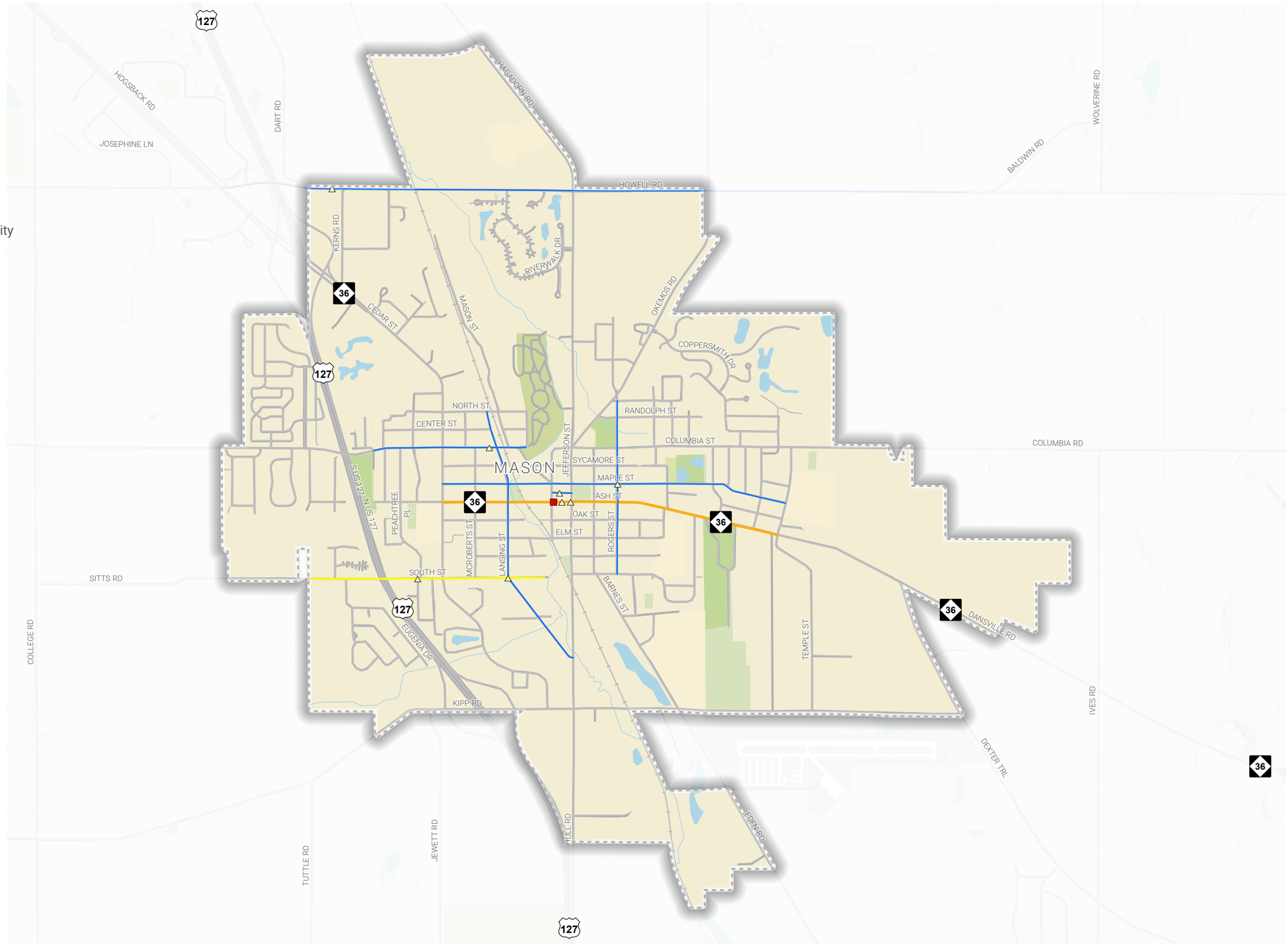
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF MILAN

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

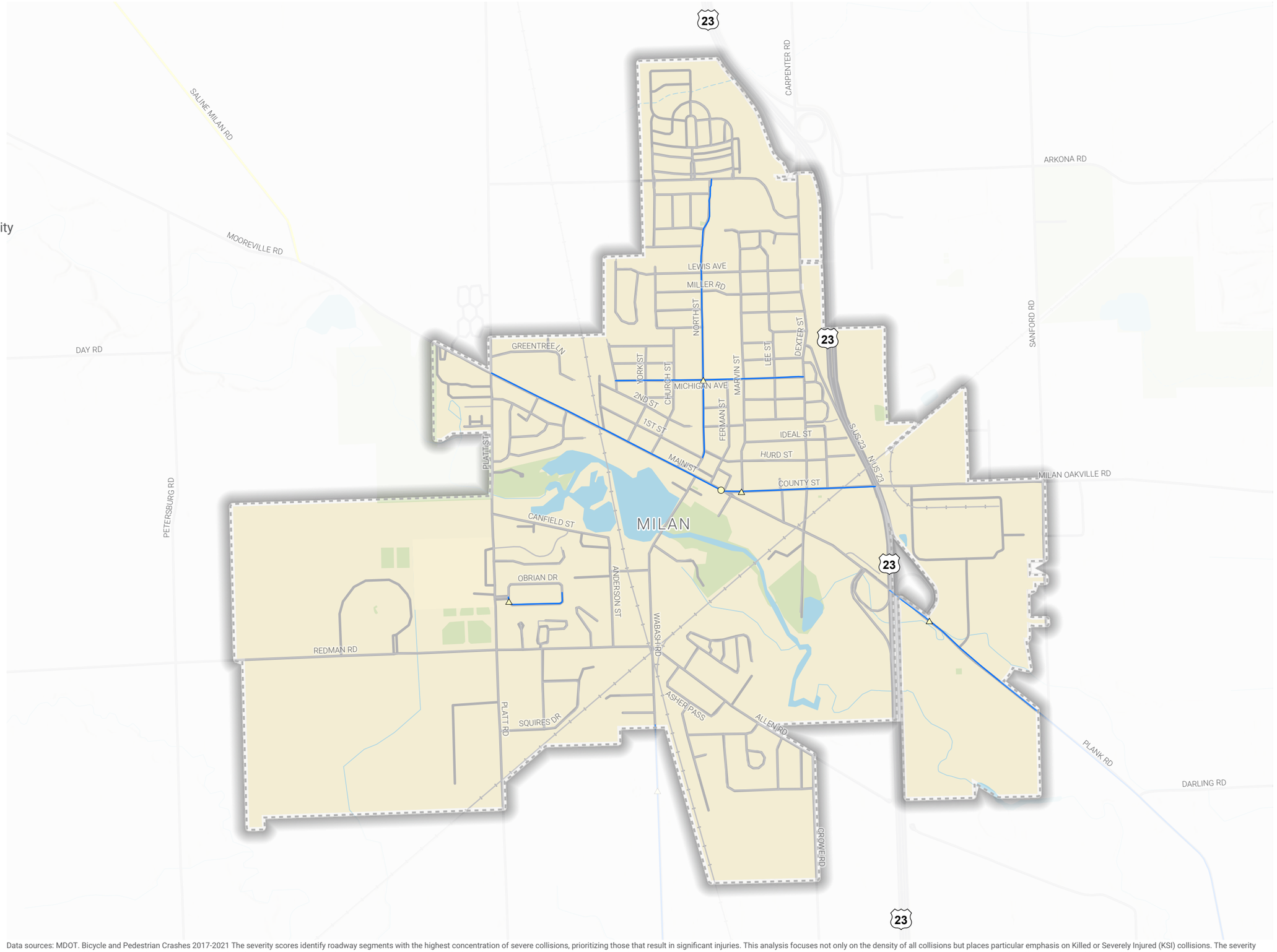


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF MONROE

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

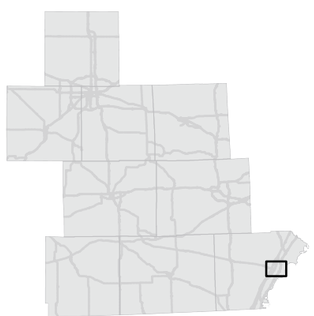
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
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- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

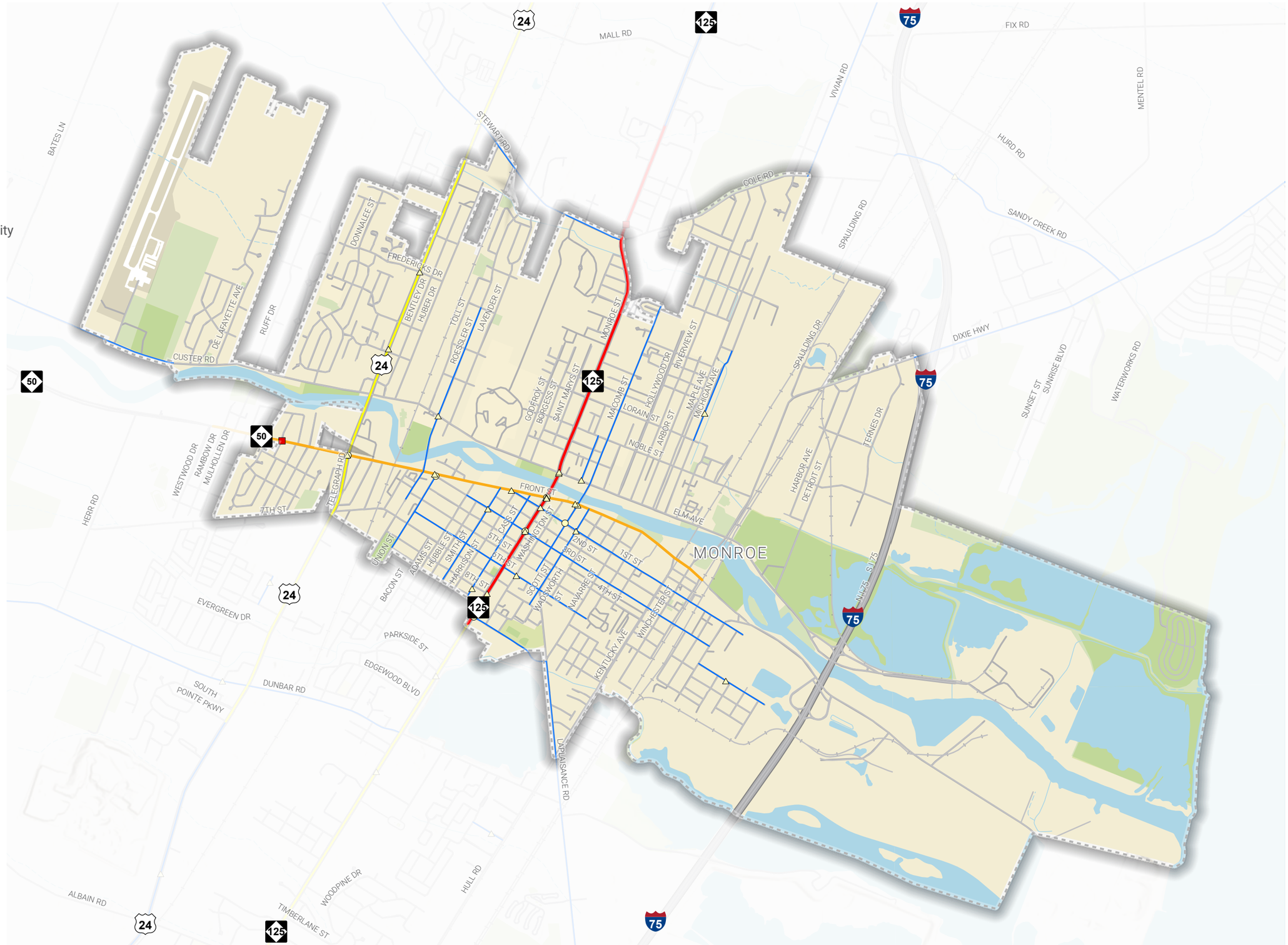


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



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CITY OF ST JOHNS

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

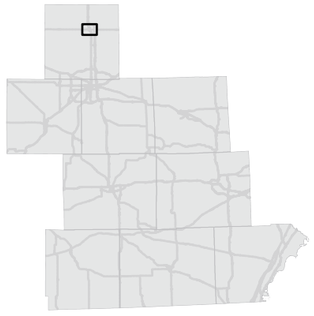
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5

- Parks
- Railroads
- City Boundary

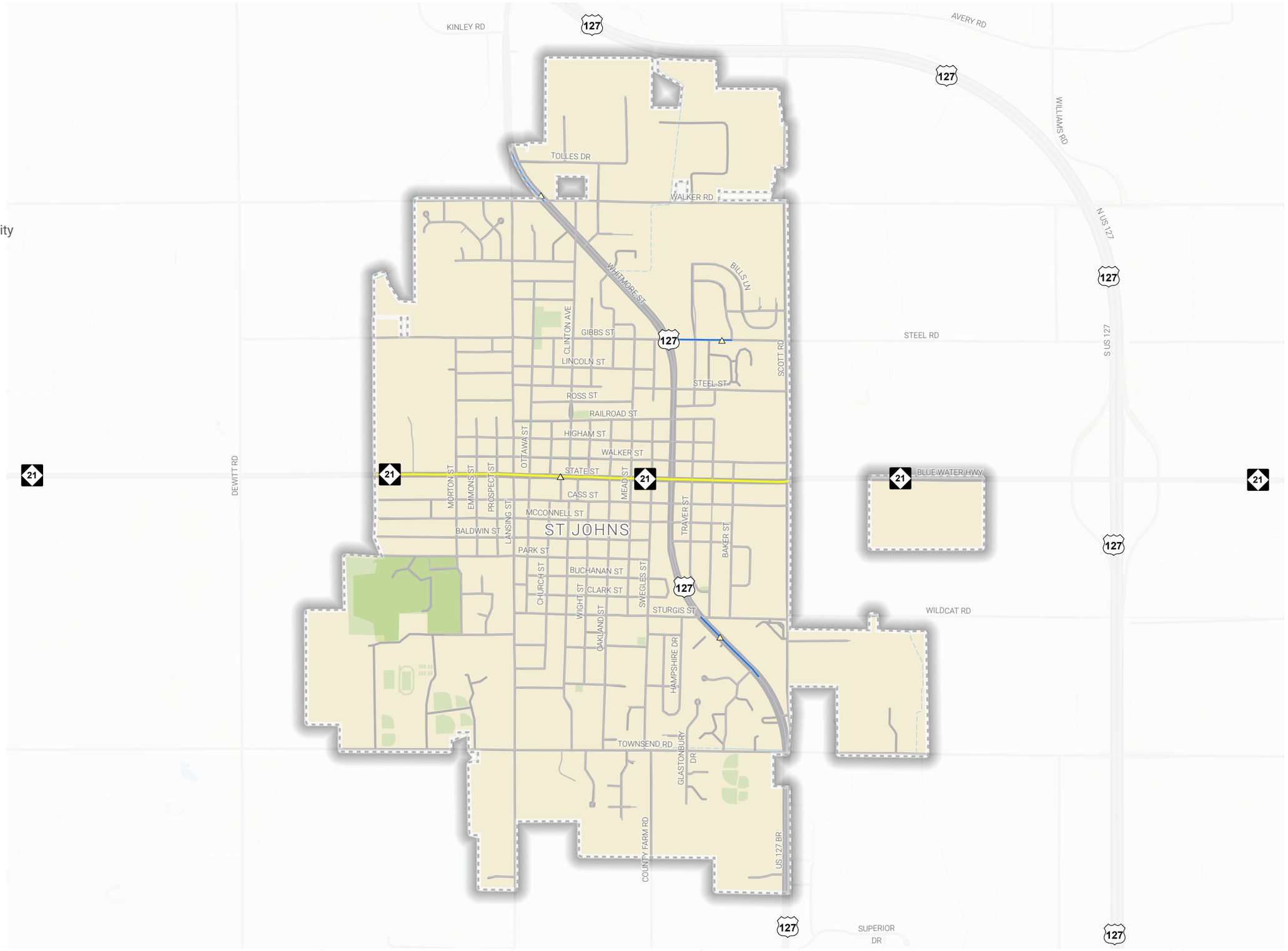
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF TECUMSEH

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

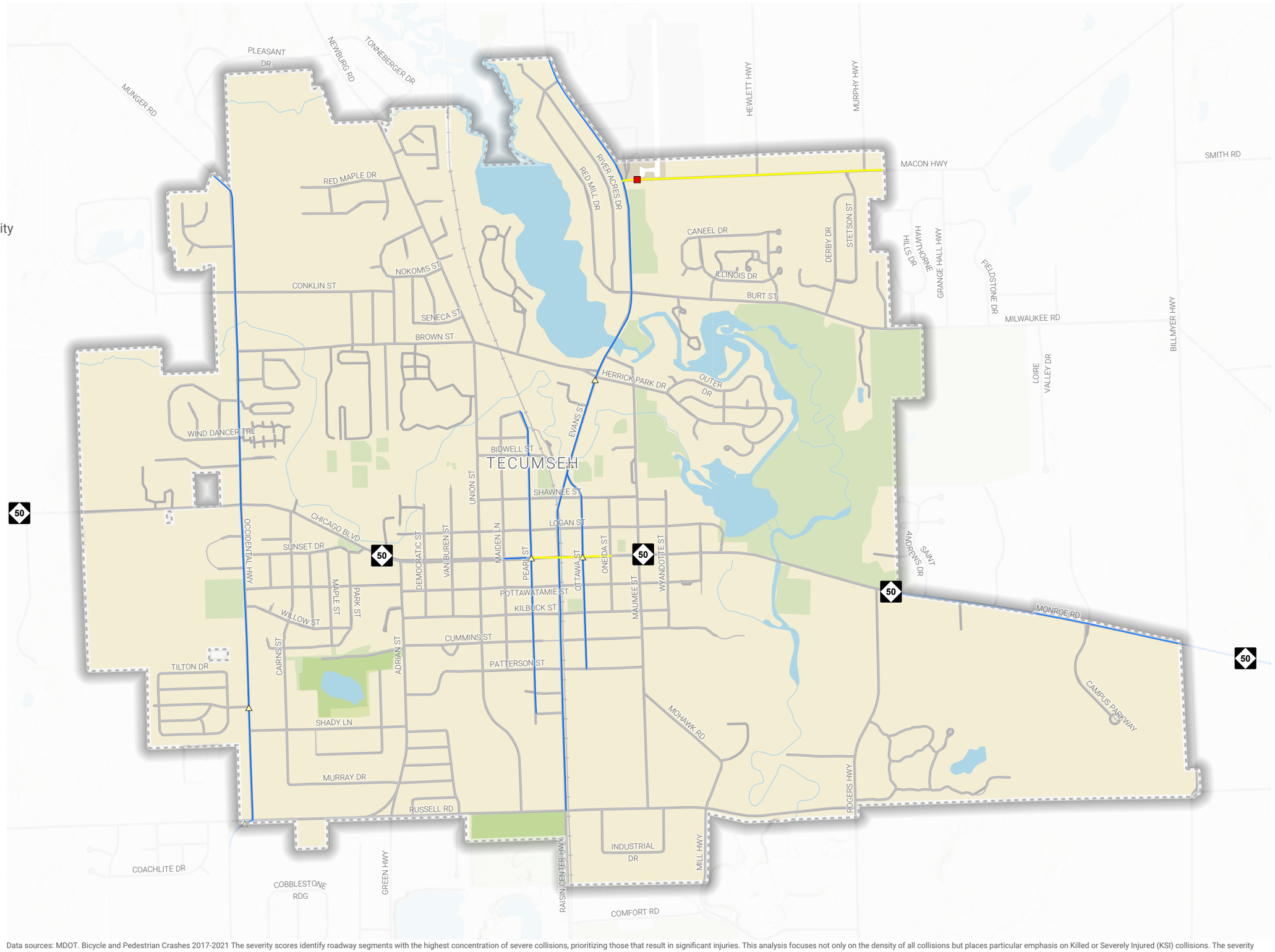


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF YPSILANTI

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

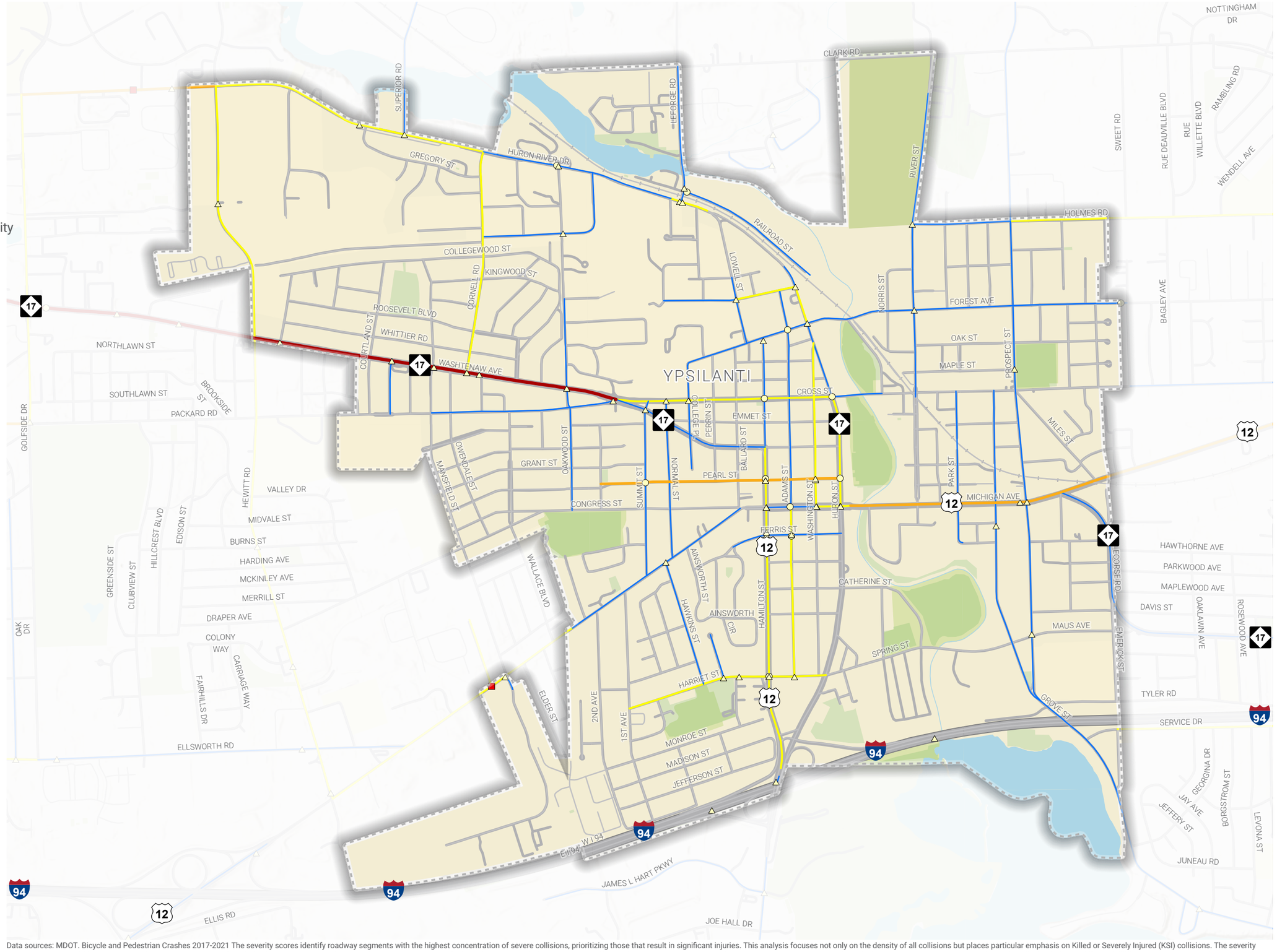
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CLINTON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

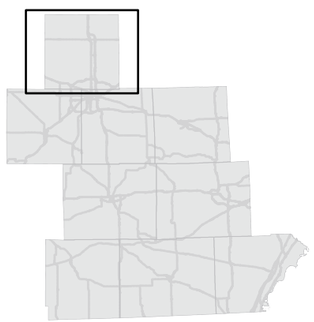
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5

- Parks
- Railroads
- City Boundary

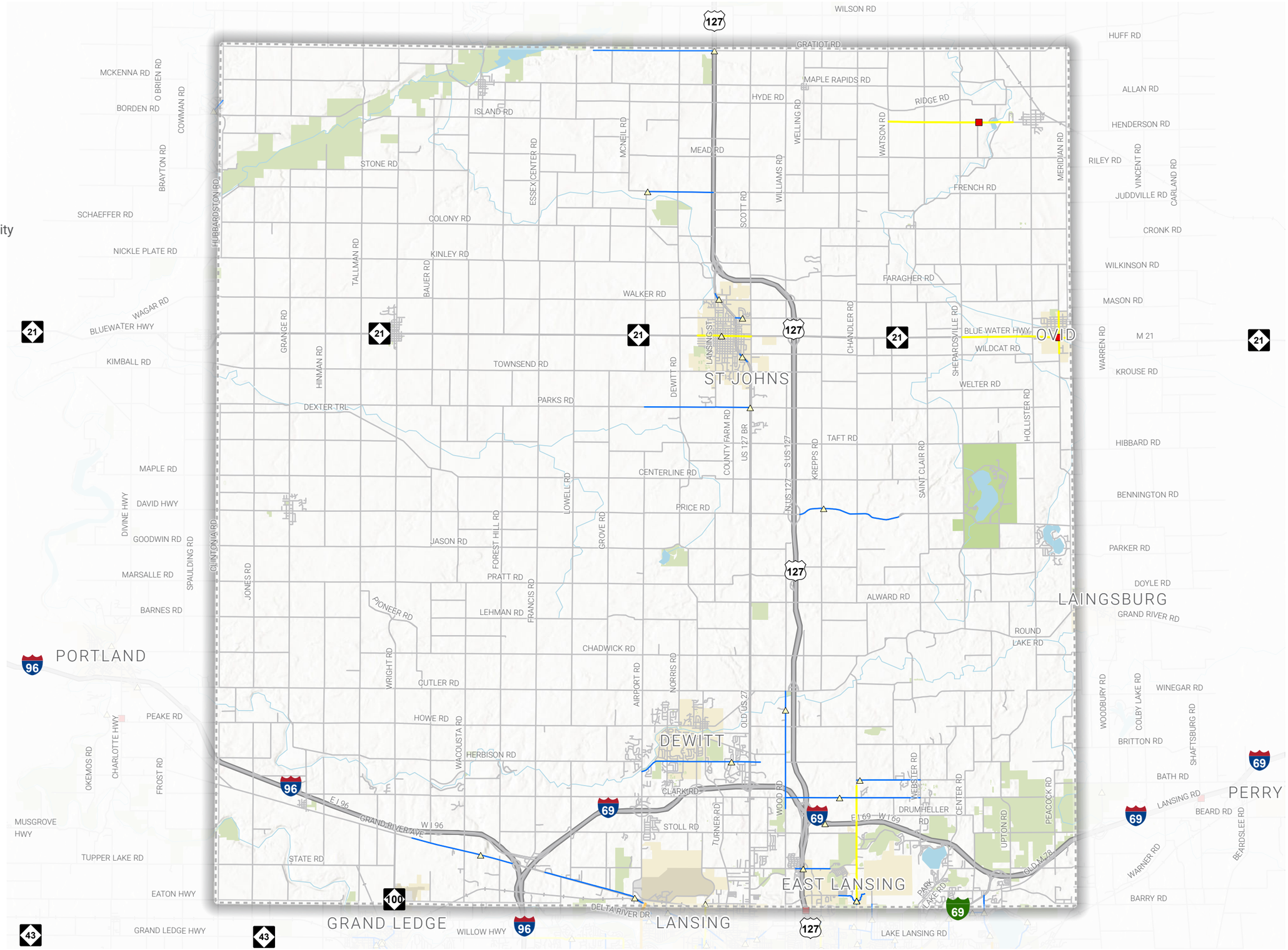
UNIVERSITY REGION



0 2 4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

EATON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

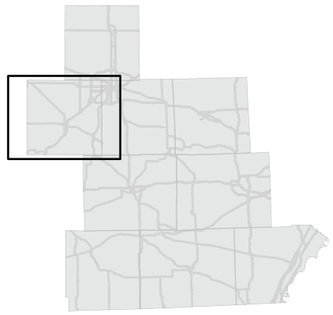
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

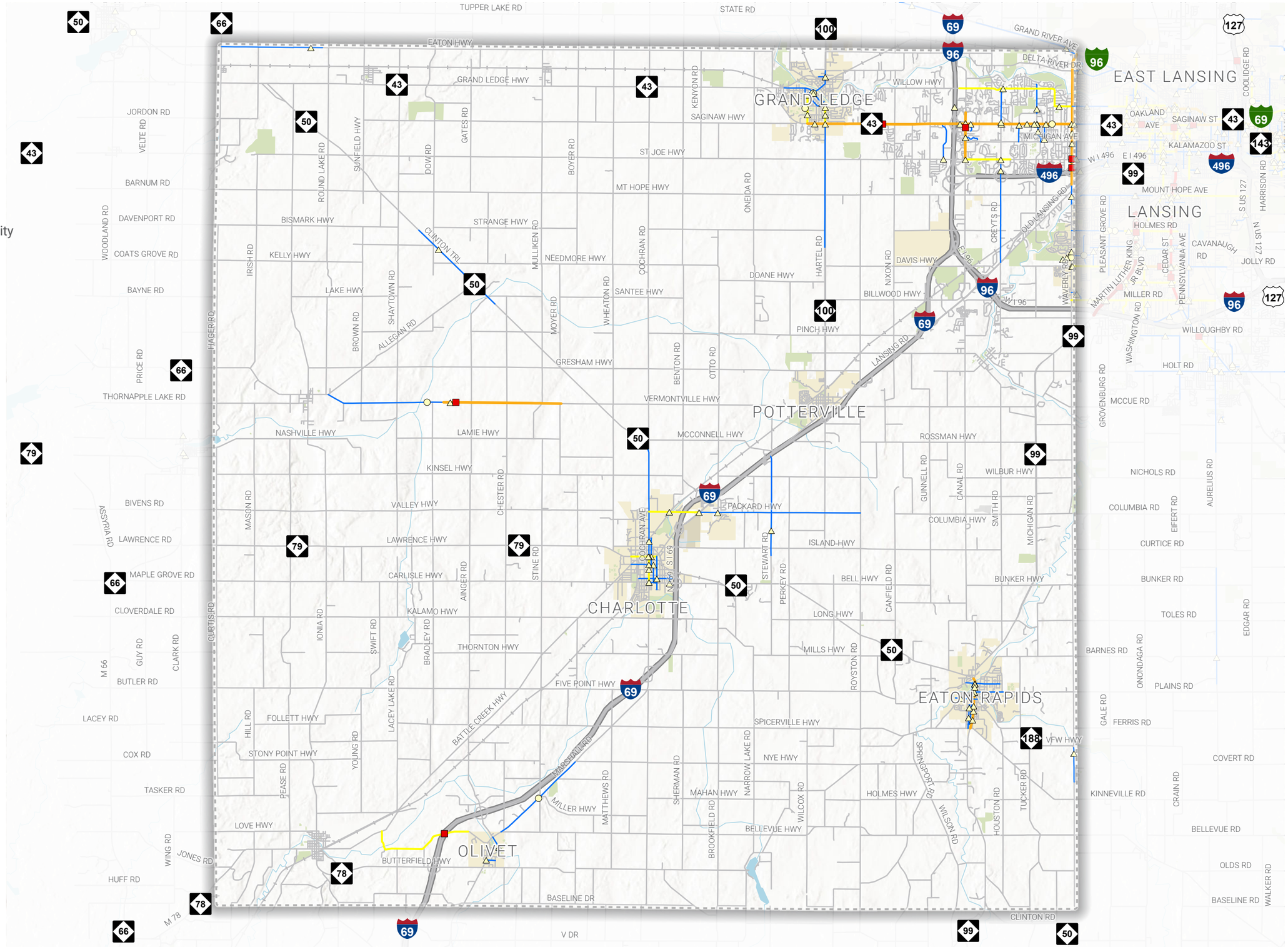


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

GREATER LANSING

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

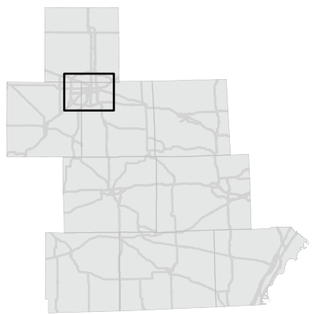
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

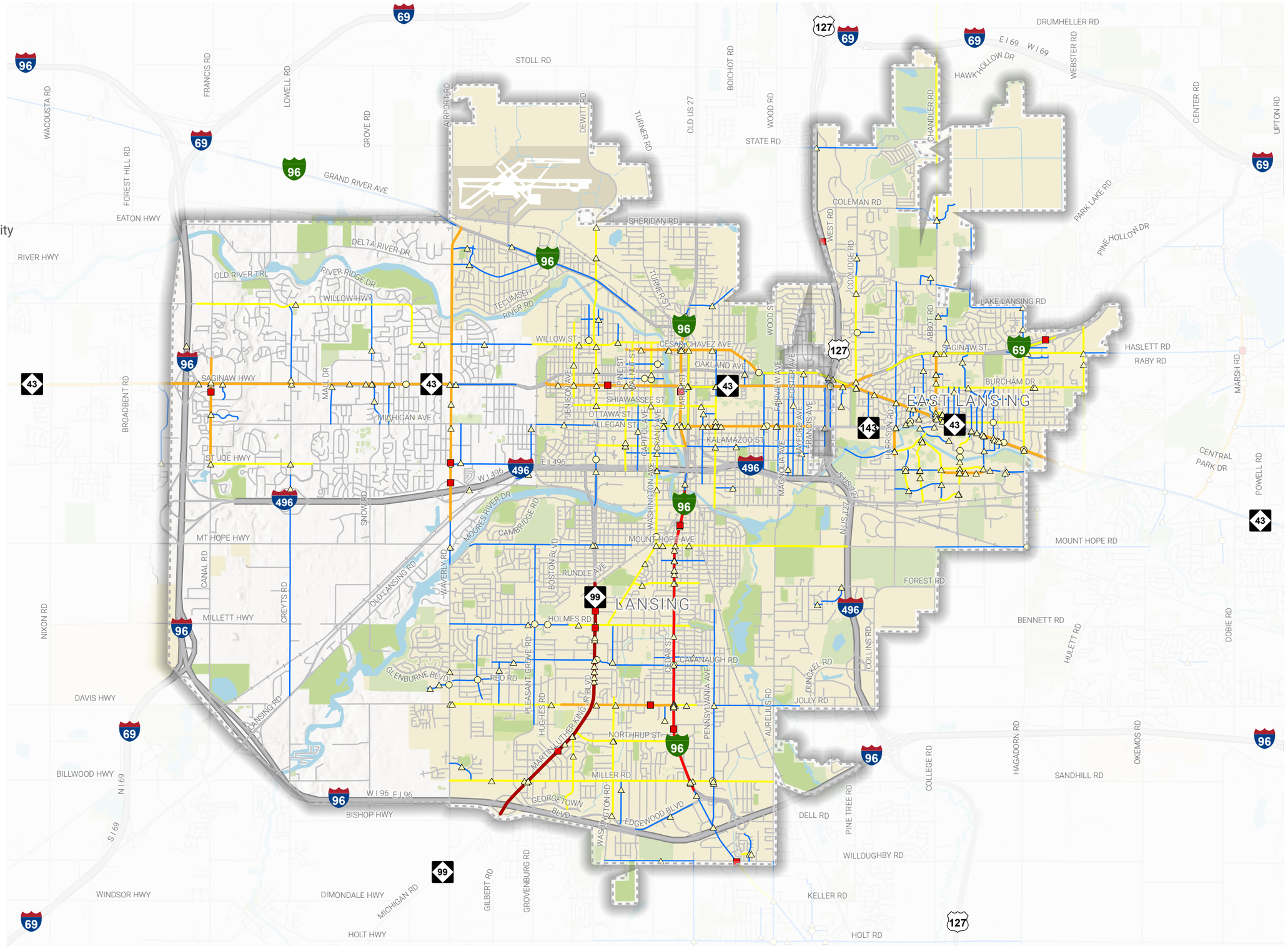


0 0.85 1.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

HILLSDALE COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

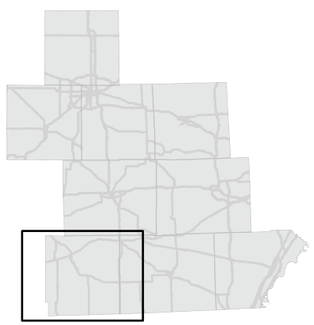
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

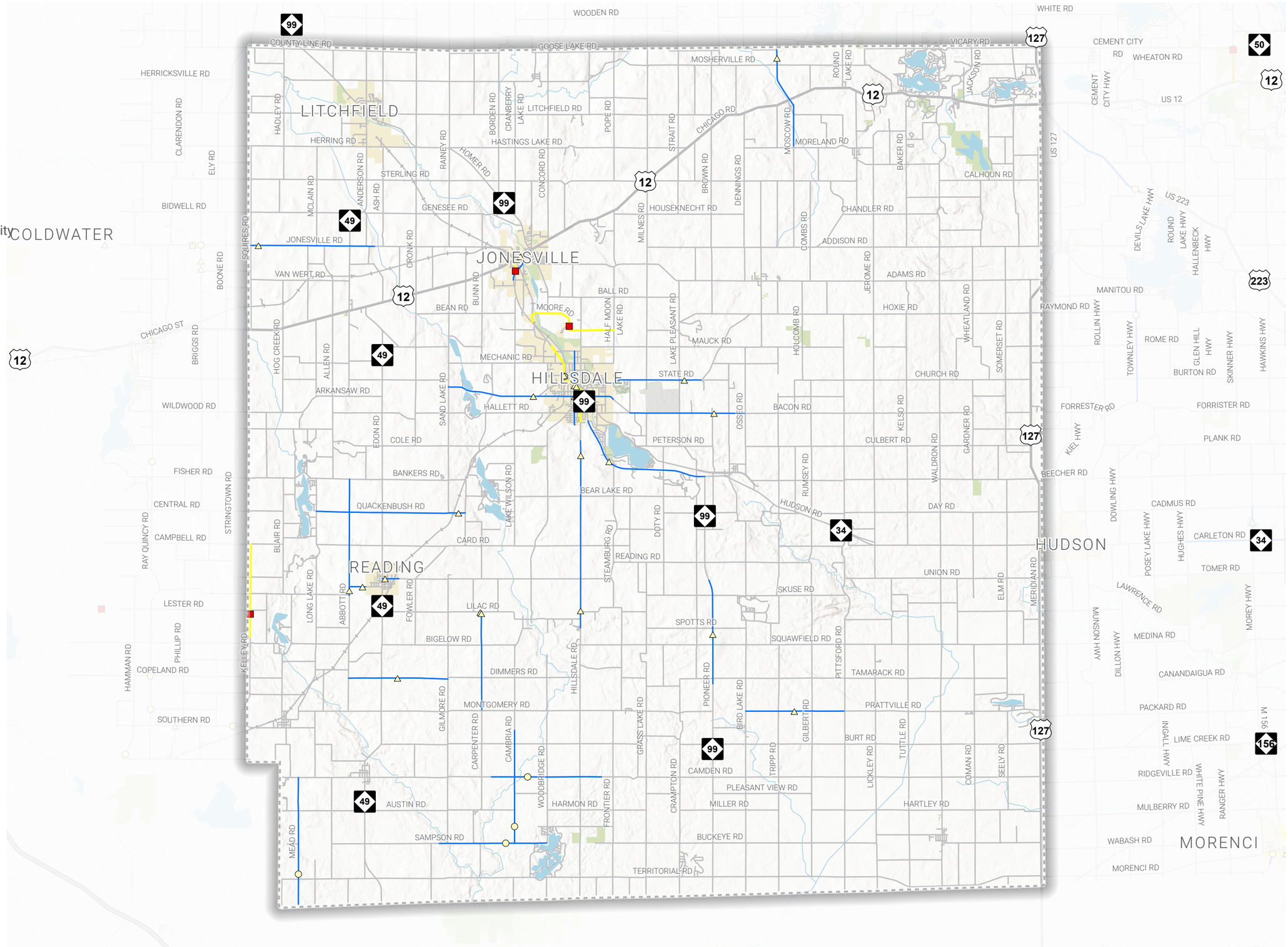


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

INGHAM COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

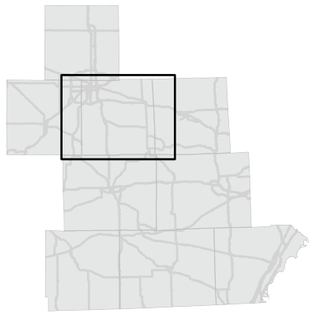
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

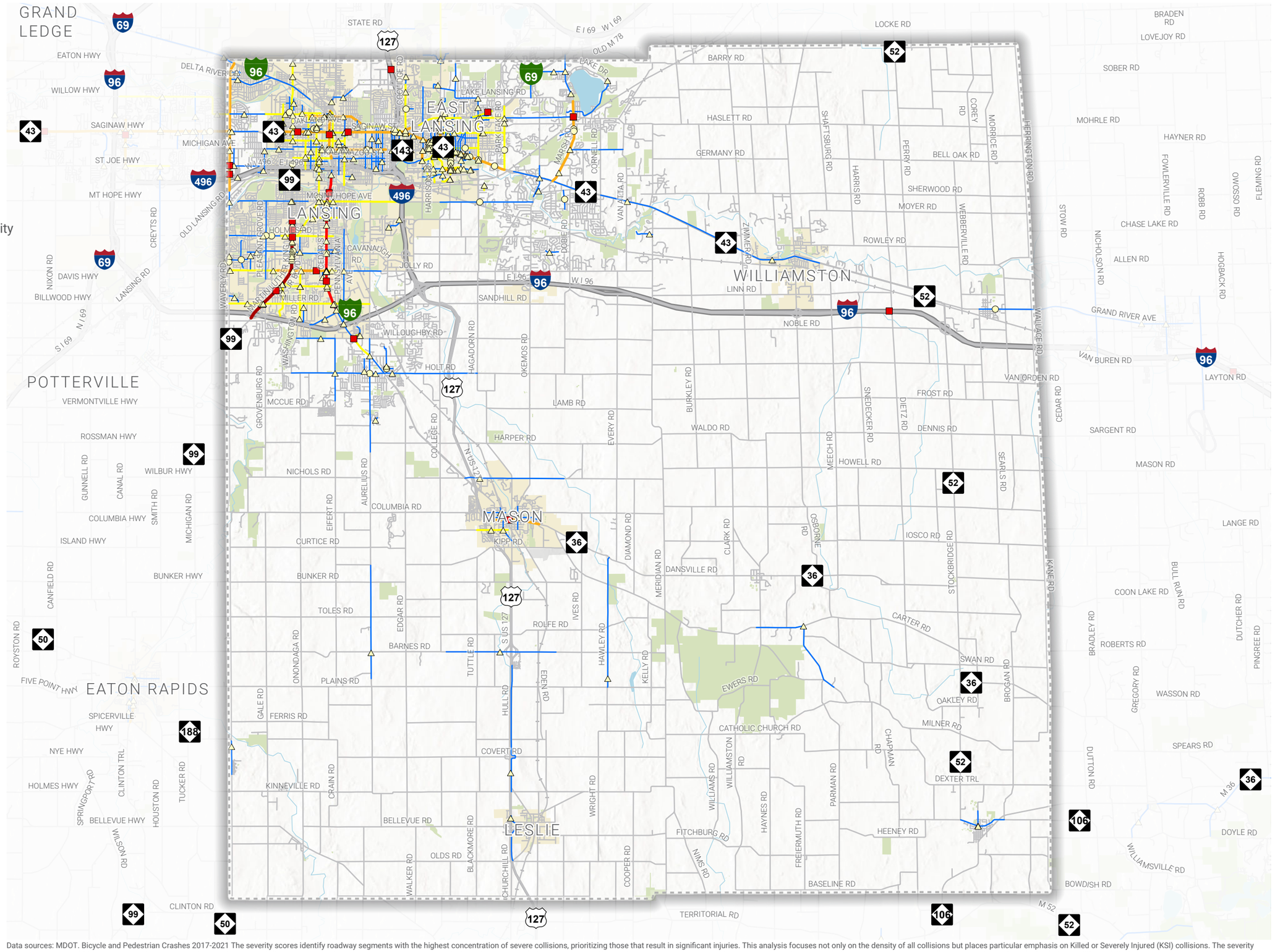


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



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JACKSON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

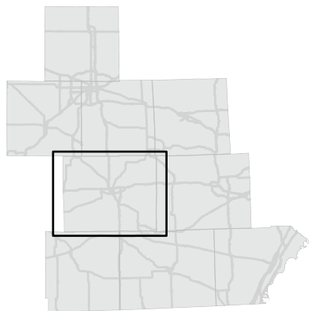
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

