MDOT University Region

Active Transportation Plan

July 2025 | DRAFT

Michigan Department of Transportation

Acknowledgments

The development of the University Region Active Transportation Plan was a collaborative effort and we gratefully acknowledge the following organizations for their valuable contributions, coordination, data support and engagement throughout the planning process:

Michigan Department of Transportation (MDOT)
Central Office and University Region

Regional Planning Organizations

- Southeast Michigan Council of Governments (SEMCOG)
- Region 2 Planning Commission (R2PC)
- Tri-County Regional Planning Commission (TCRPC)
- Washtenaw Area Transportation Study (WATS)

County and Local Governments

- Clinton, Eaton, Ingham, Jackson, Hillsdale, Lenawee, Livingston, Monroe and Washtenaw counties
- City of Ann Arbor, City of Jackson, City of Lansing, City of Luna Pier and City of Monroe
- Municipal planning, engineering and transportation staff across the region

Transportation Advocates

- PEAC (Programs to Educate All Cyclists)
- Monroe County Bicycle and Pedestrian Advisory Panel

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Executive Summary

The Michigan Department of Transportation (MDOT) University Region Active Transportation Plan (ATP) offers a data-informed framework to support the development of a **safer**, **more connected** and **inclusive network for walking, biking and rolling across the nine-county University Region.**

In alignment with Michigan's 2045 vision for a multimodal, people-centered transportation system, the plan presents key findings, insights and guiding strategies to improve access, connectivity and safety in active transportation.

Plan Vision

This plan includes an update of existing and planned bicycle facilities and serves as a tool to analyze current conditions, identify infrastructure gaps and highlight opportunities to enhance active transportation across the University Region. Rather than prescribing specific projects, the University Region ATP provides a regional perspective on where walking and biking investments may have the greatest impact, guided by data on past crashes, demand, demographics and user comfort. It is intended to support continued planning, policy development and cross-agency collaboration.

Two bicyclists on a paved sidepath.

Engagement and Community Input

Public and stakeholder engagement shaped every stage of the ATP. Starting in spring 2024, MDOT and its partners led an inclusive engagement process to promote that the plan reflected diverse needs and priorities. **More than 1,200 survey responses, 278 interactive map comments and eight in-person events captured community perspectives on barriers, opportunities and desired outcomes.**

The overarching themes presented here were identified through a comprehensive review of all feedback received.

- Broad support for safer, better-connected active transportation infrastructure.
- Concerns over gaps, maintenance, lighting and year-round accessibility.
- A strong call for investment in historically underserved communities.

Current Conditions and Data Analysis

To inform its findings, the plan includes five core analyses: Bicycle Level of Traffic Stress (BLTS), Pedestrian Soft Barriers, Demand, Demographics and Crashes. Together, these analyses provide a spatial and thematic understanding of active transportation data across urban, suburban and rural contexts.

Notable findings:

- **High-stress roadways** limit biking in many downtown and arterial corridors.
- **Major arterials pose significant pedestrian barriers**.
- **Communities with higher concentrations of underserved demographic groups often lack adequate active transportation infrastructure.**
- **More than 6,100 crashes involving people walking or biking** occurred between 2011–2021, with most happening on high-speed roadways.

A participant drawing and writing insights on a plotted map of the region at a public open house.

Tent and project poster at public event for outreach.

Two people biking on a shared-use path.

University Region Proposed Strategic Network

As a planning tool, the ATP introduces a set of proposed network segments (corridors that respond to the plan's analyses and illustrate potential regional priorities for walking and biking investments). These segments highlight where crashes, demand, demographics and traffic stress overlap to indicate high-opportunity corridors for future exploration.

This regional network is not prescriptive, nor does it represent a final blueprint for implementation. Rather, it is intended to guide future discussions, support coordination and help MDOT and partners identify investment opportunities that align with regional and local goals. The actual planning, design and delivery of infrastructure along these corridors will require continued collaboration with local agencies, communities and stakeholders.

Framework for Implementation

The Michigan's MM2045 Active Transportation Plan and the Strategic Highway Safety Plan have four key focus areas:

- **Policy, Planning and Coordination:** Supporting integrated planning and policy alignment.
- **Data and Evaluation:** Promoting consistent, statewide data practices and performance tracking.
- **Education and Awareness:** Increasing knowledge of safe and accessible design practices.
- **Infrastructure and Design:** Closing network gaps and prioritizing improvements for safety and accessibility.

Looking Ahead

This University Region ATP offers a shared foundation for ongoing planning and investment in active transportation. By grounding recommendations in data and shaped by public input, the plan provides a resource to support informed decision-making, coordinate across jurisdictions and advance mobility options that are safe, accessible and connected.

Future efforts could involve refining priorities, developing project-specific plans, securing funding and maintaining inclusive engagement to promote continued alignment with community needs and aspirations.

An adult and child walk on a sidewalk.

Group of people riding bicycles on a rural road wearing helmets and bright clothing.

Chapter 1

Introduction

Introduction

The Planning Process

The development of the University Region ATP was a collaborative effort aimed at identifying opportunities to enhance walking, biking and rolling across the region. From the outset, the planning process was designed to build on existing work, reflect the unique needs of communities and offer suggested strategies and tools to guide local and regional decision-making.

The project began with a comprehensive review of existing plans and facilities at the city, township, county, regional and state levels. This early work helped establish a shared planning context and encouraged that the ATP would complement, not duplicate, ongoing efforts to improve active transportation throughout the region. By grounding the plan in existing visions, policies and data, the project team laid a strong foundation for promoting alignment across jurisdictions and connecting local priorities to statewide goals.

Stakeholder and public engagement were central to shaping the plan's content and direction. A project steering committee (composed of representatives from local governments, planning agencies, advocacy organizations and state partners) met at key milestones to review findings, offer feedback and help refine recommendations. Public input was gathered through a variety of channels, including an online survey with more than 1,200 responses, an interactive input map, public open houses and pop-up outreach events at farmers markets and festivals. These efforts provided important insight into people's experiences walking and biking in the region and identified key opportunities for improvement. While turnout at public open houses was modest, other in-person and digital engagement helped make community input part of every step of the planning process.

At the same time, the project team conducted a suite of technical analyses to assess current conditions and help evaluate areas for investment. Using updated MDOT GIS standards and a variety of datasets, five core analyses were completed: Bicycle Level of Traffic Stress (BLTS), Pedestrian Soft Barriers, Demographics, Demand and Crashes. Together, these analyses provided a spatial understanding of where gaps and challenges exist and where active transportation investments could offer the greatest benefit.

A major outcome of the planning process is the identification of a University Region Proposed Strategic Network, a set of corridors that connect regional destinations and close network gaps all within the context of improving safety and addressing disparities. The proposed network, however, is not prescriptive. Rather, it serves as a planning tool to support further dialogue, coordination and prioritization across agencies. Corridor scoring based on demand, crashes, demographic and comfort data was used to help suggest potential areas for focus, while recognizing that implementation decisions will require local context, collaboration and refinement.

The ATP concludes with a range of recommendations, strategies and best practices, all offered as encouraged considerations to support future planning, design and investment decisions. These include suggested steps to maintain a shared GIS inventory, promote regional coordination and apply consistent facility terminology.

Through this inclusive, data-informed and flexible planning process, the University Region ATP offers a shared regional framework to help improve safety, connectivity and access, empowering communities to move forward at their own pace and based on their own priorities.

Connections to Other Plans

The University Region ATP is built on past efforts to improve conditions for walking, rolling and biking. At the outset of the planning process, the project team gathered and reviewed relevant plans, policies and data from city, township, county, regional and state agencies. This helped establish a strong planning foundation and ensured an accurate understanding of current conditions. By aligning with existing efforts across all levels of government, the ATP serves as a coordinated blueprint for future improvements.

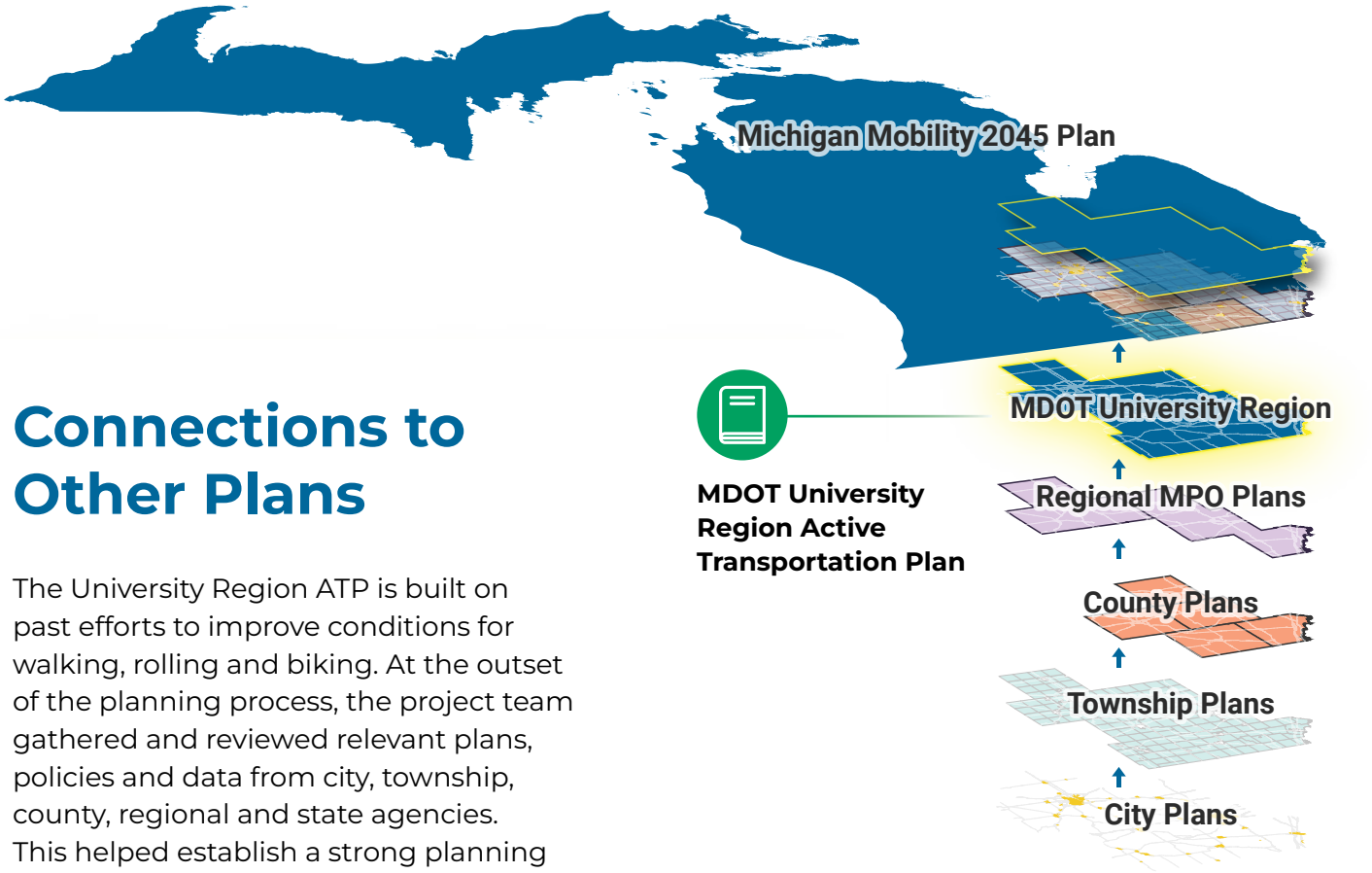


Figure 1: Graphic highlighting connection between the MDOT ATP and other planning efforts from local to the state levels.

What's in This Plan

The chapters that follow provide a foundation for understanding and improving active transportation across the University Region.

Chapter 2 details the stakeholder and public engagement process, highlighting community priorities, concerns and opportunities that emerged through surveys, events and outreach.

Chapter 3 presents a snapshot of current conditions, including existing infrastructure and results from five regional analyses that assess crashes, demographics, comfort and demand.

Chapter 4 introduces the University Region Proposed Strategic Network, a data-informed planning tool that identifies potential corridors for future consideration, and outlines how it can guide regional coordination and investment.

Finally, **Chapter 5** recommends strategies, tools and best practices to support implementation. These include guidance on data governance, maintenance, facility terminology and collaboration frameworks, providing MDOT and its partners with actionable next steps to build a safer and more connected regional network.

Three people walk along a curved shared-use path toward a small bridge in a park with autumn trees.

Chapter 2

Community and Public Engagement

Community and Public Engagement

Overview of Engagement Efforts

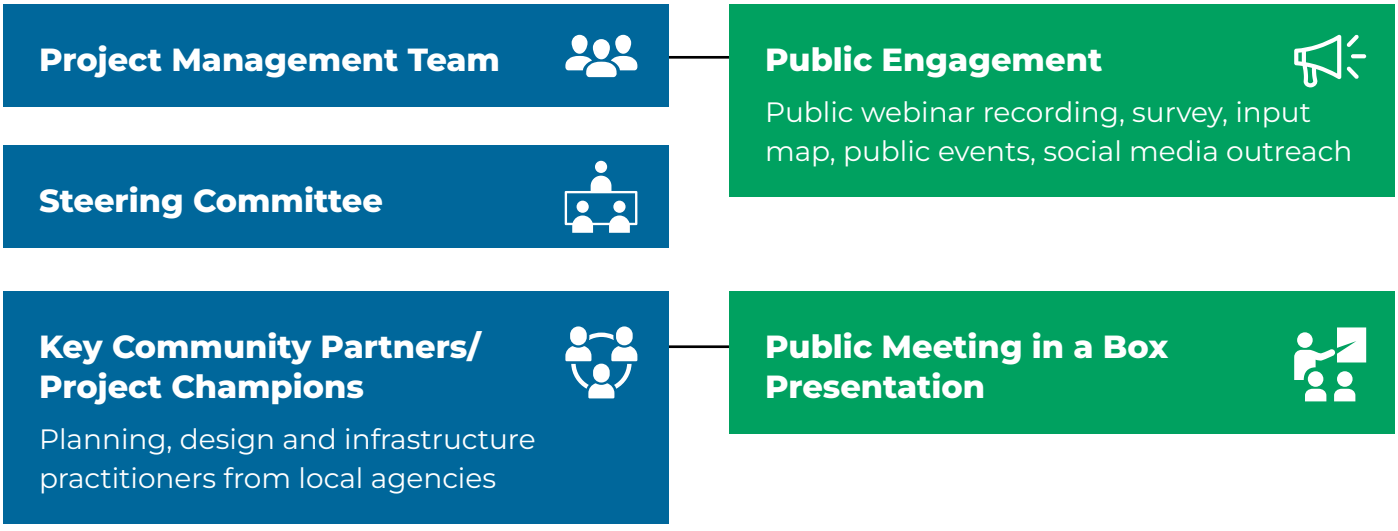
Community and public engagement played a central role in shaping the ATP. This chapter outlines the inclusive and collaborative engagement process carried out to encourage that the plan reflects the voices of communities across the nine-county region.

Engagement efforts were designed to promote meaningful participation from a wide range of audiences. The approach emphasized both in-person and virtual opportunities for involvement, with activities ranging from surveys and mapping tools to steering committee meetings and pop-up events at community functions. The project team also shared social media messaging to broaden outreach, hosted a project website to provide updates and key dates and held a public webinar to present the draft plan. The webinar slides were then shared with key stakeholders as a "meeting-in-a-box" resource they could use to present to their own networks.

These engagement efforts served multiple purposes: to ground the planning process in lived experience, seek to validate the results of technical analyses, uncover local knowledge and address barriers and opportunities as identified by the people they impact most. Throughout the process, transparency and accessibility were prioritized to encourage broad and representative input.

The sections that follow detail the methods used, stakeholders engaged and key themes that emerged, providing a foundation for the plan's recommendations and priorities moving forward.