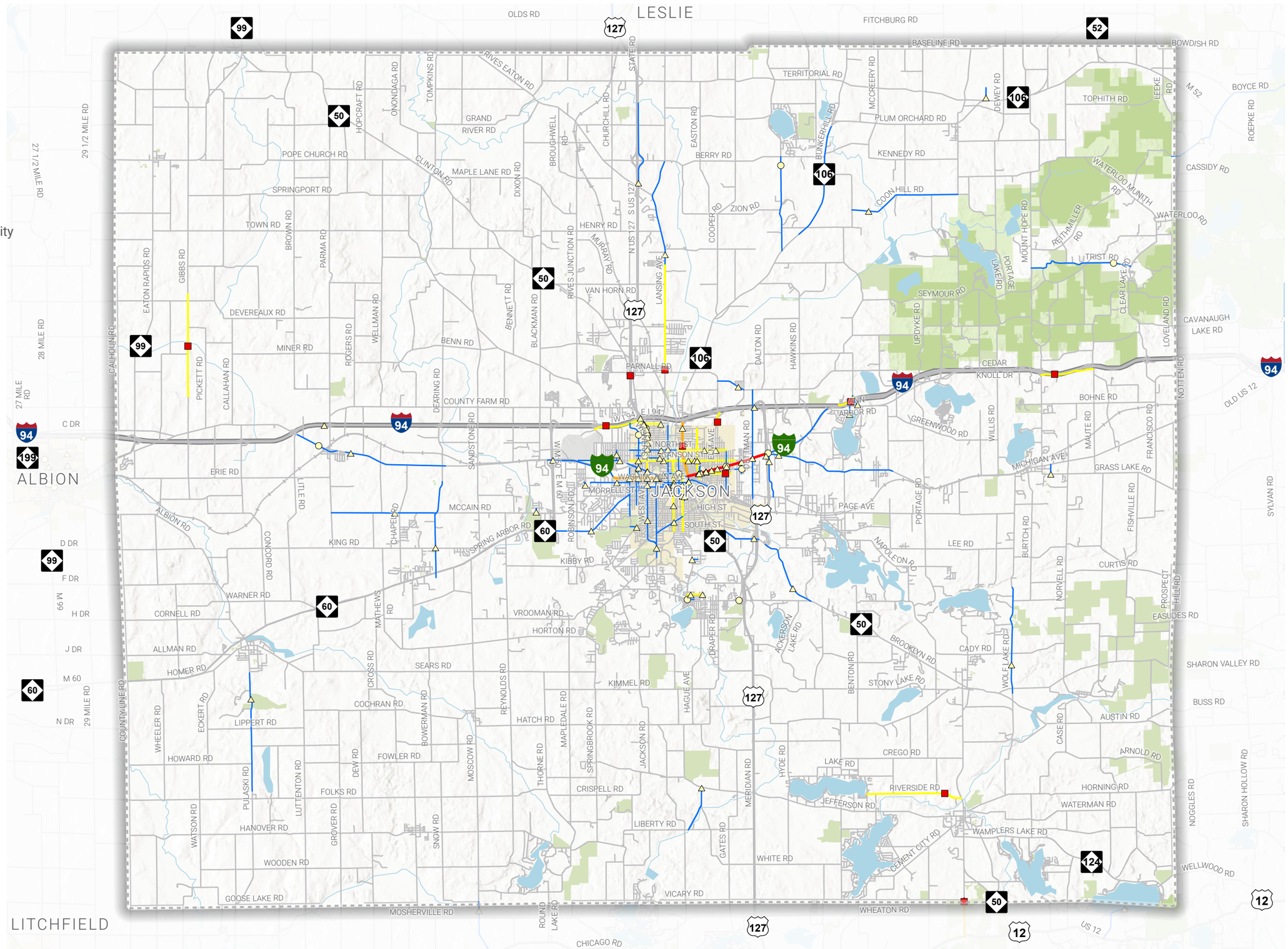


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



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LENAWEE COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

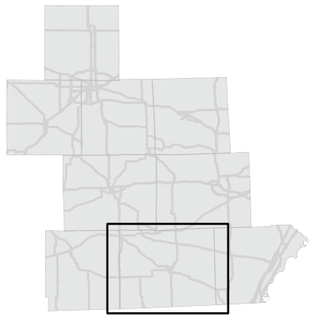
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

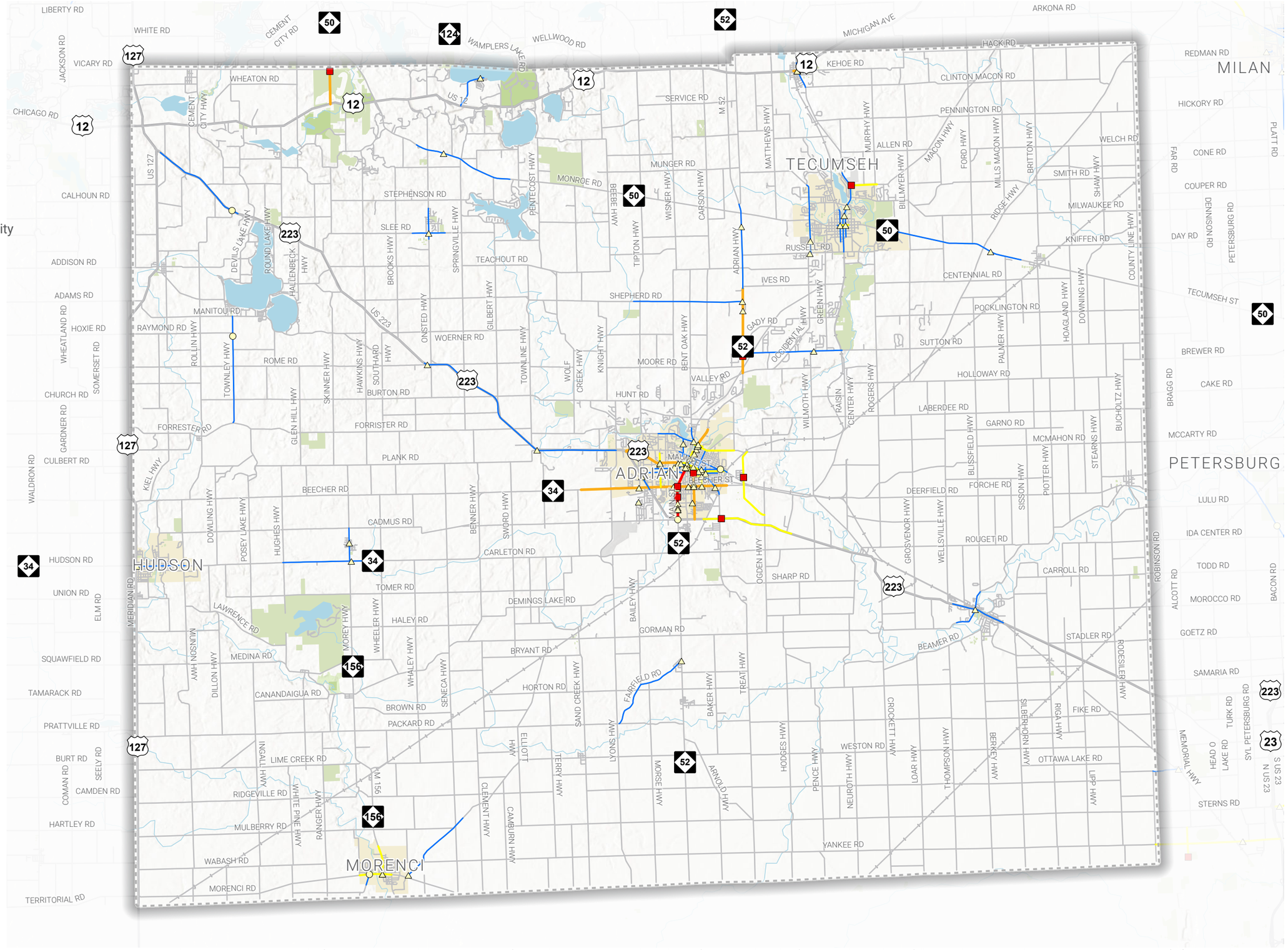


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



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LIVINGSTON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Pedestrian Crashes 2017-2021 by severity

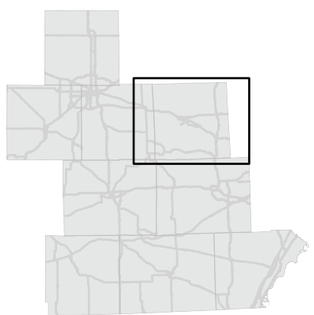
- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

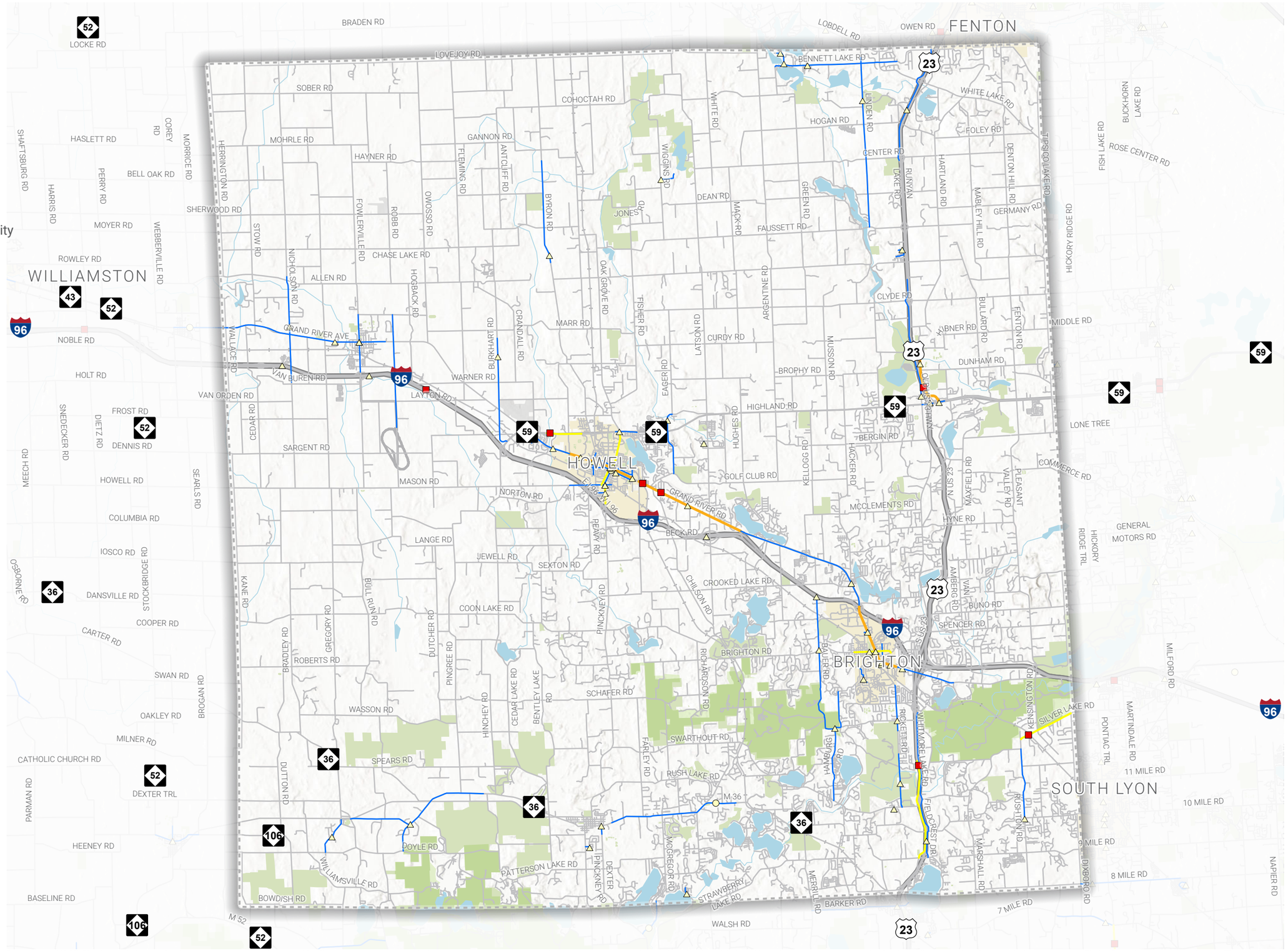


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

MONROE COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

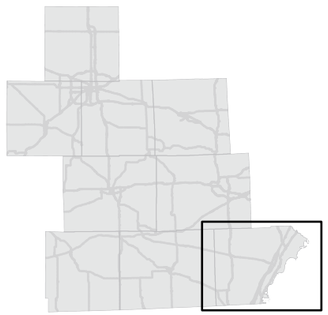
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

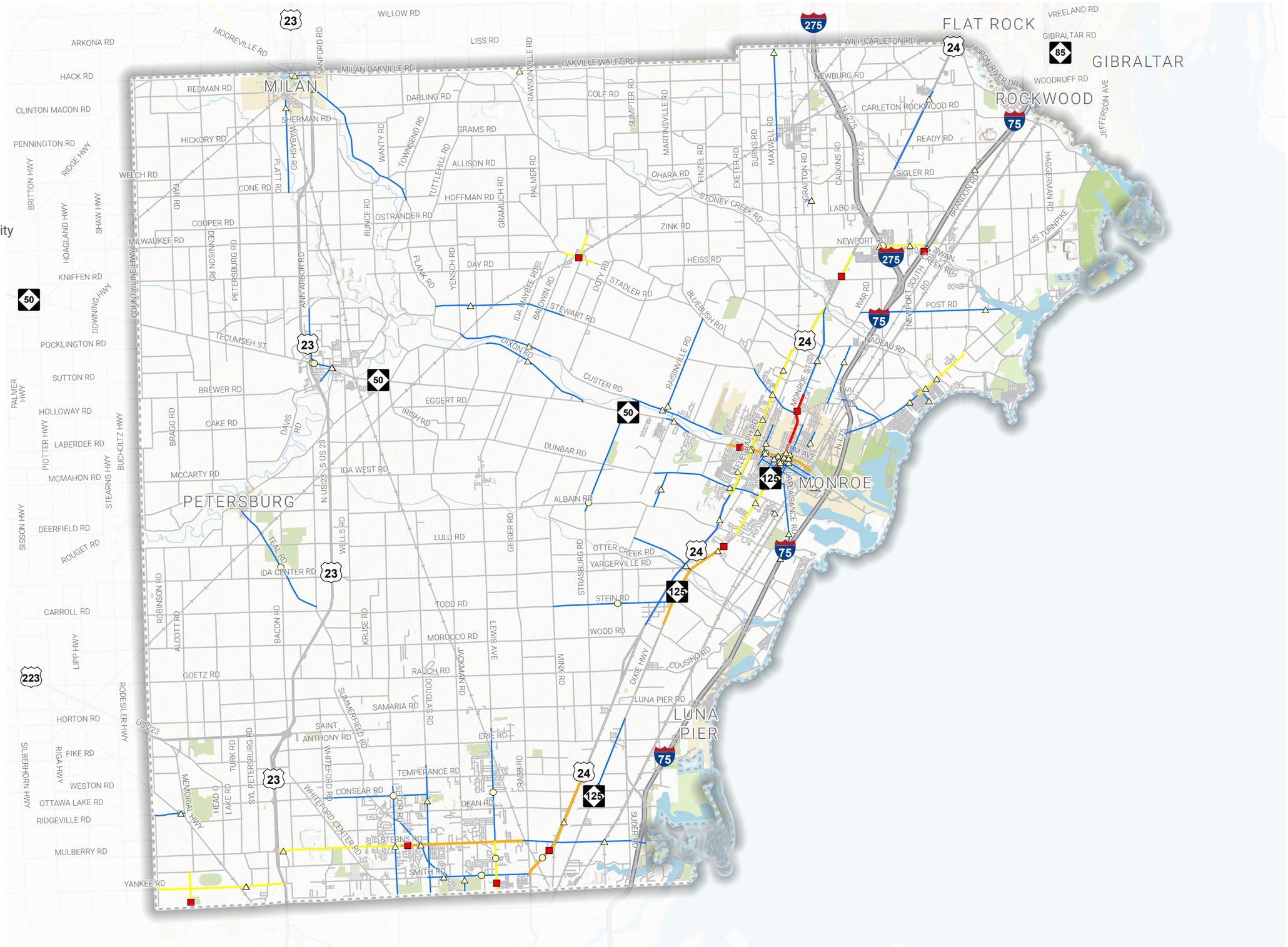


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

WASHTENAW COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

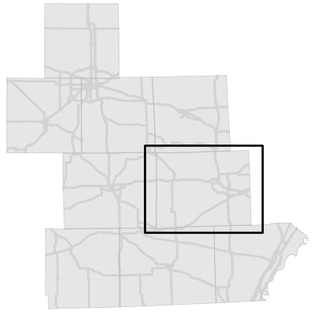
Pedestrian Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Pedestrian Collision Severity Score

- 19 - 39
- 10.5 - 19
- 4.5 - 10.5
- 1.5 - 4.5
- < 1.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

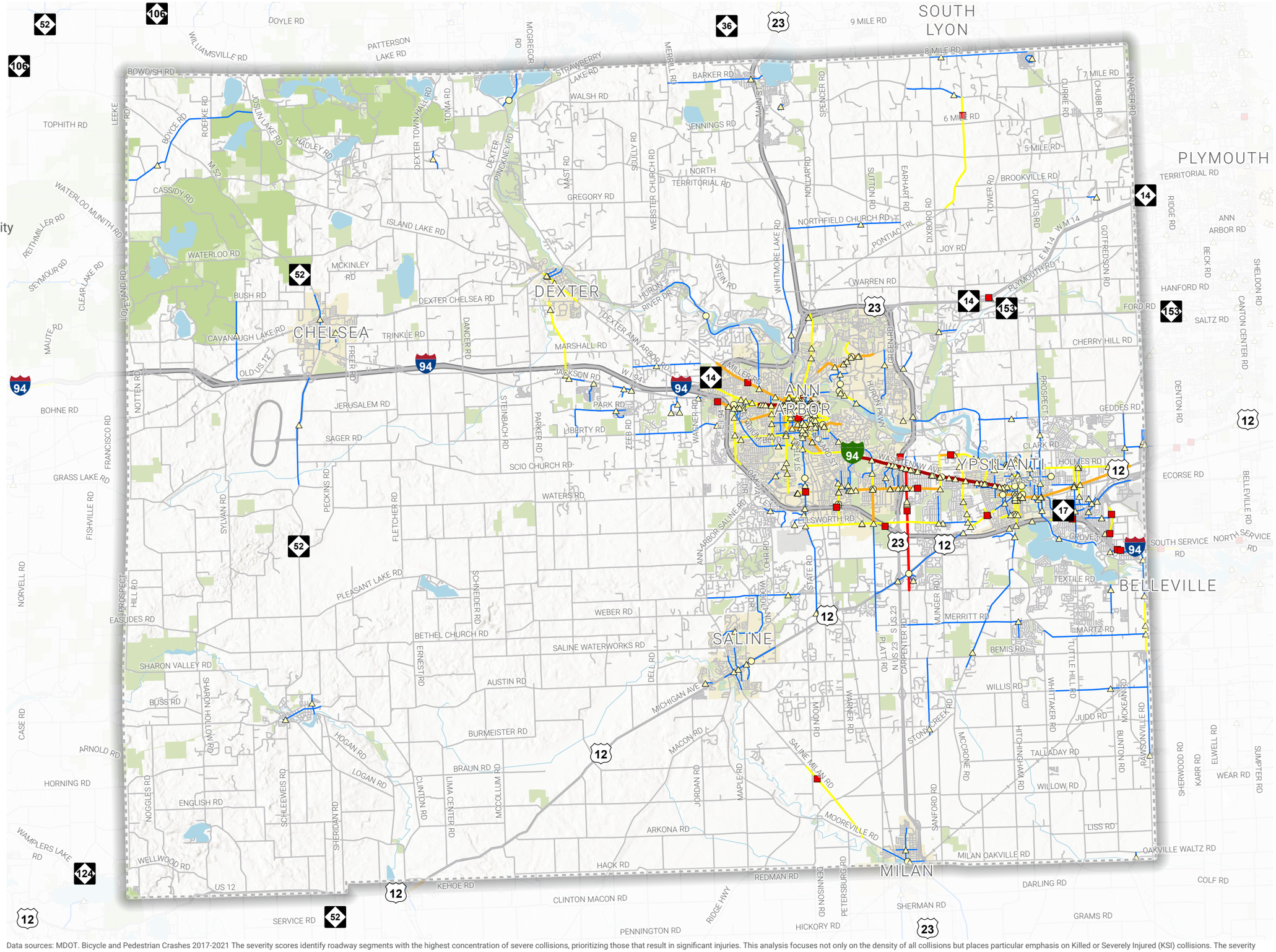


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



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Bicycle Crash Maps

CITY OF ADRIAN

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

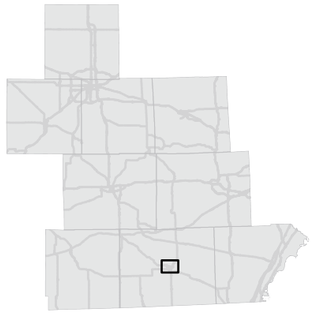
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

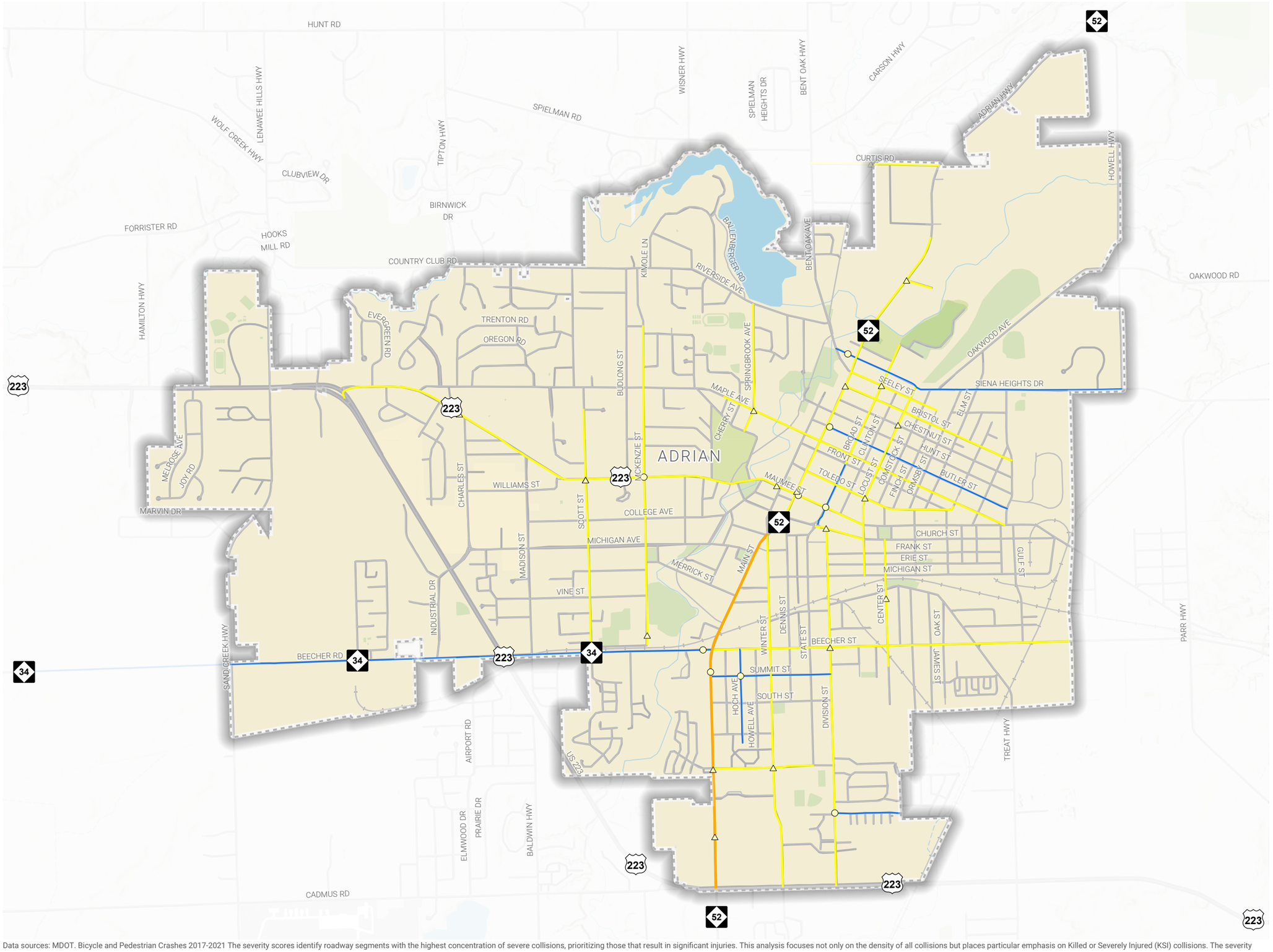


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



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CITY OF ANN ARBOR

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

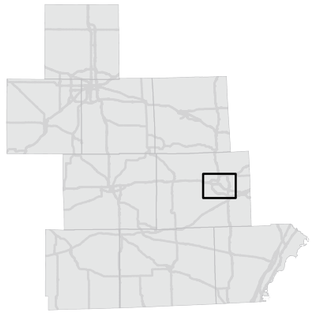
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

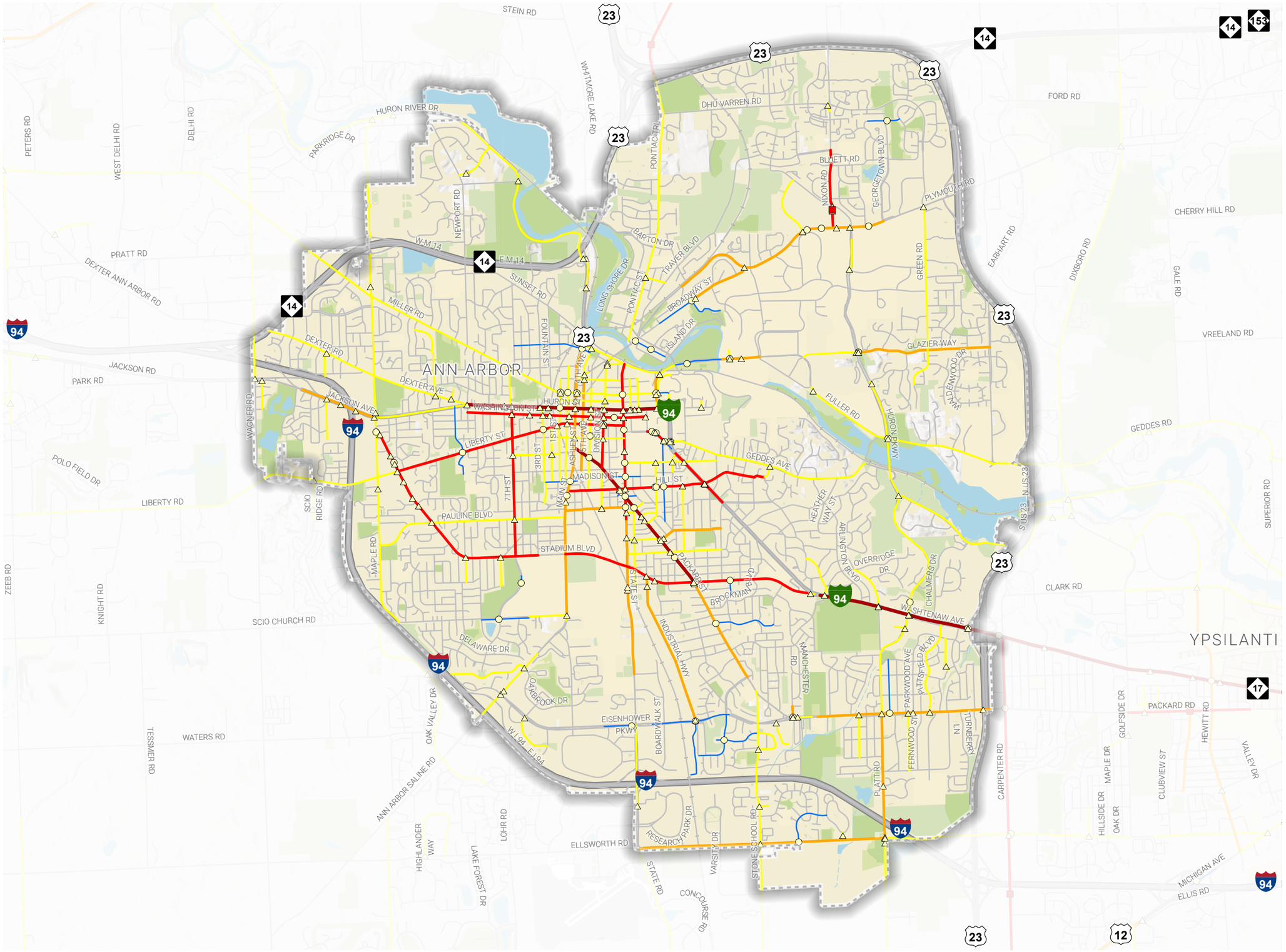
UNIVERSITY REGION



0 0.55 1.1 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF BRIGHTON

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

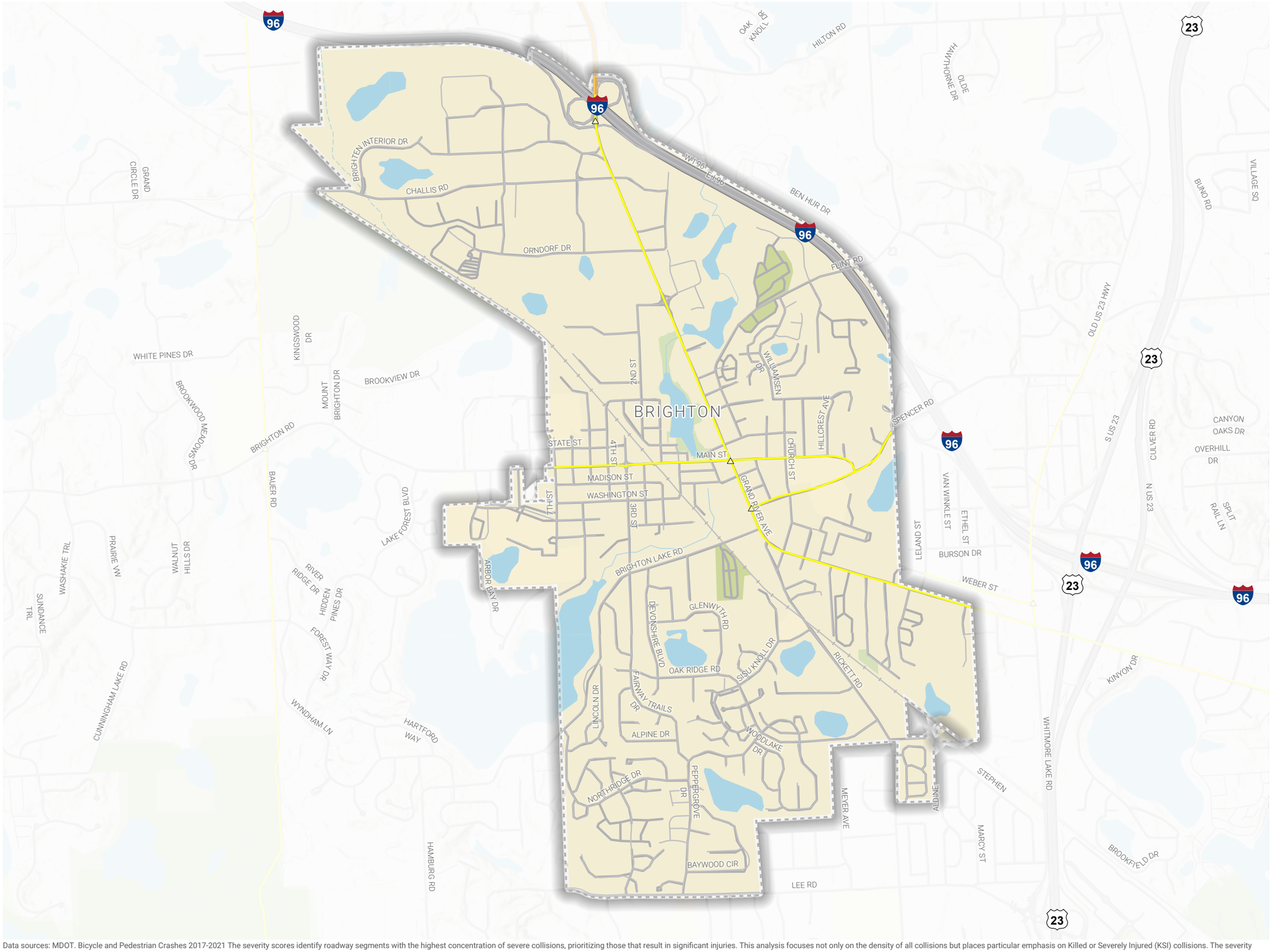
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



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CITY OF CHARLOTTE

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

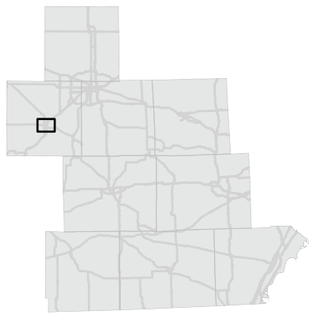
Bicycle Crashes 2017-2021 by severity

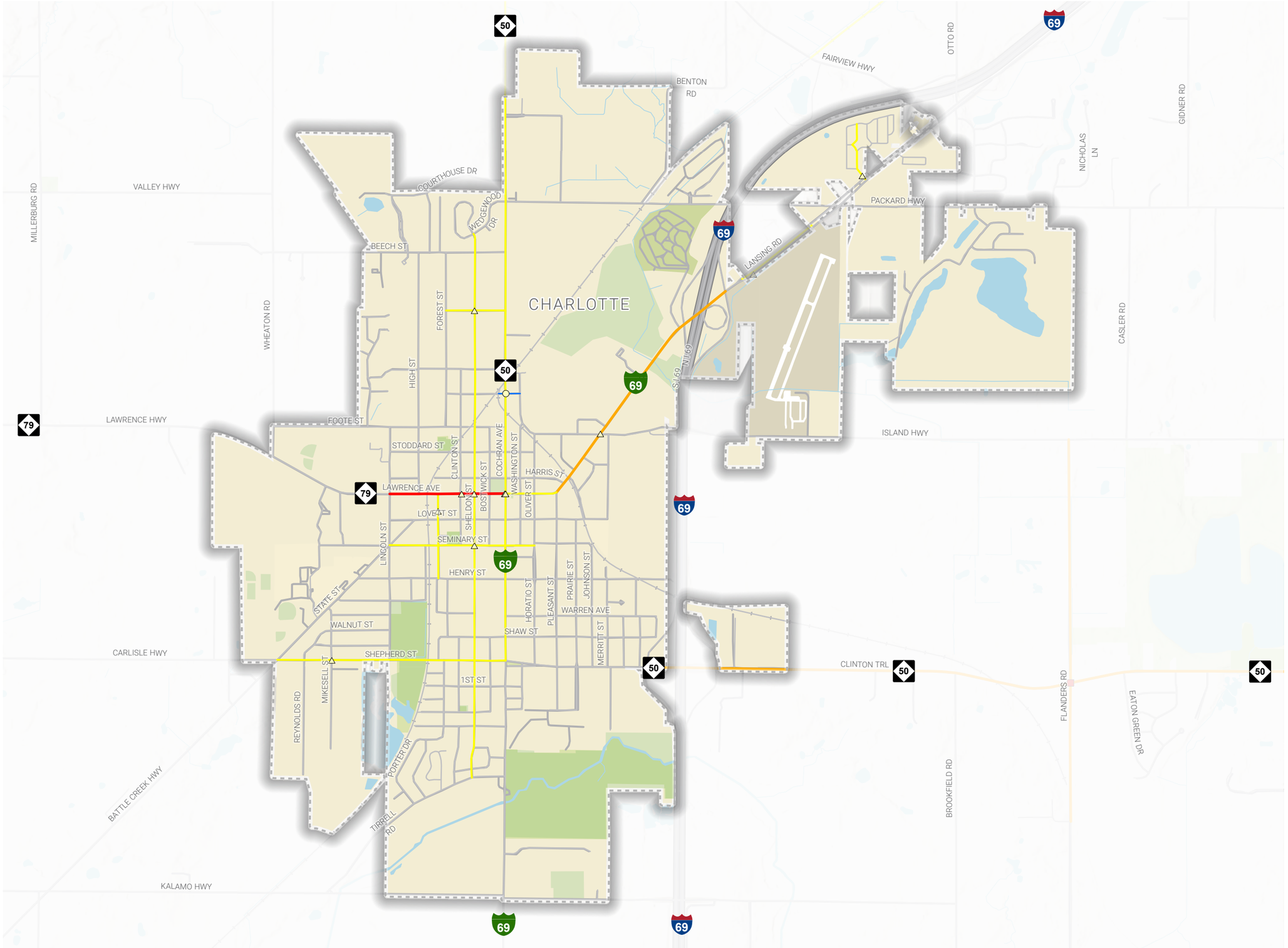
- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION





0 0.3 0.6 MILES

N

MDOT Michigan Department of Transportation

alta

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CITY OF HILLSDALE

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

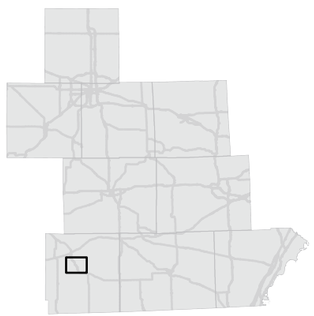
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

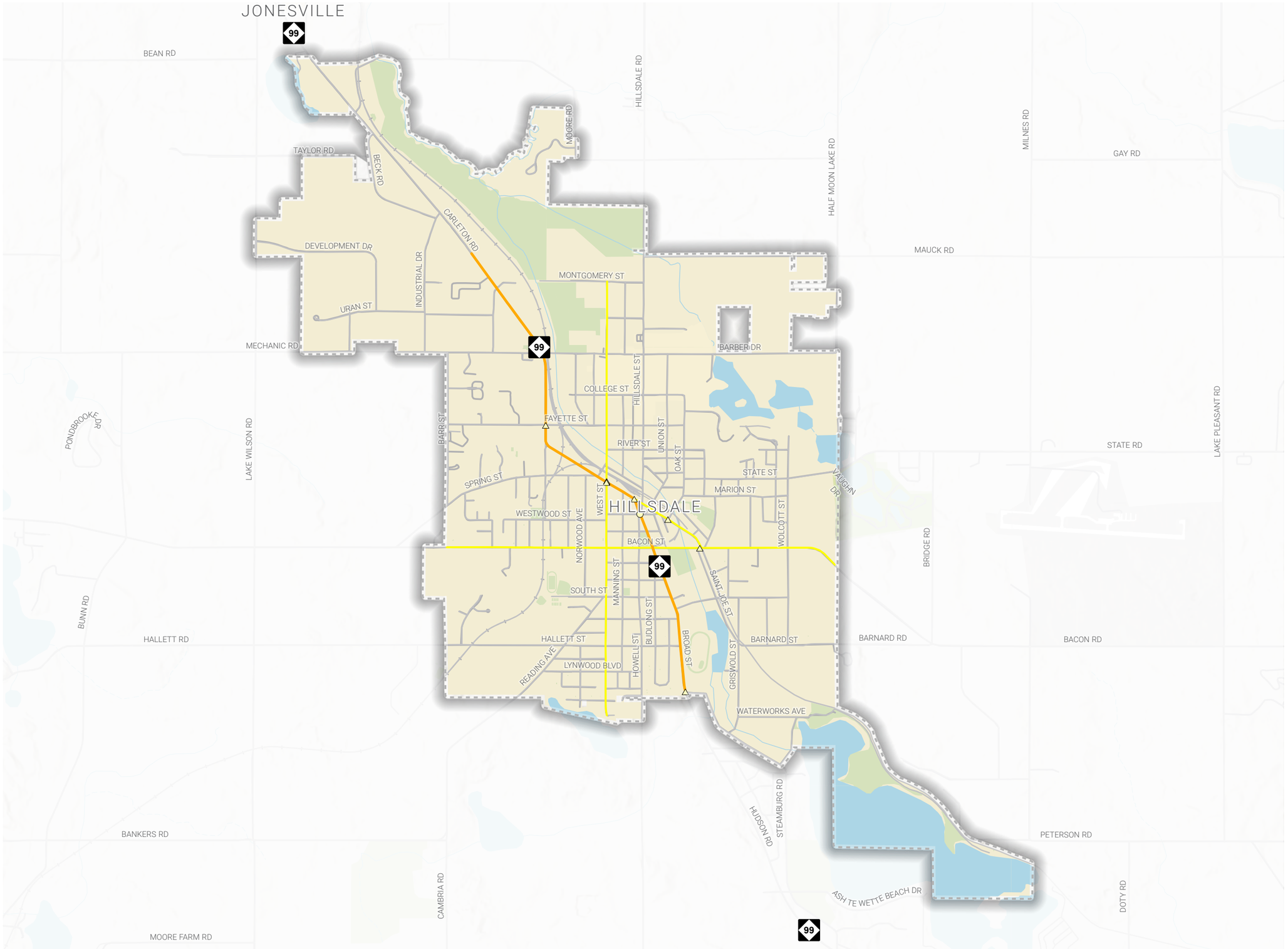


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



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CITY OF HOWELL

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

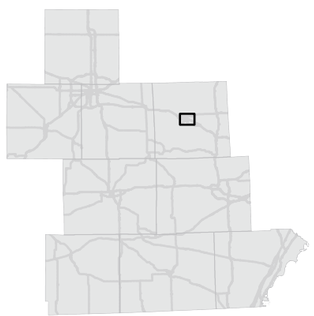
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

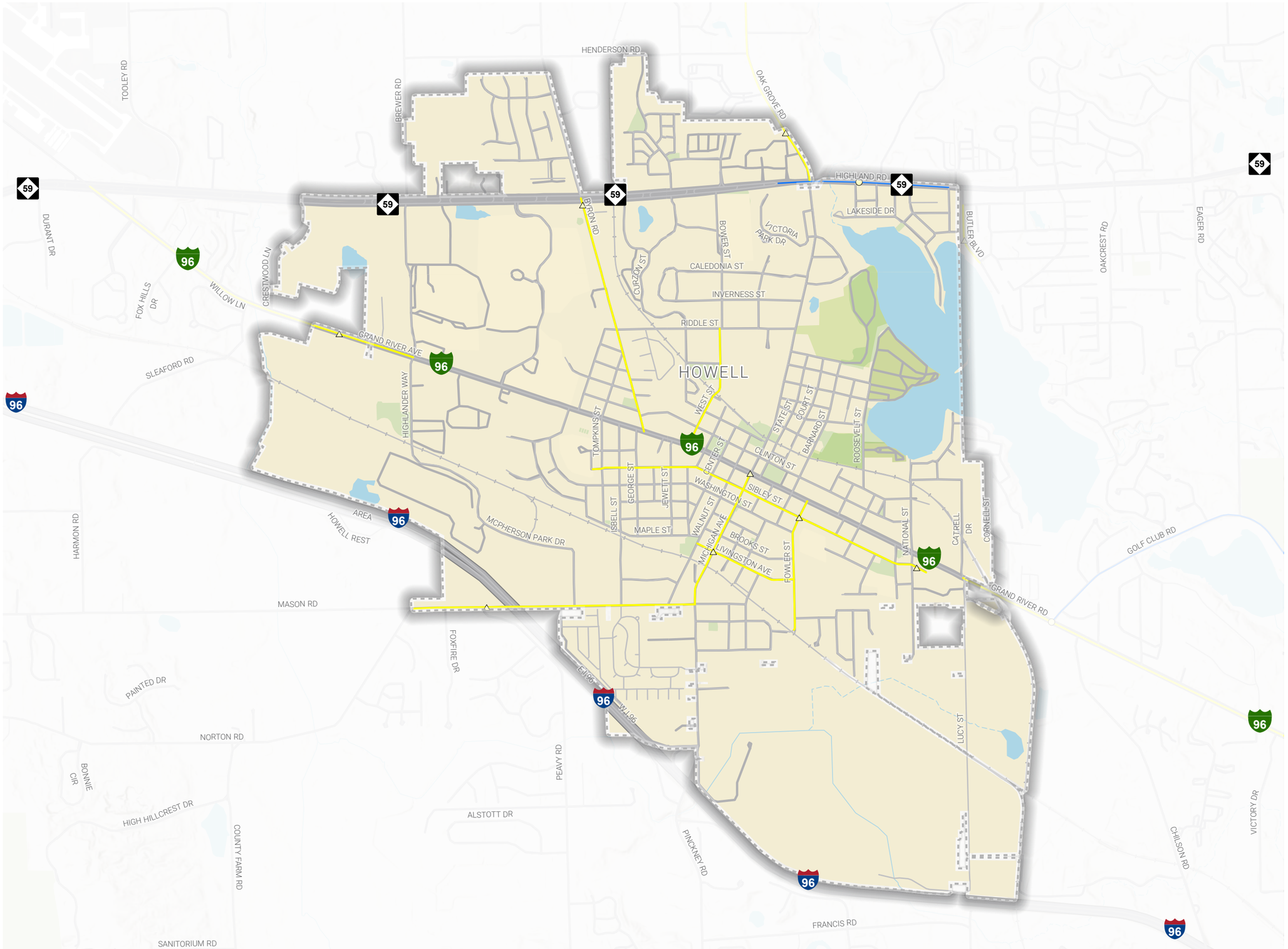
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF JACKSON

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

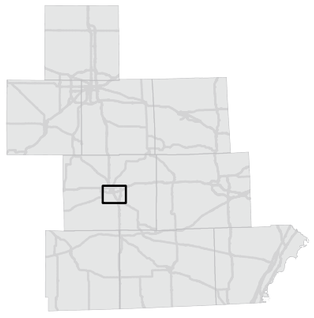
- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

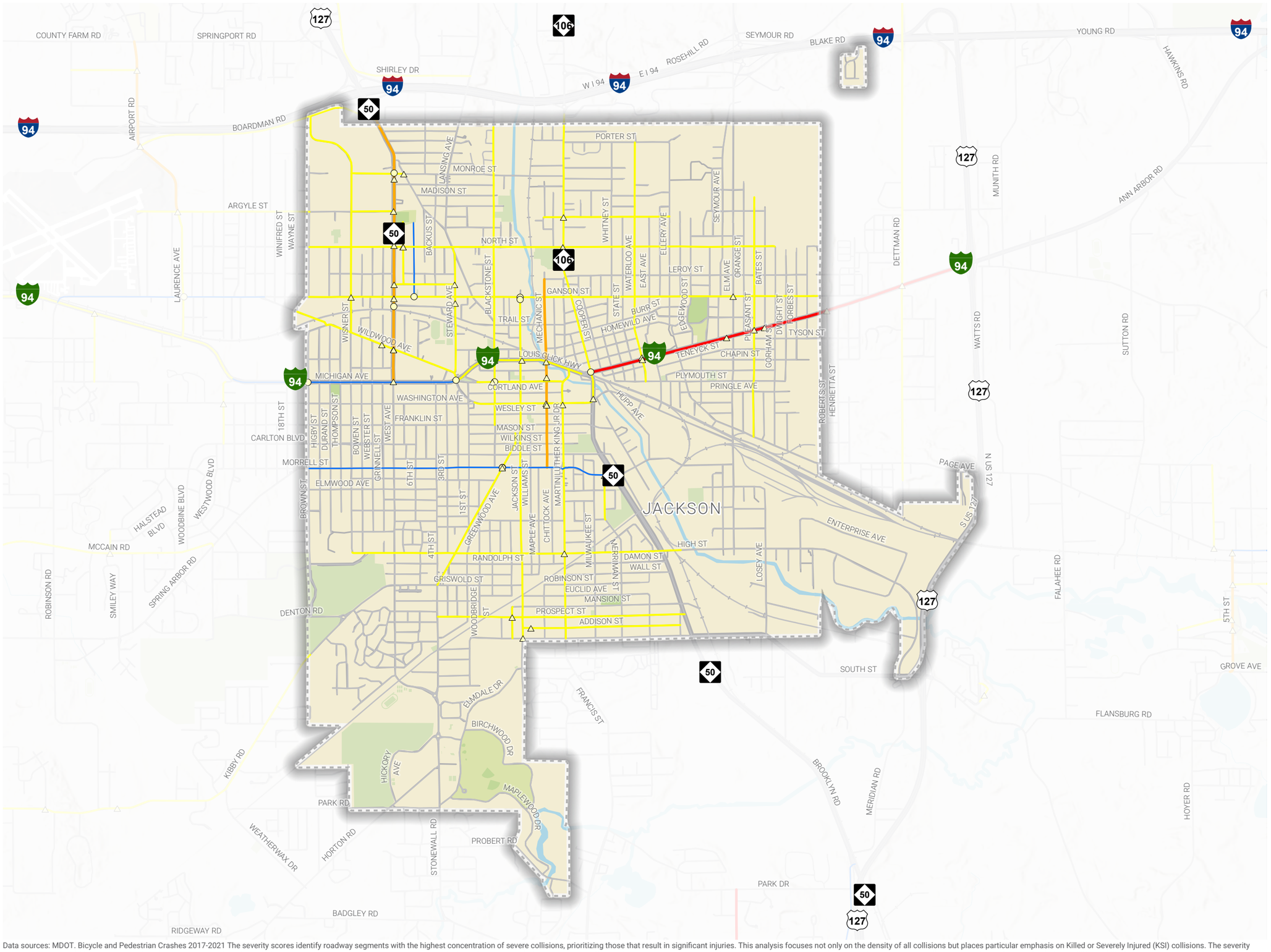


0 0.4 0.8 MILES

N

MDOT Michigan Department of Transportation

alta



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CITY OF LITCHFIELD

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

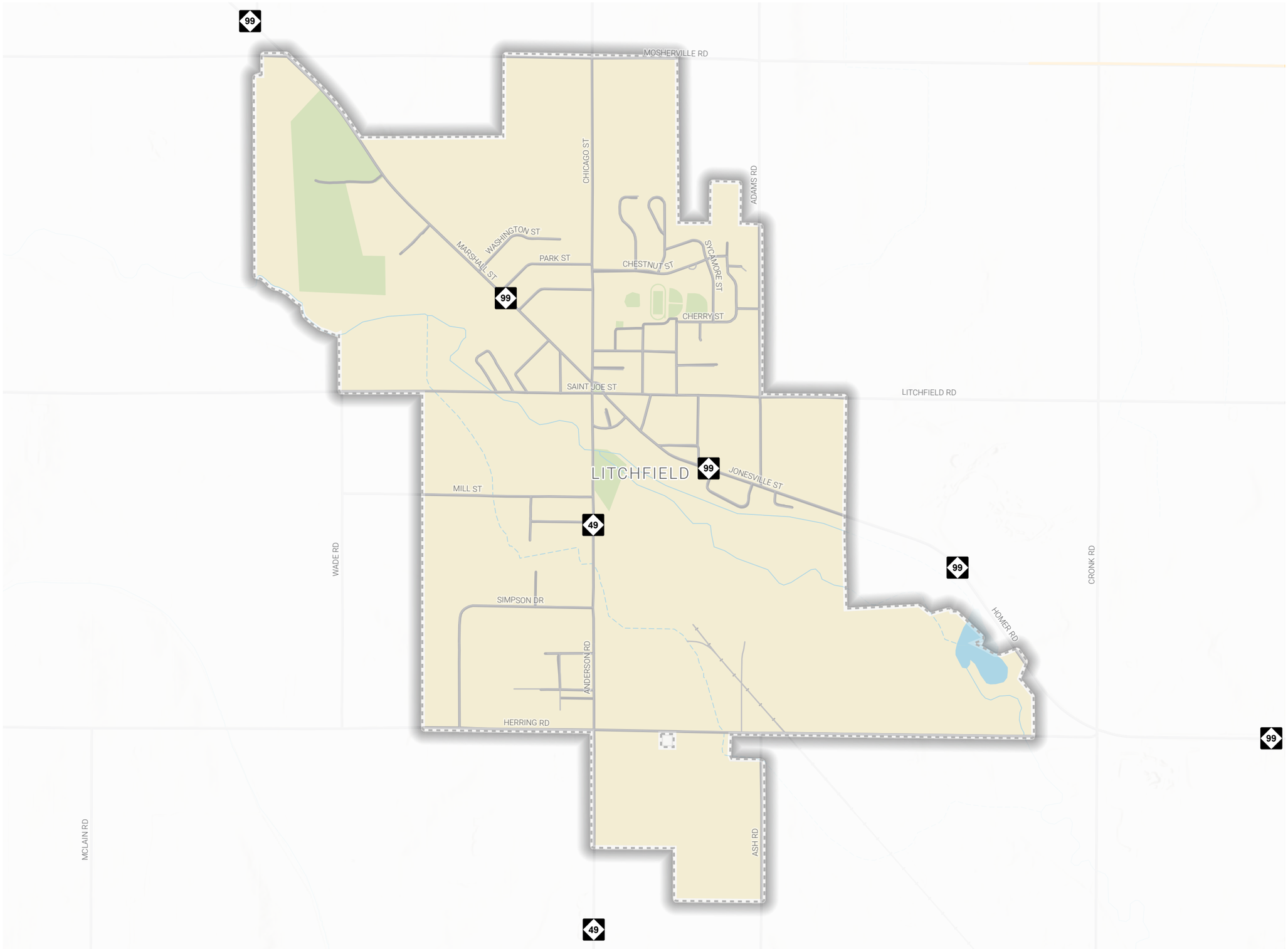


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF MASON

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

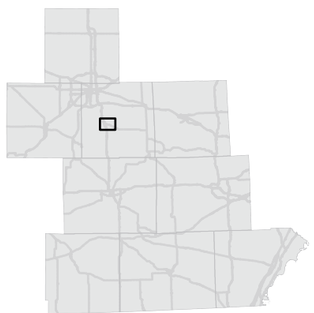
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

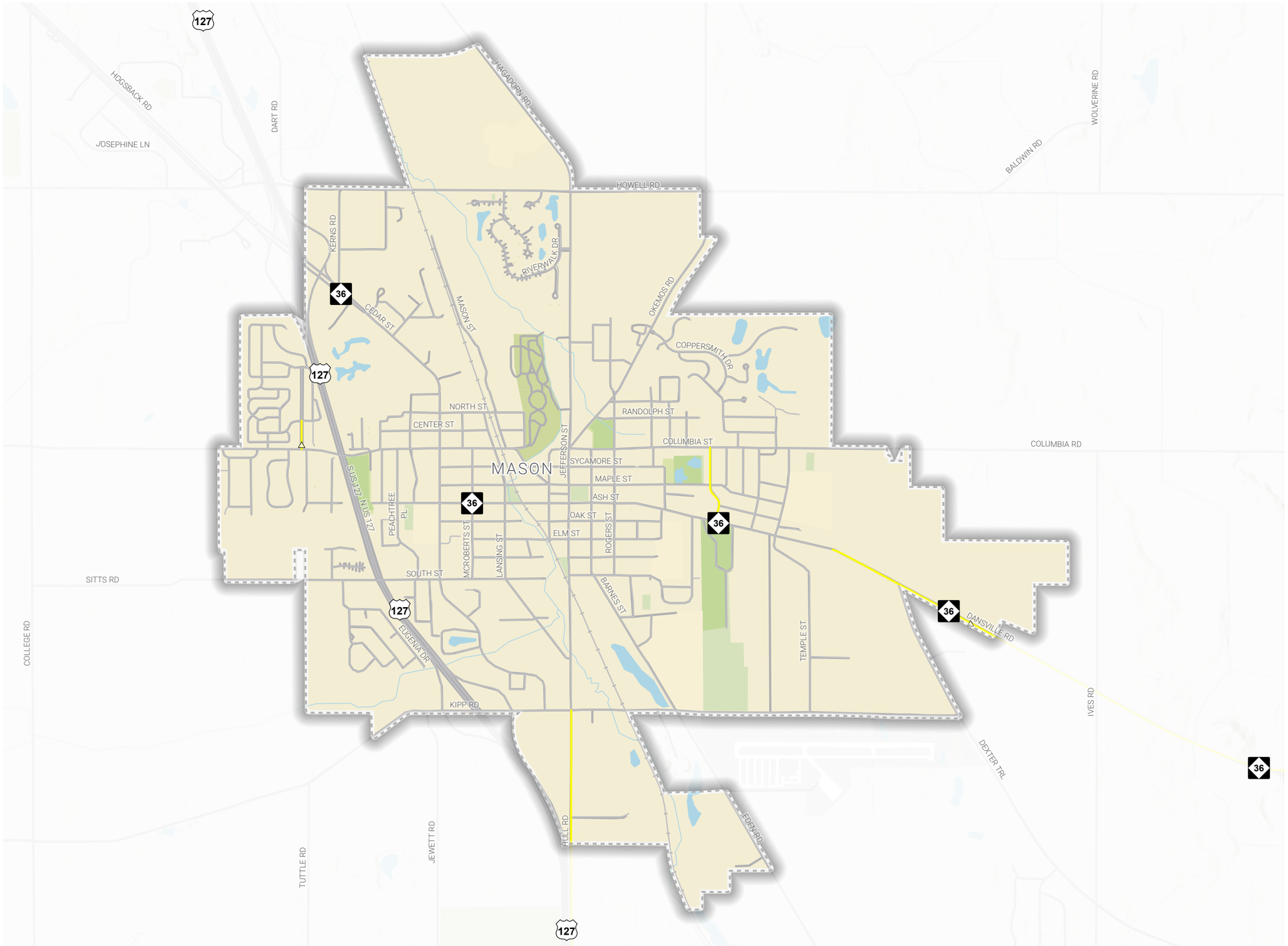
UNIVERSITY REGION



0 0.25 0.5 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF MILAN

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

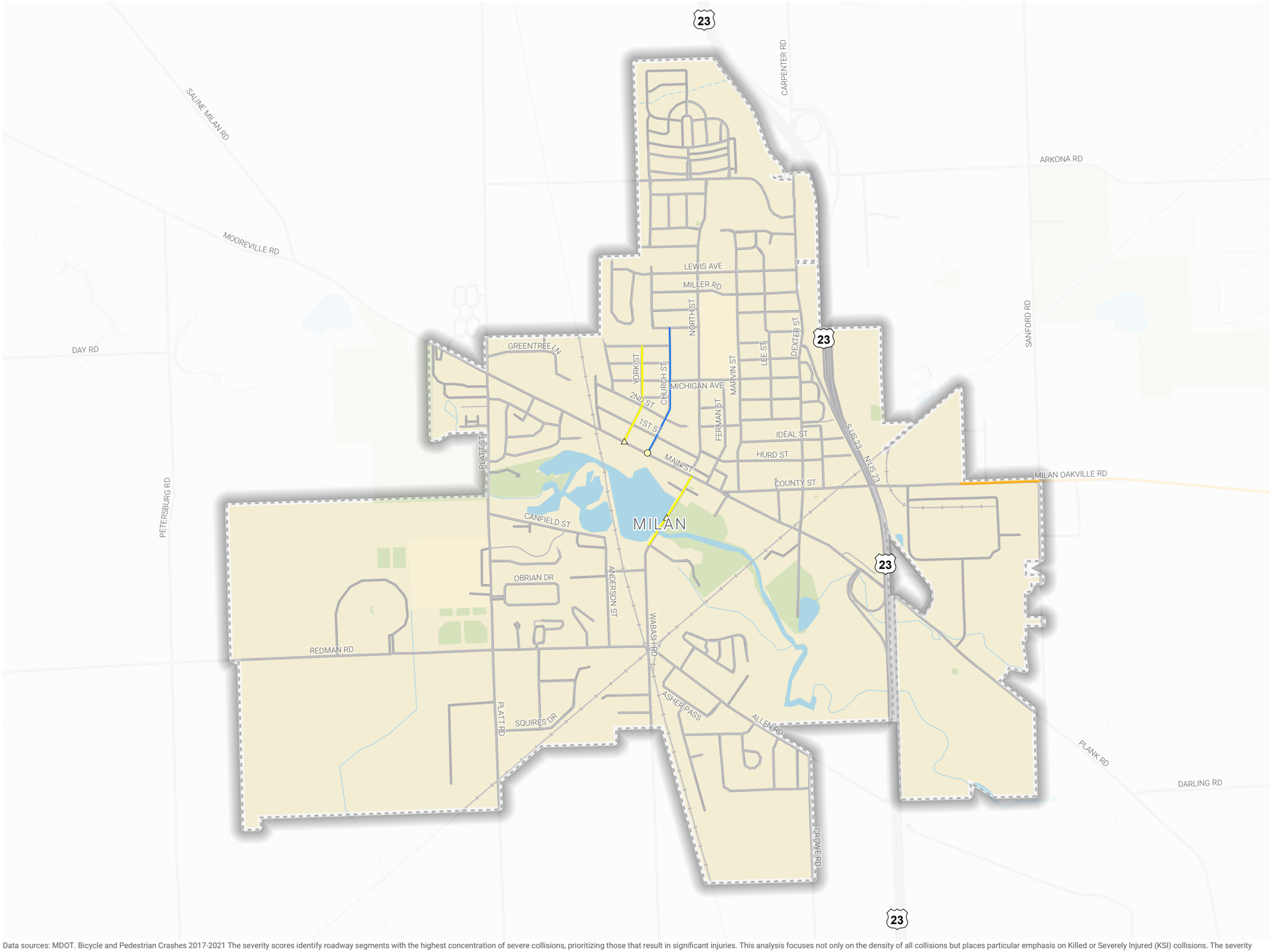
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF MONROE

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

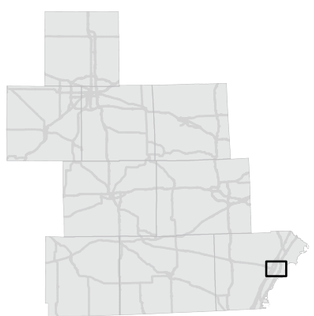
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION



0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF ST JOHNS

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

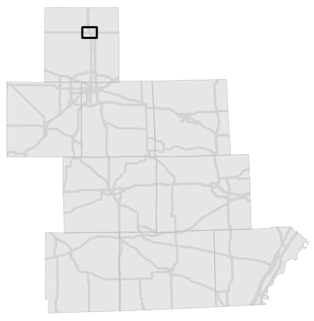
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

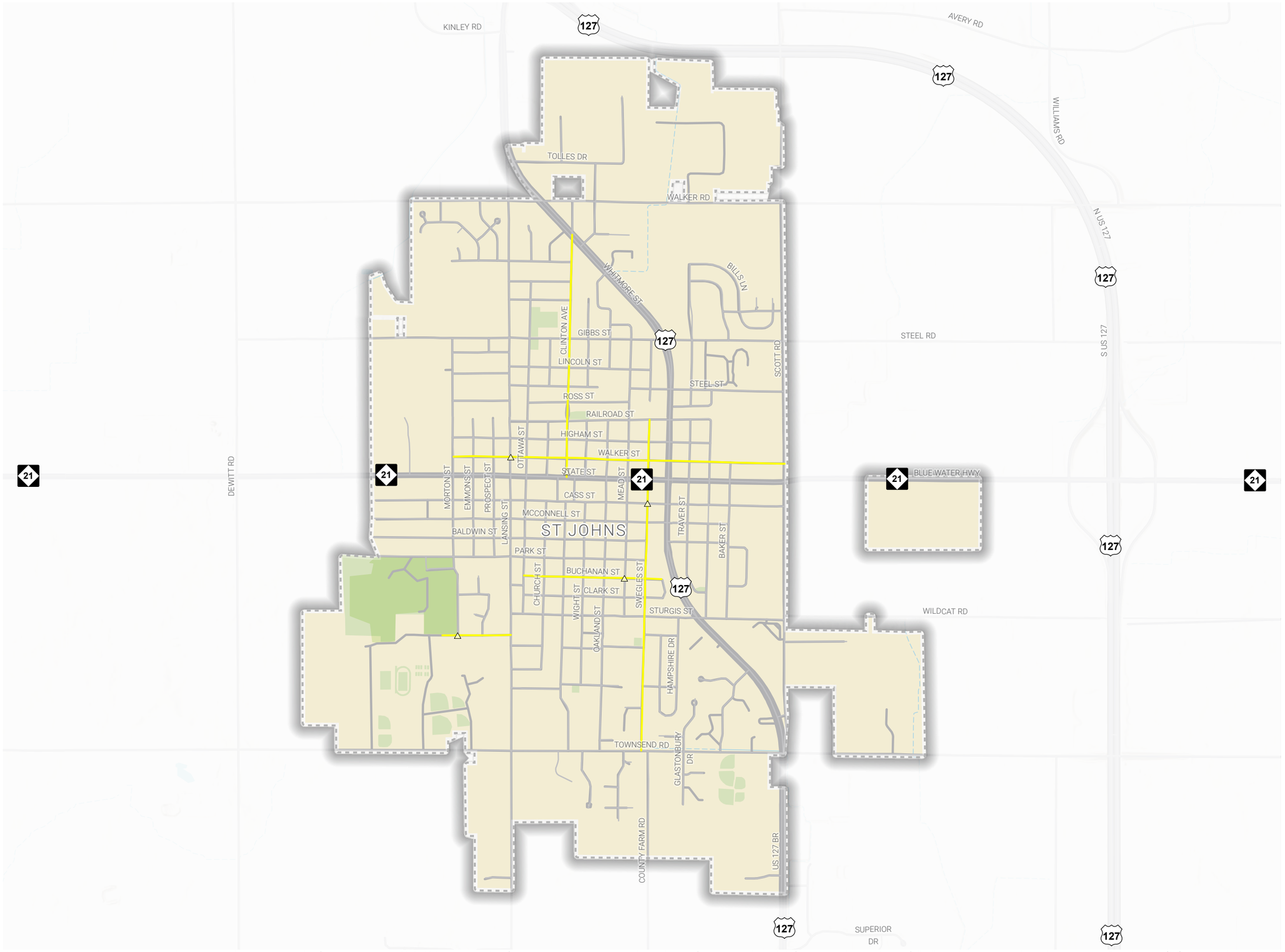


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF TECUMSEH

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

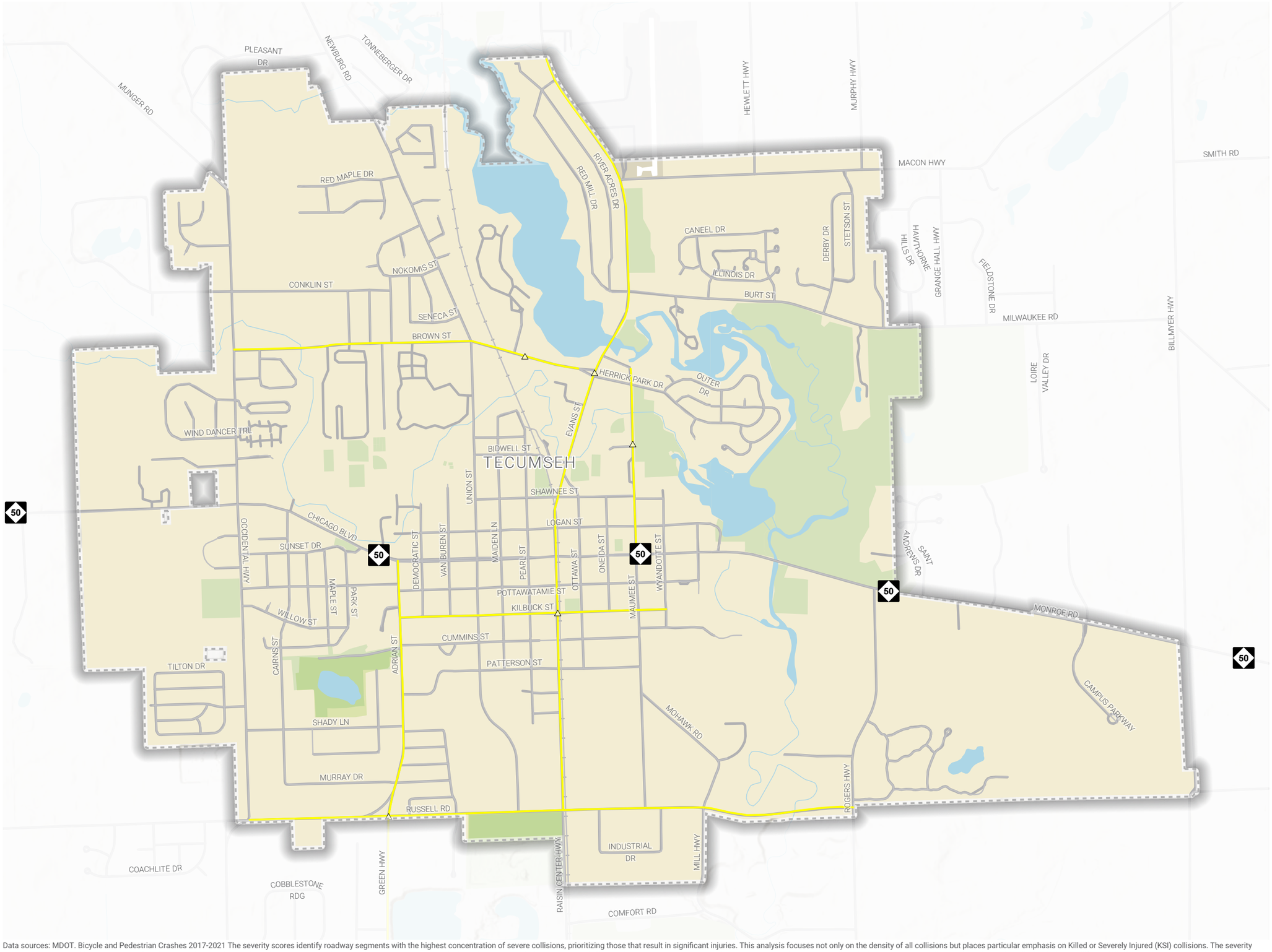


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CITY OF YPSILANTI

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

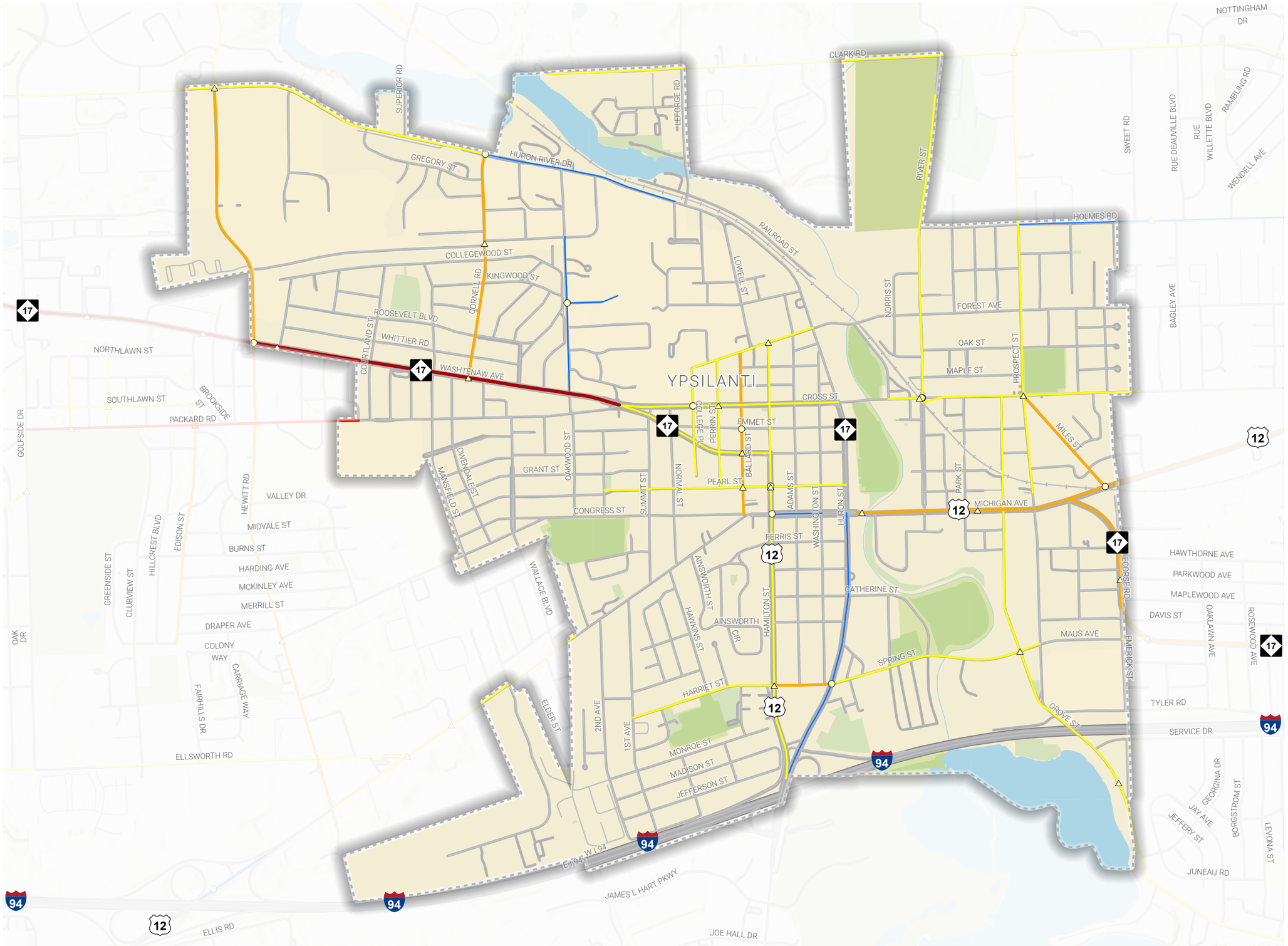


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

CLINTON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

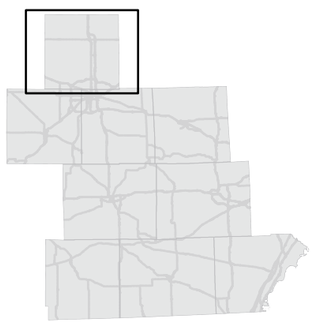
- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

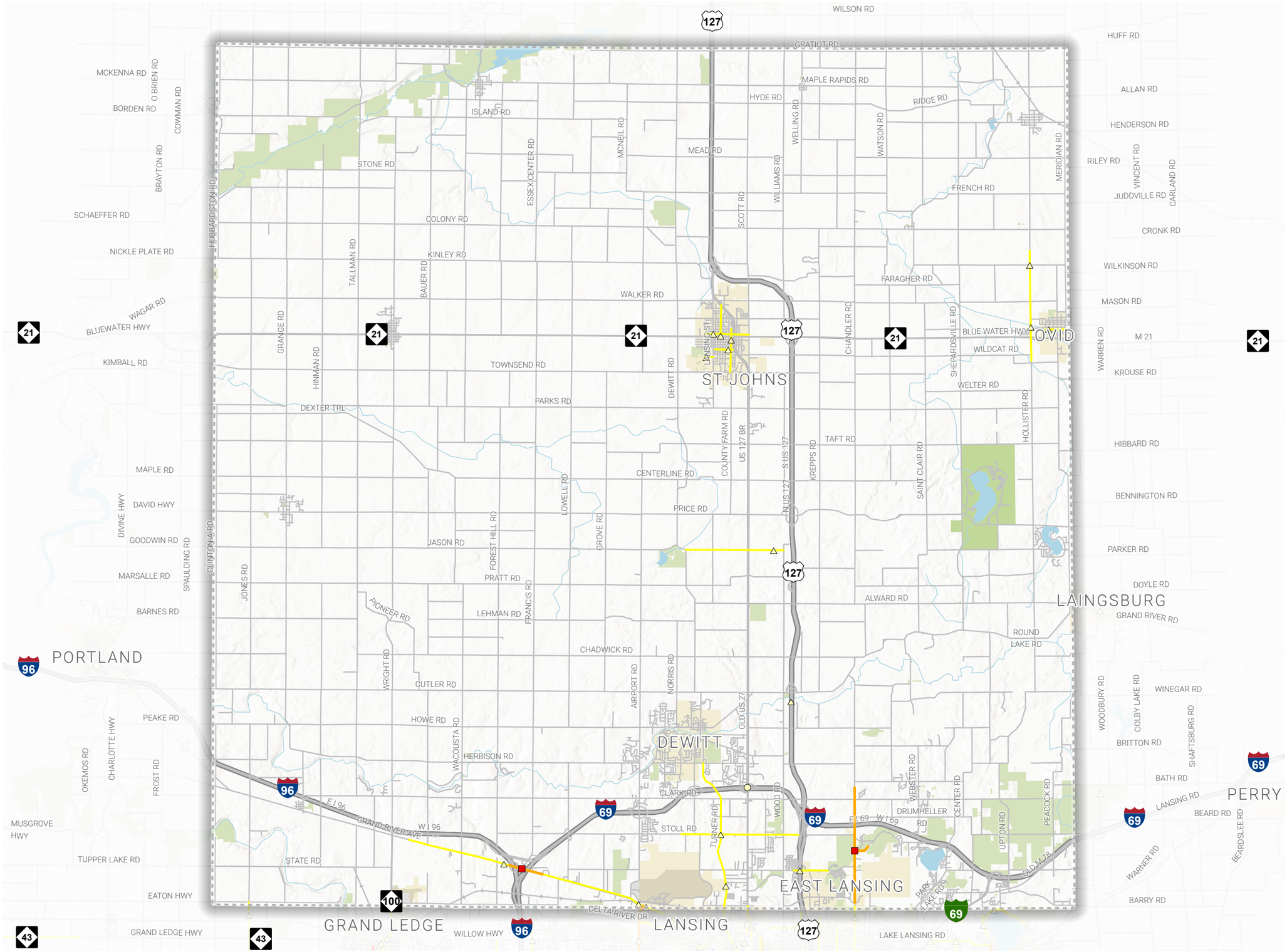


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

EATON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

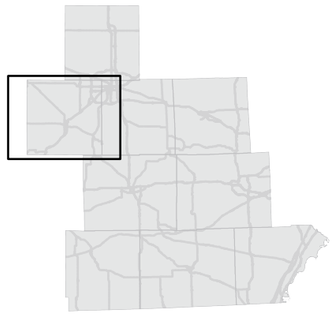
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

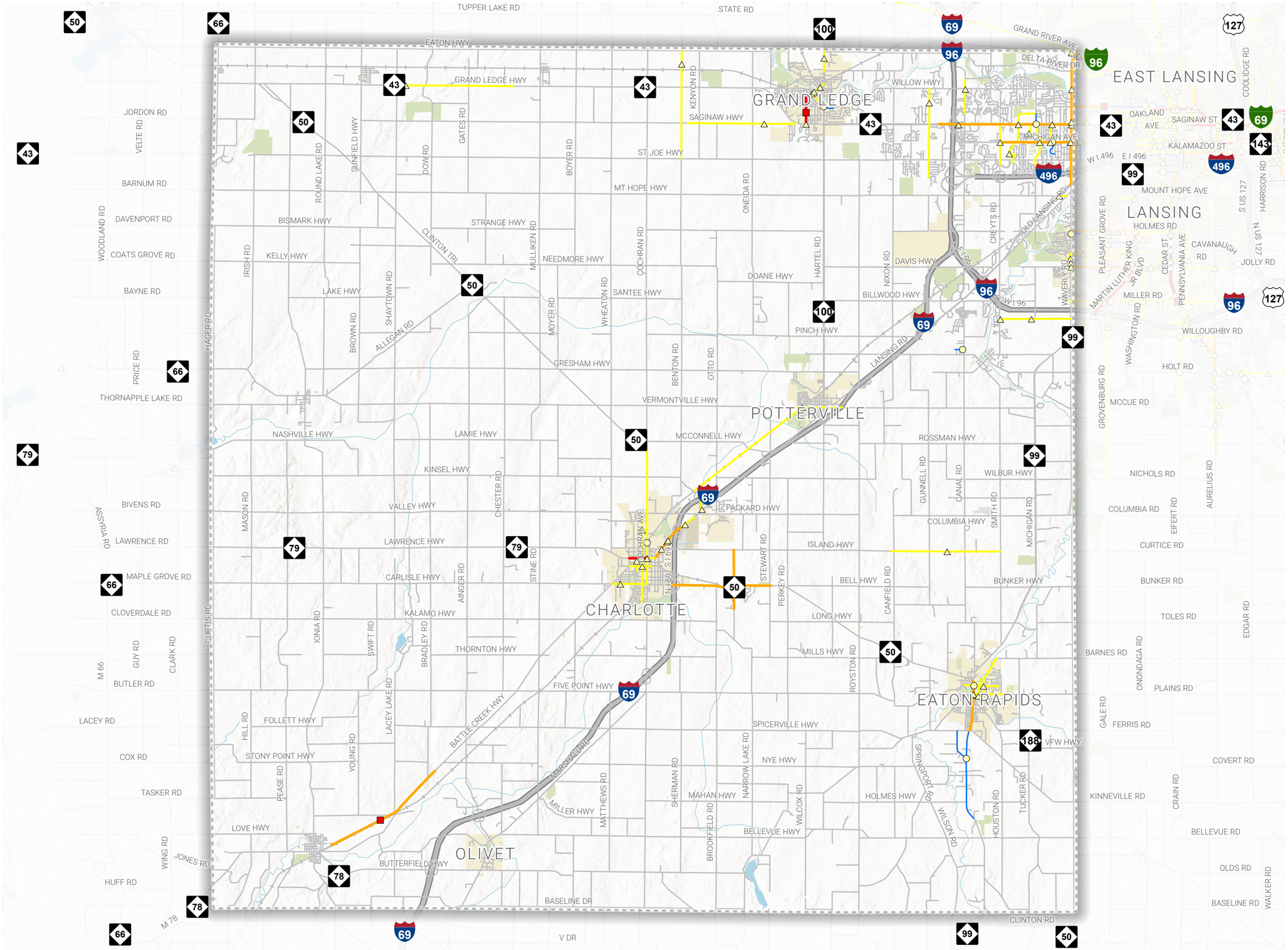


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



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GREATER LANSING

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

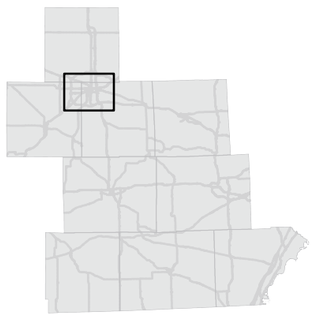
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

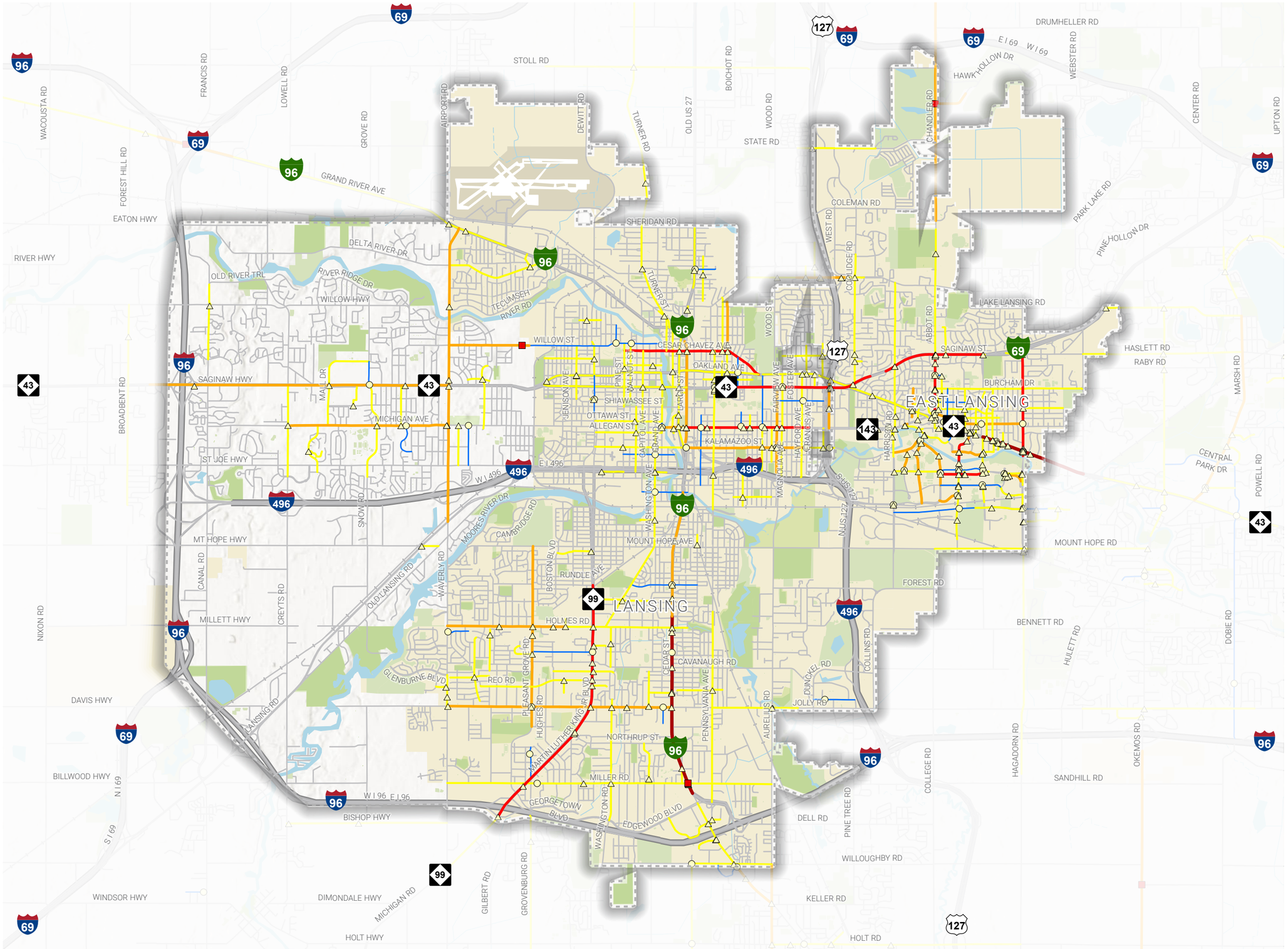


0 0.85 1.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

HILLSDALE COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

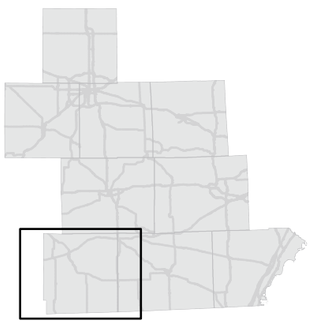
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

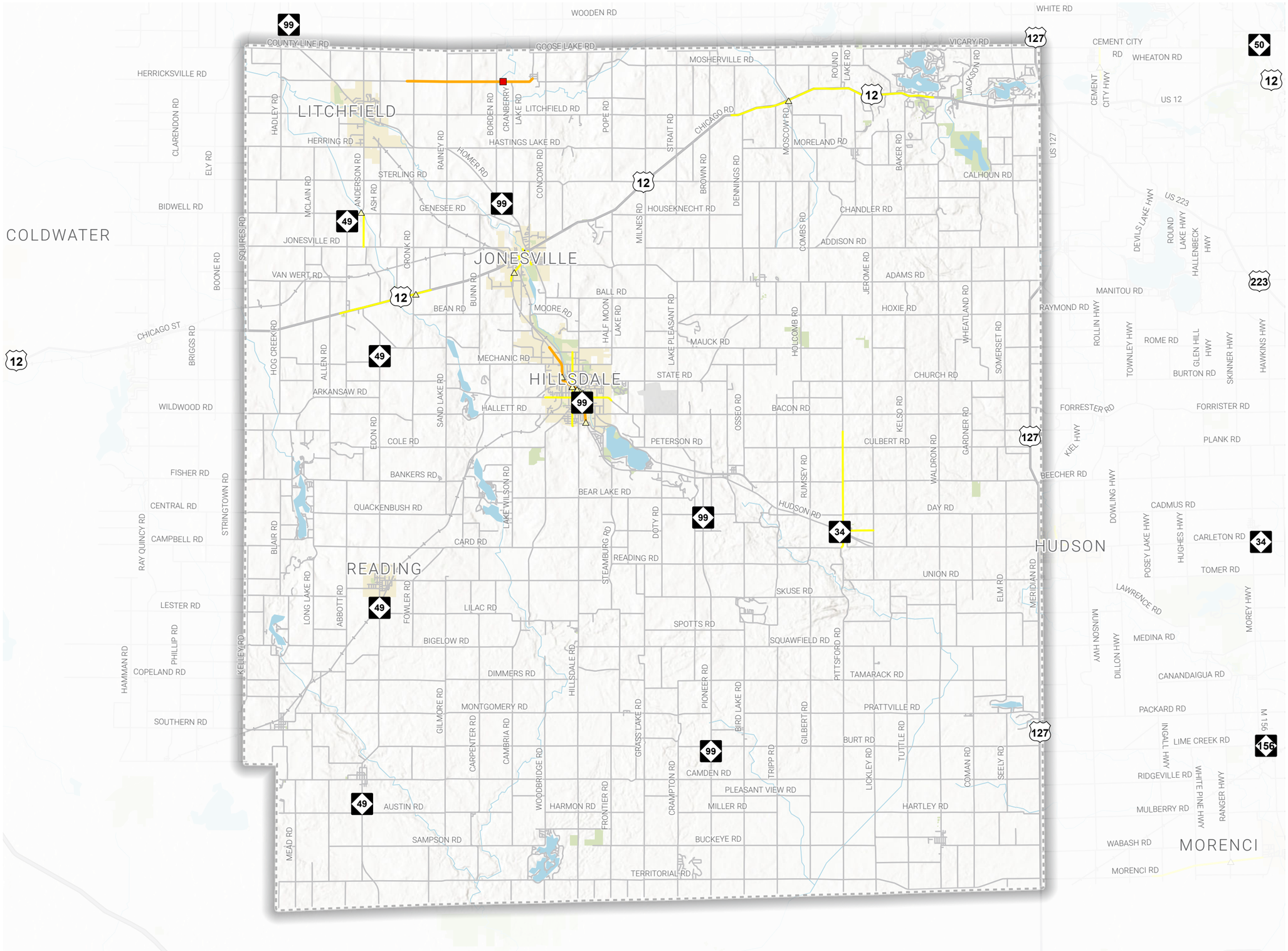


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



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INGHAM COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