Figure 2: Graphic Highlighting Engagement Activities and Stakeholder Groups



Stakeholder Groups

Project Steering Committee Meetings

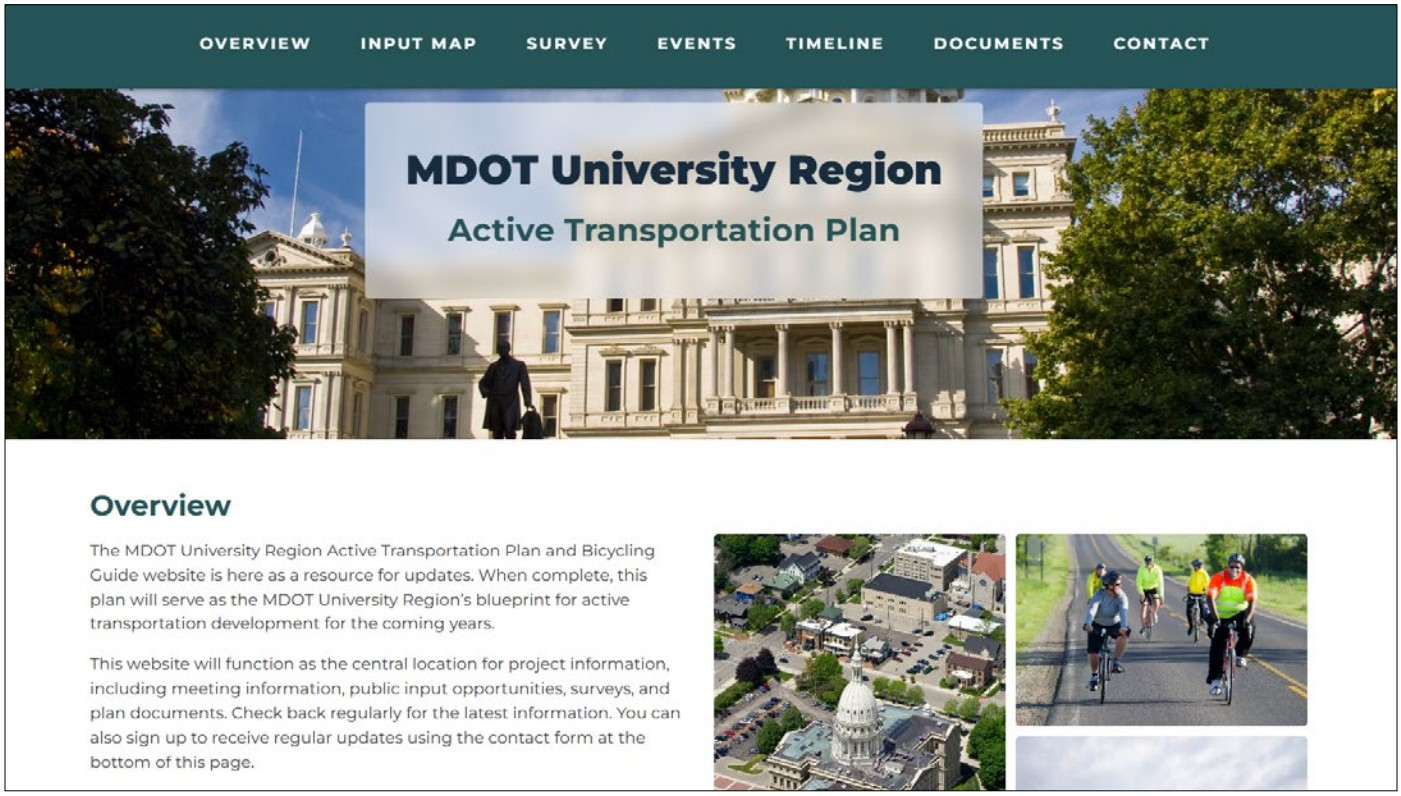
The planning process was guided by a project steering committee composed of representatives from relevant transportation, planning and advocacy organizations. The committee met at key milestones to discuss project progress, review technical analyses and provide strategic direction. Discussions focused on identifying barriers to active transportation implementation, prioritizing infrastructure investments and aligning the plan with broader regional and statewide transportation goals.

The project steering committee met virtually in July and November 2024 and again in April and June 2025. Each meeting featured interactive presentations with multiple opportunities for discussion and feedback throughout.

Table 1: Table outlining meeting dates, content and participation

DATE	CONTENT
July 15, 2024	**1.** An overview of the ATP **2.** ATP Schedule **3.** ATP Website **4.** Interactive Active Transportation Comment Map **5.** Public engagement plan review
Nov. 19, 2024	**1.** Data Analysis Presentation (methodology, results and maps from recent data analysis work). **2.** Draft Road and Trail Bicycling Guide Map (discussion of the draft guide map, including key dates and drafts to look out for) **3.** Public Engagement Summaries (findings from public event tabling, open houses, online survey and online input map) **4.** Open Discussion and Next Steps
April 15, 2025	**1.** Project Progress and Timeline **2.** Strategic Network Methodology and Results **3.** Next Steps and Key Dates **4.** Open Discussion
June 25, 2025	Presentation of the Final Drafts of the ATP and University Region Road and Trail Bicycling Guide Open for Public Comment

Figure 3: Screenshot of the Project Website



Regional Data Collection Stakeholders

These stakeholders, including MDOT regional and central office staff and metropolitan planning organizations (MPOs), provided essential digital data. This data was critical for compiling maps, analysis and other tasks that benefited from regional input.

Public Representatives Stakeholders

These groups provided input through various platforms, including virtual meetings, surveys and public open houses. They consisted of members from advocacy groups, nonprofit organizations and representatives from K-12 and secondary educational institutions. MDOT and MPOs provided the initial list of stakeholders and additional groups were identified as the project progressed.

University Region Residents and Visitors

The public was actively engaged through a virtual kick-off webinar, social media, in-person events, distribution of postcards with online engagement links and online input opportunities. These outreach methods provided accessible channels for the public to participate, ask questions and provide feedback, encouraging that the community's voices were heard and considered in the development of the active transportation plan.

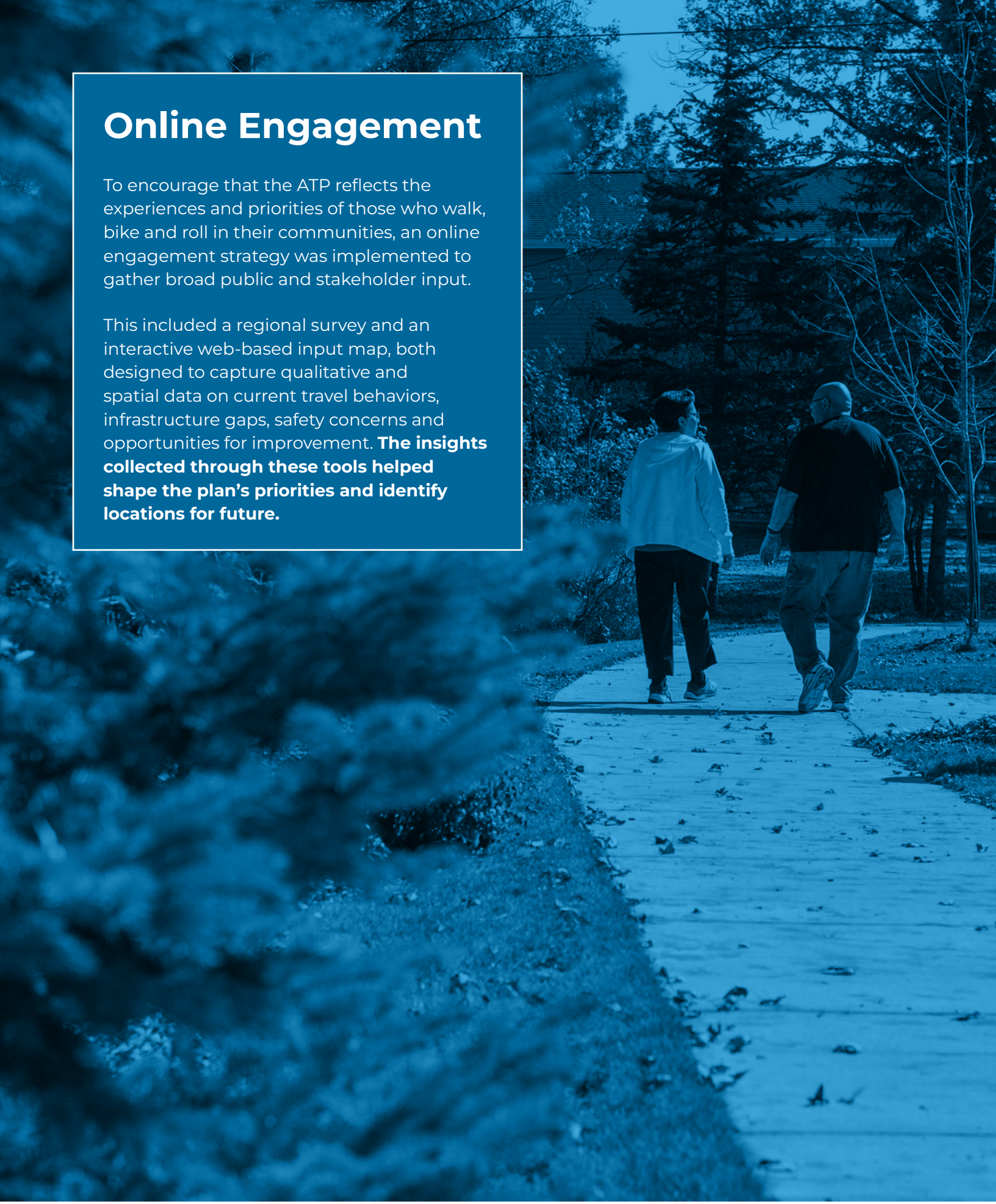
Online Engagement

To bolster engagement, the study team solicited interested individuals through the project's steering committee, community engagement events, media and social media channels and through direct email to a list of individuals maintained by the region (public representatives). Parties were asked to complete a survey and to provide input through an interactive map.