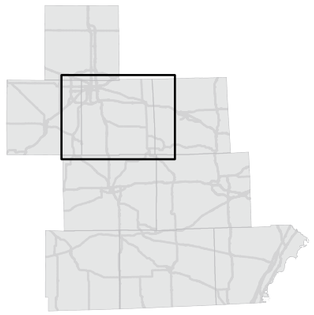
- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5

- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

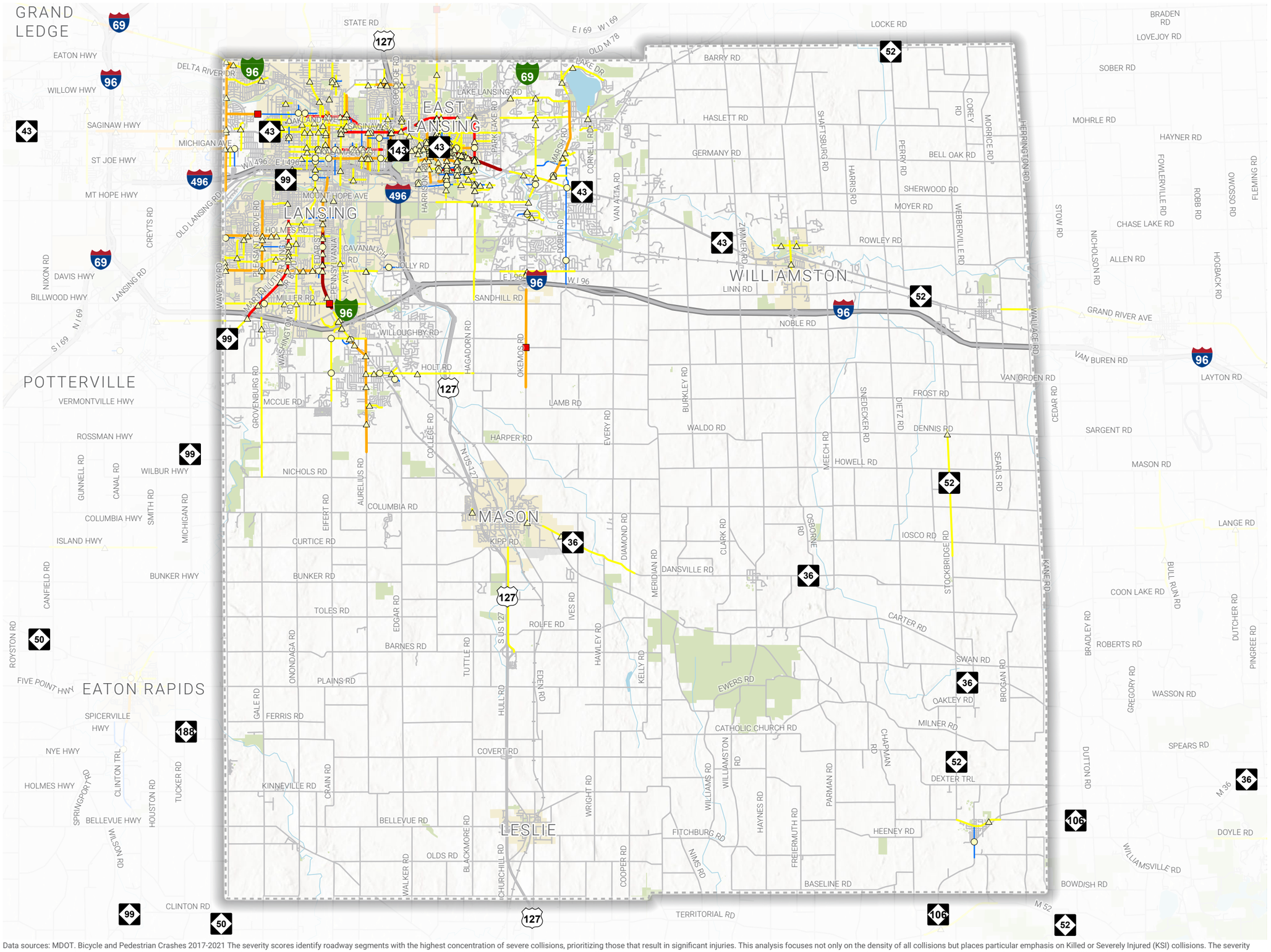


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

JACKSON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

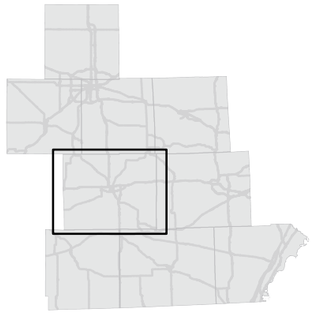
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

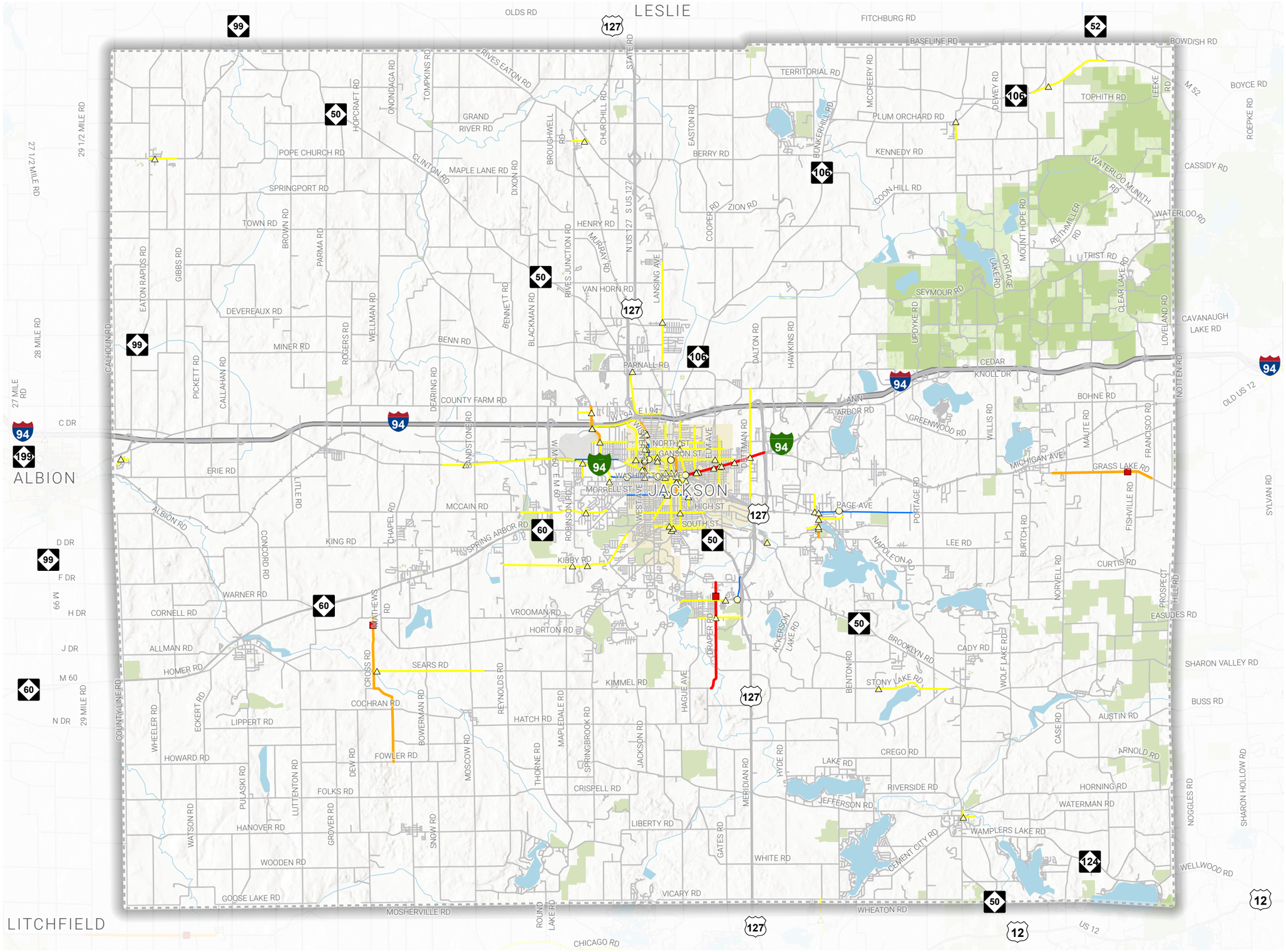


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

LENAWEE COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

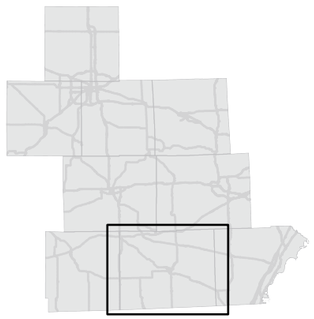
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

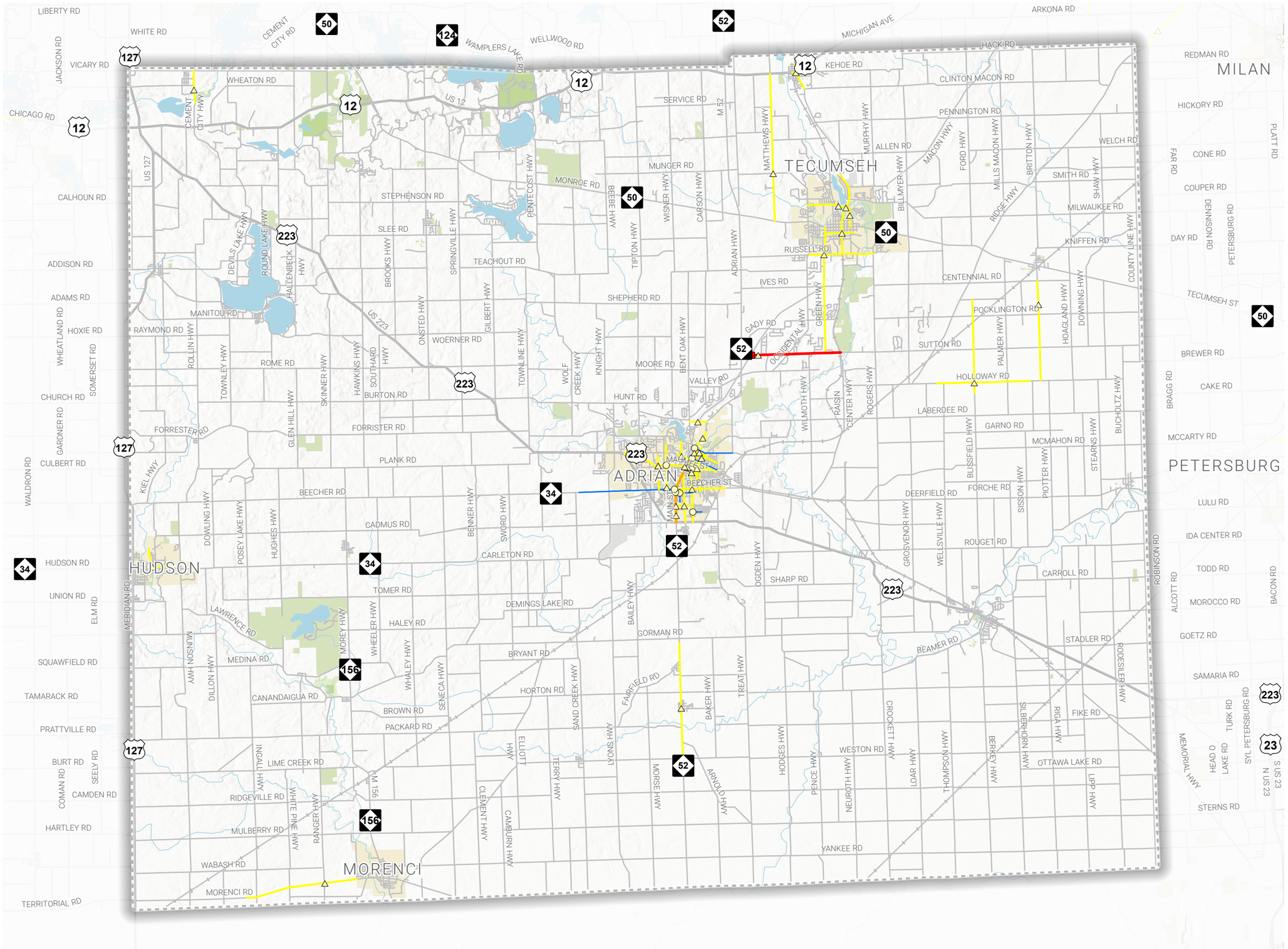


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

LIVINGSTON COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

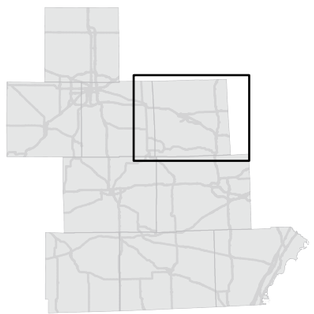
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

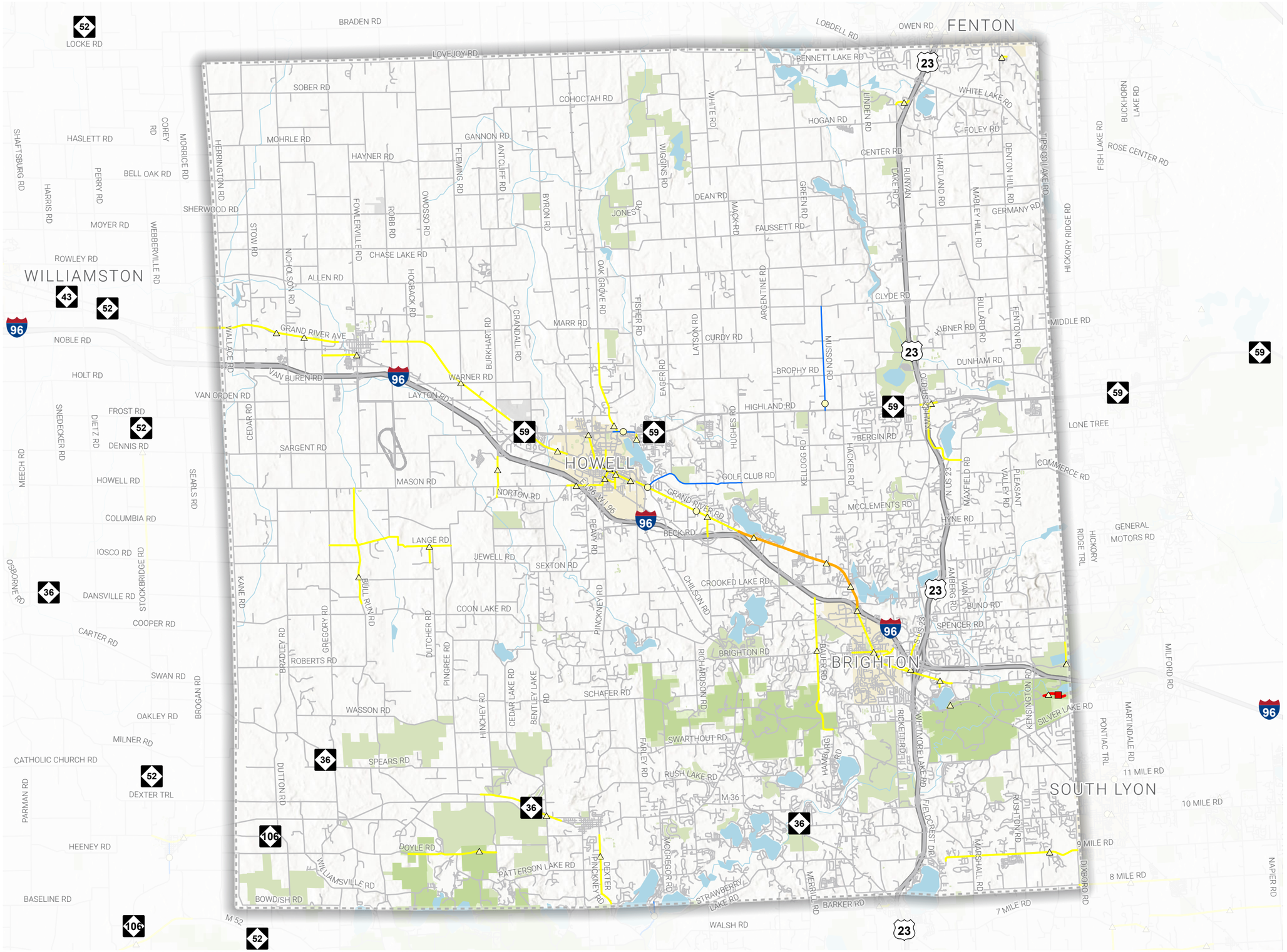


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

MONROE COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

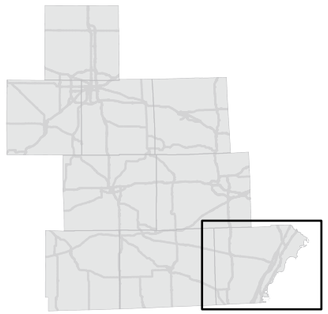
Bicycle Crashes 2017-2021 by severity

- Fatal
- Injury
- Property Damage Only

Bicycle Collision Severity Score

- 9 - 13.5
- 4.5 - 9
- 2 - 4.5
- 0.5 - 2
- < 0.5
- Parks
- Railroads
- City Boundary

UNIVERSITY REGION

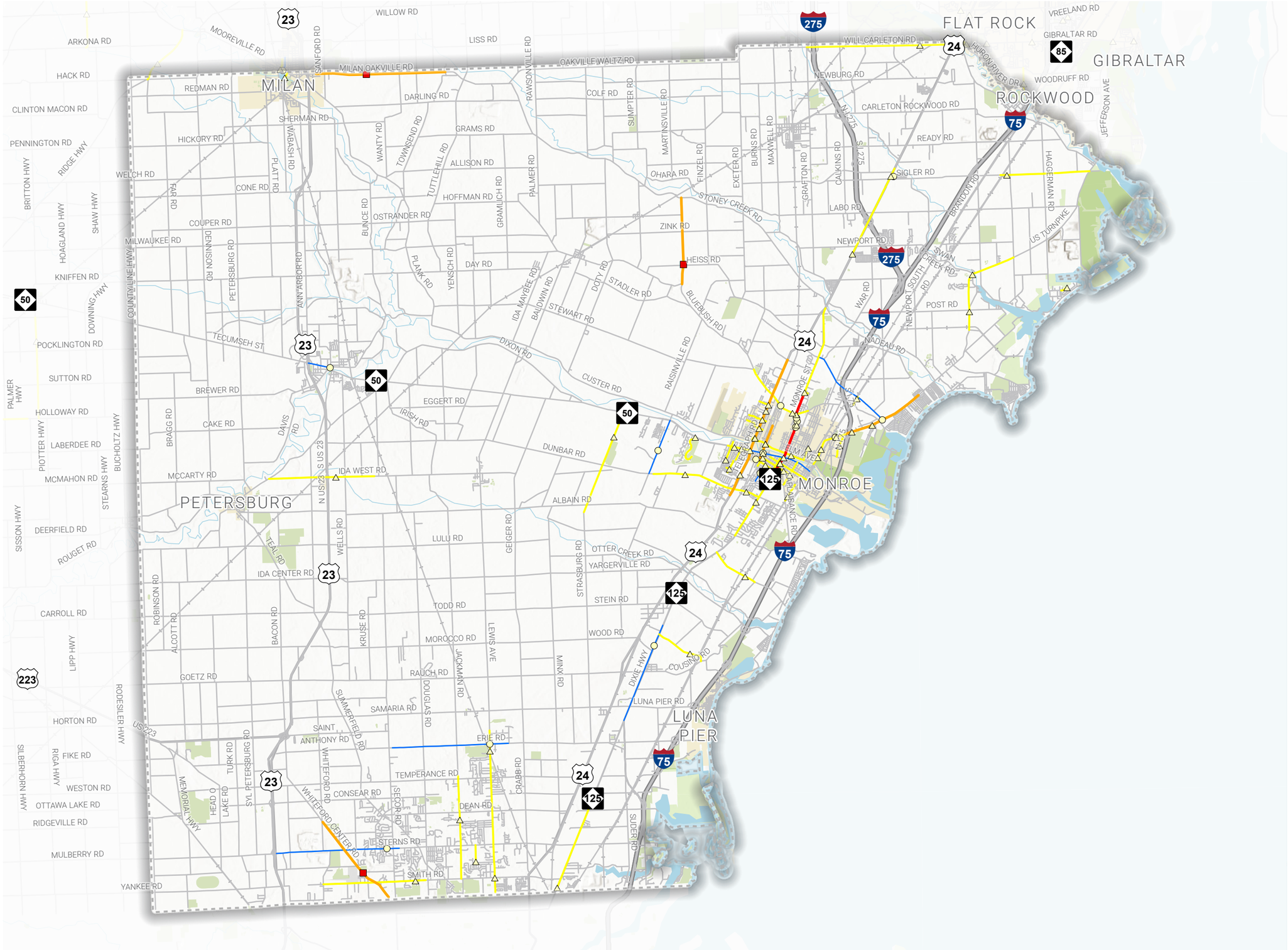


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

WASHTENAW COUNTY

BICYCLE AND PEDESTRIAN CRASH ANALYSIS

LEGEND

Bicycle Crashes 2017-2021 by severity

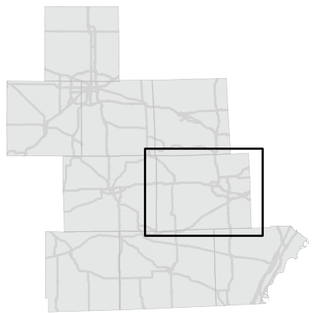
- Fatal
- Injury
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Bicycle Collision Severity Score

- 9 - 13.5
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- Parks
- Railroads
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UNIVERSITY REGION

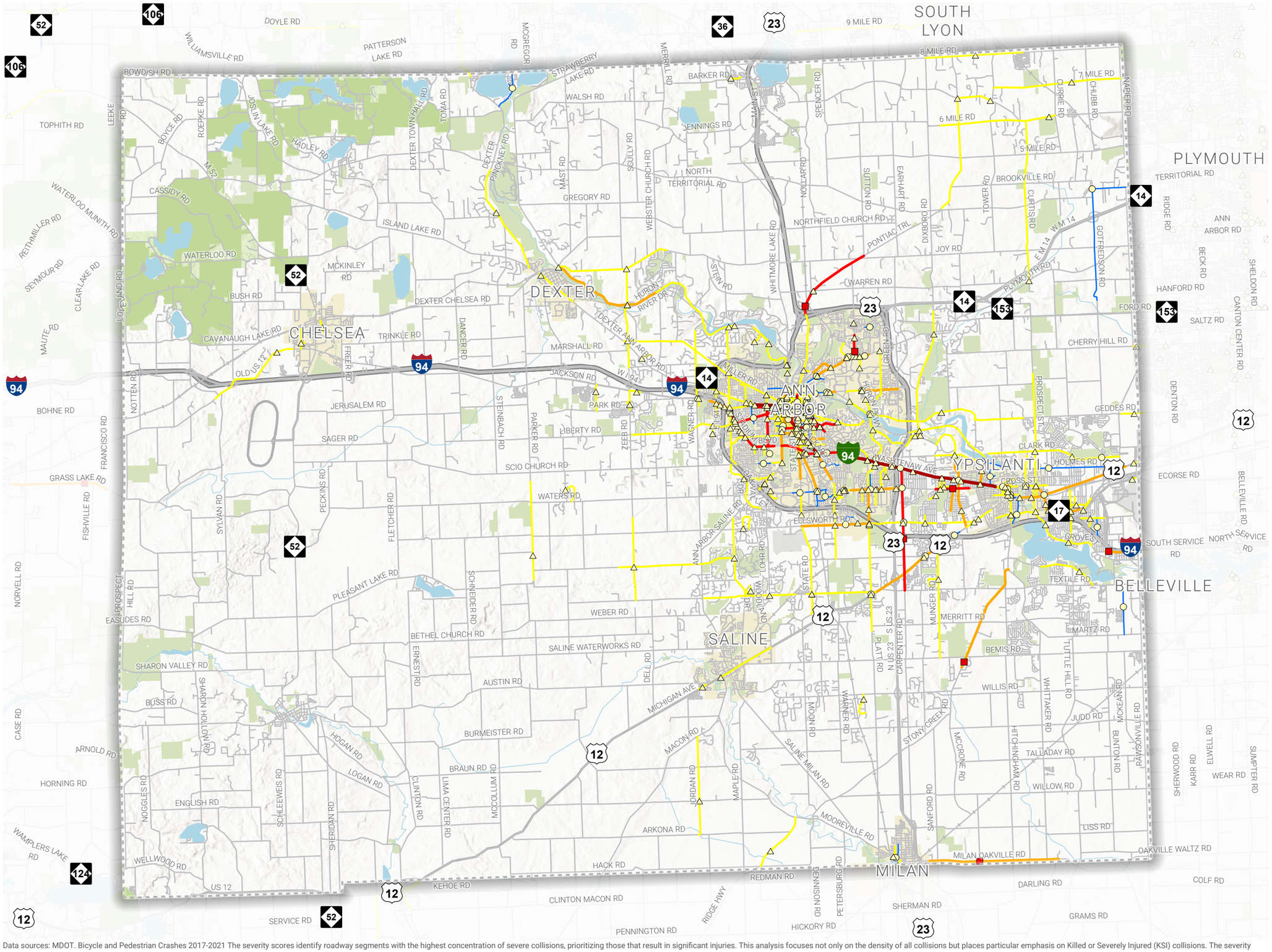


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT. Bicycle and Pedestrian Crashes 2017-2021 The severity scores identify roadway segments with the highest concentration of severe collisions, prioritizing those that result in significant injuries. This analysis focuses not only on the density of all collisions but places particular emphasis on Killed or Severely Injured (KSI) collisions. The severity score assigns a weight to each collision type based on its severity, with the following values: Fatal injury: 4, Major or minor injury: 1, Property damage only (non-injury crash): 0.5. Each non-highway road segment was given a severity score for both pedestrian and bicycle collisions, based on data collected between 2017 and 2021. Higher scores indicate more crashes and greater severity.

Appendix I - University Region Proposed Strategic Network Methodology

The following section details the steps the project team took to create the strategic active transportation network starting from the priority corridors identified in the 2015 University Region Active Transportation Plan.

1. **Aligning Regional Corridors:** The project team began by aligning proposed regional corridors from the 2024 University Region Active Transportation Plan (UR ATP) with MDOT roadways where applicable.
2. **Incorporating Connections:** The project team then added regional corridor connections through towns and addressed gaps identified in the 2015 plan. The team added regional corridor designations on locally planned bike facilities, particularly those on MDOT roadways that serve as local main streets. This allows the University Region Proposed Strategic Network to supplement planning efforts that improve local biking and walking trips—not just long-distance bike routes.
3. **Spatial Analysis:** Next, the project team conducted spatial joins between the designated strategic active transportation corridors, MDOT roadways, and relevant analysis layers (e.g., crashes, demographics, demand, level of traffic stress). The project team then simplified the network by dissolving individual roadway segments into larger corridors. For each corridor, the median analysis score among all the roadway segments in a corridor is used to represent overall conditions.
4. **Quantile Scoring:** The project team then assigned a score from 1 to 5 based on the quantile bin for each corridor's median analysis score in individual metrics. (For example, among all the regional corridors, those in the top 20% in terms of bicycle crashes were given a score of 5.) Quantile scores for the crashes, demographics, demand, and level of traffic stress metrics were summed with equal weighting to produce a composite score. The composite score represents data-driven locations where MDOT and its partners could enhance facilities for walking and biking. This approach allows planners to evaluate corridors based on overall need (composite score) or individual criteria.
5. **Integration with Existing and Planned Facilities:** Finally, the project team enhanced the network using existing and planned facility data. This step incorporated feedback from local plans and promoted compatibility with future infrastructure developments.

As a result of these steps, each corridor has the following attributes:

- **Corridor ID** (A unique number for each corridor for planning purposes)
- **Name** (text name field)
- **Statewide Significance** (Name if the corridor is part of a statewide trail)

- **ATP2015** (Active Transportation Plan 2015: i.e., was the corridor identified in the 2015 University Region Active Transportation Plan?)
- **ATP2024** (Active Transportation Plan 2024: i.e., was the corridor identified in the 2024 University Region Active Transportation Plan?)
- **Jurisdiction** (County in which the corridor is located)
- **Existing Facility** (Type of bicycle facilities found on the corridor today, if any)
- **Planned Facility** (Type of bicycle facilities currently planned for the corridor, if any)
- **Highway Number** (Highway Number if applicable)
- **AADT Max** (The maximum Average Annual Daily Traffic of motor vehicles as reported by MDOT among all roadway segments along the corridor)
- **AADT Min** (The minimum Average Annual Daily Traffic of motor vehicles as reported by MDOT among all roadway segments along the corridor)
- **Bike Crash Score** (An index of all roadways in the MDOT University Region that reflects the places with the most bike collisions that resulted in fatalities or severe injuries). This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those in the top 20% of bicycle crashes were given a score of 5.) For more information on the Bike Crashes Analysis, refer to: Appendix H.

Quantile Scoring Detail:

Corridors in the lowest 20% of the bicycle severity-weighted crash index				Corridors in the highest 20% of the bicycle severity-weighted crash index
1	2	3	4	5

- **Ped Crash Score** (An index of all roadways in the MDOT University Region that reflects the places with the most pedestrian collisions that resulted in fatalities or severe injuries). This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those

in the top 20% in terms of pedestrian crashes were given a score of 5.) For more information on the Pedestrian Crashes Score, refer to: Appendix H.

Quantile Scoring Detail:

Corridors in the lowest 20% of the pedestrian severity-weighted crash index				Corridors in the highest 20% of the pedestrian severity-weighted crash index
1	2	3	4	5

- **Bike Demand Score** (An index that reflects both trip generators (where people live and work) and trip attractors (destinations like schools, parks, and retail establishments where people learn and play), serving as a generalized view of both existing and latent demand for bicycle trips across an area.) This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those in the top 20% in terms of bicycle demand were given a score of 5.) For more information on the Bike Demand Score, refer to: Appendix G.

Quantile Scoring Detail:

Corridors in the lowest 20% of the bike demand index				Corridors in the highest 20% of the bike demand index
1	2	3	4	5

- **Ped Demand Score** (An index that reflects both trip generators (where people live and work) and trip attractors (destinations like schools, parks, and retail establishments where people learn and play), serving as a generalized view of both existing and latent demand for pedestrian trips across an area.) This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those in the top 20% in terms of pedestrian demand

were given a score of 5.) For more information on the Ped Demand Score, refer to: Appendix G.

Quantile Scoring Detail:

Corridors in the lowest 20% of the pedestrian demand index				Corridors in the highest 20% of the pedestrian demand index
1	2	3	4	5

- **Demographics Score** (An index of demographic data at the census block group level across the University Region, identifying areas that may need more active transportation facilities. It highlights communities with lower economic opportunity, higher housing cost burdens, poorer air quality, lower tree canopy coverage, higher rates of coronary heart disease, and a greater proportion of non-white residents, youth, seniors, and households without vehicles. This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those in the top 20% in terms of demographics need were given a score of 5.) For more information on the Demographics Score, refer to: Appendix F.

Quantile Scoring Detail:

Corridors in the lowest 20% of the demographics index				Corridors in the highest 20% of the demographics index
1	2	3	4	5

- **Bike Level of Traffic Stress (LTS) Score**: A measure of bicyclist comfort on roadway segments, identifying gaps in the bike network based on factors like speed limit, lane count, and bike facility presence. It assesses how likely different rider types are to use a given corridor based on their comfort level and perception of crashes. Higher scores reflect places that are more uncomfortable to ride on due to high speeds and more

motor vehicle lanes. This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those in the top 20% in terms of bicycle discomfort were given a score of 5.) For more information on the Bike LTS Score, refer to: Appendix D.

Quantile Scoring Detail:

Corridors scoring a 1 (least stressful) on the BLTS Index	Corridors scoring a 2 on the BLTS Index		Corridors scoring a 3 on the BLTS Index	Corridors scoring a 5 (most stressful) on the BLTS Index
1	2	3	4	5

- **Ped Level of Traffic Stress (LTS) Score**: A measure of pedestrian comfort, identifying "soft barriers" where crossing conditions discourage walking, even on otherwise low-stress routes. Higher scores reflect corridors that present as barriers to pedestrians crossing based on traffic volume, lane count, and speed limits. This column ranges from 1 to 5 based on the quantile bin that this corridor falls in based on its score in this index. (For example, among all the regional corridors, those in the top 20% in terms of pedestrian discomfort were given a score of 5.) For more information on the Ped LTS Score, refer to: Appendix E.

Quantile Scoring Detail:

Corridors scoring as “Not a Soft Barrier”		Corridors scoring as “Minor Soft Barrier”		Corridors scoring as “Major Soft Barrier”
1	2	3	4	5

- **Composite Analysis Score:** the quantile scores for the crashes, demographics, demand, and level of traffic stress metrics were summed with equal weighting to produce a composite score. The composite score represents data-driven locations where MDOT and its partners could focus on enhancing facilities for walking and biking.

Scoring Detail:

	Possible Scores
Bike Crash Quantile Score	1-5
Ped Crash Quantile Score	1-5
Demographics Quantile Score	1-5
Bike Demand Quantile Score	1-5
Ped Demand Quantile Score	1-5
Bike Level of Traffic Stress (LTS) Score	1-5
Ped Level of Traffic Stress (Soft Barriers Analysis) Score	1-5
Composite Analysis Score	7-35 (sum of all analysis quantile scores)

Note: The composite analysis score for each corridor on the Strategic Active Transportation Network is a cumulative measure based on seven factors relating to crashes, demographics, demand, and the level of traffic stress. The score is not intended to serve as a final decision-making tool but as a starting place for regional planning discussions, highlighting the corridors that may have higher needs based on their context and crash history.

CITY OF ADRIAN

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
- < 15 (Lowest Level of Need According to Analyses)
- Parks
- Railroads
- City Boundary

Note: Corridor ID Highlighted in yellow. Higher composite scores indicate places where investments in active transportation could yield the highest benefits in terms of level of traffic stress, demand, crashes, and demographic need. Scores were derived by aggregating the scores from each analysis conducted for the Active Transportation Plan. Corridor IDs can be referenced in the appendices of this plan.

UNIVERSITY REGION

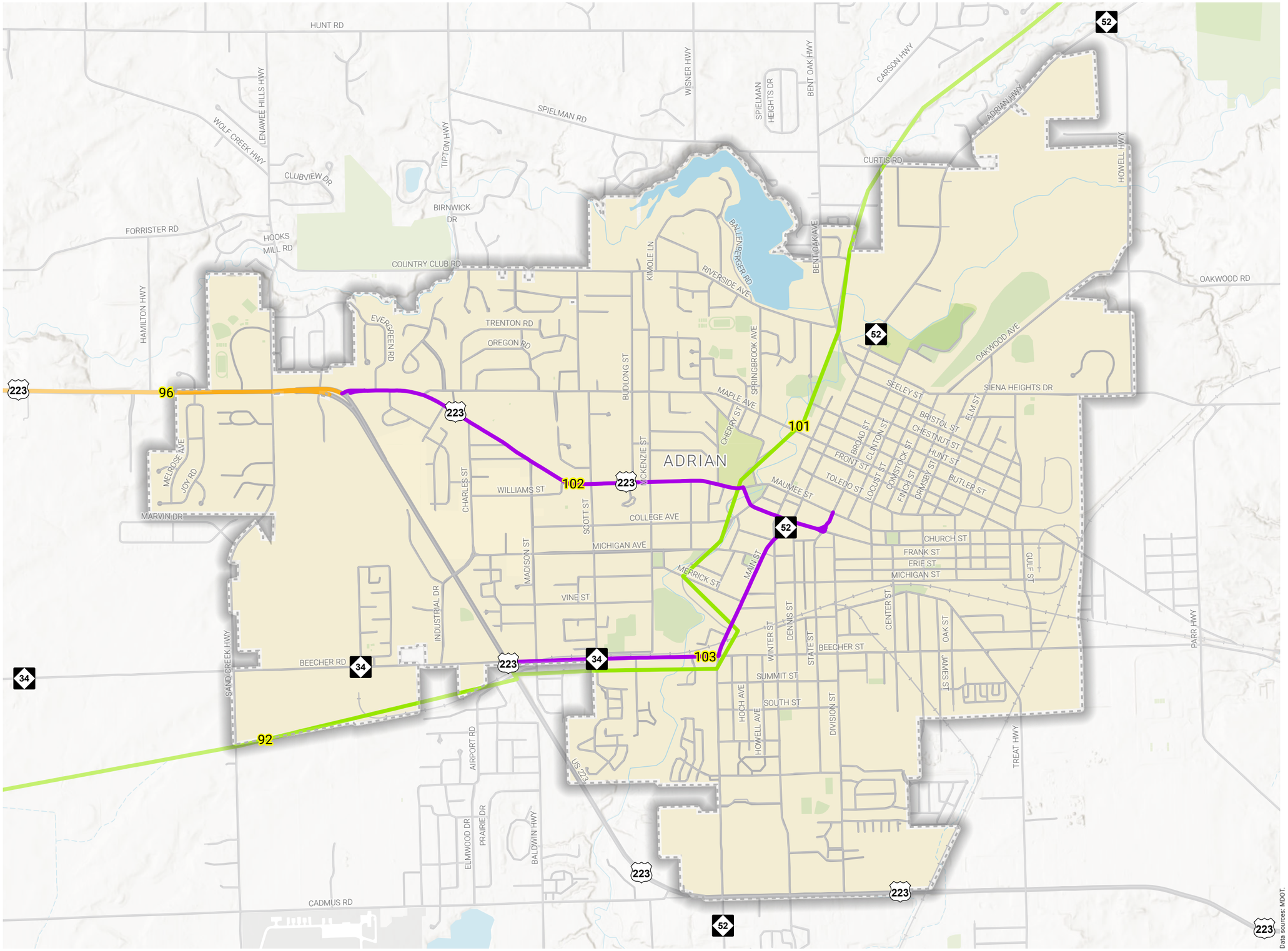


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

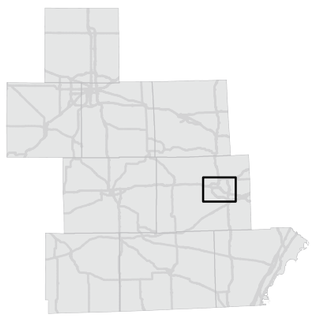
CITY OF ANN ARBOR

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
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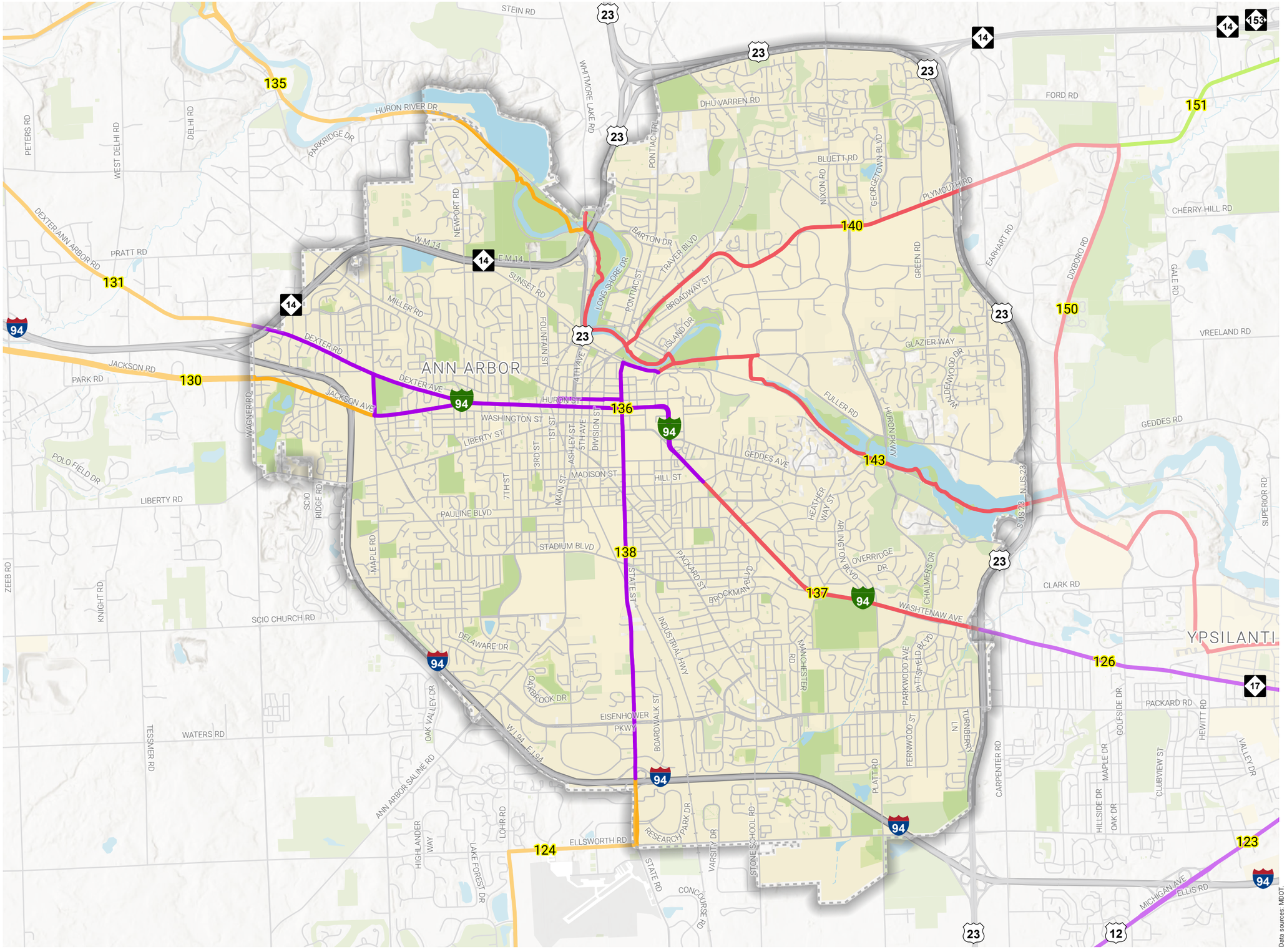
UNIVERSITY REGION



0 0.55 1.1 MILES

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CITY OF BRIGHTON

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
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- Parks
- Railroads
- City Boundary

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UNIVERSITY REGION

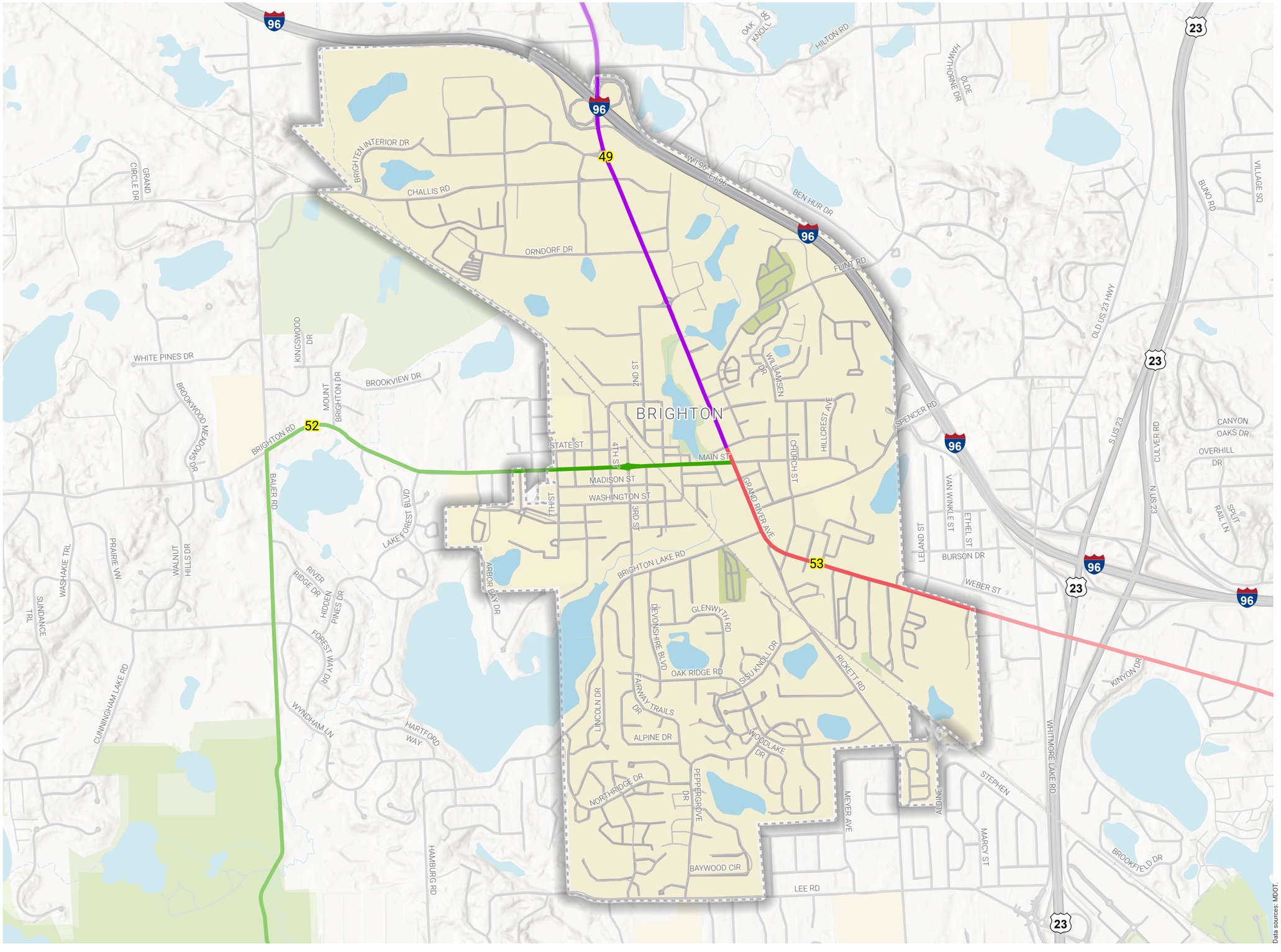


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

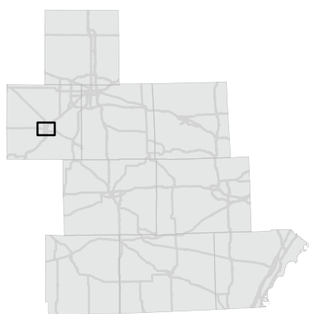
CITY OF CHARLOTTE

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
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- < 15 (Lowest Level of Need According to Analyses)
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- Railroads
- City Boundary

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UNIVERSITY REGION

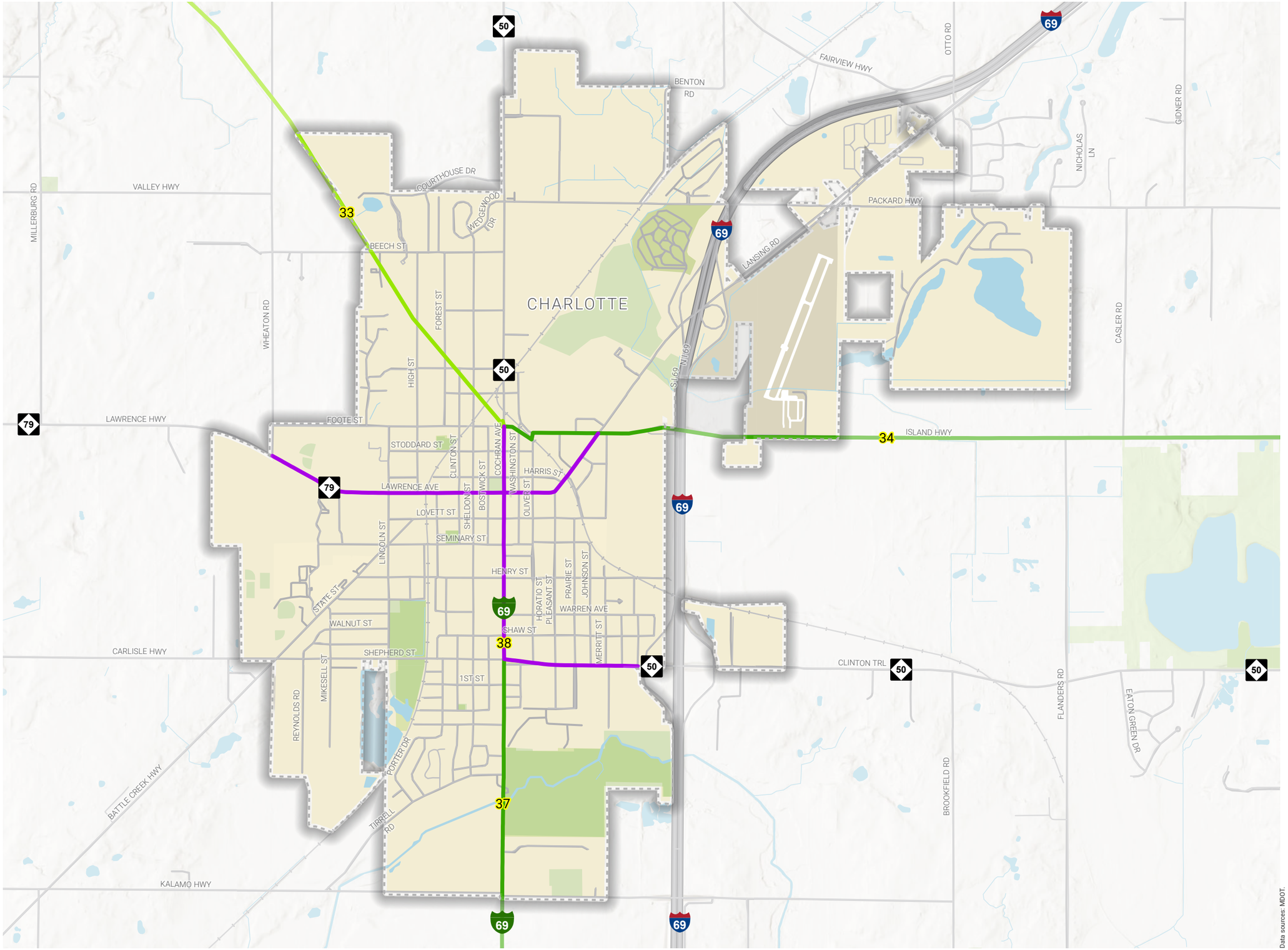


0 0.3 0.6 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

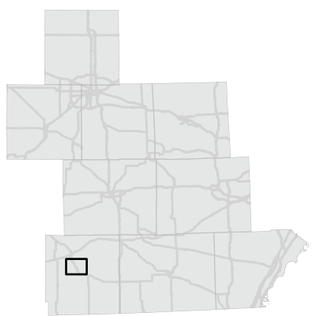
CITY OF HILLSDALE

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
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- 16 - 18
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- Railroads
- City Boundary

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UNIVERSITY REGION

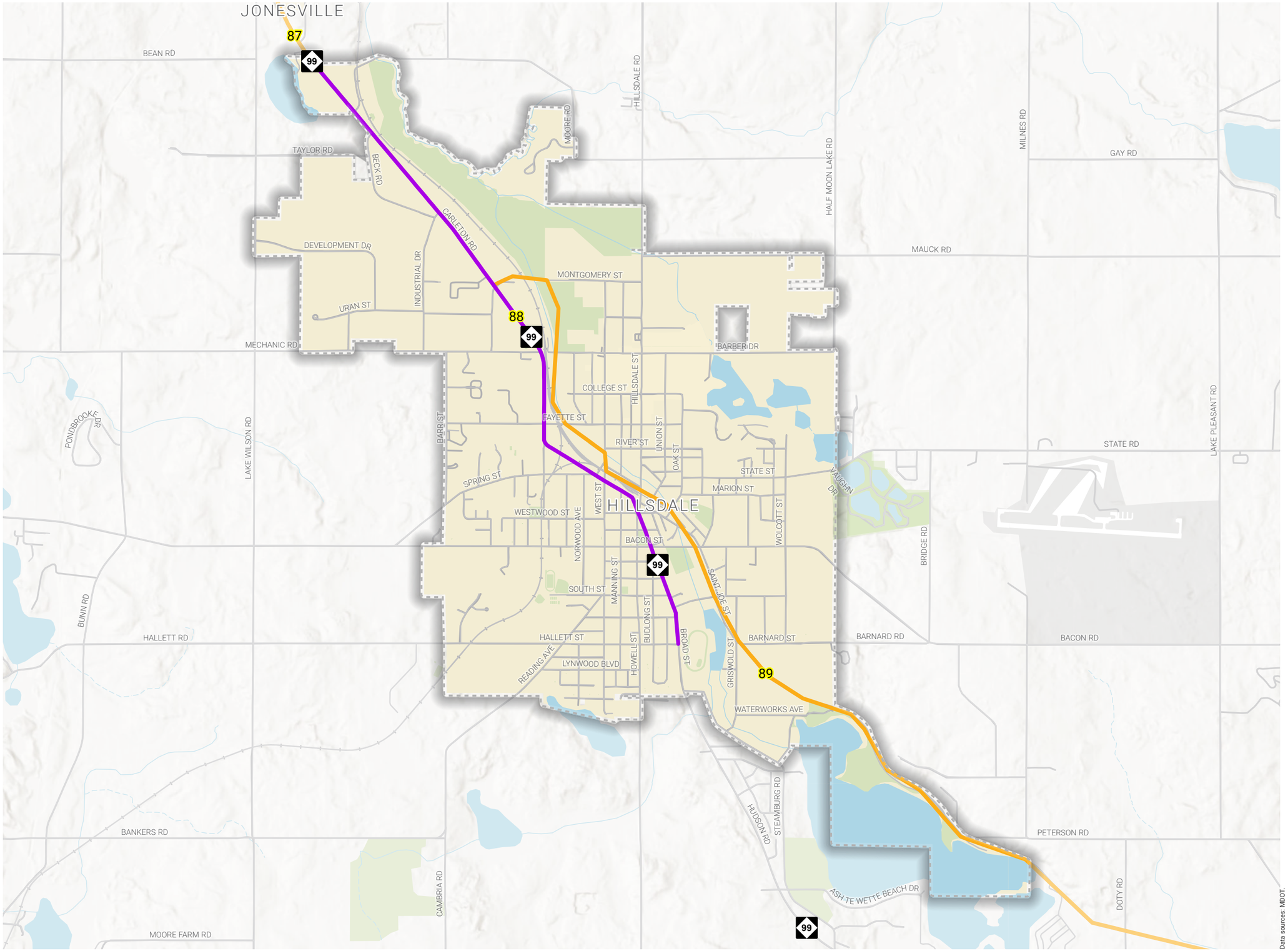


0 0.35 0.7 MILES

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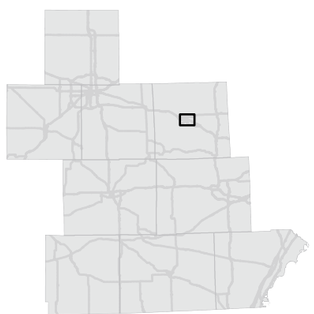
CITY OF HOWELL

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
- < 15 (Lowest Level of Need According to Analyses)
- Parks
- Railroads
- City Boundary

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UNIVERSITY REGION

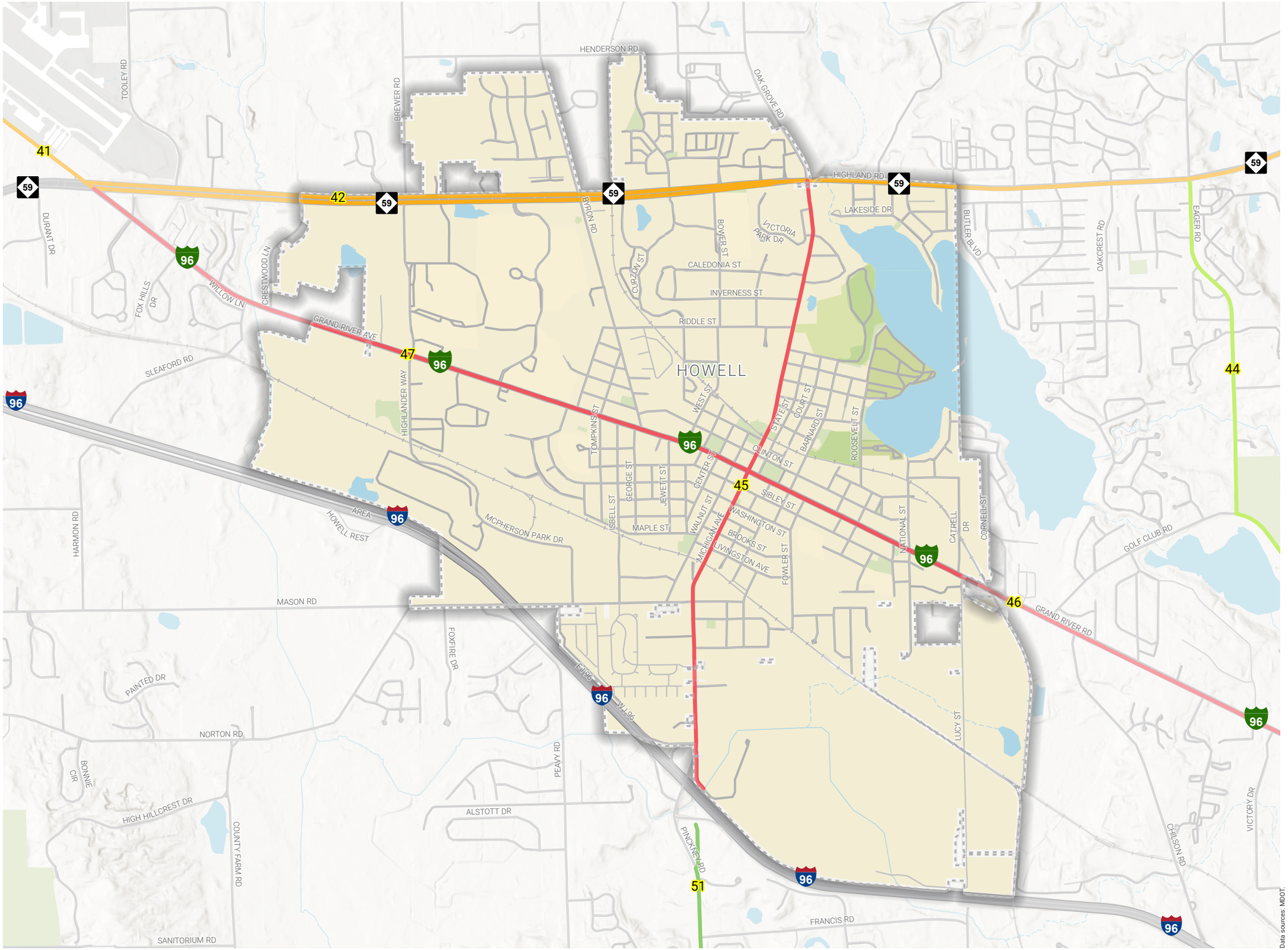


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

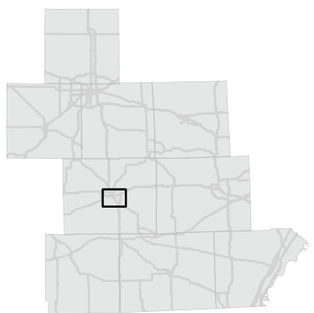
CITY OF JACKSON

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
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- Parks
- Railroads
- City Boundary

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UNIVERSITY REGION

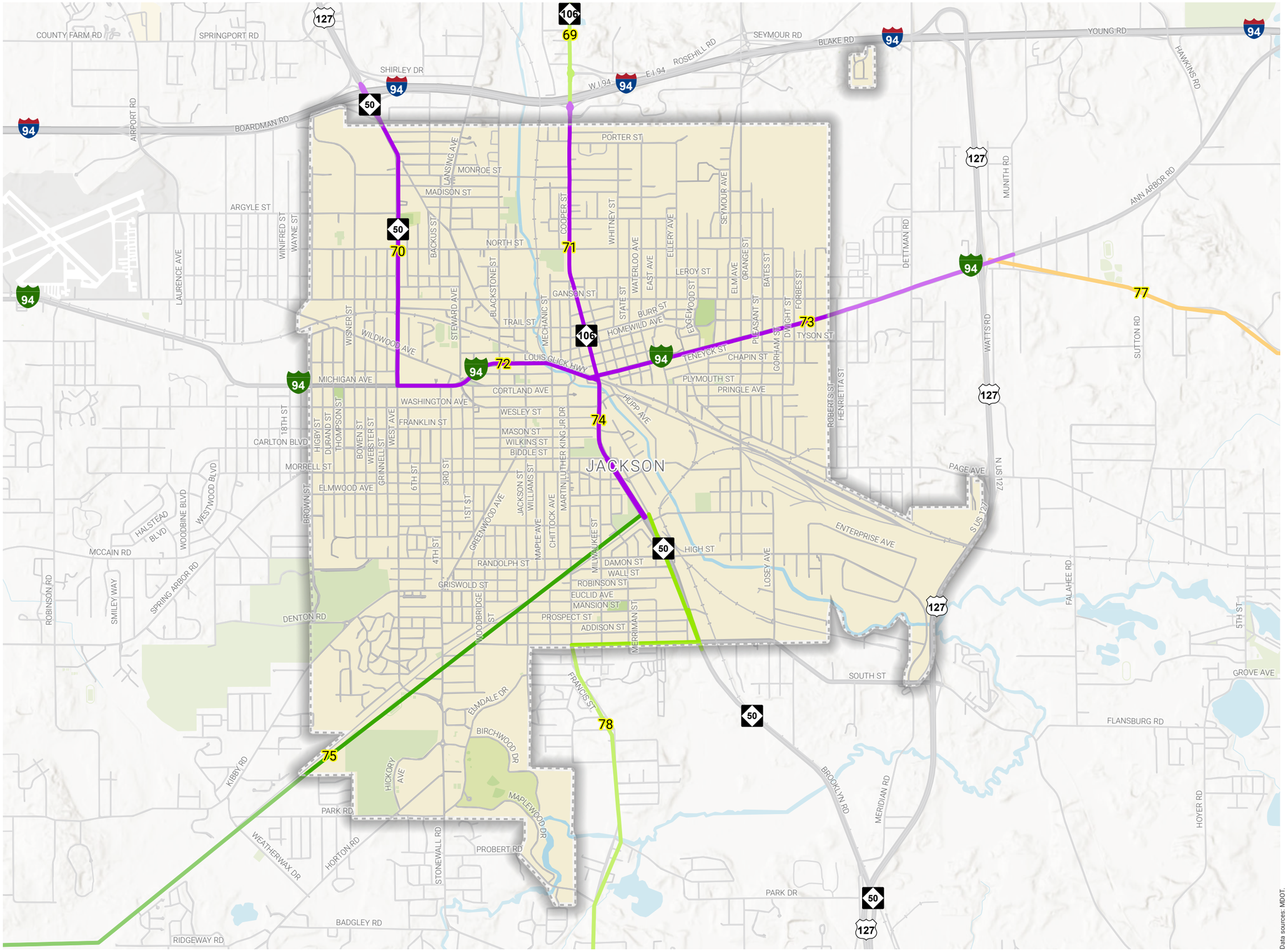


0 0.4 0.8 MILES

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MDOT Michigan Department of Transportation

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CITY OF LITCHFIELD

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
- < 15 (Lowest Level of Need According to Analyses)
- Parks
- Railroads
- City Boundary

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UNIVERSITY REGION

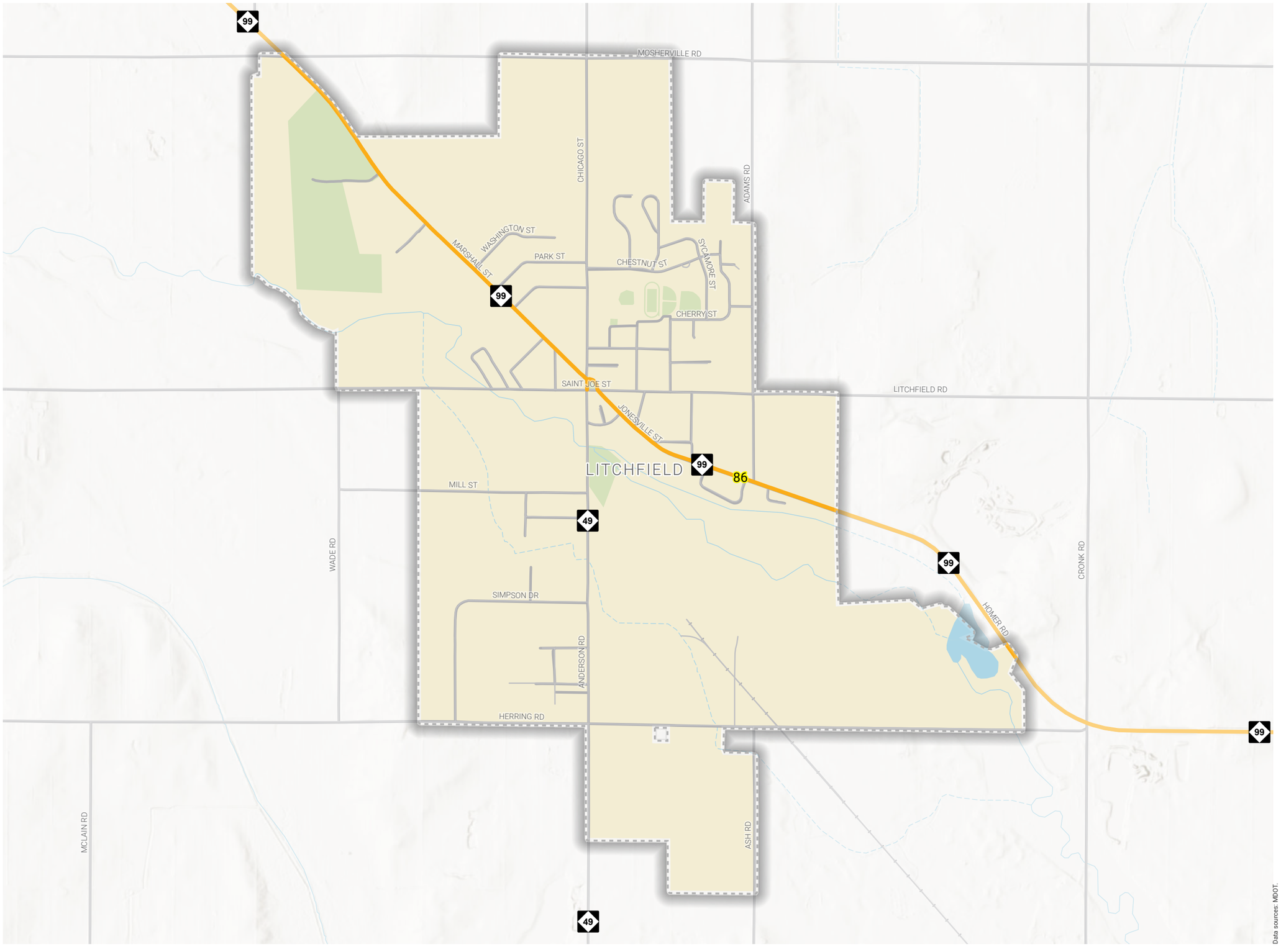


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

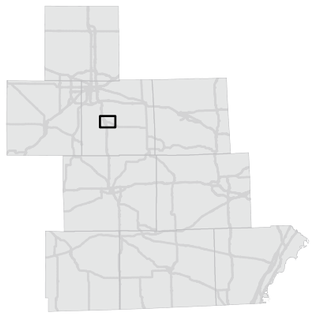
CITY OF MASON

STRATEGIC NETWORK

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UNIVERSITY REGION

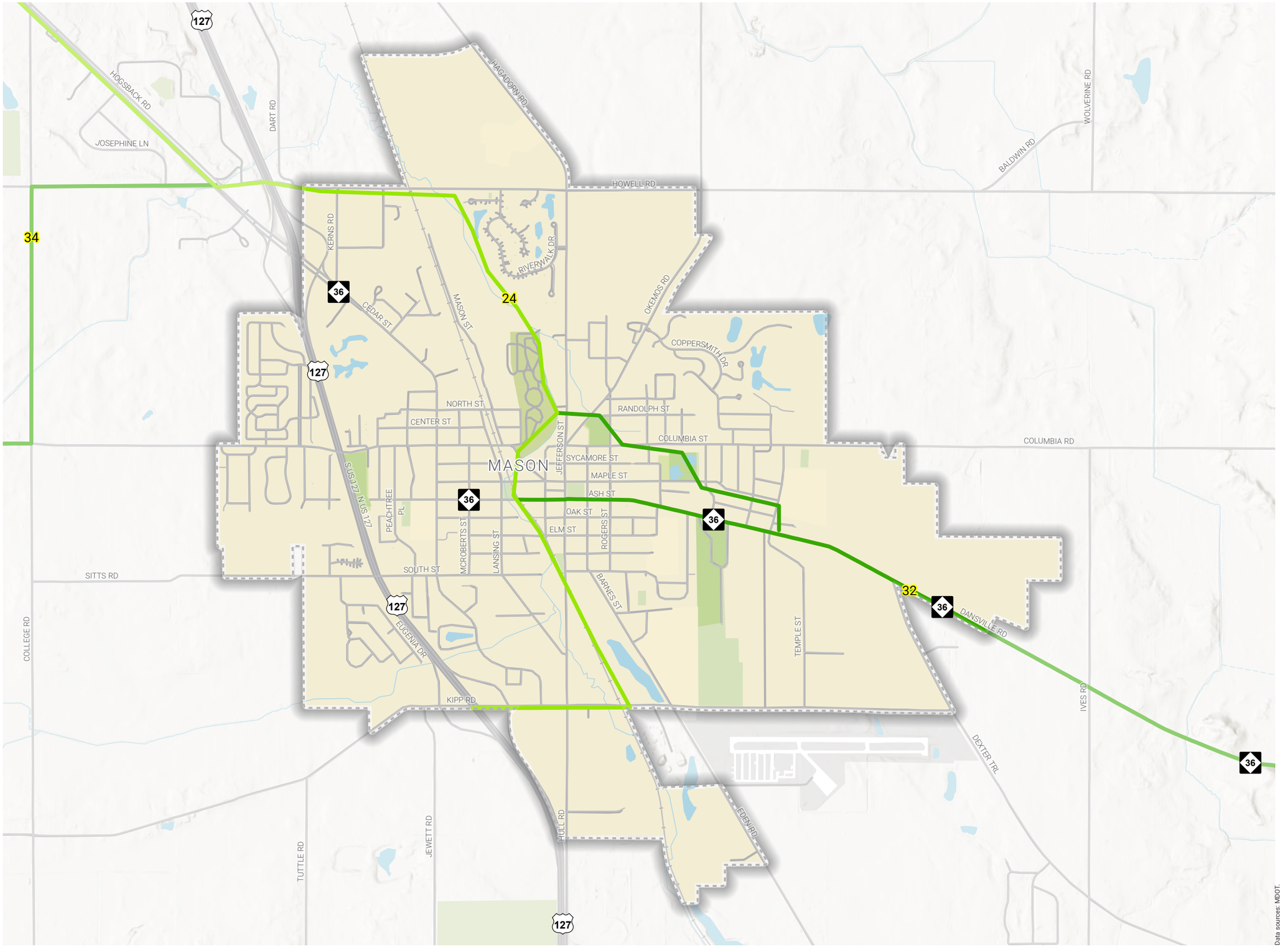


0 0.25 0.5 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

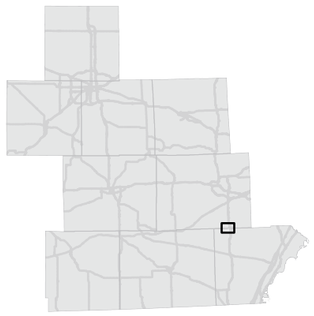
CITY OF MILAN

STRATEGIC NETWORK

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UNIVERSITY REGION

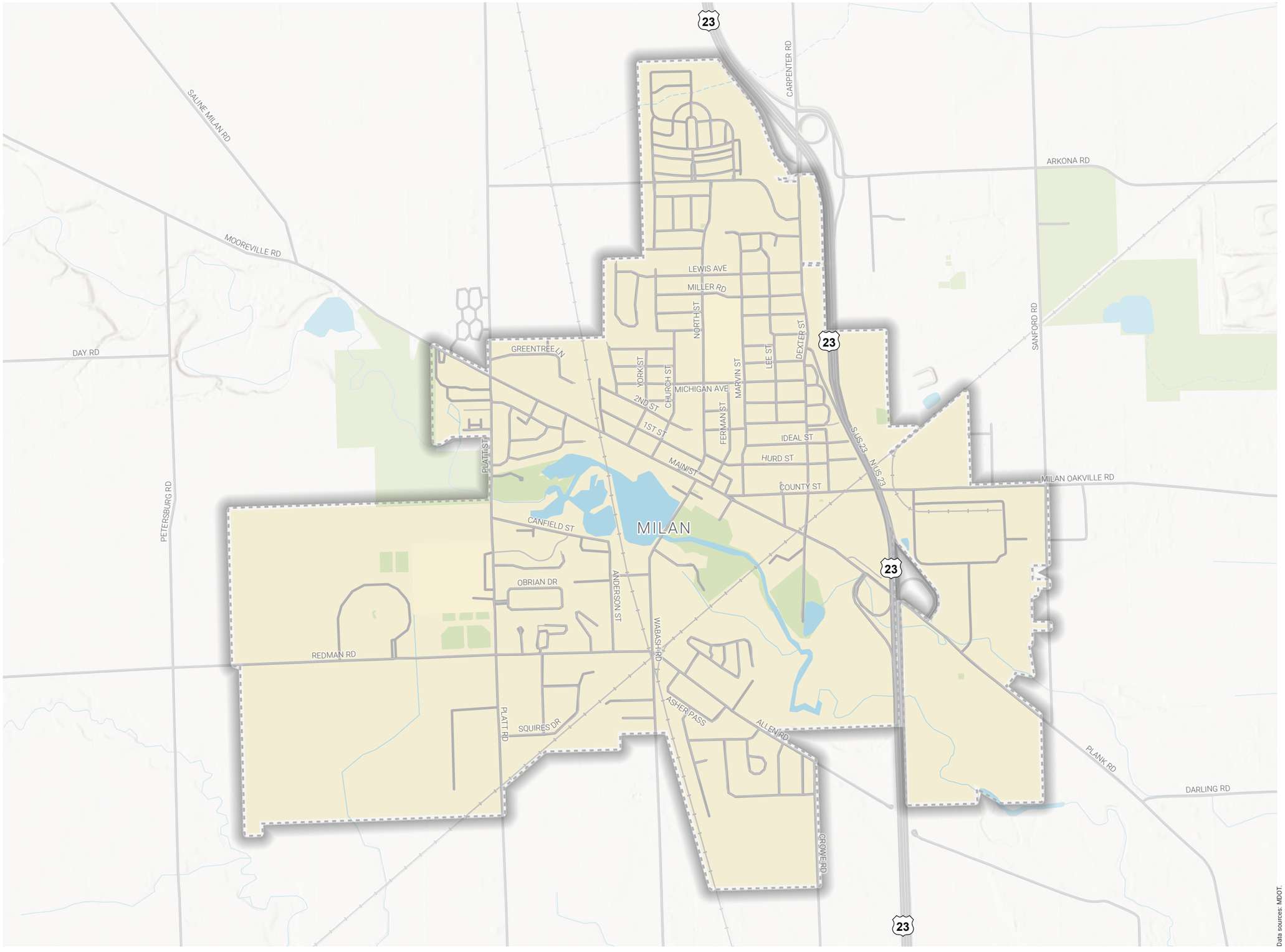


0 0.2 0.4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

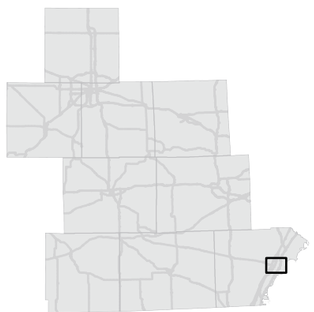
CITY OF MONROE

STRATEGIC NETWORK

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UNIVERSITY REGION

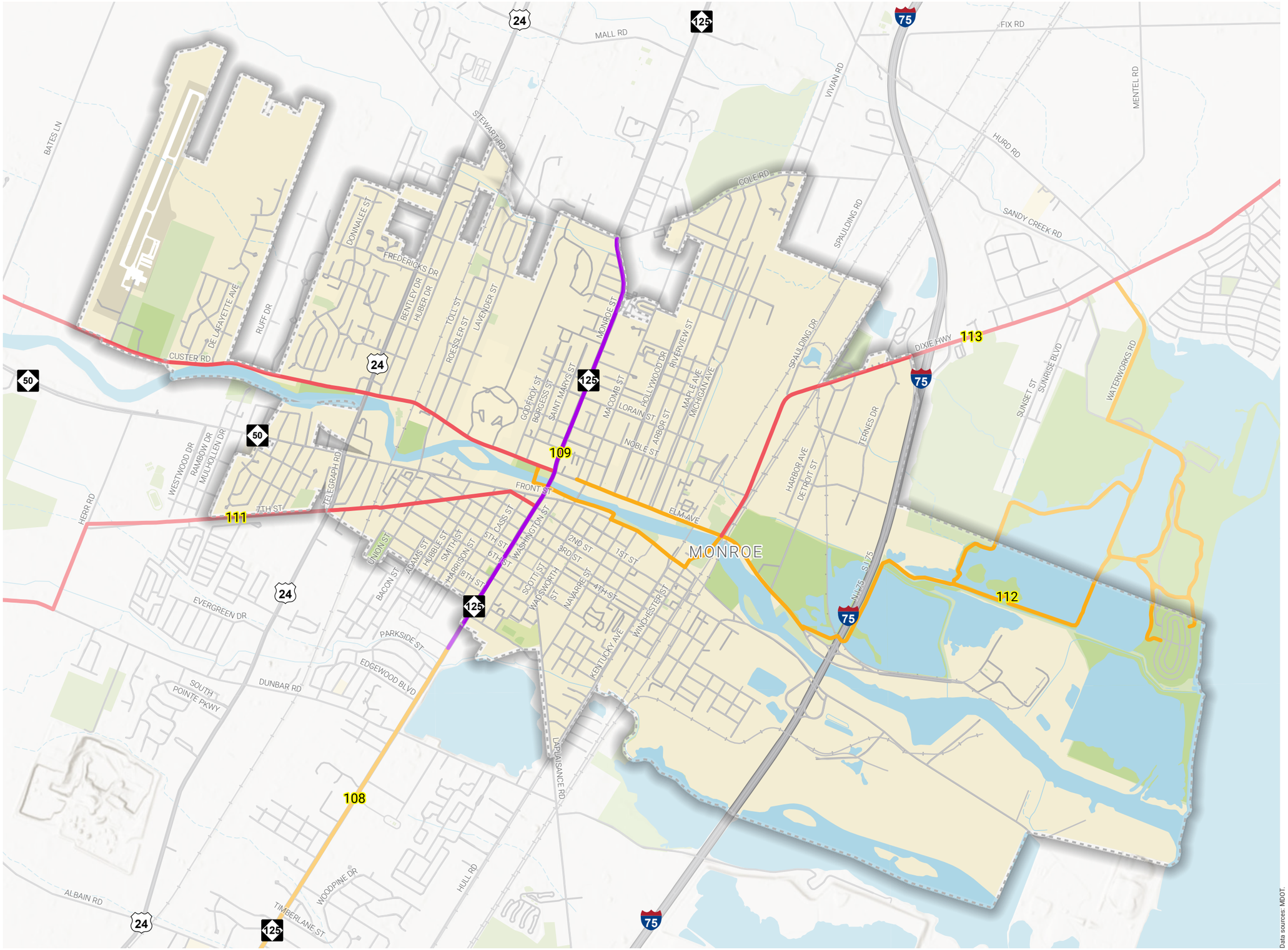


0 0.35 0.7 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT.

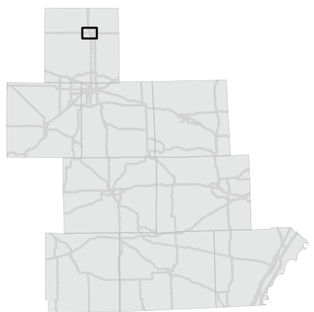
CITY OF ST JOHNS

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
- < 15 (Lowest Level of Need According to Analyses)
- Parks
- Railroads
- City Boundary

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UNIVERSITY REGION

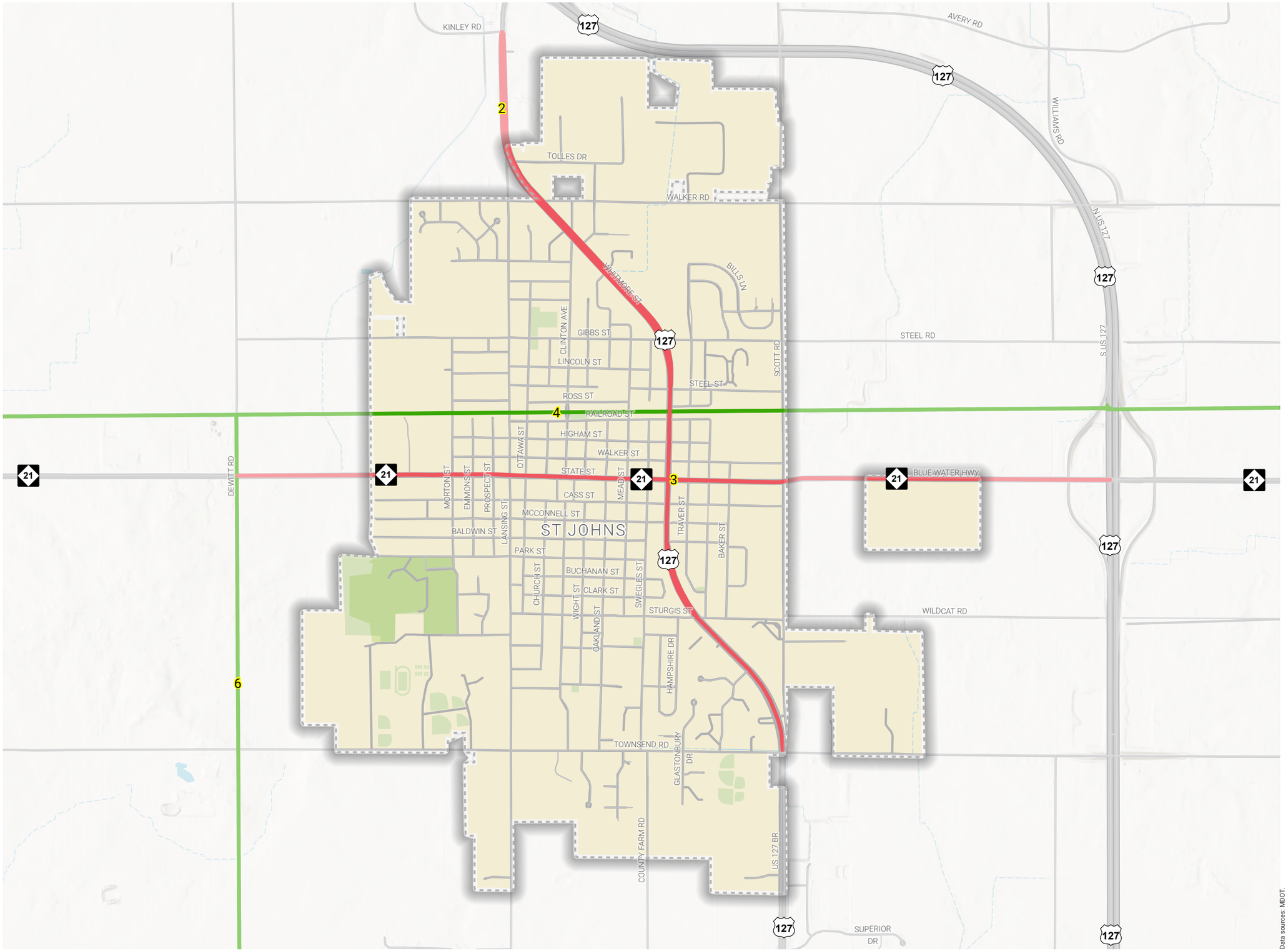


0 0.25 0.5 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT.

CITY OF TECUMSEH

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
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- Railroads
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UNIVERSITY REGION

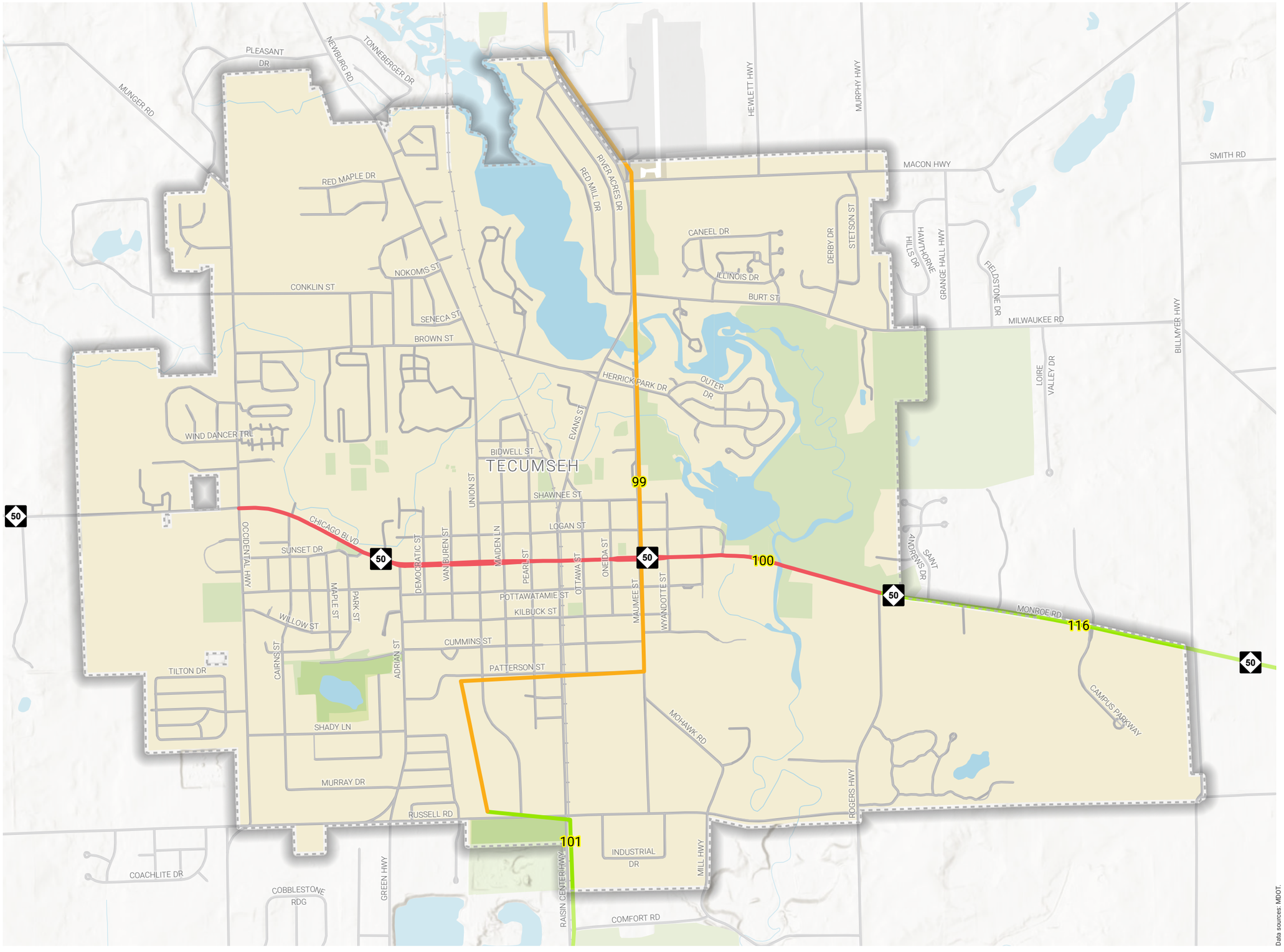


0 0.2 0.4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT.