Online Engagement

To encourage that the ATP reflects the experiences and priorities of those who walk, bike and roll in their communities, an online engagement strategy was implemented to gather broad public and stakeholder input.

This included a regional survey and an interactive web-based input map, both designed to capture qualitative and spatial data on current travel behaviors, infrastructure gaps, safety concerns and opportunities for improvement. **The insights collected through these tools helped shape the plan's priorities and identify locations for future.**



Public Engagement

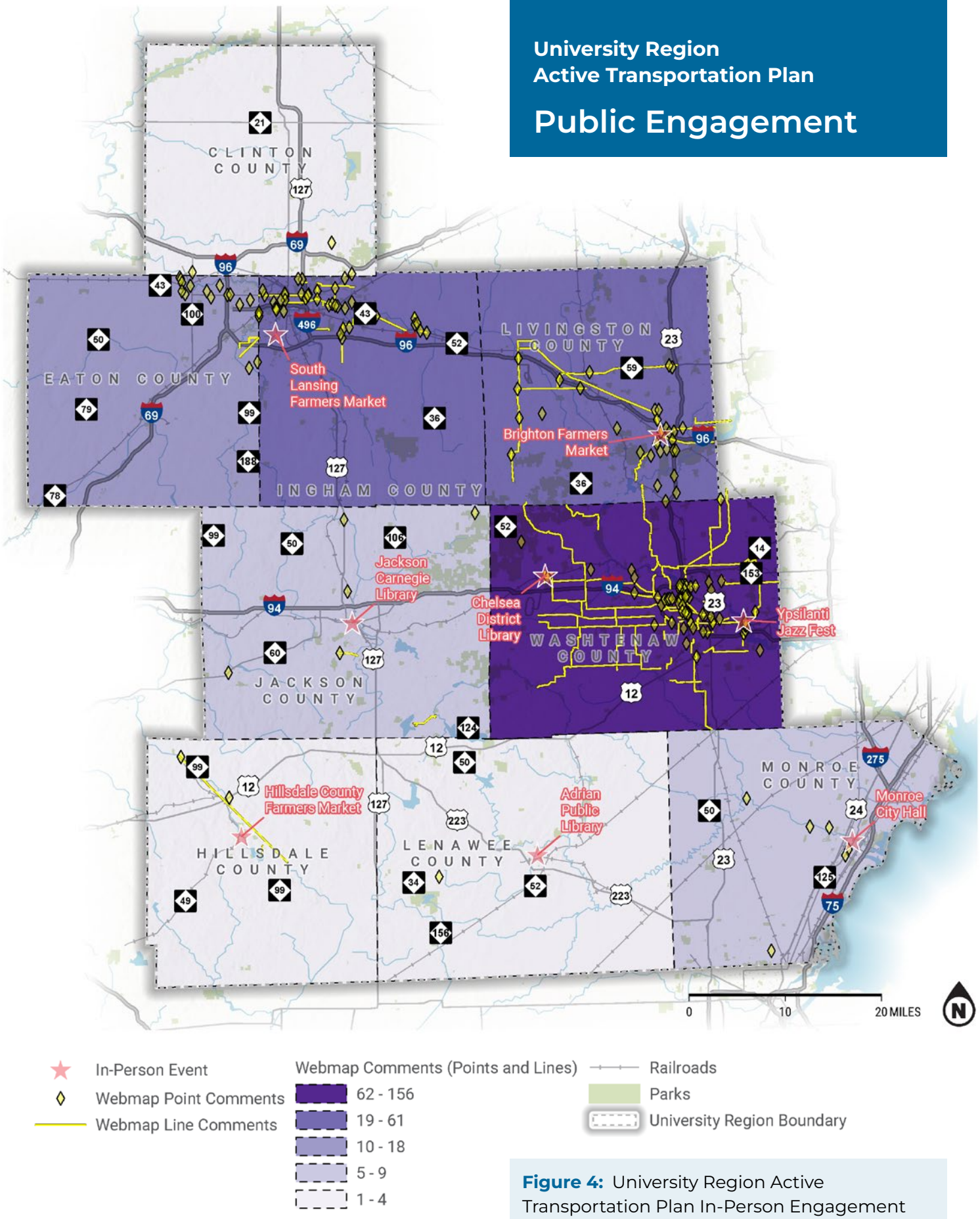


Figure 4: University Region Active Transportation Plan In-Person Engagement and Webmap Comments

Public Engagement

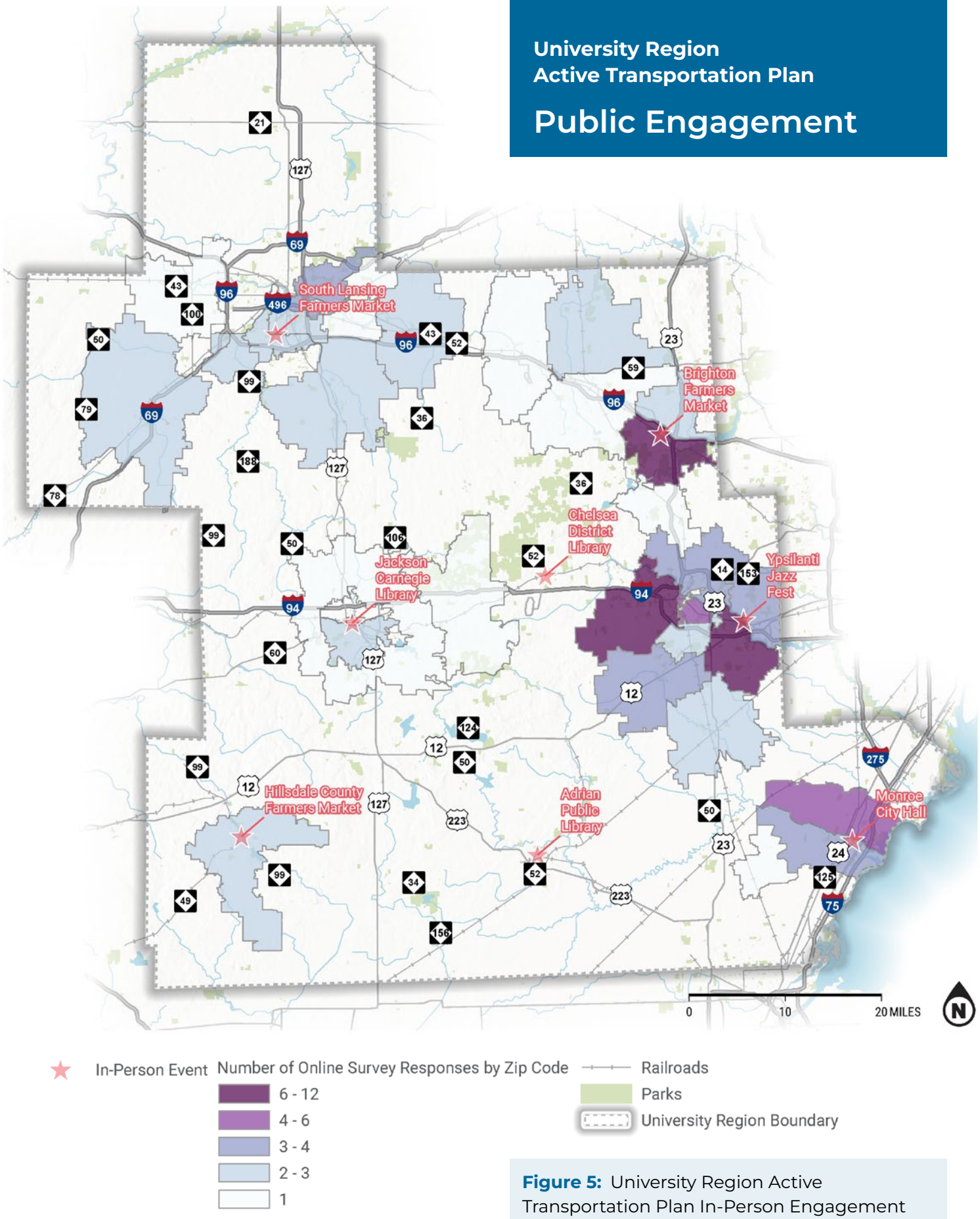


Figure 5: University Region Active Transportation Plan In-Person Engagement and Online Survey Responses

Understanding the Online Public Survey

An online public survey was conducted to gather insights into the habits, priorities and challenges of individuals who walk, bike or use other active transportation modes. The survey was open June to December 2024 and collected **118 responses.**

Key findings included:

- **Many respondents expressed a strong desire to walk and bike more frequently** but cited safety concerns, infrastructure gaps and lack of connectivity as barriers.
- **Recreation, fitness and cost savings were major motivators for active transportation use**, while poor maintenance, high vehicle speeds and insufficient crossings were common deterrents.
- **Respondents highlighted the need for better lighting, improved sidewalk and bikeway networks and year-round maintenance** to enhance accessibility and safety.