CITY OF YPSILANTI

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
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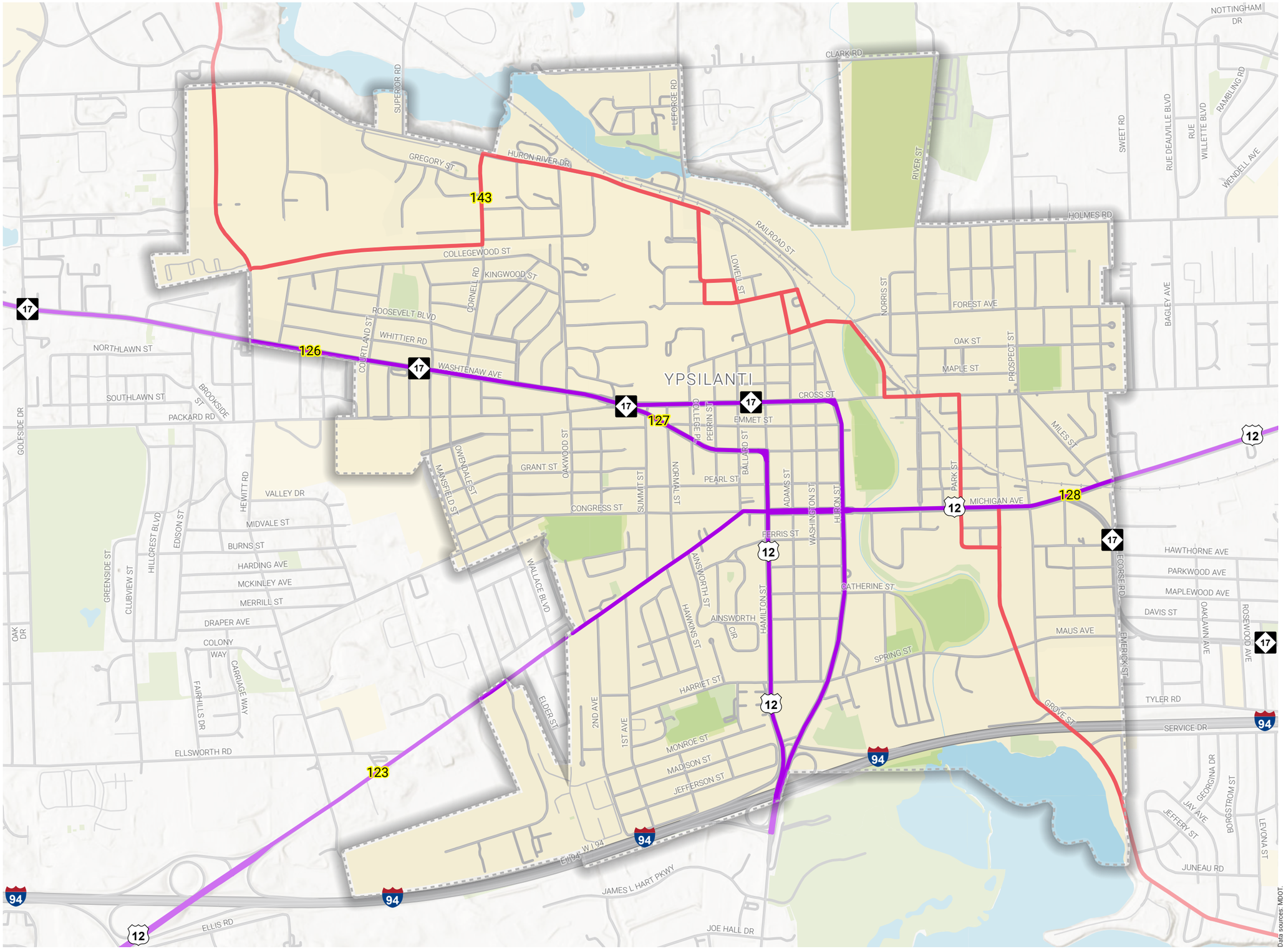
UNIVERSITY REGION



0 0.2 0.4 MILES

MDOT Michigan Department of Transportation

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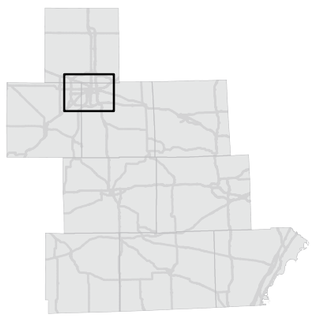
GREATER LANSING

STRATEGIC NETWORK

- 29 - 35 (Highest Level of Need According to Analyses)
- 24 - 28
- 19 - 23
- 16 - 18
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UNIVERSITY REGION

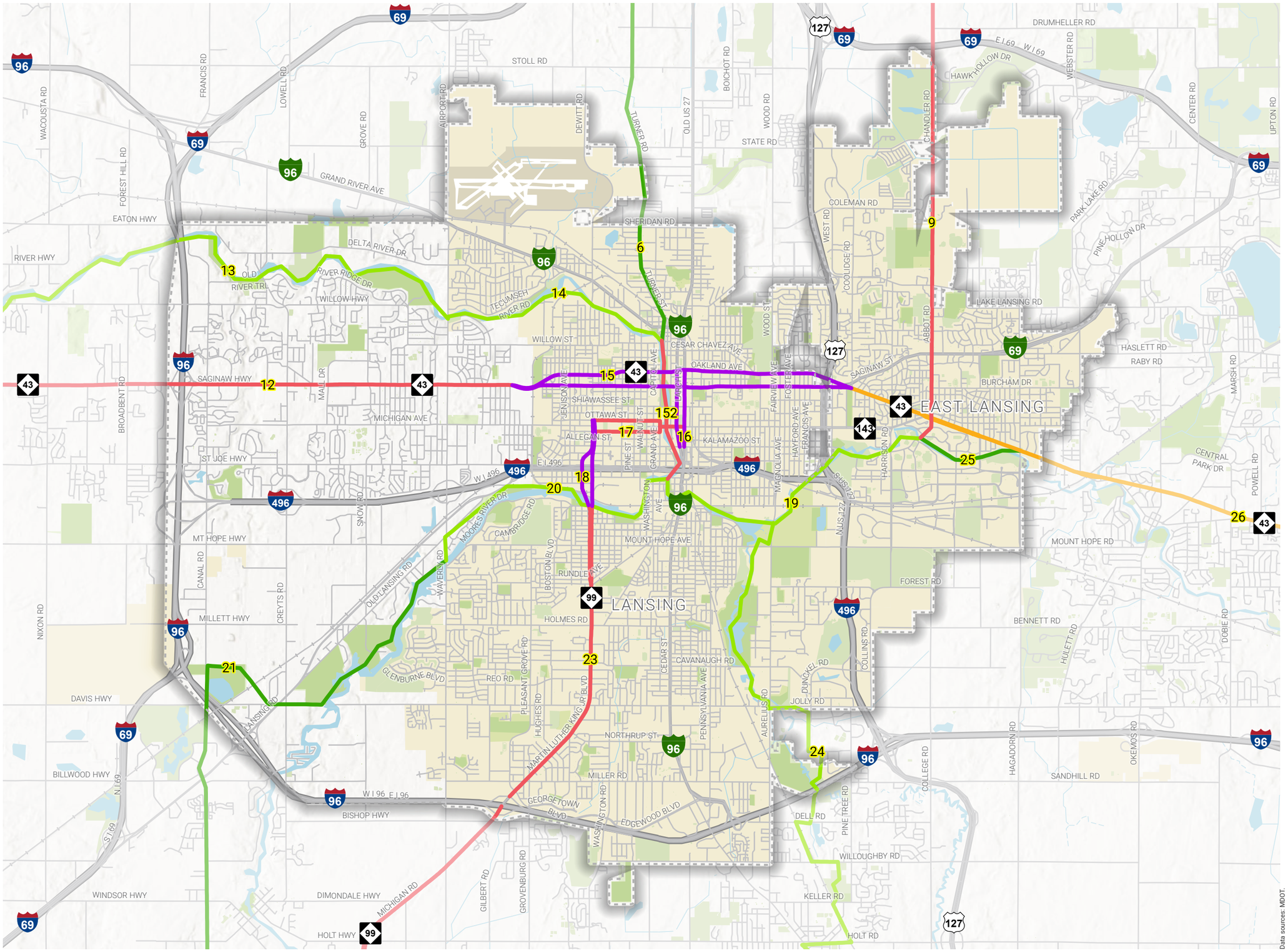


0 0.85 1.7 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT.

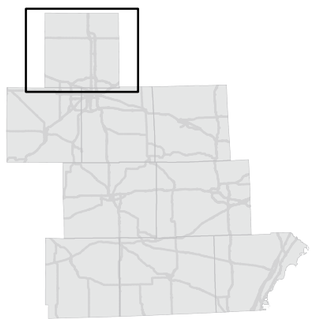
CLINTON COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

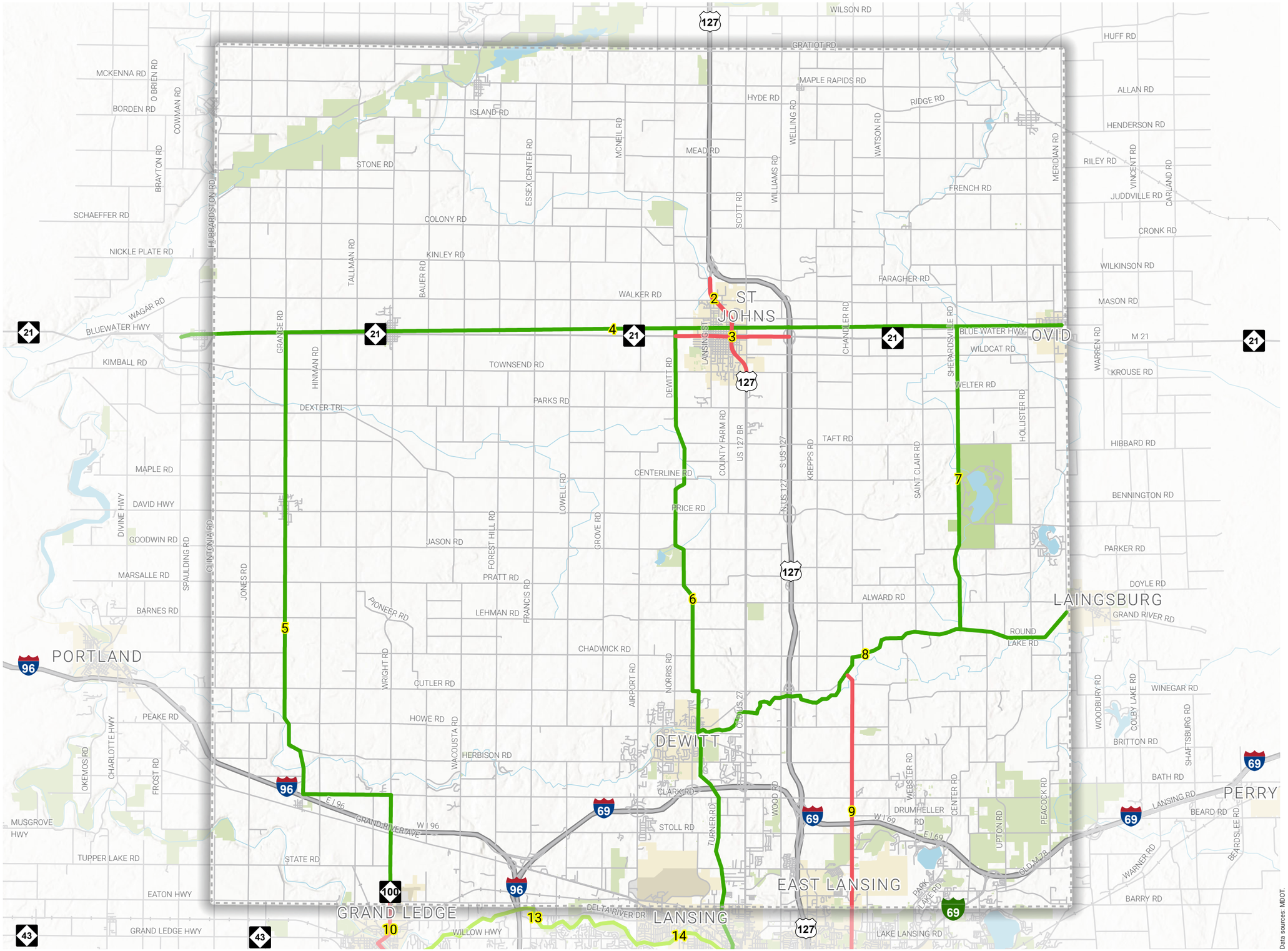


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT.

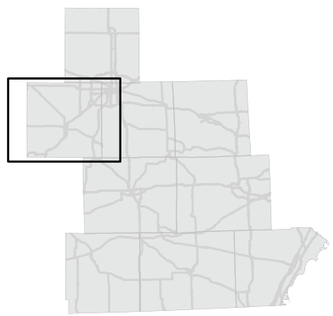
EATON COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

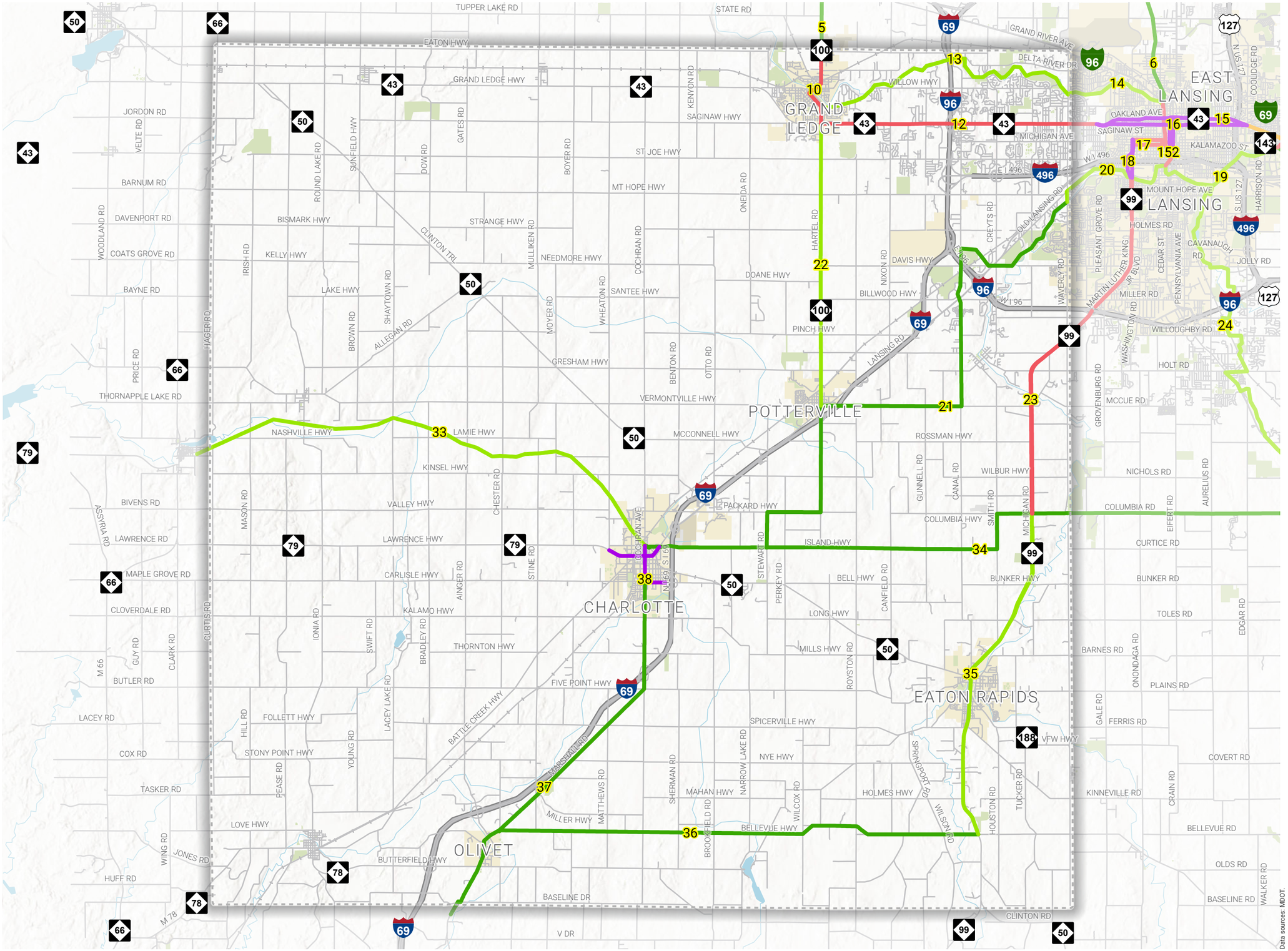


0 2 4 MILES

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MDOT Michigan Department of Transportation

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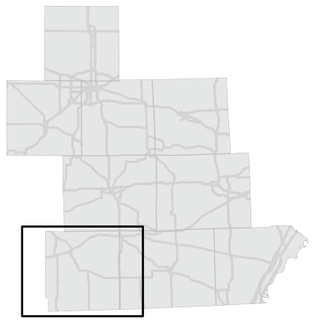
HILLSDALE COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

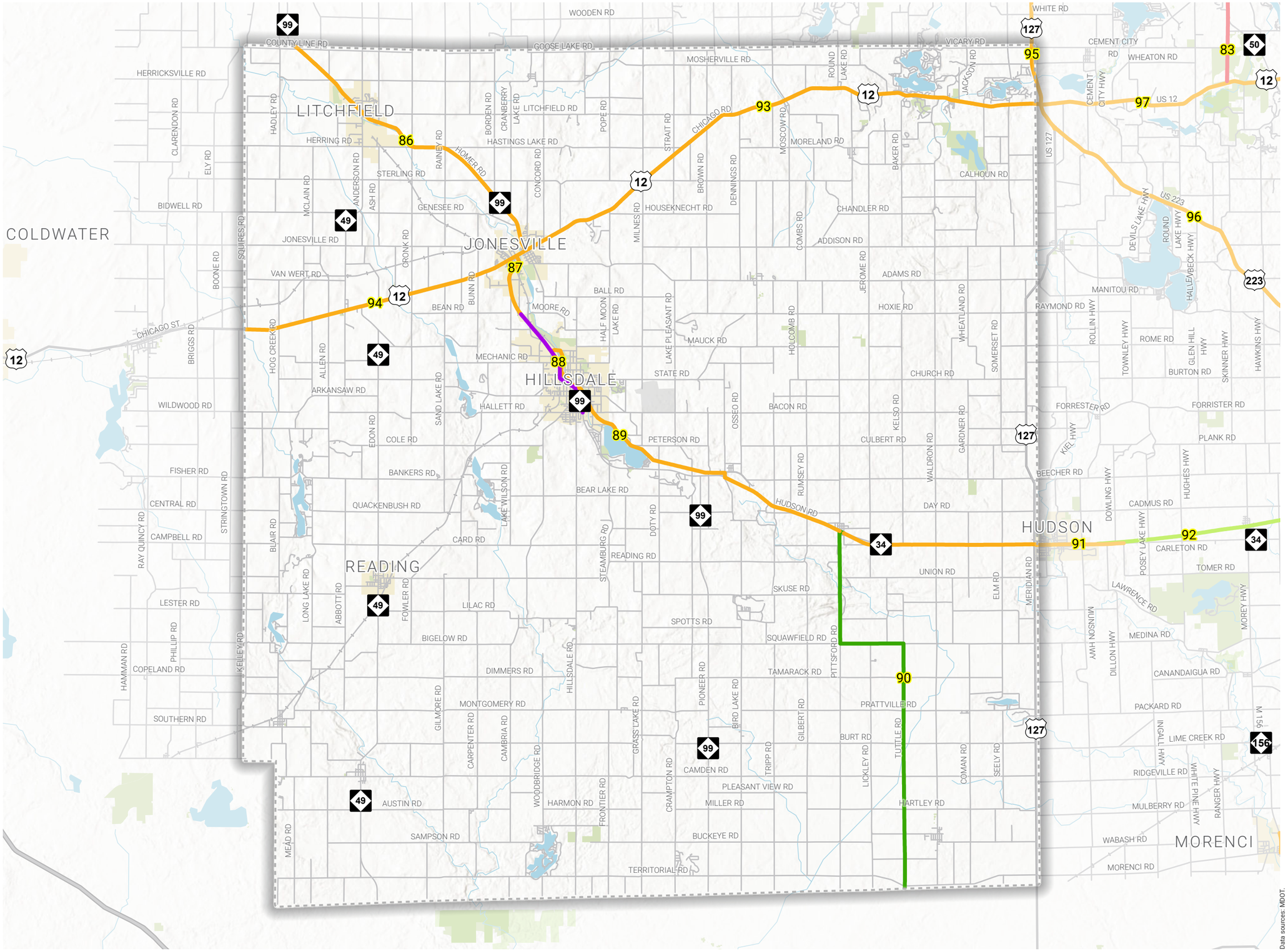


0 2 4 MILES

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MDOT Michigan Department of Transportation

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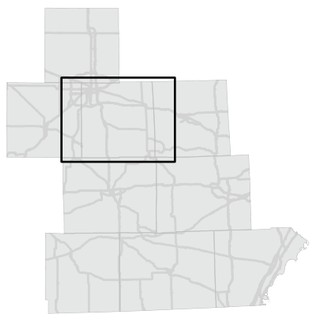
INGHAM COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

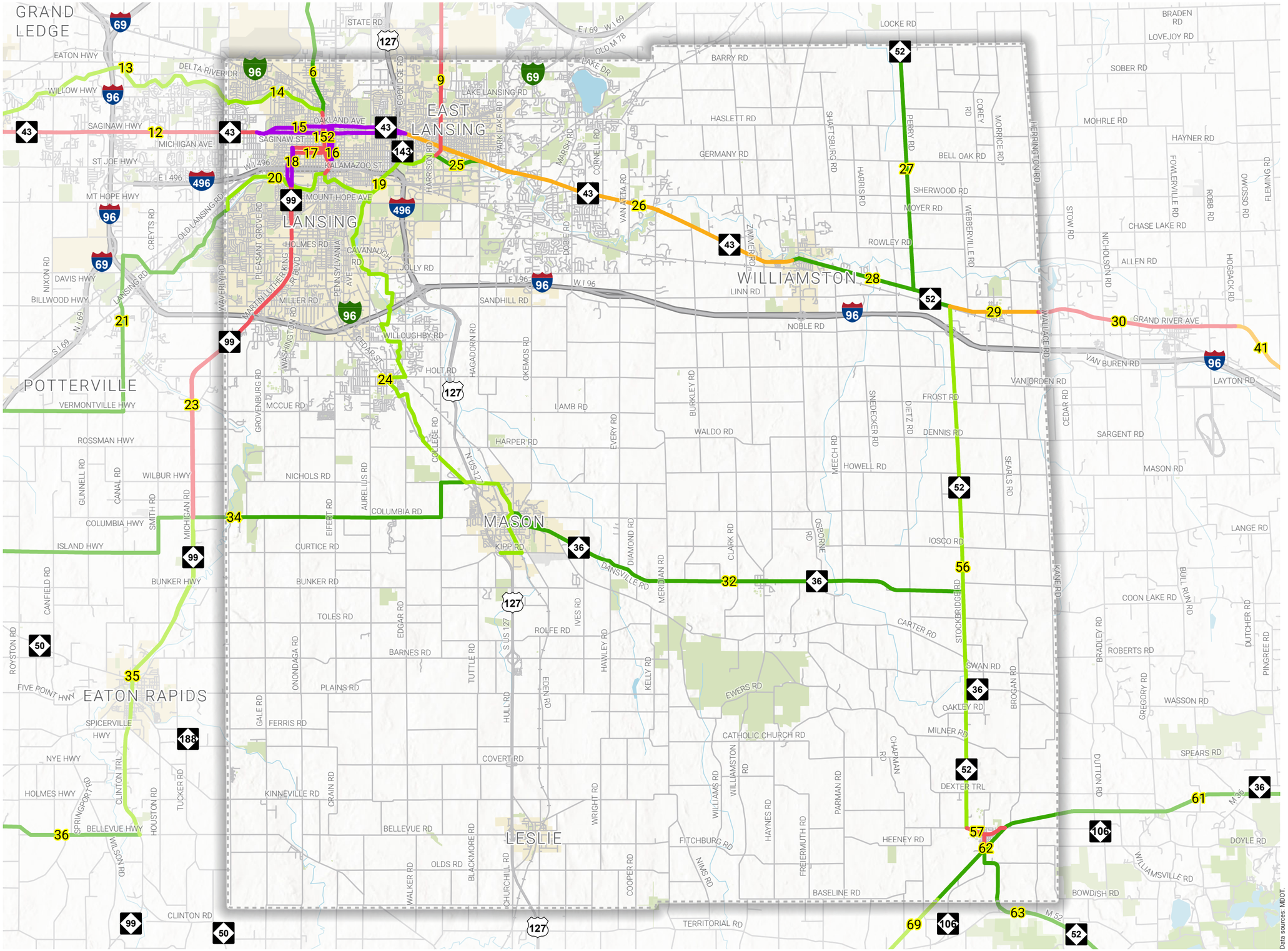


0 2 4 MILES

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MDOT Michigan Department of Transportation

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GRAND LEDGE
EATON HWY
DELTA RIVER DR
WILLOW HWY
SAGINAW HWY
MICHIGAN AVE
ST JOE HWY
E I 496
MT HOPE HWY
OLD LANSING RD
CREYTS RD
NIXON RD
DAVIS HWY
BILLWOOD HWY
LANSING RD
S I 69
N I 69
POTTERVILLE
VERMONTVILLE HWY
ROSSMAN HWY
GUNNELL RD
CANAL RD
WILBUR HWY
SMITH RD
MICHIGAN RD
COLUMBIA HWY
ISLAND HWY
CANFIELD RD
ROYSTON RD
FIVE POINT HWY
EATON RAPIDS
SPICERVILLE HWY
NYE HWY
HOLMES HWY
SPRINGPORT RD
CLINTON TRL
HOUSTON RD
TUCKER RD
BELLEVUE HWY
WILSON RD
CLINTON RD
STATE RD
OAKLAND AVE
SAGINAW ST
W I 496
KALAMAZOO ST
MOUNT HOPE AVE
LANSING
HOLMES RD
MILLER RD
JOLLY RD
CAVANAUGH RD
WILLOUGHBY RD
HOLT RD
MCCUE RD
NICHOLS RD
COLUMBIA RD
CURTICE RD
BUNKER RD
BUNKER HWY
TOLES RD
PLAINS RD
BARNES RD
FERRIS RD
COVERT RD
KINNEVILLE RD
BELLEVUE RD
OLDS RD
HARPER RD
LAMB RD
SANDHILL RD
NOBLE RD
LINN RD
I 96
E I 69 W I 69
OLD M 78
LAKE DR
LAKE LANSING RD
EAST LANSING
HASLETT RD
GERMANY RD
BARRY RD
LOCKE RD
WILLIAMSTON
ROWLEY RD
MOYER RD
SHERWOOD RD
BELL OAK RD
CHASE LAKE RD
ALLEN RD
GRAND RIVER AVE
VAN BUREN RD
VAN ORDEN RD
FROST RD
DENNIS RD
SARGENT RD
MASON RD
MOHRLE RD
HAYNER RD
SOBER RD
LOVEJOY RD
BRADEN RD
LAYTON RD
DOYLE RD
BOWDISH RD
WILLIAMSVILLE RD
LANGE RD
COON LAKE RD
ROBERTS RD
WASSON RD
SPEARS RD
MILNER RD
OAKLEY RD
SWAN RD
IOSCO RD
CARTER RD
EWERS RD
CATHOLIC CHURCH RD
DEXTER TRL
HEENEY RD
FITCHBURG RD
BASELINE RD
TERRITORIAL RD
HOWELL RD
MEECH RD
SNEDECKER RD
DIETZ RD
CHAPMAN RD
PARMAN RD
WILLIAMS RD
HAYNES RD
FREIERMUTH RD
WALDO RD
BURKLEY RD
EVERY RD
OKEMOS RD
HAGADORN RD
MASON
KIPP RD
DANSVILLE RD
DIAMOND RD
MERIDIAN RD
CLARK RD
OSBORNE RD
LESLIE
WRIGHT RD
HULL RD
EDEN RD
KELLY RD
HAWLEY RD
IVES RD
S US 127
ROLFE RD
TUTTLE RD
EDGAR RD
ONONDAGA RD
GALE RD
COLLEGE RD
N US 127
EIFERT RD
AURELIUS RD
WALKER RD
BLACKMORE RD
CHURCHILL RD
COOPER RD
CRAIN RD
GROVENBURG RD
WASHINGTON RD
CEDAR ST
PENNSYLVANIA AVE
MARTIN LUTHER KING JR BLVD
PLEASANT GROVE RD
WAVERLY RD
COGSWELL RD
HARRISON RD
PARK LAKE RD
MARSH RD
CORNELL RD
DOBIE RD
VAN ALTA RD
ZIMMER RD
HARRIS RD
SHAFTSBURG RD
COREY RD
MORRICE RD
PERRY RD
WEBBERVILLE RD
HERRINGTON RD
STOW RD
NICHOLSON RD
FOWLERVILLE RD
ROBB RD
OWOSSO RD
FLEMING RD
HOGBACK RD
WALLACE RD
CEDAR RD
KANE RD
BULL RUN RD
DUTCHER RD
PINGREE RD
BRADLEY RD
GREGORY RD
DUTTON RD
STOCKBRIDGE RD
BROGAN RD
M 36
M 52
M 99
M 43
M 78
M 127
M 496
M 69
M 96
M 52
M 106
M 188
M 50
M 36
M 99
M 127
M 43
M 52
M 96
M 52
M 36
M 106
M 52
M 36
M 43
M 43
M 43

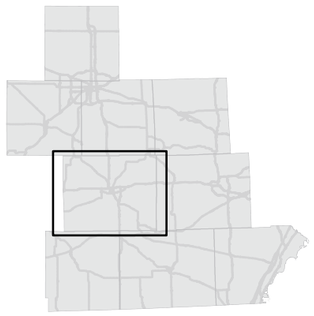
JACKSON COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

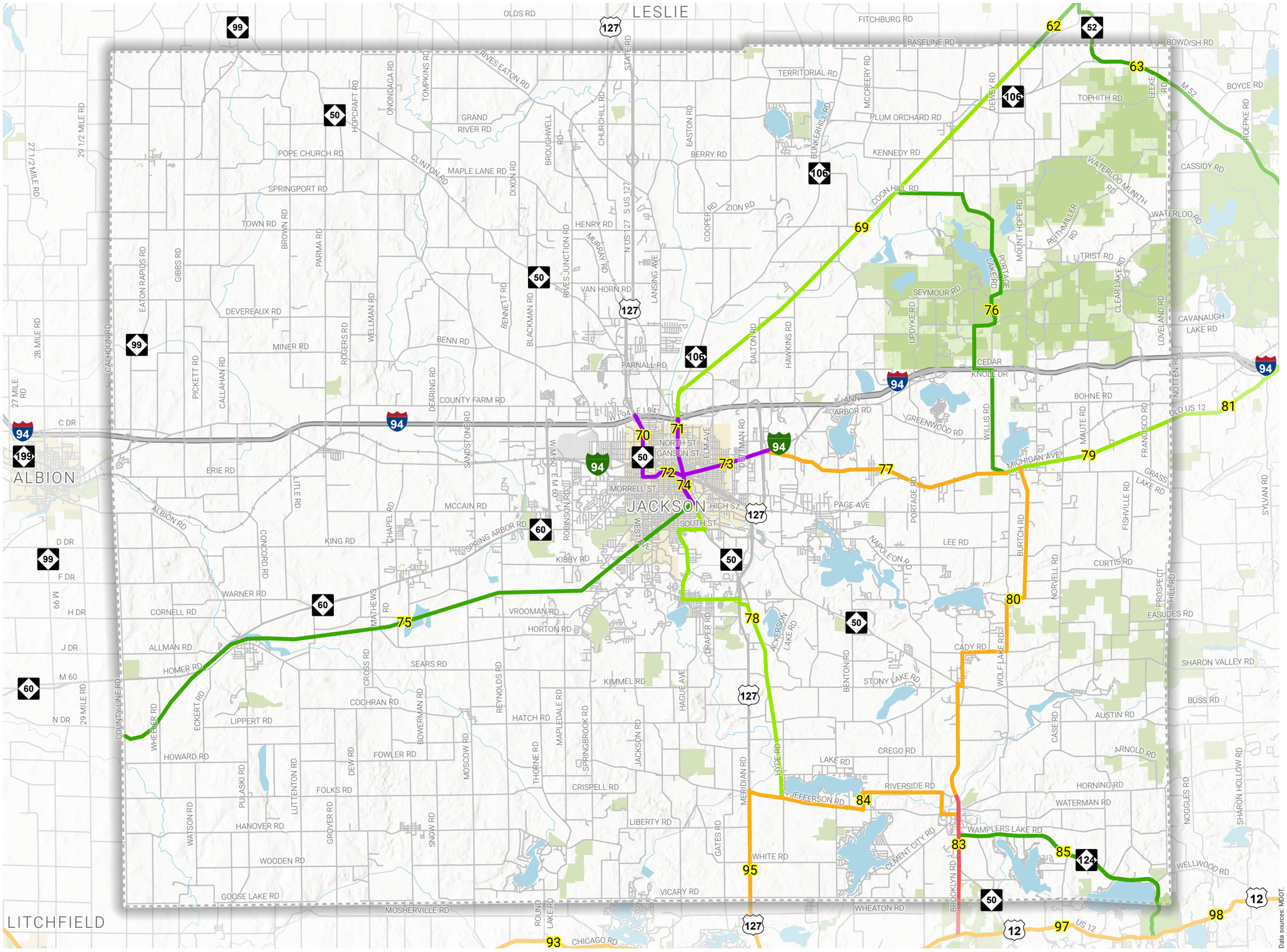


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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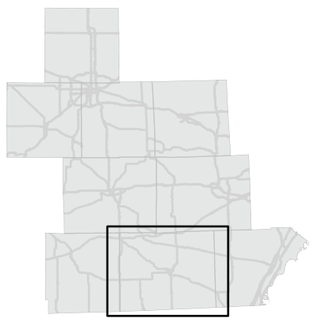
LENAWEE COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

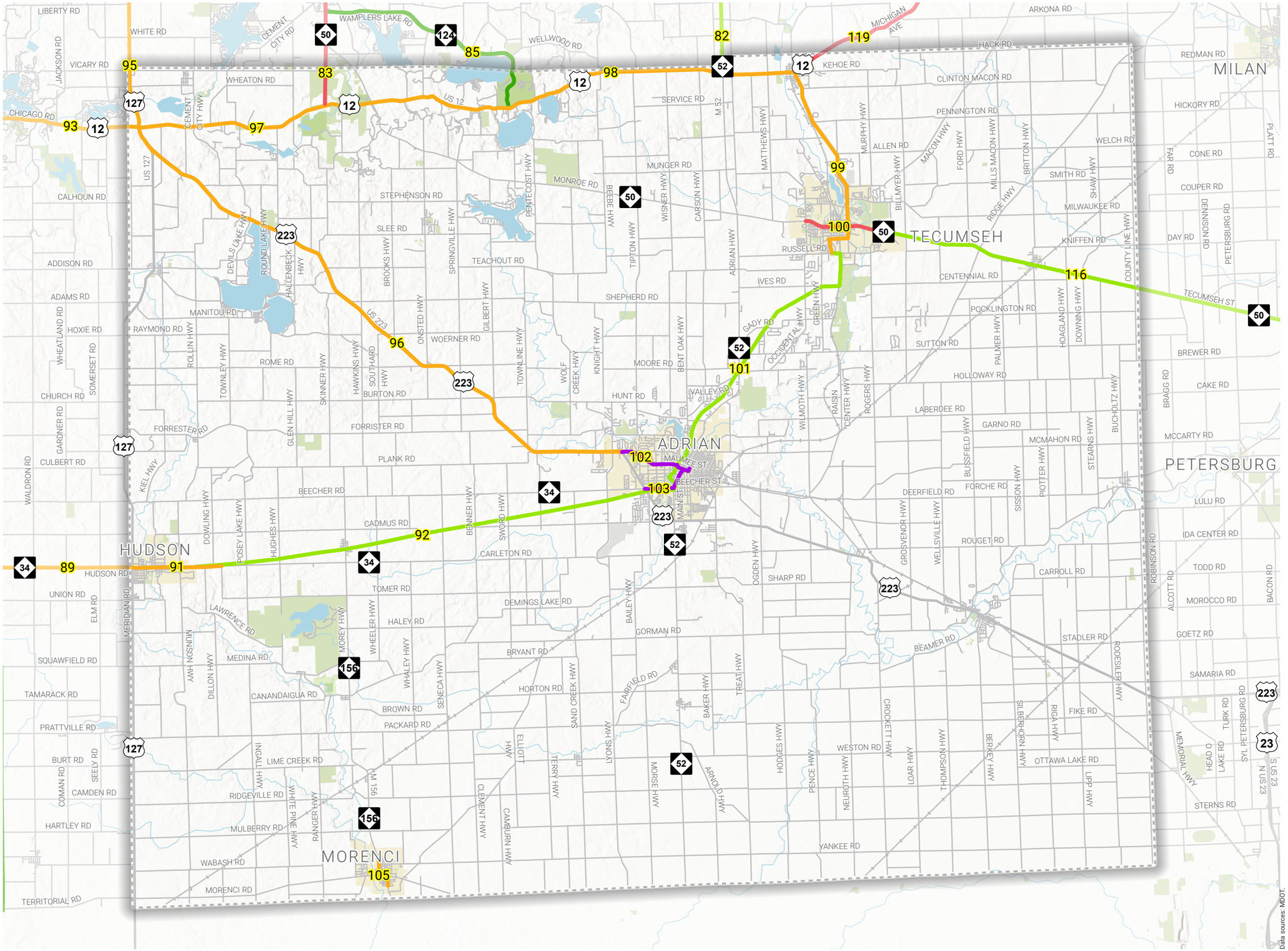


0 2 4 MILES

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MDOT Michigan Department of Transportation

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Data sources: MDOT.

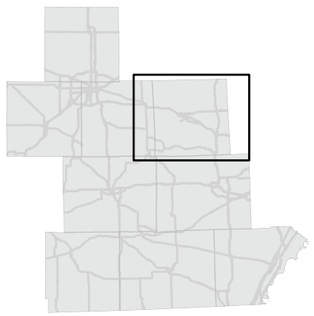
LIVINGSTON COUNTY

STRATEGIC NETWORK

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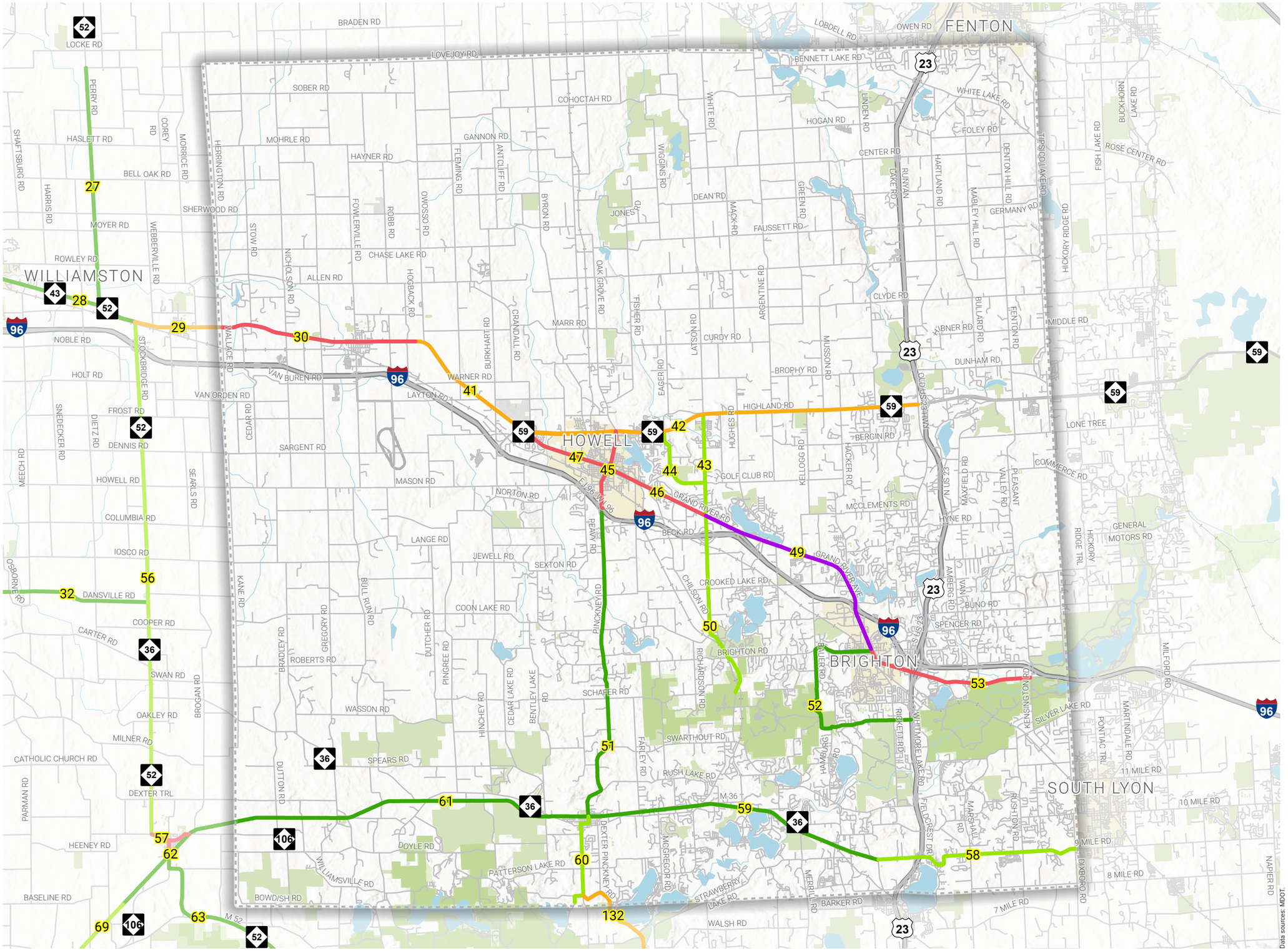
UNIVERSITY REGION



0 2 4 MILES

MDOT Michigan Department of Transportation

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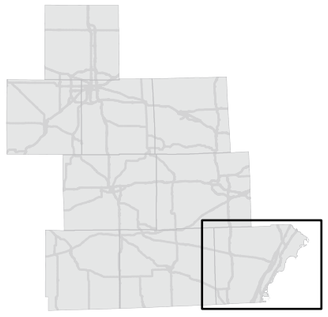
MONROE COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

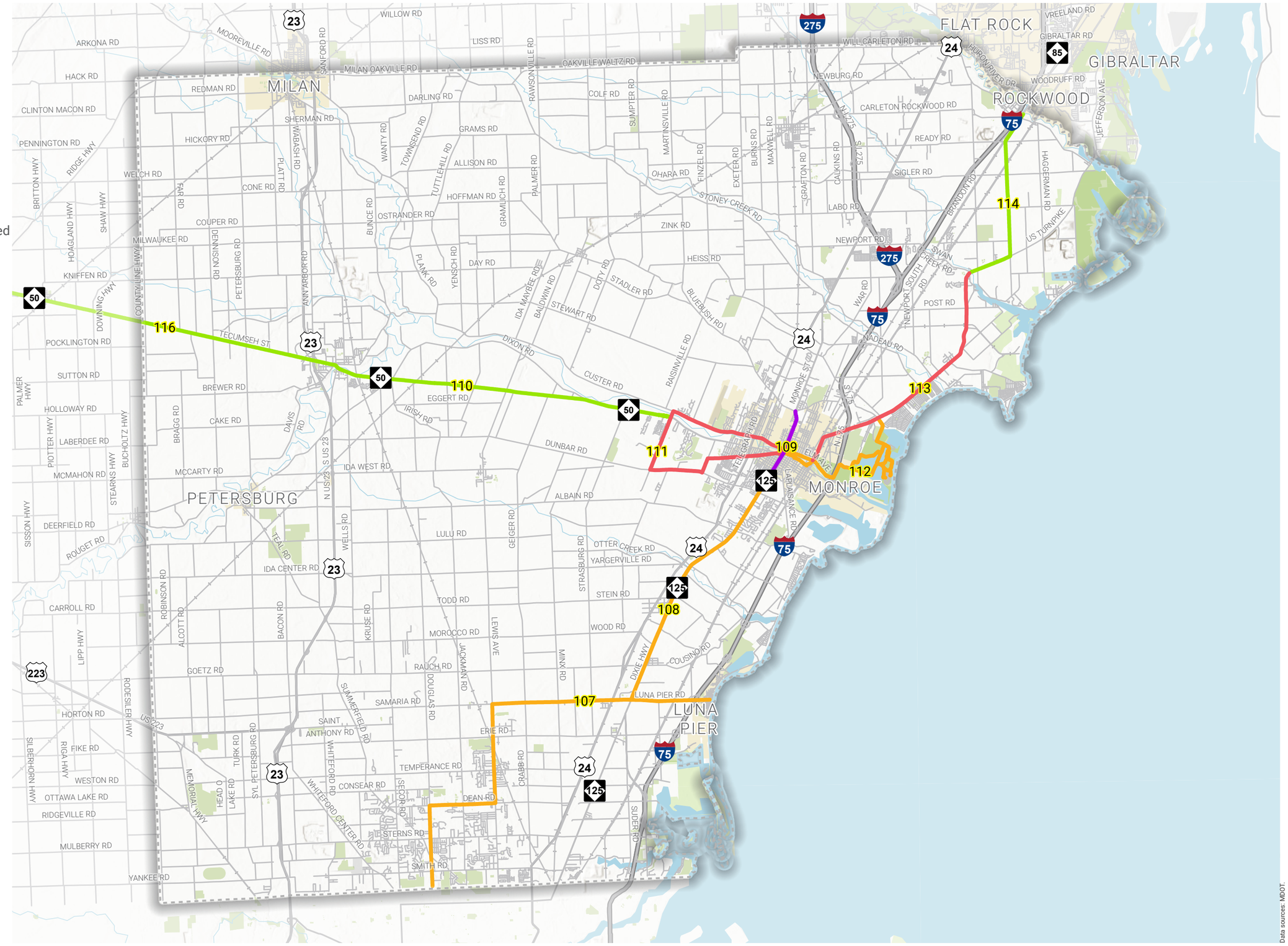


0 2 4 MILES

N

MDOT Michigan Department of Transportation

alta



Data sources: MDOT.

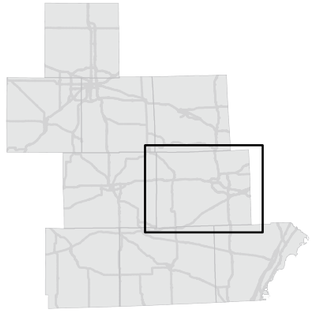
WASHTENAW COUNTY

STRATEGIC NETWORK

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UNIVERSITY REGION

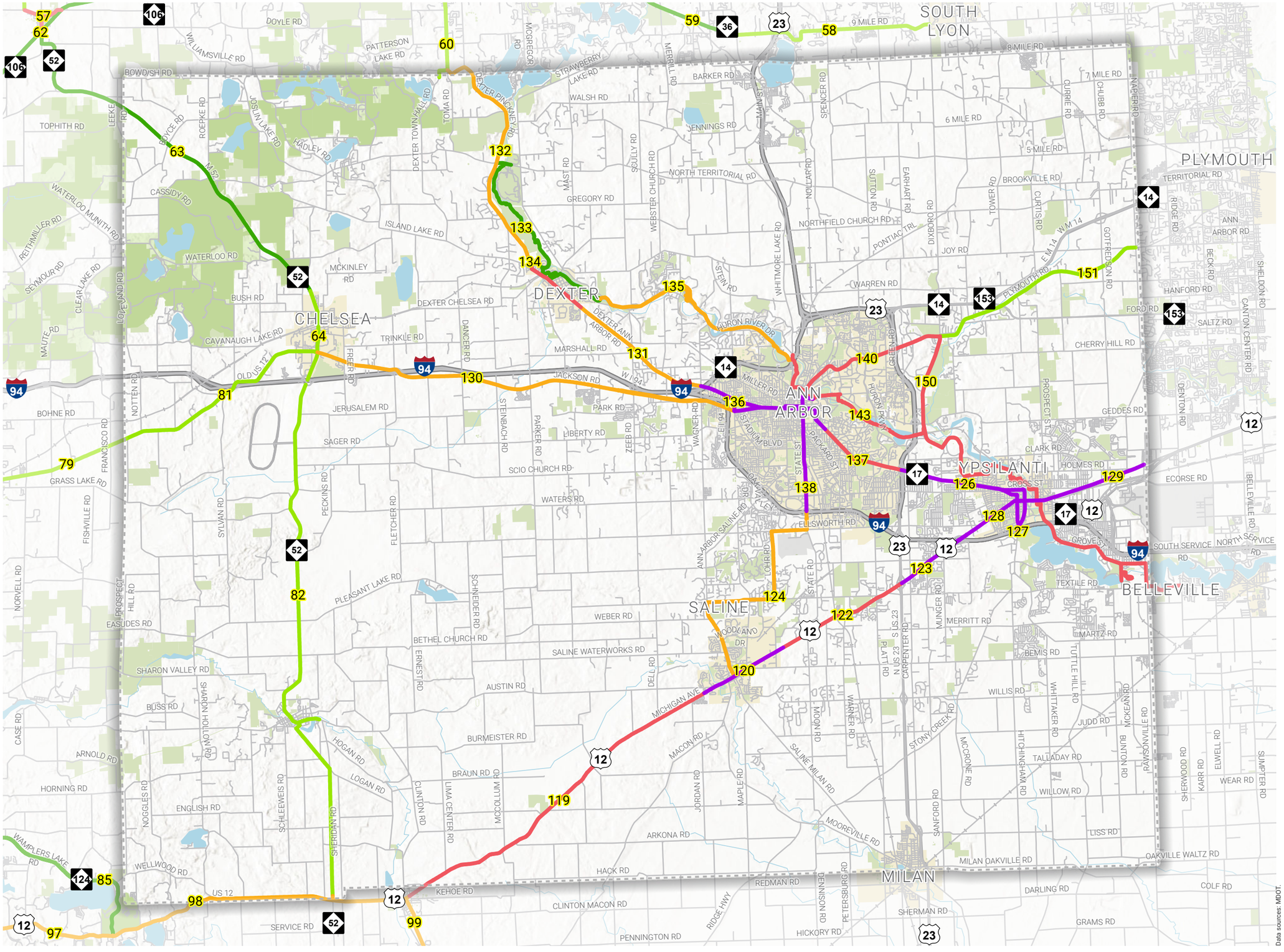


0 2 4 MILES

N

MDOT Michigan Department of Transportation

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Data sources: MDOT.

CorridorID	Composite Analysis Score	Ped_Safety_score (Crash Analysis)	Bike_Safety_score (Crash Analysis)	Ped_Demand_score	Bike_Demand_score	Equity_score	Bike_LTS_score	Ped_LTS_score (Soft Barriers Analysis)	County	ExistingFacility	PlannedFacility	HighwayNumber	AADT_max	AADT_min	FEDIRP	FENAME	FETYPE	FENAME2	FETYPE2	FENAME3	FETYPE3
2	25	2	1	4	4	4	5	5	Clinton County	Bike Lane / Paved Sh	NA	127, NA	13266	302	N	Whitmore	St	US 127 BR			
3	24	4	1	4	3	4	5	3	Clinton County	NA	NA	21	7579	302	E	Blue Water	Hwy	M 21		Blue Water	Hwy
4	15	4	3	2	2	2	1	1	Clinton County, Ionia Co	Shared-Use Path / Tr	NA	NA, 21	3966	118	N	Blue Water	Hwy	Bluewater	Hwy	M 21	
5	10	1	1	1	1	1	4	1	Clinton County	NA, Shared-Use Path	NA	100, 96, NA	38170	118	S	Grange	Rd	Grange	Rd	M 100	
6	15	1	3	2	3	1	4	1	Ingham County, Clinton	Shared-Use Path / Tr	NA, Bike Route, Bike L	NA	6398	150	S	Dewitt	Rd	Dewitt	Rd		
7	11	1	1	1	1	1	2	4	Clinton County	NA	NA	NA	2302	150	S	Shepardsville	Rd	Shepardsville	Rd		
8	12	2	1	1	1	2	4	1	Clinton County	NA	NA	NA	3222	150	E	Round Lake	Rd	Round Lake	Rd		
9	24	4	5	3	3	3	5	1	Ingham County, Clinton	NA, Shared-Use Path	NA, Bike Route	NA, 43	40035	150	S	Chandler	Rd	Chandler	Rd		
10	26	4	3	4	4	3	5	3	Eaton County, Clinton C	NA, Shared-Use Path	NA	100	12586	6258	N	Clinton	St	M 100			
12	25	5	1	4	4	1	5	5	Ingham County, Eaton C	Bike Lane / Paved Sh	Bike Lane / Paved Sho	43	28575	3292	W	Saginaw	Hwy	M 43	Rd	Saginaw	Hwy
13	17	1	2	3	3	1	4	3	Eaton County	NA, Bike Lane / Paved	NA, Shared-Use Path /	NA, 96	31577	649		Willow	Hwy				
14	18	1	1	4	5	5	1	1	Ingham County	NA, Bike Lane / Paved	NA, Shared-Use Path /	NA	3879	3879	N	Grand River	Ave				
15	32	4	3	5	5	5	5	5	Ingham County	NA, Bike Lane / Paved	Bike Lane / Paved Sho	43, NA	25612	615	E	Saginaw	St	M 43	Ct		
16	33	5	3	5	5	5	5	5	Ingham County	NA, Bike Lane / Paved	Bike Lane / Paved Sho	96	11468	615	N	Cedar	St	I 96 BL			
17	26	2	3	5	5	5	5	1	Ingham County	NA, Shared-Use Path	NA, Bike Lane / Paved	496	7991	556	W	Ottawa	St	Capitol Loop			
18	29	4	1	4	5	5	5	5	Ingham County	NA	Bike Lane / Paved Sho	99, 496, NA	42153	615	S	Martin Luther	Blvd	Capitol Loop	Fwy		
19	17	2	1	5	4	3	1	1	Ingham County	Shared-Use Path / Tr	NA	NA, 496, 127	19386	4529	E	E I 496/N US :	RAMP	Exit 8			
20	17	2	1	4	4	4	1	1	Eaton County, Ingham C	NA, Shared-Use Path	Shared-Use Path / Tra	NA	24986	196		Canadian Nat	Rd	Waverly	Rd		
21	15	2	1	2	3	2	4	1	Eaton County	Bike Lane / Paved Sh	NA, Shared-Use Path /	NA, 100, 27	24986	145	E	Vermontville	Rd	Canal	Rd		
22	16	2	1	1	1	3	5	3	Eaton County	NA, Bike Lane / Paved	NA	100	9003	4590	E	Hartel	Rd	M 100	Hwy		
23	28	5	5	3	3	2	5	5	Eaton County, Ingham C	Bike Lane / Paved Sh	NA, Shared-Use Path /	NA, 99	21611	145	N	Michigan	Rd	M 99	Hwy		
24	17	2	1	4	4	4	1	1	Ingham County	NA, Shared-Use Path	NA, Shared-Use Path /	NA, 127, 96	51775	196	N	Cedar	St	Holt	Rd		
25	14	1	1	5	3	2	1	1	Ingham County	NA, Shared-Use Path	NA	NA									
26	22	2	1	4	3	2	5	5	Ingham County	Bike Lane / Paved Sh	NA, Shared-Use Path /	43, NA	21827	556	E	Grand River	Ave	M 43	Dr		
27	13	1	1	1	1	1	5	3	Ingham County	NA, Bike Lane / Paved	NA	52	5570	214	E	Perry	Rd	M 52			
28	15	2	1	1	2	1	5	3	Ingham County	Bike Lane / Paved Sh	NA, Shared-Use Path /	52, 43	9080	4784	E	Grand River	Ave	M 43		M 43	
29	22	2	4	2	2	4	5	3	Ingham County	Bike Lane / Paved Sh	NA, Shared-Use Path /	NA, 52	7373	214	E	Grand River	Ave	Maple	Rd	M 52	
30	24	3	4	2	3	4	5	3	Livingston County, Ingha	NA	NA, Bike Route	NA	8914	6683	W	Grand River	Ave	Grand River	Rd		
32	15	1	3	1	1	3	5	1	Ingham County	NA, Bike Lane / Paved	NA, Shared-Use Path /	36, NA, 96	44095	214	E	Dansville	Rd	Dansville	Rd	M 36	Rd
33	18	3	4	3	2	4	1	1	Eaton County, Barry Cou	NA, Bike Lane / Paved	NA, Bike Route, Share	50, NA	5009	39	N	Nashville	Hwy	M 50			
34	12	1	3	1	1	1	4	1	Eaton County, Ingham C	Bike Lane / Paved Sh	NA, Shared-Use Path /	NA, 99	8092	198	W	Island	Hwy	College	Rd		
35	16	1	2	2	2	1	5	3	Eaton County	NA, Shared-Use Path	NA	99, NA	14067	2578	S	Michigan	Rd	M 99	Hwy	M 50	
36	11	1	1	1	1	2	4	1	Calhoun County, Eaton (	NA, Bike Lane / Paved	NA	NA	5126	39	E	Bellevue	Hwy	Bellevue	Hwy	US Highway 27	
37	13	2	1	1	1	2	5	1	Eaton County	NA, Bike Lane / Paved	NA, Bike Route	NA, 69	7619	145	S	Marshall	Rd	I 69 BL	Hwy		
38	32	4	4	5	5	4	5	5	Eaton County	NA, Bike Lane / Paved	NA, Bike Route	50, 69, 79	11627	250	W	Lawrence	Ave	I 69 BL			
41	21	1	3	2	3	2	5	5	Livingston County	NA	Bike Route, NA	NA	8914	8914	W	Grand River	Ave				
42	23	3	2	3	4	1	5	5	Livingston County	Shared-Use Path / Tr	NA, Shared-Use Path /	59, 96, NA	19346	278	E	Highland	Rd	M 59			
43	17	1	3	2	3	1	4	3	Livingston County	Shared-Use Path / Tr	NA	NA	22085	278	N	Latson	Rd	Hidden Trail			
44	16	3	1	2	2	1	4	3	Livingston County	NA, Bike Lane / Paved	NA, Shared-Use Path /	NA, 59	16151	278	N	Eager	Rd	M 59			
45	28	4	1	5	5	3	5	5	Livingston County	NA, Shared Lane Mar	NA, Shared-Use Path /	NA, 96, 155	14937	151	S	Michigan	Ave	D 19	Rd	Old M 155	
46	26	5	5	4	5	5	1	1	Livingston County	NA, Shared-Use Path	NA, Shared-Use Path /	96	21363	8148	E	Grand River	Rd	I 96 BL		Old M 155	
47	28	5	1	5	5	4	5	3	Livingston County	Bike Lane / Paved Sh	NA, Shared-Use Path /	96	11488	8148	W	Grand River	Ave	I 96 BL			
49	30	3	5	4	4	4	5	5	Livingston County	NA, Shared-Use Path	Shared-Use Path / Tra	NA, 96	24219	3927	E	Grand River	Ave	I 96 BL			
50	16	1	3	2	2	1	4	3	Livingston County	NA, Shared-Use Path	Bike Lane / Paved Sho	NA, 96	22085	8886	S	Latson	Rd	Nixon	Rd		
51	15	1	1	2	2	1	5	3	Livingston County	NA	NA, Bike Route	NA	14937	201	W	Pinckney	Rd	D 19			
52	15	3	3	3	3	1	1	1	Livingston County	NA, Shared-Use Path	NA, Shared-Use Path /	NA	12908	151	S	Bauer	Rd				
53	25	3	3	4	2	5	5	5	Livingston County	NA	Bike Route, NA	NA	22976	12460	E	Grand River	Ave				
56	16	1	3	1	1	2	5	3	Ingham County	Bike Lane / Paved Sh	NA, Shared-Use Path /	52, 36	7373	214	E	Stockbridge	Rd	Stockbridge	Rd	M 52	
57	27	3	3	5	4	4	5	3	Ingham County	Shared-Use Path / Tr	NA, Shared-Use Path /	52, 106	9169	81	E	Main	St	M 52	St		
58	17	1	3	2	2	1	5	3	Livingston County	NA, Shared-Use Path	NA, Shared-Use Path /	NA, 36, 23	62770	1582	E	9 Mile	Rd	9 Mile	Rd		
59	11	1	1	3	3	1	1	1	Livingston County	Shared-Use Path / Tr	NA, Shared-Use Path /	NA, 36	7224	151	E	Forest Creek	Ct	9 Mile	Rd		
60	16	3	1	3	3	3	2	1	Livingston County	NA, Shared-Use Path	NA	NA	5825	151	S	Toma	Rd				
61	11	1	3	1	1	3	1	1	Livingston County, Ingha	Shared-Use Path / Tr	NA, Bike Route	NA, 36	5099	151	W	LakeLands Sta	Trl	M 36			
62	13	1	1	3	4	2	1	1	Ingham County	Shared-Use Path / Tr	NA, Shared-Use Path /	NA	1018	81	S	LakeLands Sta	Trl	Water	St		
63	12	1	3	2	2	2	1	1	Washtenaw County, Jacl	Shared-Use Path / Tr	NA, Shared-Use Path /	52, NA, 106	12021	3632	S	M 52	Rd	Stockbridge Ch	Rd		
64	18	3	2	5	4	1	2	1	Washtenaw County	NA, Bike Lane / Paved	NA, Shared-Use Path /	52	16103	10583	W	Main	St	M 52	Rd		
69	18	3	2	1	1	3	5	3	Jackson County	NA, Bike Lane / Paved	NA, Bike Lane / Paved	106, 94, NA	62747	169	N	Cooper	St	M 106	St	M 106	
70	35	5	5	5	5	5	5	5	Jackson County	NA, Shared-Use Path	NA, Shared-Use Path /	50, NA, 94, 127	49352	10009	N	West	Ave	M 50		US 127 BR	
71	32	5	4	4	4	5	5	5	Jackson County	NA, Bike Lane / Paved	Bike Lane / Paved Sho	106, NA	12741	3606	E	Cooper	St	M 106			
72	34	4	5	5	5	5	5	5	Jackson County	NA, Shared-Use Path	NA, Bike Lane / Paved	94	15423	991	W	Louis Glick	Hwy	I 94 BL		M 50	
73	33	5	5	4	4	5	5	5	Jackson County	NA	Bike Lane / Paved Sho	94, 127	26800	343	E	Michigan	Ave	I 94 BL	St	US 127 BR	
74	29	3	3	4	4	5	5	5	Jackson County	NA, Shared-Use Path	NA, Bike Lane / Paved	50, 94	12553	991	S	Cooper	St	M 50	Ave	US 127 BR	
75	14	3	2	2	3	2	1	1	Jackson County	NA, Bike Lane / Paved	NA, Bike Lane / Paved	NA, 60	9117	169	W	Jackson Inter	St	M 60			
76	14	3	2	2	1	4	1	1	Jackson County	NA, Bike Route	Shared-Use Path / Tra	NA, 94	44072	169		Willis	Rd				
77	21	3	2	3	3	2	5	3	Jackson County	NA, Bike Lane / Paved	NA	NA, 94	8305	169	E	Michigan	Ave	Eastland	Rd		
78	17	1	3	3	3	5	1	1	Jackson County	NA, Shared-Use Path	NA, Shared-Use Path /	NA, 50, 127	21861	343	E	McDevitt	St	M 50	Ave	US 127 BR	St
79	16	1	2	2	2	1	5	3	Jackson County	NA, Bike Route, Bike I	NA, Shared-Use Path /	NA	6718	169	E	Michigan	Ave	Sarossy	Lk		
80	21	3	2	2	2	2	5	5	Jackson County	NA, Bike Lane / Paved	NA, Bike Lane / Paved	50, NA	8598	169	W	Brooklyn	Rd	M 50	Rd		
81	16	1	3	2	1	1	5	3	Washtenaw County	NA, Bike Route	NA	NA, 94, 52	45652	57		Old US 12	Rd	M 52			
82	17	3	2	1	1	2	5	3	Lenawee County, Washt	NA, Bike Lane / Paved	NA	52, NA	6690	57	E	M 52	Rd	Chelsea Manch	Rd		
83	26	1	4	3	4	4	5	5	Lenawee County, Jackso	NA, Bike Lane / Paved	NA, Bike Lane / Paved	NA, 50	9935	1597	N	Brooklyn	Rd	M 50			
84	23	5	2	3	2	3	5	3	Jackson County	NA, Shared-Use Path	NA, Bike Lane / Paved	NA	6986	169	N	Jefferson	Rd				
85	13	1	2	1	1	2	5	1	Jackson County, Lenawe	NA, Bike Lane / Paved	NA, Shared-Use Path /	NA	4292	1870	E	Wamplers Lak	Rd	M 124	Rd	Wamplers Lake	Rd
86	19	2	2	3	2	4	5	1	Hillsdale County, Calhou	Bike Lane / Paved Sh	NA	99, 49	3615	100		Homer	Rd	M 99	St	Homer	Rd
87	22	3	4	4	4	5	1	1	Hillsdale County	NA, Shared-Use Path	NA	99, 12	13693	5021	W	Olds	St	M 99	St		
88	35	5	5	5	5	5	5	5	Hillsdale County	NA, Shared-Use Path	NA	99	13456	291	W	Carleton	Rd	M 99			
89	22	3	5	1	1	4	5	3	Hillsdale County	NA, Shared-Use Path	NA, Shared-Use Path /	34, NA	6473	291	W	Hudson	Rd	M 34			
90	14	2	4	1	1	4	1	1	Hillsdale County, NA	NA	NA	NA, 34	3606	118	S	Tuttle	Rd	M 34			
91	23	3	2	3	2	5	5	3	Hillsdale County, Lenaw	NA, Shared-Use Path	NA	34	5585	3645	E	Main	St	M 34			
92	17	3	2	1	1	4	5	1	Lenawee County	NA	Shared-Use Path / Tra	NA, 223	14126	131	W	Cadmus	Rd				
93	22	2	4	2	2	4	5	3	Hillsdale County, Lenaw	NA, Bike Lane / Paved	NA	12	9975	118	E	Chicago	Rd	US 12			
94	21	2	4	1	1	5	5	3	Branch County, Hillsdale	NA	NA	12	9866	335	W	Chicago	Rd	US 12			
95	20	2	2	1	1	4	5	5	Lenawee County, Hillsda	Bike Lane / Paved Sh	NA	127	16554	13026	S	Meridian	Rd	US 127	Rd		
96	20	3	2	2	2	3	5	3	Lenawee County	Bike Lane / Paved Sh	NA	223, NA, 127	16211	131	N	US 223	Rd	US 223			
97	23	5	2	2	2	4	5	3	Lenawee County	Bike Lane / Paved Sh	NA, Shared-Use Path /	12	5300	131		US 12	Hwy	Old W M50/Sports Park			
98	23	5	4	2	2	2	5	3	Lenawee County, Washt	Bike Lane / Paved Sh	Shared-Use Path / Tra	12, NA, 52	11115	131	W	US 12	Ave	Michigan	Ave		
99	22	2	4	4	3	2	4	3	Lenawee County	NA, Shared-Use Path	NA, Shared-Use Path /	NA, 50	9276	226	N	Tecumseh Clii	St	M 50			
100	27	3	2	5	4	3	5	5	Lenawee County	NA, Shared-Use Path	NA	50	13709	8054	W	Chicago	Blvd	M 50			
101	18	3	4	3	3	3	1	1	Lenawee County	NA, Shared-Use Path	NA, Shared-Use Path /	223, NA	12102	478	W	Kiwanis	Trl				
102	30	5	4	4	4	5	5	3	Lenawee County	NA, Bike Lane / Paved	Shared-Use Path / Tra	223, NA	7966	6165	W	Maumee	St	US 223 BR			
103	33	5	3	5	5	5	5	5	Lenawee County	NA, Shared-Use Path	Shared-Use Path / Tra	34, 52, NA	14957	6599	W	Beecher	St	M 52			
105	22	4	2	4	2	4	5	1	Lenawee County	NA	NA	NA	3818	1488	W	North	St	M 156			
107	22	2	4	3	2	3	5	3	Monroe County	NA, Bike Lane / Paved	NA	NA, 125, 75	8013	1718	W	Lewis	Rd	Lakeside	Rd	Interstate 75	

108	23	4	3	2	2	4	5	3	Monroe County	NA	NA	125	13401	2220	S	Dixie	Hwy	M 125		State Highway 125
109	34	5	5	5	5	4	5	5	Monroe County	NA	NA	125	16927	13401	N	Monroe	St	M 125	St	State Highway 125
110	18	4	3	1	1	1	5	3	Monroe County	Bike Lane / Paved Sh	NA	50, NA	16865	7735	S	Custer	Rd	M 50		State Highway 50
111	24	2	3	4	4	4	4	3	Monroe County	NA, Bike Route, Bike	NA	125, NA, 50	10822	769	W	Custer	Rd	Seventh	St	State Highway 125
112	22	5	3	4	5	3	1	1	Monroe County	Shared-Use Path / Tr	NA	75, NA	64615	506	E	Elm	Ave	Detroit-Toledo	Freeway	Interstate 75
113	28	3	5	4	3	3	5	5	Monroe County	Bike Lane / Paved Sh	NA	NA, 75	64615	125	N	Dixie	Hwy	Detroit-Toledo	St	Interstate 75
114	16	2	5	1	1	2	4	1	Monroe County	NA	NA	NA	3142	125	N	Dixie	Hwy			
116	18	3	2	1	1	3	5	3	Lenawee County, Monr	NA, Bike Lane / Pave	NA	50	16865	4586	E	Monroe	Rd	M 50	Rd	State Highway 50
119	24	5	4	1	1	3	5	5	Lenawee County, Washt	NA	NA	12	11115	10059	W	Michigan	Ave	US 12		
120	29	4	4	4	4	3	5	5	Washtenaw County	NA	NA	12	23085	10059	E	Michigan	Ave	US 12		
122	28	4	5	3	4	2	5	5	Washtenaw County	NA, Shared-Use Path	NA	12	23158	20219	E	Michigan	Ave	US 12		
123	32	4	5	4	4	5	5	5	Washtenaw County	NA, Bike Lane / Pave	NA	12, 94, NA	95924	16371	W	Michigan	Ave	US 12		
124	22	4	4	3	4	1	5	1	Washtenaw County	NA, Bike Lane / Pave	NA	NA, 94	68653	3588	W	Lohr	Rd	Ellsworth	Rd	
126	35	5	5	5	5	5	5	5	Washtenaw County	Shared-Use Path / Tr	NA	17, 94	29383	18188	N	Washtenaw	Ave	M 17		
127	35	5	5	5	5	5	5	5	Washtenaw County	NA, Shared-Use Path	NA	12, 94, 17	95924	709	S	Huron	St	M 17		
129	35	5	5	5	5	5	5	5	Washtenaw County	NA	NA	12, NA	13376	11534	E	Michigan	Ave	US 12 BR		
130																				
131	20	2	4	2	3	1	5	3	Washtenaw County	Bike Lane / Paved Sh	NA	NA	6902	190	N	Dexter Ann Ar	Rd			
133	15	4	2	3	3	1	1	1	Washtenaw County	Shared-Use Path / Tr	NA, Shared-Use Path /	NA	7362	709		Hudson Mills	St			
135	21	2	5	3	3	2	5	1	Washtenaw County	Shared-Use Path / Tr	NA, Shared-Use Path /	NA	6902	190	N	Huron River	Dr			
137	28	5	5	5	5	2	1	5	Washtenaw County	NA, Shared-Use Path	NA	94, NA	29383	709	E	Washtenaw	Ave	I 94 BL		
140	25	5	5	5	5	3	1	1	Washtenaw County	Shared-Use Path / Tr	NA	NA	24867	709	N	Plymouth	Rd			
150	26	2	5	4	4	3	5	3	Washtenaw County	Bike Lane / Paved Sh	NA	NA	15399	190	N	Dixboro	Rd	Dixboro	Rd	
152	26	5	4	5	5	5	1	1	Ingham County	NA, Shared-Use Path	Bike Route, NA, Share	NA, 496	48246	615	E	Cesar Chavez	St	Olds	Fwy	

Appendix K – Online Engagement Summary

Online Survey Summary

Between June and December 2024, MDOT and Alta Planning + Design conducted a public survey to better understand active transportation behaviors, barriers, and priorities across the University Region. A total of 118 responses were received. Respondents included a wide demographic range of residents, with a mix of ages, income levels, and personal mobility needs. The results provide rich qualitative and quantitative data to inform infrastructure investments, policy development, and future planning efforts.

The survey aimed to gather insights into:

- Current and desired use of active transportation
- Motivations and deterrents
- Infrastructure preferences and gaps
- Safety and comfort concerns
- Community-specific barriers
- Values and priorities related to walking, biking, and rolling

Key Findings

Demand for More Active Transportation

While current daily use of active modes (walking, biking, rolling) is modest, many respondents expressed a strong desire to use these modes more frequently. 116 respondents indicated a strong interest in increasing their frequency of use—particularly for walking and biking—highlighting a gap between current habits and desired behavior.

Respondents cited multiple motivations for walking and biking. Out of 117 respondents:

- Over 90 selected recreation and fitness
- More than 60 indicated saving money
- 55 selected environmental reasons

Additional open-ended responses emphasized mental health benefits, enjoyment, and accessibility for those who don't drive.

Barriers to Use

Among 116 respondents, the most cited issues included:

- Safety from motor vehicles (93 selections)
- Poor condition or availability of pedestrian infrastructure (77)
- Lack of winter maintenance (71)
- Personal safety concerns (e.g., harassment or crime) (66)
- Poor lighting and noise from traffic (50+)

Infrastructure Use and Needs

Facility Preferences

Of the 117 who responded:

- Most reported using neighborhood streets or roads without infrastructure due to the absence of sidewalks, bike lanes, or trails.
- Trails and multi-use paths were frequently used when available, though several respondents described gaps or unsafe transitions between them.
- Comments mentioned gravel roads, state highways, and unprotected shoulders as common, though often potentially undesired, routes.

Maintenance and Comfort

More than 70 respondents selected lack of maintenance or comfort-related features (e.g., shade, benches) as barriers. Snow and ice, particularly, were noted by over 60 individuals as deterrents to year-round travel.

Safety Concerns

Safety ranked as a top concern across multiple questions:

- 93 respondents specifically selected safety from vehicles as a major barrier (Q5)
- 75 respondents elaborated in open-ended comments (Q6), describing personal or family experiences with near-misses, dangerous intersections, and inadequate pedestrian infrastructure

Many called for lower speeds, safer crossings, and designs that prioritize vulnerable road users.

Desired Improvements

Of 116 respondents to the question about community priorities:

- 94 rated lower driving speeds as “very important”
- 92 selected creating separated spaces for walking and biking
- 87 prioritized better crosswalks and intersection improvements
- 73 emphasized year-round maintenance
- 66 chose increased connections to transit and trails

Additional written comments stressed improved trailhead access, inclusive training programs, and improved public transit frequency.

Geographic Insights

65 respondents used the open-ended field to describe specific locations they find challenging for walking and biking. Frequently cited locations included:

- Brighton Lake Road (4 mentions)
- Grand River Avenue (2 mentions)
- Washtenaw Avenue, Cedar Street, Downtown Howell, MSU Campus, and Monroe County roads (1–2 mentions each)

Several locations were described as unsafe due to high traffic speeds, lack of crossings, or missing infrastructure.

Equity, Inclusion, and Long-Term Vision

Themes of equity and inclusive design were prominent in the 43 responses to the final open-ended question (Q9):

- Respondents highlighted the importance of serving non-drivers, including seniors, youth, and people with disabilities
- There were specific calls for ADA-compliant sidewalks, accessible trailheads, and equitable distribution of funding across rural and urban areas
- A few noted historical impacts of highway infrastructure (e.g., I-496 dividing communities in Lansing)

Several respondents advocated for bold, future-focused solutions like trail-based commuting, repurposing rail corridors, and building car-free connections between cities

Demographics of Respondents

- Age: Of 114 responses, a majority were between 35–64, with 14% over 65
- Gender: Among 103 responses, most identified as female or male, with a few identifying as non-binary
- Disability: 113 respondents answered, with over 10% indicating a temporary or permanent condition that affects their mobility
- Income: 112 responses showed a broad income range; roughly one-third reported household incomes under $50,000
- Race/Ethnicity: Among 109 responses, most identified as White, with small but important representation of Black, Hispanic/Latinx, Asian, and multiracial residents
- Zip Codes: 108 participants provided valid zip codes, with clustering in Ann Arbor (48103, 48104), Ypsilanti (48197, 48198), Howell (48843, 48116), and Monroe County

Online Input Map Summary

An interactive web map was launched as part of the MDOT University Region Active Transportation Plan to collect geographically specific feedback on walking, biking, and rolling across the region. The map was live during the same engagement period as the survey (June–December 2024) and allowed users to place comments on specific locations.

A total of over 361 comments were received across eight counties in the University Region.

Key Themes & Findings

Safety and Access Barriers

Barriers were the most common type of comment across nearly every county. In total:

- More than 110 barriers were identified, primarily along high-speed roads, across highway interchanges, and in areas lacking sidewalks or bike lanes.
- Frequent issues included narrow shoulders, missing crosswalks, unsafe intersections, and driver behavior.

Demand for New Routes

Across counties, nearly 100 comments were marked as routes needed, indicating widespread interest in better connectivity:

- Respondents called for regional trail connections, side paths along arterials, and safer links to schools and downtowns.
- Many requested that gravel routes and rail corridors be formalized into bikeways or shared-use paths.

Popular Destinations

There were at least 55 destination comments, identifying places people want or try to access by foot or bike, such as:

- Grocery stores
- Parks and beaches
- Schools and downtown cores
- Recreational trailheads

Existing Infrastructure Observations

Roughly 40 comments were related to existing facilities:

- Some identified gaps in trail data or outdated infrastructure
- Others acknowledged recent improvements (e.g., road diets or park paths)
- A few praised gravel paths and park trails that already support safe walking and biking

County-by-County Summary

Clinton County

- Barriers/Destinations: 1 bicycle destination at Saginaw Hwy & Marsh Rd (dangerous intersection)
- Infrastructure Needs: Wider shoulders along Wright Rd, connections to schools

Eaton County

- Bicycling: 9 (4 destinations, 5 barriers), focused on lack of bike infrastructure along W Saginaw Hwy
- Existing Infrastructure: 7, noting recreational vs. shared-use trails and recent improvements
- Routes Needed: 2, including Dimondale–Lansing Trail link via rail corridor

Hillsdale County

- Bicycling & Routes Needed: Comments focused on gaps between towns and within Jonesville

Ingham County

- Bicycling: 23 (10 destinations, 13 barriers), especially in Lansing; Grand River and Saginaw cited multiple times
- Walking: 5, calling for sidewalks/crossings near schools

- Existing Infrastructure: 14, including network gaps and canoe/kayak signage
- Routes: 22 (20 needed, 2 work well), with calls for protected bike lanes and better crossings

Jackson County

- Bicycling: 2 destinations focused on trips to stores
- Walking: 1, noting sidewalk absence on a key route
- Infrastructure: 3, including signage and missing trails
- Routes Needed: 4, connecting neighborhoods to libraries, schools, and grocery stores

Lenawee County

- A single comment requesting a path between Adrian and Clayton

Livingston County

- Bicycling: 13 (6 destinations, 7 barriers); overpasses and lack of rural-urban connections cited
- Walking: 17 (14 destinations, 3 barriers), mostly in Brighton
- Routes: 16 (12 needed, 4 work well), especially regional routes and school access
- Infrastructure: 2 comments misidentifying proposed paths as existing

Monroe County

- Bicycling: 9 (8 destinations, 1 barrier), focusing on connections to the beach, neighborhoods, and Monroe
- Walking: 2 destinations, including sidewalk access and a proposed footbridge
- Infrastructure: 3, including safety outside neighborhoods and existing trail conditions

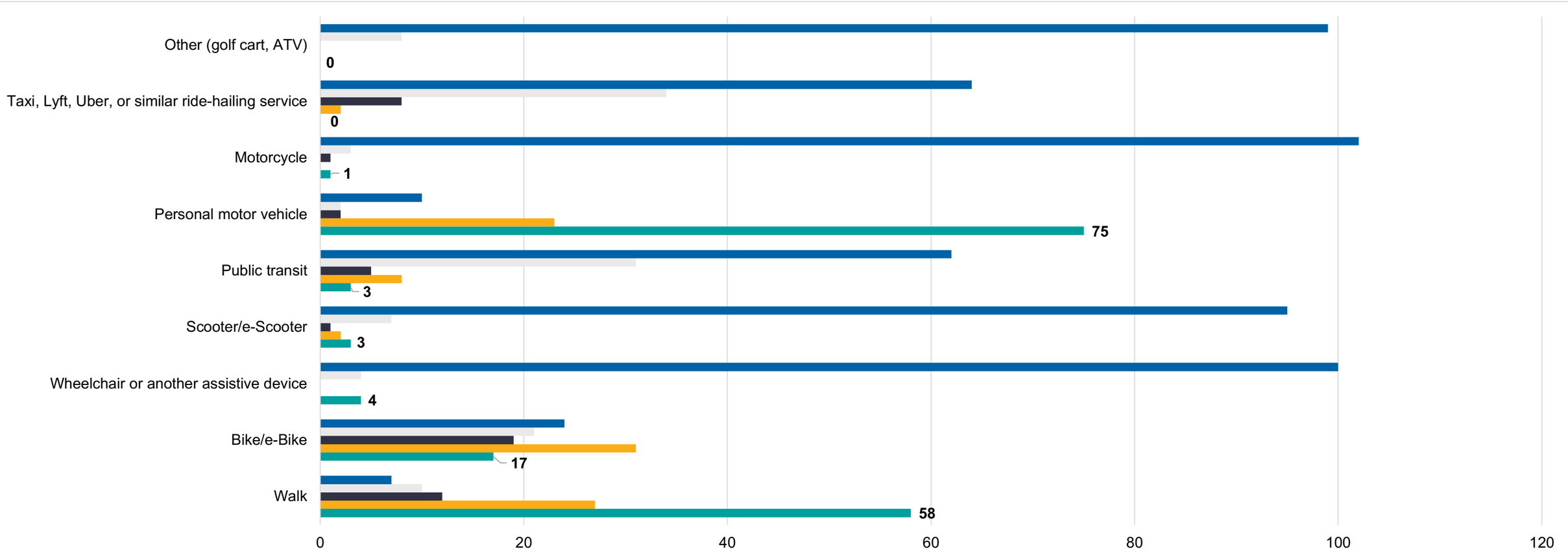
Washtenaw County

- Bicycling: 38 (7 destinations, 31 barriers), mostly in Ann Arbor and near I-94
- Walking: 23 (20 barriers, 3 destinations), with concerns on major corridors and downtown Ypsilanti
- Routes: 87 (56 needed, 31 work well); requested connections spanned rural and urban areas, including schools and key corridors
- Infrastructure: 9, mostly related to data accuracy and gaps

Appendix L – Online Survey Results

Question 1: How often do you TYPICALLY use the following transportation options to get around your community, regardless of trip purpose?

Answered 117
Skipped 1

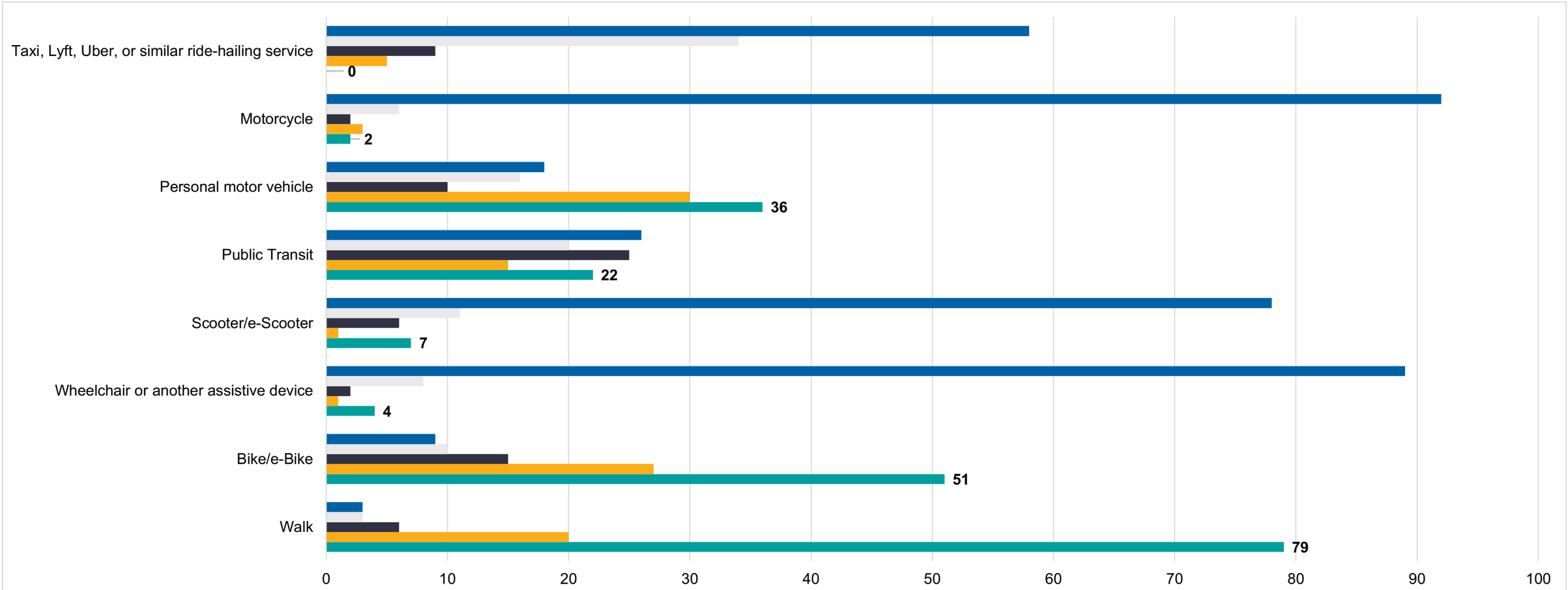


	Walk	Bike/e-Bike	Wheelchair or another assistive device	Scooter/e-Scooter	Public transit	Personal motor vehicle	Motorcycle	Taxi, Lyft, Uber, or similar ride-hailing service	Other (golf cart, ATV)
Never	7	24	100	95	62	10	102	64	99
Rarely	10	21	4	7	31	2	3	34	8
A few times a month	12	19	0	1	5	2	1	8	0
A few times a week	27	31	0	2	8	23	0	2	0
Daily	58	17	4	3	3	75	1	0	0

Question 1 Responses. Note: Data labels are shown only for the count of respondents who selected "Daily" under each transportation mode.

Question 2: How often do you WANT to use the following transportation options to get around your community, regardless of trip purpose?

Answered 116
Skipped 2

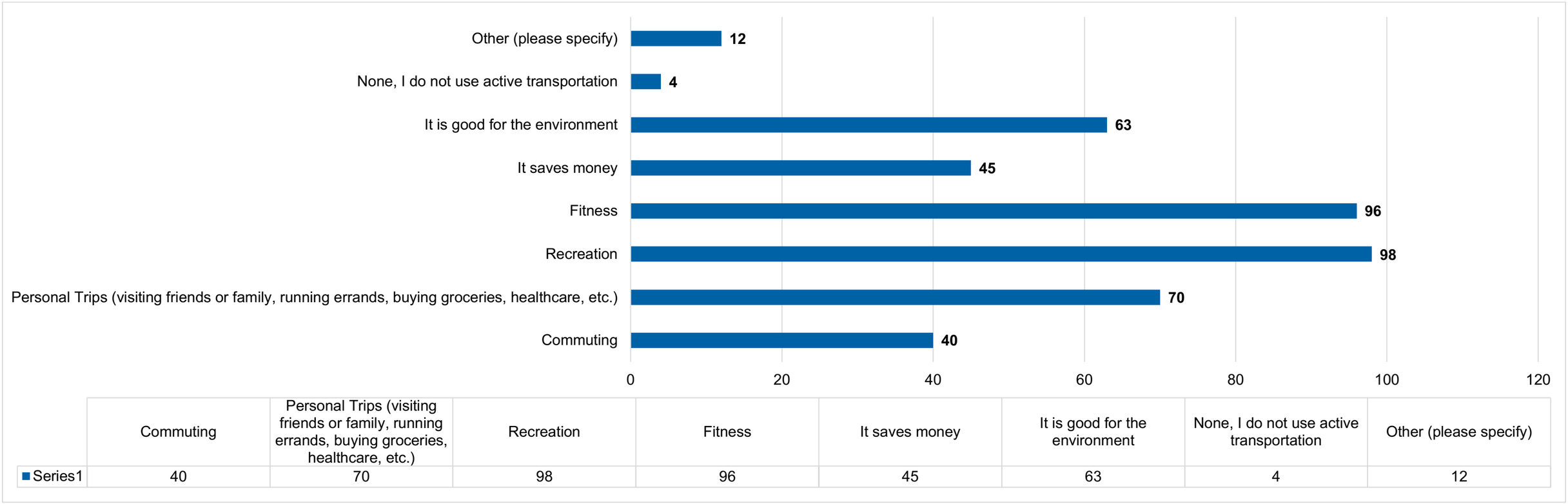


	Walk	Bike/e-Bike	Wheelchair or another assistive device	Scooter/e-Scooter	Public Transit	Personal motor vehicle	Motorcycle	Taxi, Lyft, Uber, or similar ride-hailing service
Never	3	9	89	78	26	18	92	58
Rarely	3	10	8	11	20	16	6	34
A few times a month	6	15	2	6	25	10	2	9
A few times a week	20	27	1	1	15	30	3	5
Daily	79	51	4	7	22	36	2	0

Question 2 Responses. Note: The "Daily" desire-to-use category includes individual data labels for each transportation mode

Question 3: Why do you walk, bike, and roll? Check all that apply.