The survey results reinforced the importance of prioritizing infrastructure improvements that align with public needs and expectations, encouraging that investments support safer and more accessible transportation options.

The ATP survey provides valuable insights into the habits, preferences and challenges faced by residents in their efforts to walk, bike and roll within their communities. The survey highlights a strong interest in expanding and improving active transportation infrastructure, with respondents emphasizing safety, accessibility and connectivity as critical concerns. Many respondents expressed frustration over existing gaps in infrastructure and inconsistent maintenance, which impact their ability to rely on active transportation as a primary mode of travel. This chapter explores the key questions posed in the survey, summarizes the responses and distills the key takeaways to inform future planning and policy decisions.

The survey results highlight the importance of prioritizing infrastructure improvements that reflect public needs and expectations, emphasizing the need for investments that enhance safety and accessibility in transportation.

Key Survey Findings

The survey findings underscore the need for a more connected, safer and better-maintained active transportation network. Residents are eager to walk, bike and use transit more frequently but face significant barriers that could be addressed through thoughtful planning and investment.

Key recommendations include:

- **Expanding and maintaining pedestrian and bike networks to close connectivity gaps.**
- Prioritizing safety improvements such as separated bike lanes, better crossings and reduced traffic speeds.
- **Implementing better year-round maintenance strategies**, especially for winter conditions.
- **Enhancing accessibility features to support individuals with disabilities.**
- **By prioritizing safety, accessibility and year-round usability, agencies across the state can work together to create a more inviting active transportation system** that reflects the needs and aspirations of Michigan's communities.

Understanding the Online Input Map

An online input map gathered public and stakeholder feedback on active transportation needs and gaps. This interactive tool allowed participants to pinpoint locations where improvements were needed, such as missing sidewalk connections, unsafe crossings and areas lacking bike infrastructure. Additionally, stakeholders used the map to identify existing facilities that were missing in the original data and to highlight locations where planned active transportation facilities were proposed. This mapping exercise provided valuable spatial data that enhanced the accuracy of infrastructure planning and helped prioritize key investment areas.

The input map response data reflects a strong desire for improved biking and walking infrastructure, with specific focus on safety, connectivity and accessibility. The 361 comments provide insights into the current challenges and potential improvements that could enhance active transportation.

Final Online Input Map Participation Statistics

285 participants

361 comments

833 unique visitors

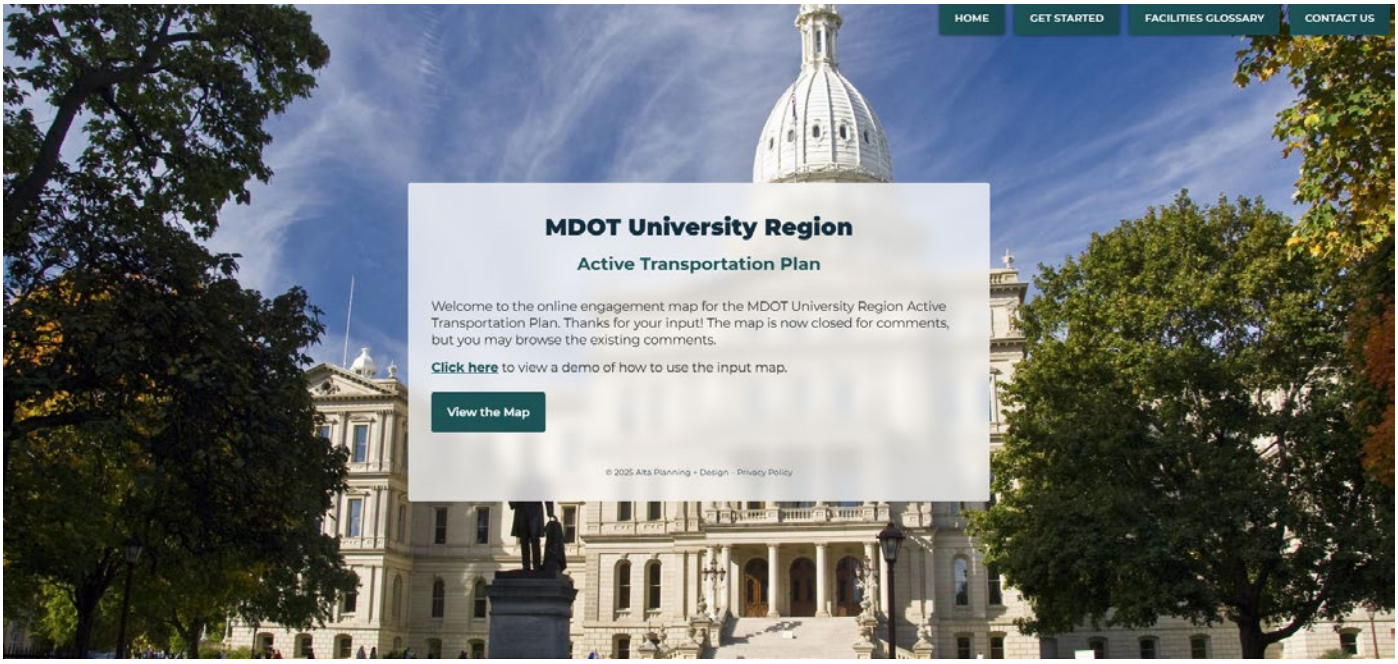
General Themes

- **Route improvements needed:** Numerous suggestions for new bike connections, improved connections between existing routes and safer crossings.
- **Documenting new infrastructure:** Some comments note the presence of existing bike lanes or paths that were missing in existing data. This helped the project team understand the regional active transportation network more accurately.
- **Walking barriers:** Issues include lack of sidewalks, crossing issues and areas where pedestrians could not navigate high-traffic roads without missing safety measures.
- **Biking destinations:** Requests for improved connectivity to key destinations like schools, parks and shopping areas.
- **Community support:** Some comments reflect community support for proposed infrastructure projects, particularly those that would connect neighborhoods to schools and parks.

Selection of Specific Locations Identified

- **Perceived dangerous road sections:** Several comments mention specific roads that feel hazardous for biking, such as Mason Road, Bull Run and Fowlerville Road.
- **Proposed routes:** Suggestions for new routes include connections from Dimondale to Lansing and from various rural areas to city centers.
- **Infrastructure gaps:** Notable gaps in infrastructure are highlighted, such as missing bike lanes on Pontiac Trail and inadequate pedestrian crossings on major roads like Washtenaw Avenue.

Figure 6: Screenshot from the Online Input Map for the MDOT University Region Active Transportation Plan and Bicycling Guide (Landing Page)



Example Comments from the Online Input Map

Biking Barrier: "Mason Road should have bike infrastructure to connect rural residents to Howell and Fowlerville."

Route Needed: "Would love to have a safer connection from Dimondale to the Lansing Trail network."

New Infrastructure: "The new Meridian Township path from the east end of Shaw Lane to the south end of Park Lake Road."

Walking Barrier: "To cross Washtenaw Avenue, you have to move across five lanes of traffic with no pedestrian safety island in between."

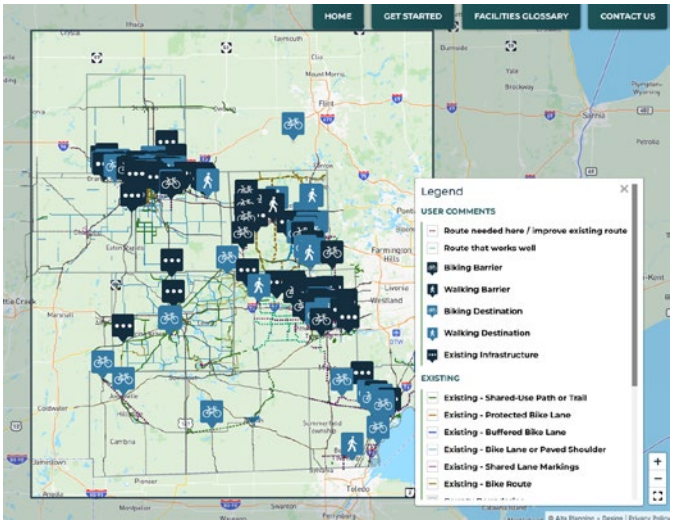


Figure 7: Screenshot from the Online Input Map for the MDOT University Region Active Transportation Plan and Bicycling Guide (Map Page)

In-Person Engagement

The project team conducted eight in-person engagement sessions to foster community involvement in the active transportation plan.