Answered 117
Skipped 1



	Commuting	Personal Trips (visiting friends or family, running errands, buying groceries, healthcare, etc.)	Recreation	Fitness	It saves money	It is good for the environment	None, I do not use active transportation	Other (please specify)
Series1	40	70	98	96	45	63	4	12

Question 3 Responses

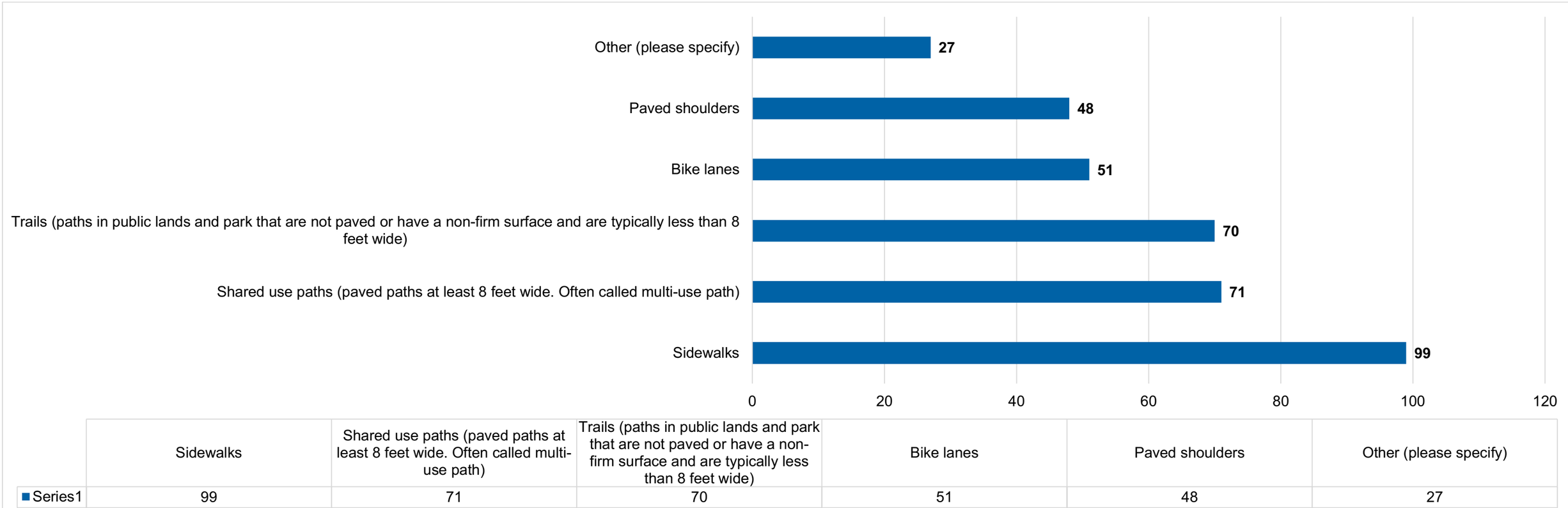
Additional Comments

Respondents shared a variety of personal and practical motivations for choosing active transportation that expand beyond standard survey options:

- Mental and Emotional Well-being: Several participants emphasized the mental health benefits of walking, biking, and rolling. These modes were seen as ways to reduce stress, improve mood, and avoid the frustrations of driving.
- Lack of Driving Access: A few individuals noted they use active transportation because they cannot drive or were without access to a car, making walking or biking their only viable option.
- Enjoyment and Connection to Place: Respondents described walking and biking as enjoyable alternatives to driving that foster a stronger connection to their community and surroundings. These modes were viewed as more engaging, fun, and fulfilling ways to travel.
- Commuting and Convenience: Some respondents use active transportation for commuting or daily travel because it's practical, affordable, and convenient—offering benefits such as easier parking and flexible travel options when infrastructure supports it.

Question 4: What type of facility do you typically walk, bike, and roll on? Check all that apply.

Answered 117
Skipped 1



	Sidewalks	Shared use paths (paved paths at least 8 feet wide. Often called multi-use path)	Trails (paths in public lands and park that are not paved or have a non-firm surface and are typically less than 8 feet wide)	Bike lanes	Paved shoulders	Other (please specify)
Series1	99	71	70	51	48	27

Question 4 Responses

Additional Comments

Respondents identified a variety of facilities—often informal or undesignated—that they rely on in the absence of dedicated infrastructure:

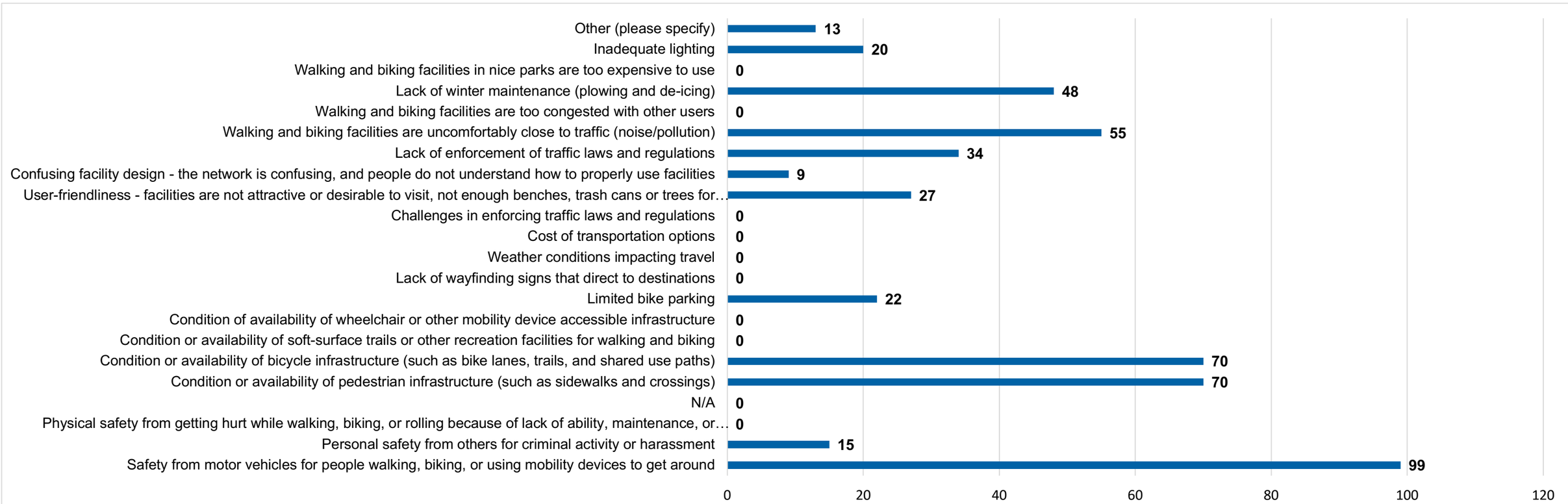
- Roads Without Infrastructure: Many participants reported using standard roadways with no sidewalks, bike lanes, or paved shoulders. These include rural highways, high-speed local roads, and township roads signed at 55 mph.
- Gravel and Dirt Roads: Several respondents walk or bike on gravel or dirt roads, including those with little to no separation from fast-moving vehicle traffic.
- Neighborhood and Subdivision Streets: Low-traffic residential roads and subdivisions were frequently used as default walking and biking routes, especially where safer facilities are lacking.
- Workarounds and Transitions: Respondents noted needing to use unsafe or “spicy” segments (e.g., high-traffic or narrow areas) to connect to safer facilities, indicating a need for improved connectivity.
- Main Roads and Highways: A few individuals stated they bike on major roads like M-59 or Grand River due to necessity or comfort with traffic, particularly where no other options exist.
- Roadside Margins: Some walk or bike directly on the side of the road where no shoulders or paths exist, often out of necessity.

Question 5: What are the biggest issues you face walking and biking in your community? Select all that apply.

Answered	116
Skipped	2

Full list of choices for Question 5:

- Other (please specify)
- Inadequate lighting
- Walking and biking facilities in nice parks are too expensive to use
- Lack of winter maintenance (plowing and de-icing)
- Walking and biking facilities are too congested with other users
- Walking and biking facilities are uncomfortably close to traffic (noise/pollution)
- Lack of enforcement of traffic laws and regulations
- Confusing facility design - the network is confusing, and people do not understand how to properly use facilities
- User-friendliness - facilities are not attractive or desirable to visit, not enough benches, trash cans or trees for shade to make walking, biking, or rolling appealing
- Challenges in enforcing traffic laws and regulations
- Cost of transportation options
- Weather conditions impacting travel
- Lack of wayfinding signs that direct to destinations
- Limited bike parking
- Condition of availability of wheelchair or other mobility device accessible infrastructure
- Condition or availability of soft-surface trails or other recreation facilities for walking and biking
- Condition or availability of bicycle infrastructure (such as bike lanes, trails, and shared use paths)
- Condition or availability of pedestrian infrastructure (such as sidewalks and crossings)
- N/A
- Physical safety from getting hurt while walking, biking, or rolling because of lack of ability, maintenance, or flawed roadway design.
- Personal safety from others for criminal activity or harassment
- Safety from motor vehicles for people walking, biking, or using mobility devices to get around



	Safety from motor vehicles for people walking, biking, or using mobility devices to get around	Personal safety from others for criminal activity or harassment	Physical safety from getting hurt while walking, biking, or rolling because of lack of ability, maintenance, or flawed roadway design.	N/A	Condition or availability of pedestrian infrastructure (such as sidewalks and crossings)	Condition or availability of bicycle infrastructure (such as bike lanes, trails, and shared use paths)	Condition or availability of soft-surface trails or other recreation facilities for walking and biking	Condition of availability of wheelchair or other mobility device accessible infrastructure	Limited bike parking	Lack of wayfinding signs that direct to destinations	Weather conditions impacting travel	Cost of transportation options	Challenges in enforcing traffic laws and regulations	User-friendliness - facilities are not attractive or desirable to visit, not enough benches, trash cans or trees for shade to make walking, biking, or rolling appealing	Confusing facility design - the network is confusing, and people do not understand how to properly use facilities	Lack of enforcement of traffic laws and regulations	Walking and biking facilities are uncomfortably close to traffic (noise/pollution)	Walking and biking facilities are too congested with other users	Lack of winter maintenance (plowing and de-icing)	Walking and biking facilities in nice parks are too expensive to use	Inadequate lighting	Other (please specify)
Series1	99	15	0	0	70	70	0	0	22	0	0	0	0	27	9	34	55	0	48	0	20	13

Question 5 Responses

Additional Comments

Respondents highlighted several concerns not fully captured by predefined survey options:

- Lack of Countywide Planning and Support: Some noted the absence of a comprehensive non-motorized transportation plan supported by county leadership and coordinated with local municipalities.
- Gaps in Connectivity: Several respondents emphasized that their small communities lack safe and continuous connections to nearby villages, cities, or regional facilities.
- Inadequate Infrastructure: Comments pointed to a complete lack of bike lanes in certain counties (e.g., Livingston County), despite high demand for biking.
- Maintenance Issues: Seasonal concerns such as summer debris on road shoulders and general lack of maintenance were cited as barriers to safe biking.
- Traffic Safety and Driver Behavior: Distracted driving, road rage, and unsafe motorist behavior were commonly mentioned as major deterrents to walking and biking.
- Design Barriers: Respondents called for more active transportation-specific design that prioritizes walking and biking over motor vehicle use in terms of speed, directness, and comfort—especially for less confident users.
- Facility Comfort and Accessibility: Beyond physical safety, several noted that infrastructure should be more inviting and comfortable for cautious or less experienced users. One respondent also noted the importance of accessible parking for individuals with disabilities to reach public trails.
- Inappropriate Use of Infrastructure: One comment raised concern about cyclists using sidewalks when bike lanes are available, which can create conflicts with pedestrians.

Question 6: Tell us about why you care about the transportation issues you selected. (Open Ended)

Answered	75
Skipped	43

Several key themes emerged to this open-ended survey question asking why they care about the transportation issues they selected:

Personal and Community Safety
Many respondents expressed significant concern over the safety of walking and biking due to high-speed traffic, inadequate separation from vehicles, and lack of infrastructure. Numerous individuals shared personal experiences involving near-misses, injuries, or crashes, including children and individuals with disabilities. The need for safer sidewalks, crossings, and bike lanes—especially around schools, parks, and neighborhoods—was expressed frequently.

Health and Quality of Life
Respondents emphasized the physical and mental health benefits of active transportation. Walking and biking were described not just as transportation modes but as essential to fitness, daily enjoyment, stress relief, and maintaining mobility with age. Several mentioned how a well-connected, walkable or bikeable community contributes to a higher quality of life and allows people to remain active longer.

Environmental Responsibility
A recurring theme was the importance of sustainable transportation options for reducing emissions and car dependency. Participants linked the expansion of active transportation infrastructure to environmental preservation, reduced traffic congestion, and the opportunity to lower individual carbon footprints.

Equity, Access, and Inclusion
Many participants pointed out that not everyone can drive—citing seniors, youth, people with disabilities, and those without access to a car. Respondents highlighted the need to build transportation systems that prioritize the needs of these more vulnerable users. Some noted that car-centric development benefits more privileged groups and contributes to systemic inequities.

Connectivity and Infrastructure Gaps
Numerous responses referenced incomplete or disconnected pedestrian and bicycle networks that force people to drive short distances or travel unsafe routes. Respondents expressed frustration with missing sidewalks, disconnected trails, and the inability to access nearby parks, schools, or downtown areas without a car. Comparisons were made to nearby communities with better-connected infrastructure.

Desire for a Shift in Planning Priorities
Several participants criticized traditional planning approaches focused on personal vehicle use and called for a cultural shift toward more human-centered mobility. Respondents advocated for expanded investment in shared-use paths, trail maintenance, and improved integration of transit with active modes.

Economic and Community Value
Respondents noted that walkable, bikeable communities are more attractive places to live and support local businesses and tourism. Some emphasized the long-term cost savings of building and maintaining non-motorized infrastructure relative to vehicle infrastructure, and the broader public health cost of failing to do so.

Question 7: Are there places where you feel it is particularly challenging to walk and bike? If so, please describe the location using the input map linked here or describe in the text box below.

Answered	65
Skipped	53

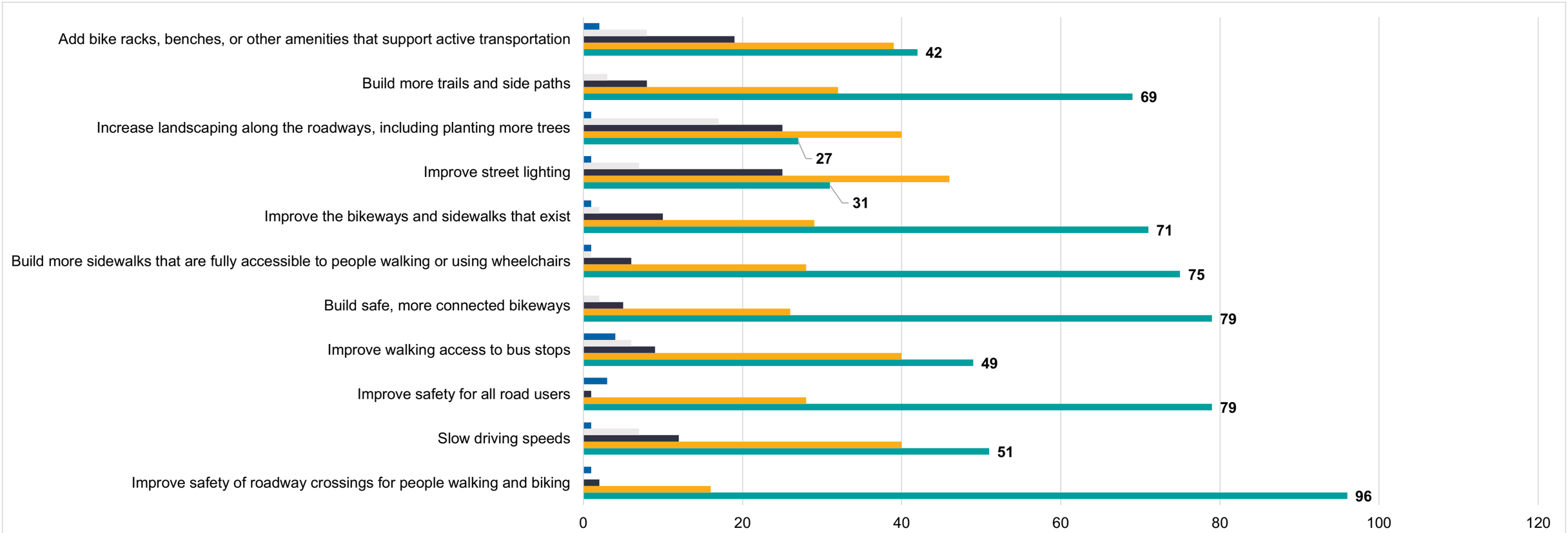
Places Mentioned:

- Brighton Lake Road – 4 mentions
- Lansing - Cedar St – 1 mention
- Grand River Avenue / Ave – 2 mentions
- MSU Campus – 1 mention
- Frandor Strip Mall – 1 mention
- Webberville – 1 mention
- Williamstown – 1 mention
- Leroy – 1 mention
- Locke – 1 mention
- Williamston – 1 mention
- Mason – 1 mention
- Lake Lansing – 1 mention
- Hogsback Rd – 1 mention
- Kerns Rd – 1 mention
- Howell Rd – 1 mention
- Charlotte – 1 mention
- Potterville – 1 mention
- Creytes – 1 mention
- Coolidge Rd – 1 mention
- Carpenter Rd – 1 mention
- Larch St – 1 mention
- Eisenhower – 1 mention
- State trunkline arterials – 1 mention
- State-owned trunklines and highways – 1 mention
- Washtenaw – 1 mention
- North Main – 1 mention
- Jackson – 1 mention
- MDOT trunklines – 1 mention
- Williams Street – 1 mention
- North Territorial Road – 1 mention
- Marion Township – 1 mention
- Howell Township – 1 mention
- Oak Grove – 1 mention
- City of Howell – 1 mention
- Great Lakes to Lakes Route 1 1 mention
- Pennsylvania – 1 mention
- S. Washington – 1 mention
- Canal – 1 mention
- Ypsilanti – 1 mention
- Ecorse Rd – 1 mention
- Holmes – 1 mention
- Michigan Avenue – 1 mention
- Textile Road – 1 mention
- Whittaker – 1 mention
- Merritt – 1 mention
- Hitchingham – 1 mention
- Washtenaw Ave – 1 mention
- City of Monroe – 1 mention
- Willis Rd – 1 mention
- South Monroe – 1 mention
- Telegraph Road – 1 mention
- Raisinville Road – 1 mention
- Monroe Community College – 1 mention
- Lansing Road – 1 mention
- Dimondale – 1 mention
- Milan – 1 mention

Question 8: There are many ways to make our community safer and more comfortable to walk and roll in. How important are each of these goals for your community?

Answered 116

Skipped 2



	Improve safety of roadway crossings for people walking and biking	Slow driving speeds	Improve safety for all road users	Improve walking access to bus stops	Build safe, more connected bikeways	Build more sidewalks that are fully accessible to people walking or using wheelchairs	Improve the bikeways and sidewalks that exist	Improve street lighting	Increase landscaping along the roadways, including planting more trees	Build more trails and side paths	Add bike racks, benches, or other amenities that support active transportation
I'm not sure	1	1	3	4	0	1	1	1	1	0	2
Not at all important	0	7	0	6	2	1	2	7	17	3	8
Not very important	2	12	1	9	5	6	10	25	25	8	19
Somewhat important	16	40	28	40	26	28	29	46	40	32	39
Very important	96	51	79	49	79	75	71	31	27	69	42

Question 8 Responses. Note: Count of responses for "Very important" per category show data labels.

Additional Comments

Respondents offered a range of thoughtful additions to the list of goals for improving safety and comfort when walking and rolling. Key themes include:

Infrastructure and Design Enhancements

- Physical Separation: Comments stressed the need for bollards, curbs, and trees to physically separate non-motorized users from vehicles—beyond painted lines.
- Road Redesign: Suggestions included road diets and redesigning streets with active mobility as a priority.
- Major Road and Freeway Crossings: Improved pedestrian and bike access across interchanges and wide roads was highlighted.
- Greenways and Wider Paths: Respondents called for accessible greenways that connect communities and accommodate users with mobility devices.
- Winter Maintenance: Keeping sidewalks, bike lanes, and paths clear of snow and ice was emphasized for year-round usability.

Accessibility and Equity

- Trail Access and Parking: Accessible parking at trailheads and along active transportation routes was requested.
- Inclusive Training: Training programs to support independent travel for individuals with cognitive impairments were recommended.

Connectivity and Transit

- Connections Beyond Downtown: Safe routes into towns, not just within them, were noted as a gap.
- Improved Transit Frequency: More frequent and reliable public transit—such as increased CATA service—was seen as essential for reducing car dependence.

Culture and Policy Shifts

- Incentives for Active Travel: Programs encouraging non-driving modes were supported.
- Lower Driving Speeds: Reducing vehicle speeds was repeatedly identified as a top safety priority.
- Focus on Function Over Aesthetics: Some noted that safety features like trees are more important than decorative landscaping.

Question 9: Are there other comments you would like to share about walking, biking, and rolling in the MDOT University Region and how to improve them? (Open Ended)

Answered	43
Skipped	75

Respondents provided a wide range of additional insights and recommendations for improving active transportation across the region. Key themes include:

Safety and Separation
Many comments stressed the need for physically separated spaces for people biking and walking, including protected bike lanes, wider sidewalks, and shared-use paths. Several respondents mentioned feeling unsafe either as a cyclist on the road or as a pedestrian near cyclists or motor vehicles.

The need for a “third space” for bikes—separate from both roads and sidewalks—was highlighted to reduce conflicts between modes.

Infrastructure Gaps and Connectivity
Respondents pointed to missing or inadequate infrastructure, especially in communities like Brighton, Saline, Hamburg Township, and Charlotte. Several noted that their neighborhoods are cut off from nearby schools, parks, or downtown areas due to a lack of sidewalks or safe crossings.

Calls for more regional trail connections were common, with Monroe County frequently mentioned as lacking in linear trail infrastructure. Others requested better trail connections to schools, particularly in Brighton.

Accessibility and Equity
Participants emphasized the need for ADA-compliant facilities and accessible paths that support people using wheelchairs, tricycles, or with limited mobility.

Several comments stressed the importance of serving rural townships and historically underserved communities. One respondent specifically mentioned the long-term impact of I-496 dividing a Black neighborhood in Lansing and called for improved crossings to reconnect communities.

Visionary and Long-Term Mobility Solutions
A few respondents shared forward-thinking ideas such as converting underused rail corridors into metro transit lines and implementing a streetcar system in the Ann Arbor–Ypsilanti corridor.

Some encouraged MDOT to design for the future rather than existing travel trends, suggesting that strong infrastructure will drive more active transportation use over time.

Funding and Investment
Respondents called for increased funding to support sidewalk repair, trail construction, and general infrastructure improvements for walking and biking.

Several stressed the importance of MDOT supporting local community plans through long-term capital investment, operations, and maintenance funding.

Planning and Policy Considerations
Suggestions included evaluating all MDOT trunklines in urban and suburban areas for pedestrian needs and installing intersection and mid-block crossings based on demand rather than existing use.

Many encouraged adoption of complete streets policies in all road projects and urged MDOT to consider land use changes and population growth in suburban and rural areas.

Education and Public Engagement
Respondents recommended early safety education for elementary students and increased outreach to the public throughout the planning and implementation process.

Some sought guidance on how neighborhood groups can advocate for sidewalk or trail improvements.

Integration with Transit
Several respondents stressed the need to strengthen connections between active transportation and public transit, noting that better infrastructure and more frequent service could reduce car reliance.

Appreciation and Optimism
Many participants expressed support for the planning process, appreciation for being included, and hope for future improvements. Several noted that walkable, bikeable communities improve quality of life, reduce stress, and promote physical activity.

Question 10: Please provide your email address if you would like plan updates (it will not be used for any other purpose and will not be shared).

Answered	54
Skipped	64

Submitted email addresses are intentionally not shared in this plan appendix.

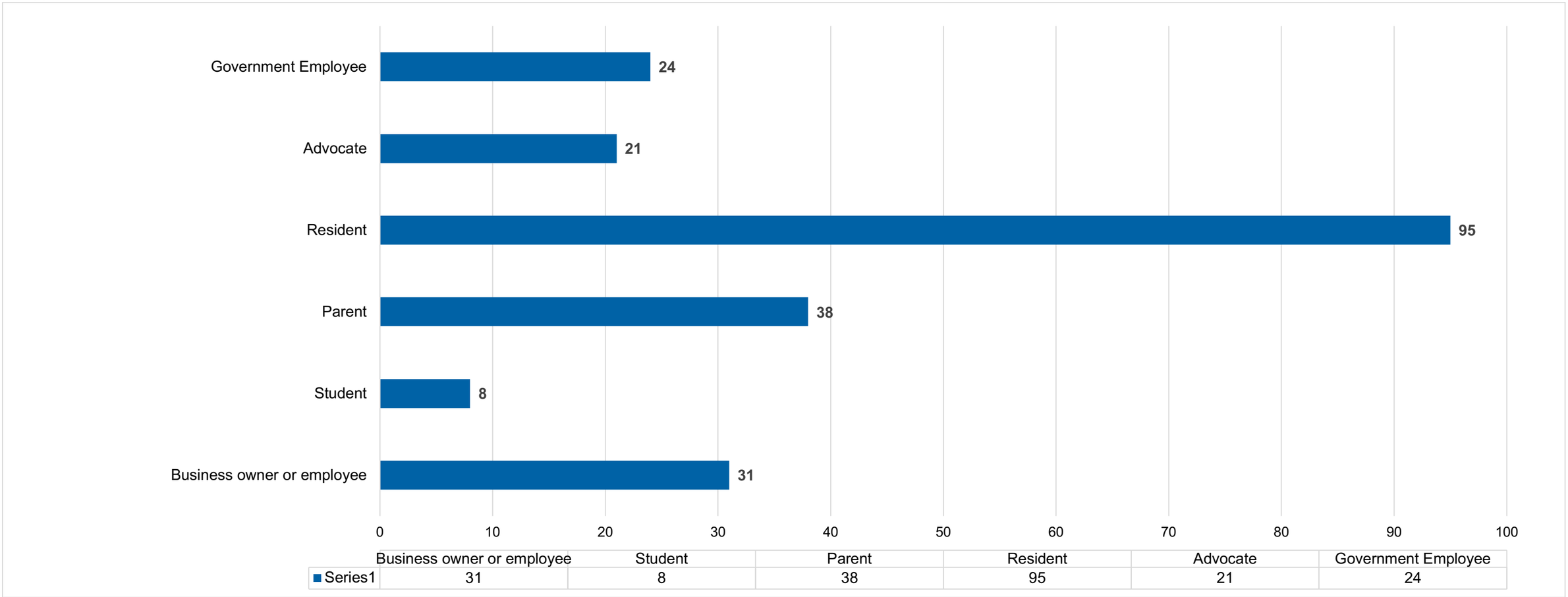
Question 11: What is your home zip code?

Answered	108
Skipped	10

Zip Codes Selected	Selection Count	Zip Codes Selected	Selection Count
49201	1	48116	9
48105	4	48911	2
48912	4	48910	3
48823	4	48189	1
48157	1	48836	1
48161	4	48915	1
48162	5	48813	2
48140	1	48854	3
48108	3	48895	2
49203	3	48837	1
48104	6	48855	2
48821	2	48864	1
48197	12	48840	1
48198	4	49240	1
48176	4		
49242	2		
40266	1		
48114	3		
48160	3		
48103	9		
48843	1		

Question 12: How would you describe yourself? Check all that apply.

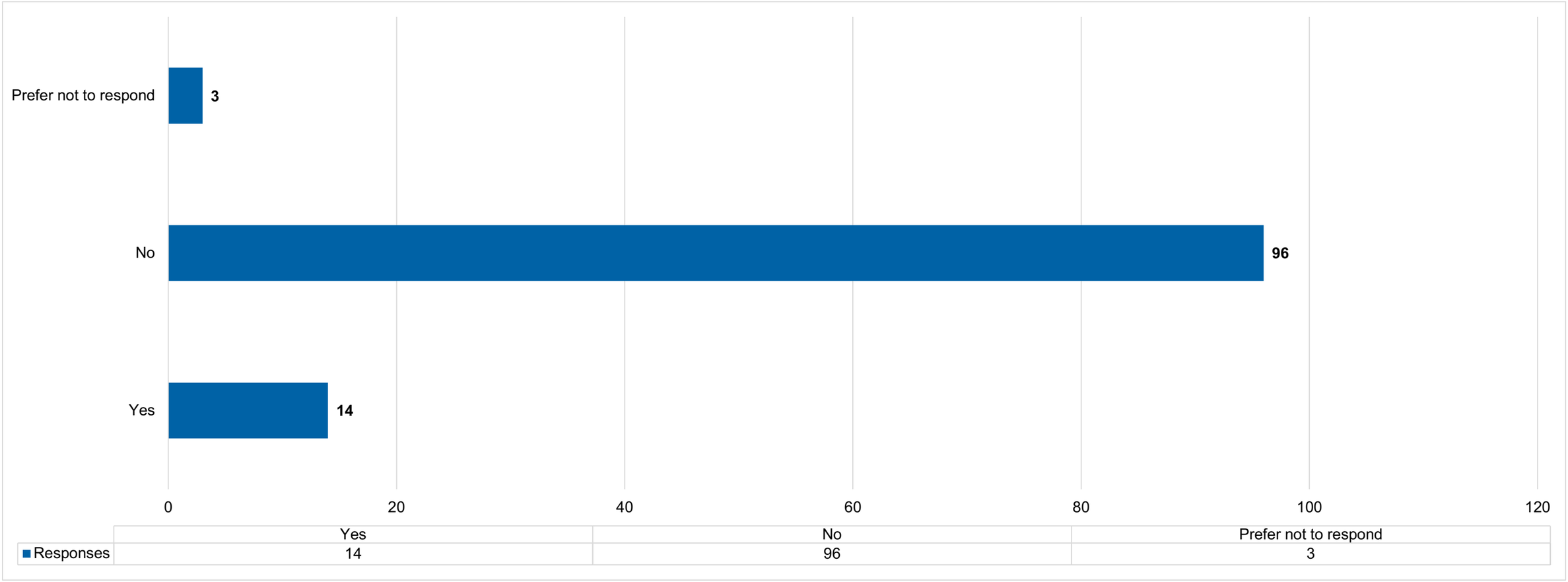
Answered 113
Skipped 5



Question 12 Responses

Question 13: Do you live with a temporary or permanent condition or disability? (e.g., vision loss, colorblindness, deafness, mobile or cognitive disability)

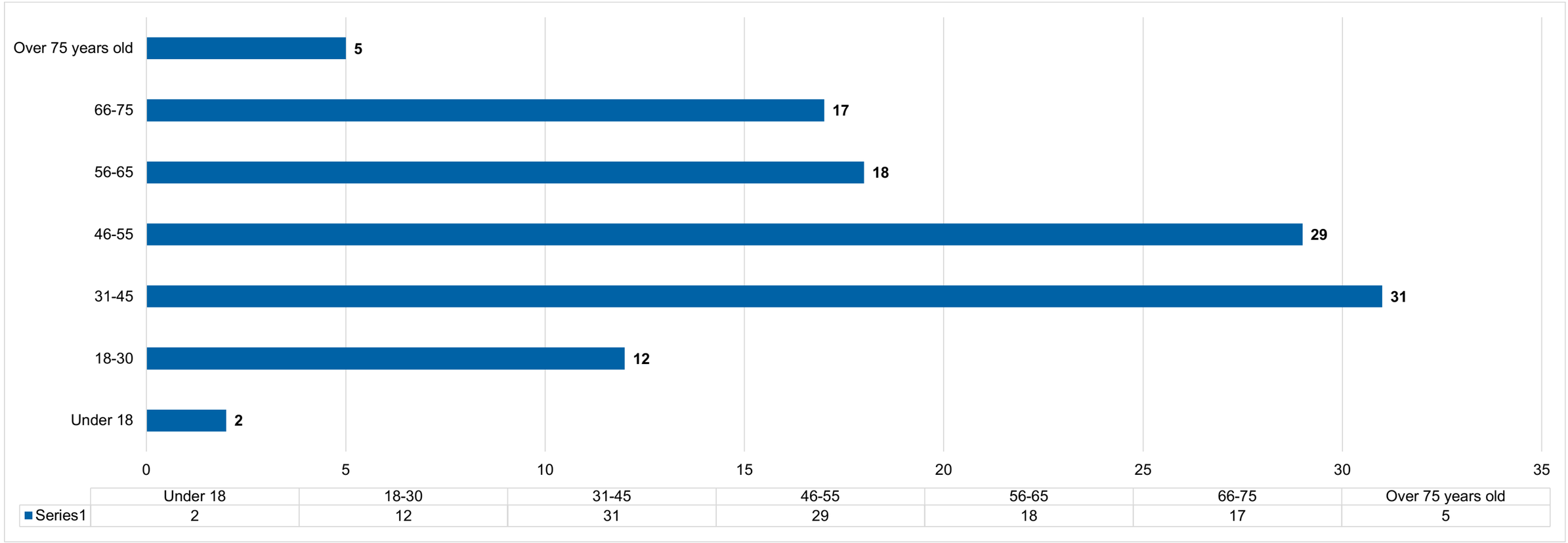
Answered 113
Skipped 5



Question 13 Responses

Question 14: What is your age?

Answered 114
Skipped 4



Question 14 Responses

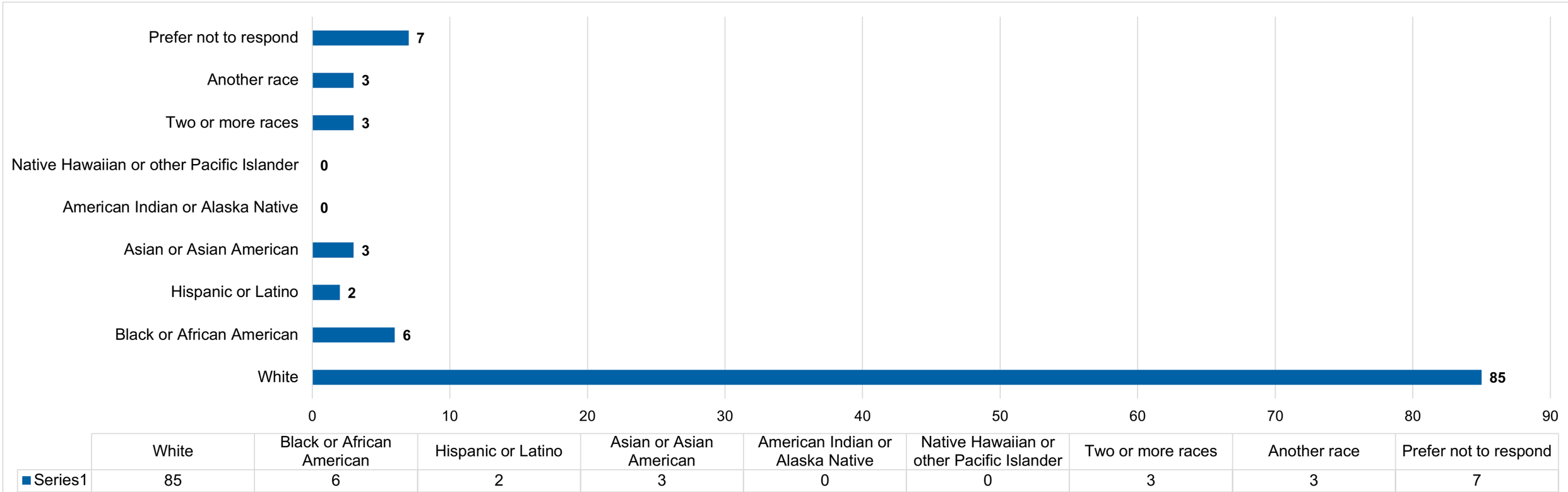
Question 15: What is your gender? (Open Ended)

Answered	103
Skipped	15

This was an open-ended response. Responses were largely a mix of male and female with a few non-binary responses.

Question 16: What is your race/ethnicity?

Answered	109
Skipped	9

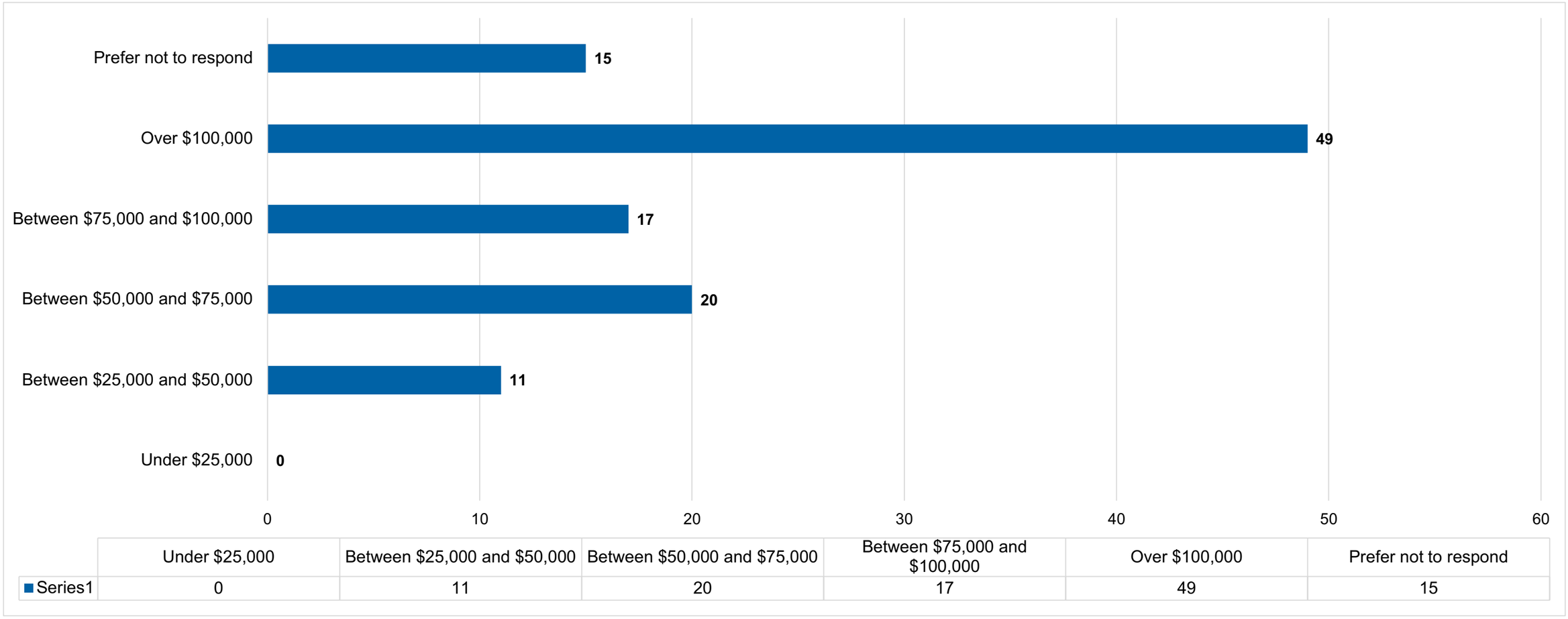


	White	Black or African American	Hispanic or Latino	Asian or Asian American	American Indian or Alaska Native	Native Hawaiian or other Pacific Islander	Two or more races	Another race	Prefer not to respond
Series1	85	6	2	3	0	0	3	3	7

Question 16 Responses

Question 17: What is your annual household income?

Answered	112
Skipped	6



	Under $25,000	Between $25,000 and $50,000	Between $50,000 and $75,000	Between $75,000 and $100,000	Over $100,000	Prefer not to respond
Series1	0	11	20	17	49	15

Question 17 Responses

Appendix M – In-Person Engagement Summary

In-Person Engagement Overview

As part of the MDOT University Region Active Transportation Plan, eight in-person public engagement events were conducted between August and November 2024. These included four informal tabling sessions at public events and four structured public open houses across the region. The events were organized to offer multiple opportunities for members of the public to learn about the plan, provide feedback, and access project resources.

The in-person engagement activities were developed to:

- Represent various community types across the region, including urban, small-town, and rural areas
- Reach communities identified as underserved or having limited access to public engagement opportunities
- Promote accessibility by selecting ADA-compliant venues served by transit and/or accessible by walking or biking
- Support broader outreach by linking in-person events with digital engagement platforms

Tabling at Public Events

Schedule and Locations

Four tabling sessions were held in August 2024:

- August 8 – South Lansing Farmers Market
- August 10 – Brighton Farmers Market
- August 23 – Ypsilanti Jazz Fest
- August 24 – Hillsdale County Farmers Market

These events were selected to coincide with regularly scheduled public activities with diverse attendance.

Engagement Approach

Staff from MDOT, Alta Planning + Design, and Value Engineering participated in each event. The outreach tables featured:

- Project posters outlining the purpose of the Active Transportation Plan
- MDOT regional bicycle maps
- Printed postcards with QR codes linking to the online survey and web input map

Team members provided a brief overview of the plan and encouraged attendees to explore the digital engagement tools. Discussions varied depending on the setting, ranging from brief conversations to longer discussions with individuals expressing concerns or ideas.

Public Open Houses

Schedule and Attendance

Open houses were held on the following dates from 4:00–7:00 PM:

- October 21 – Adrian District Library *(0 attendees)*
- October 23 – Monroe City Hall *(4 attendees)*
- October 24 – Jackson Carnegie Library *(2 attendees)*
- November 18 – Chelsea District Library *(2 attendees)*

Promotion

Promotional activities were conducted in collaboration with MDOT's Office of Communications and local partners. Strategies included:

- Email announcements
- Distribution of social media toolkits to local government contacts and hosting venues
- Event signage at each open house location
- Support from steering committee members and facility staff in promoting attendance

Engagement Activities

Open houses included a series of facilitated activities:

- Live/Work Boards: Participants identified where they live, work, or attend school by placing sticky notes on a regional map.

- Maps and Markers: Participants used maps to mark areas with infrastructure needs, suggest corrections, or provide general feedback. These notes were digitized.
- Prioritization Activity: Participants allocated a set amount of play money ($186 total) across six planning priorities to indicate areas of investment focus.

Prioritization Activity Results

Results from three open house locations are summarized below. The highest level of funding was allocated toward addressing connectivity gaps.

PRIORITY AREA	MONROE	JACKSON	ADRIAN	TOTAL
BRIDGE CONNECTIVITY GAPS FOR PEOPLE WALKING, BIKING, AND ROLLING	$586	$60	$25	**$671**
HIGH-DEMAND AREAS (E.G., SCHOOLS, SHOPPING, PARKS)	$111	$101	$150	$362
TRANSPORTATION SAFETY CONCERNS	$160	$20	$55	$235
EXISTING ACTIVE COMMUTERS	$71	$66	$110	$247
UNDERSERVED/VULNERABLE POPULATIONS	$18	$5	$21	$44
CONNECTIONS TO TRANSIT	$70	$120	$11	$201

Accessibility and Equity Considerations

Site selection for in-person events was based on criteria aimed at promoting participation and accessibility:

- Locations represented a mix of rural, suburban, and urban areas
- All venues were ADA-compliant
- Sites were chosen for their accessibility by walking, biking, or transit
- Events included communities identified through demographic data as having historically limited access to transportation options or public engagement

Relationship to Online Participation

In-person engagement activities contributed to increased participation in the project's online tools. This suggests that combined outreach approaches may increase visibility and participation in planning efforts.

Notable observations include:

- By the end of August, following the four tabling sessions:
- 272 comments were submitted to the interactive map
- 432 unique users accessed the web map
- 701 page views were recorded
- Survey participation increased from 19 responses in early July to 84 responses by the end of August.



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