These included open houses at libraries and other community locations, designed with facilitated activities, as well as tabling at popular public events, such as the Ypsilanti Jazz Fest, to meet individuals within their regular gathering spaces. In-person engagement events and sites were also selected to encourage participation from underserved communities and to reflect a wide range of walking and biking needs across many contexts, including urban, rural and small-town settings. Fully accessible venues were selected based on their proximity to underserved communities, accessibility to active transportation users and availability of transit services.

Tabling at Public Events

Public events unfolded across August 2024, beginning with the South Lansing Farmer's Market on Aug. 8. The project team next attended the Brighton Farmer's Market on Aug. 10, followed by the Ypsilanti Jazz Fest on Aug. 23. The final August event took place on Aug. 24 at the Hillsdale County Farmers Market. At each event, team members from MDOT, Alta Planning + Design and Value Engineering hosted information booths to engage with the community and raise awareness about the project.

Each event offered a slightly different engagement opportunity based on its unique schedule and audience. The team briefly introduced the project to attendees, encouraging them to complete an online survey and explore an interactive map using QR codes printed on distributed postcards. In addition to the postcards, materials such as

Tent and project poster at public event for outreach.

project posters and MDOT bicycle maps were used to draw interest, support conversations and help illustrate the types of mapping products that will be developed through the plan. These tools served as both engagement aids and visual examples of the project's goals, helping participants better understand how their input could shape future active transportation improvements.

Tabling Efforts

Aug. 8 at the South Lansing Farmers Market

Aug. 10 at the Brighton Farmers Market

Aug. 23 at the Ypsilanti Jazz Fest

Aug. 24 at the Hillsdale Farmers Market

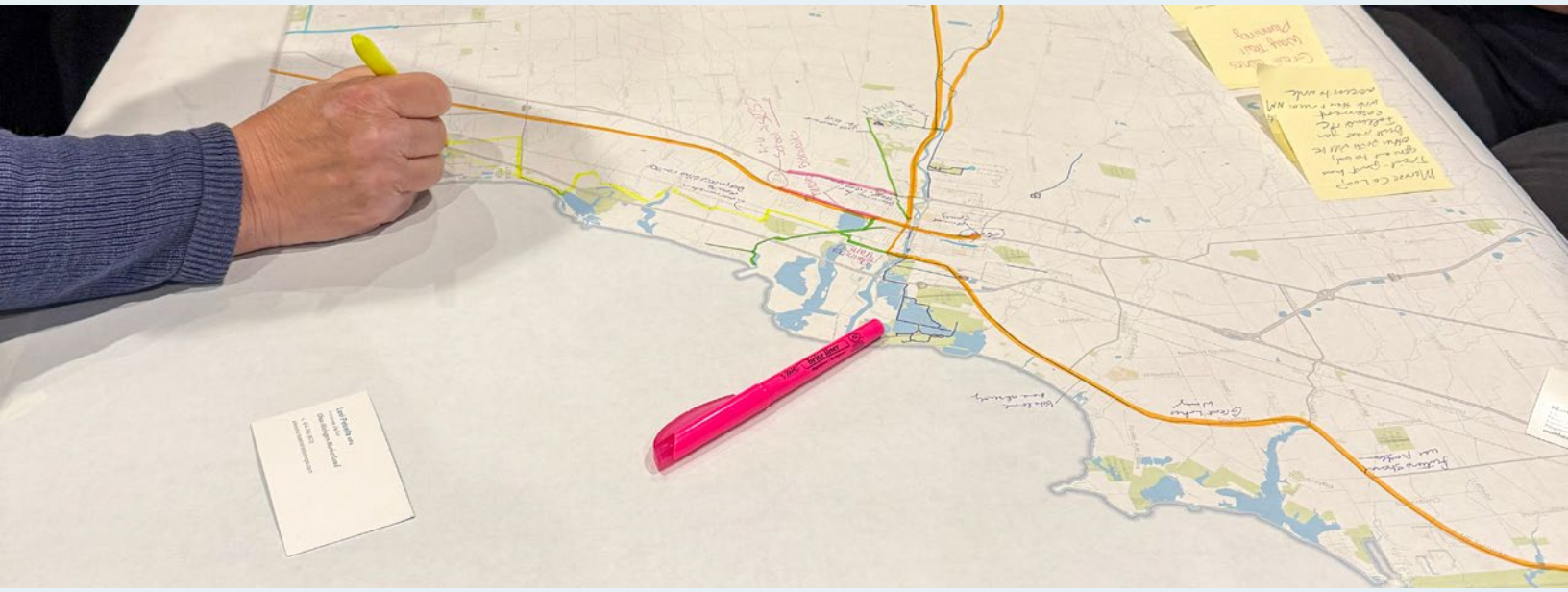
Public Open House

Oct. 21 at the Adrian Public Library

Oct. 23 at the Monroe City Hall

Oct. 24 at the Jackson Carnegie Library

Nov. 18 at the Chelsea District Library



A participant drawing and writing insights on a plotted map of the region at a public open house.

Public Open Houses

Throughout October and November 2024, the project team hosted a series of public open houses to provide more structured opportunities for community engagement. The first event, held on Oct. 21 at the Adrian District Library, unfortunately had no attendees. However, subsequent sessions saw modest participation: four community members attended the Oct. 23 open house at Monroe City Hall, followed by two attendees at the Jackson Carnegie Library on Oct. 24 and two more at the final session on Nov. 18 at the Chelsea District Library. Each open house took place from 4 to 7 p.m. and was publicized by MDOT's Office of Communications through email outreach, social media kits shared with partnering venues and onsite wayfinding signs. The project team also enlisted the help of facility hosts and steering committee members to circulate event details and encourage attendance.

Table 2: Prioritization Activity Results by Open House Location

Priorities	Monroe	Jackson	Adrian	Totals
Prioritize projects that **bridge connectivity gaps** for people who walk, bike and roll.	$586	$60	$25	**$671**
Prioritize projects in **areas of high demand** (schools, shopping districts and parks).	$111	$101	$150	**$362**
Prioritize projects in **areas with existing active mobility commuters.**	$71	$66	$110	**$247**
Prioritize projects in **areas with transportation safety concerns**.	$160	$20	$55	**$235**
Prioritize projects that **create or improve connections to transit.**	$70	$120	$11	**$201**
Prioritize projects in **areas with underserved or vulnerable populations.**	$18	$5	$21	**$44**

Despite the relatively low in-person turnout, the open houses featured a variety of interactive activities designed to gather meaningful input. Participants were invited to sign in and take part in exercises such as sticky note boards focused on where people live and work, mark up maps with markers to identify facility needs or validate planned improvements and "budget baskets" to help prioritize key themes in the ATP. These hands-on tools helped spark conversation and make the planning process more accessible. Importantly, while in-person attendance remained limited, the promotional campaign contributed to a noticeable increase in online engagement, highlighting the value of complementary digital outreach strategies.

Live/Work

Participants were asked to write on sticky notes where they live and where they work or go to school and to place the notes on a board.

Maps and Markers

Attendees were encouraged to draw on the maps locations where they believe facilities are needed or need upgrading and to indicate the type of facility and its status. They were invited to make map corrections, if needed, and to include notes. Those routes and notes were digitized and added to the maps.

Prioritization Activity

Participants were given $186 in play money (one each of $1, $5, $10, $20, $50 and $100 bills) and asked to prioritize among six categories of expenditures. The highest priority resulting from this exercise was prioritizing projects that bridge connectivity gaps for active transportation users, followed by prioritizing areas of high demand. Table 2 above represents how attendees choose to allocate their money for this activity.

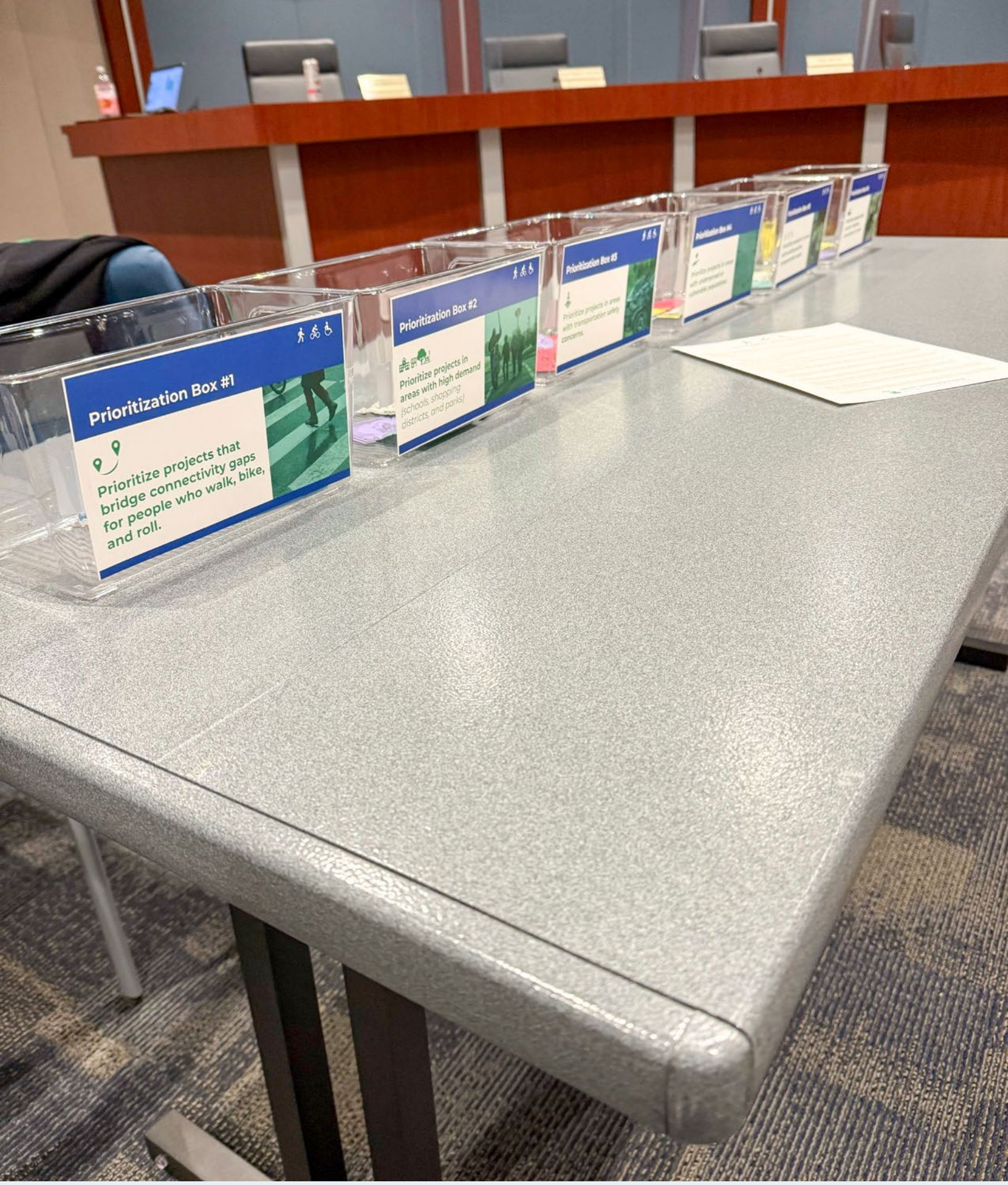


Figure 8: Photo from a Project Open House of Prioritization Activity with play money

Impact of In-Person Engagement on Online Participation

The facilitation of and outreach surrounding in-person engagement events played a key role in driving online participation. Public tabling at August events, including farmers markets in Lansing, Brighton and Hillsdale, as well as the Ypsilanti Jazz Fest, not only provided opportunities for one-on-one conversations but also raised awareness of the project's digital engagement tools. These efforts helped generate a steady increase in online activity.

By late August 2024, the online input map had recorded more than over **240 webmap participants** and **272 comments**, **432 unique site visitors** and **701 total page views**. Survey participation also rose notably during this period, increasing from 19 in early July to 84 by the end of August.

Although turnout at the October and November open houses was limited, the events were supported by a renewed communications campaign, including promotion by MDOT's Office of Communications and localized outreach by host venues. This continued visibility contributed to sustained online engagement, particularly with the interactive web map and survey. The combined effect of in-person interactions and consistent digital promotion demonstrates the importance of a multi-channel strategy for reaching a broader audience and collecting meaningful community input.

Key Engagement Findings

The engagement process, as outlined above, revealed several common themes and priorities across stakeholders:

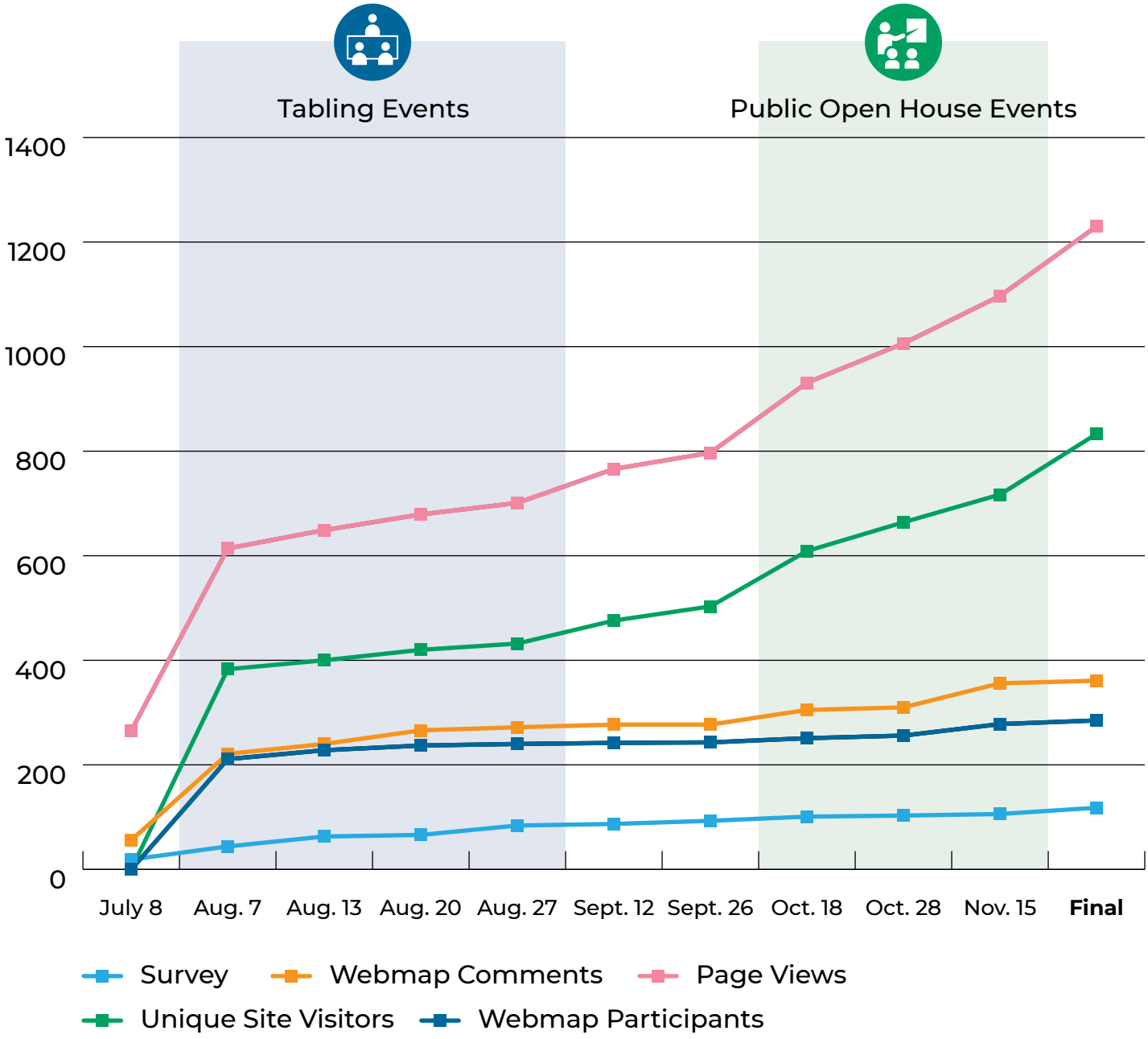
A strong desire for improved multimodal connectivity and network cohesion.

The importance of safety measures, including infrastructure improvements and educational programs.

The need for dedicated funding mechanisms and policy support to advance active transportation initiatives.

Challenges related to data availability and consistency in active transportation planning.

Figure 9: Online Engagement Participation



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Chapter 3

Active Transportation Today: Current Conditions

Active Transportation Today: Current Conditions

State and Regionally Significant Trails and Routes

The University Region is home to many major nonmotorized trails and routes including but not limited to the Great Lake-to-Lake Trails Route 1, the Iron Belle Trail hiking route, the North Country National Scenic Trail and the Underground Railroad Bicycle Route, each offering unique connections for recreation, transportation and historic exploration.

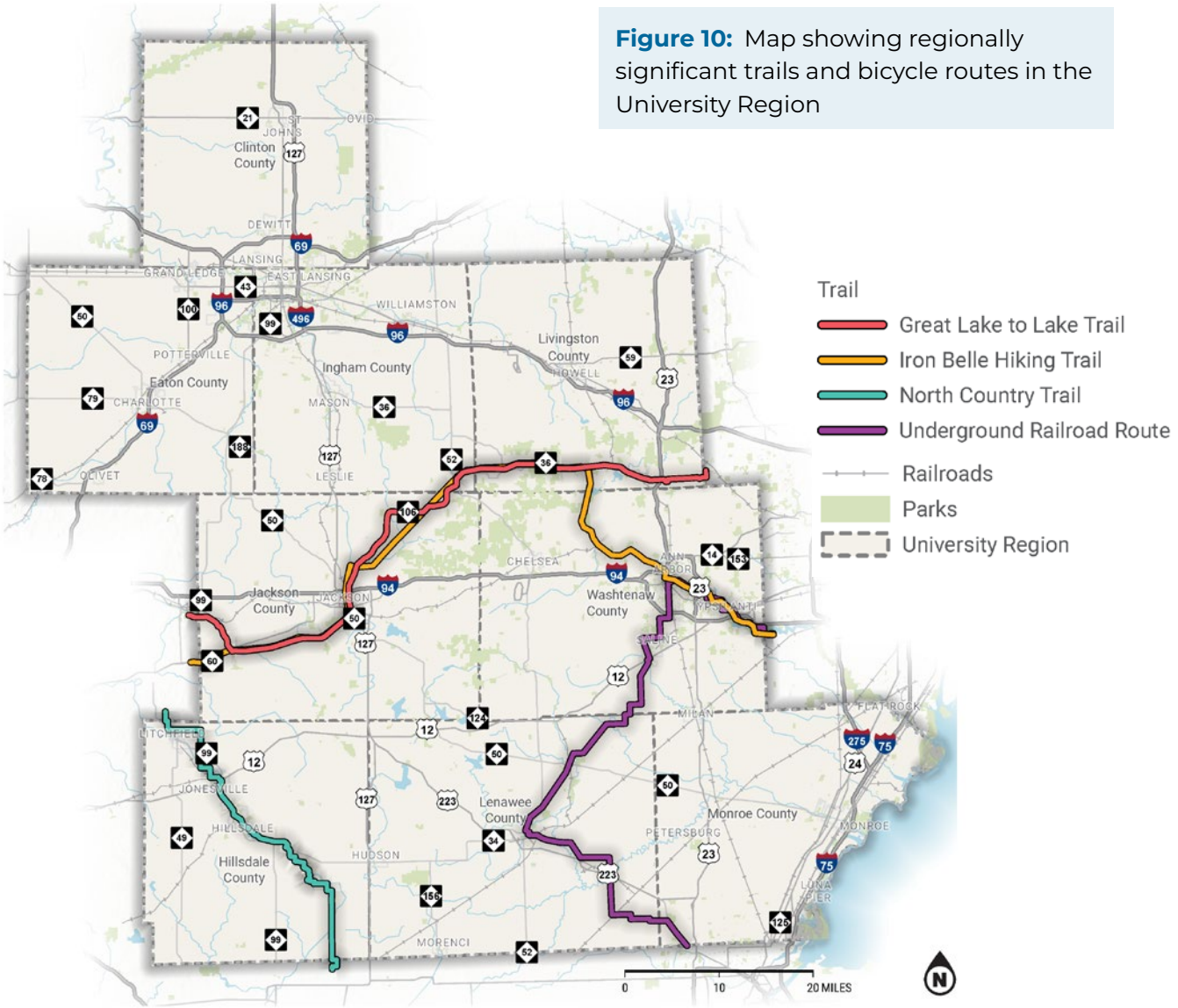


Figure 10: Map showing regionally significant trails and bicycle routes in the University Region

Great Lake-to-Lake Trails Route 1

Stretching 275 miles between South Haven to Port Huron, Route 1 was mostly built on remnants of the original Michigan Air Line Railroad. Built in 1883, the Michigan Air Line was one of Michigan's first major railroads, running between Port Huron to Niles, Michigan. When most of the rail corridor was abandoned in 1975, several sections were acquired by MDOT or the Department of Natural Resources (DNR) and other county and local governments and other county and local governments.[1]

Today, the major stretch of the Great Lake-to-Lake Trails Route 1 within the University Region consists of two major local trails.

The Falling Waters Trail

Opened in 2007, the Falling Waters Trail connects the village of Concord with the city of Jackson. Utilizing an abandoned stretch of the Michigan Central Railroad, the 10.5-mile, 12-foot-wide paved trail is ideal for walking, running or biking. According to Jackson County Parks, the trail "draws its name from the old village of Pottawatomie whose site became the first village of Spring Arbor in 1835. The name Falling Waters Trail honors the Pottawatomie village of the "Kitch-iti-kipi," or Big Springs. Jackson County is headwaters for four Michigan rivers and the Land of Falling Waters was the Native American name for this area.

The Mike Levine Lakelands Trail

The Mike Levine Lakelands Trail runs 33 miles between Hamburg Township in Livingston County and Blackman Township in Jackson County. Opened to the public in 1994 as the Lakelands Trail State Park, it is a popular destination for people looking to enjoy the outdoors. Local philanthropist Mike Levine contributed extensive resources to transform the corridor into an improved trail. In 2018, the DNR changed the trail's name to the Mike Levine Lakelands Trail State Park in recognition of Levine's efforts.

Officially opened as designated in 2019, the Great Lake-to-Lake Trails Route 1 is built upon decades of investment and work by hundreds of residents.

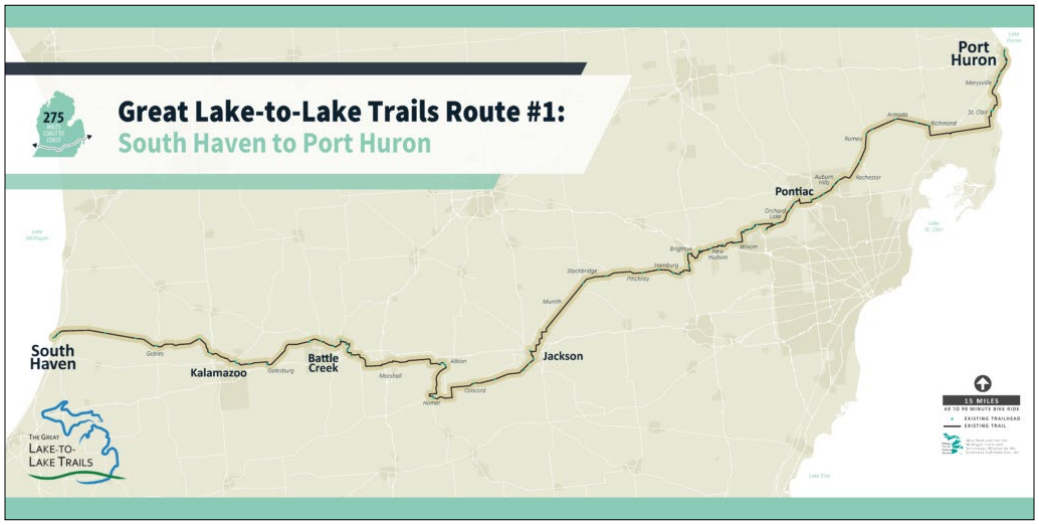


Figure 11: Map showing Great Lake-to-Lake Trails Route #1. Source: Michigantrails.org

1 https://michigantrails.org/great-lake-to-lake-trails/

Iron Belle Trail

The Iron Belle Trail is one trail with two routes, one for hiking and the other for biking. The routes touch hundreds of municipalities and cross through 48 different Michigan counties. Using existing trails, networks and new connections, the trail extends more than 2,000 miles from the far western tip of the Upper Peninsula to Belle Isle in Detroit.

Border-to-Border Trail

In 2015, the Border-to-Border Trail was incorporated into the Iron Belle Trail, which forms half of the trail within the University Region. Beginning in 1984, plans were developed for a trail spanning Washtenaw County. Originally conceived of as the Huron River Greenway, a 35-mile project headed by Washtenaw County.

As of early 2025, the Border-to-Border Trail system fully links Ypsilanti and Ann Arbor, combining off-street pathways and on-road biking facilities. Chelsea and Dexter will be connected to the existing trail using existing park trails and segments built adjacent to rural roads, new and historic bridges and segments on city streets.

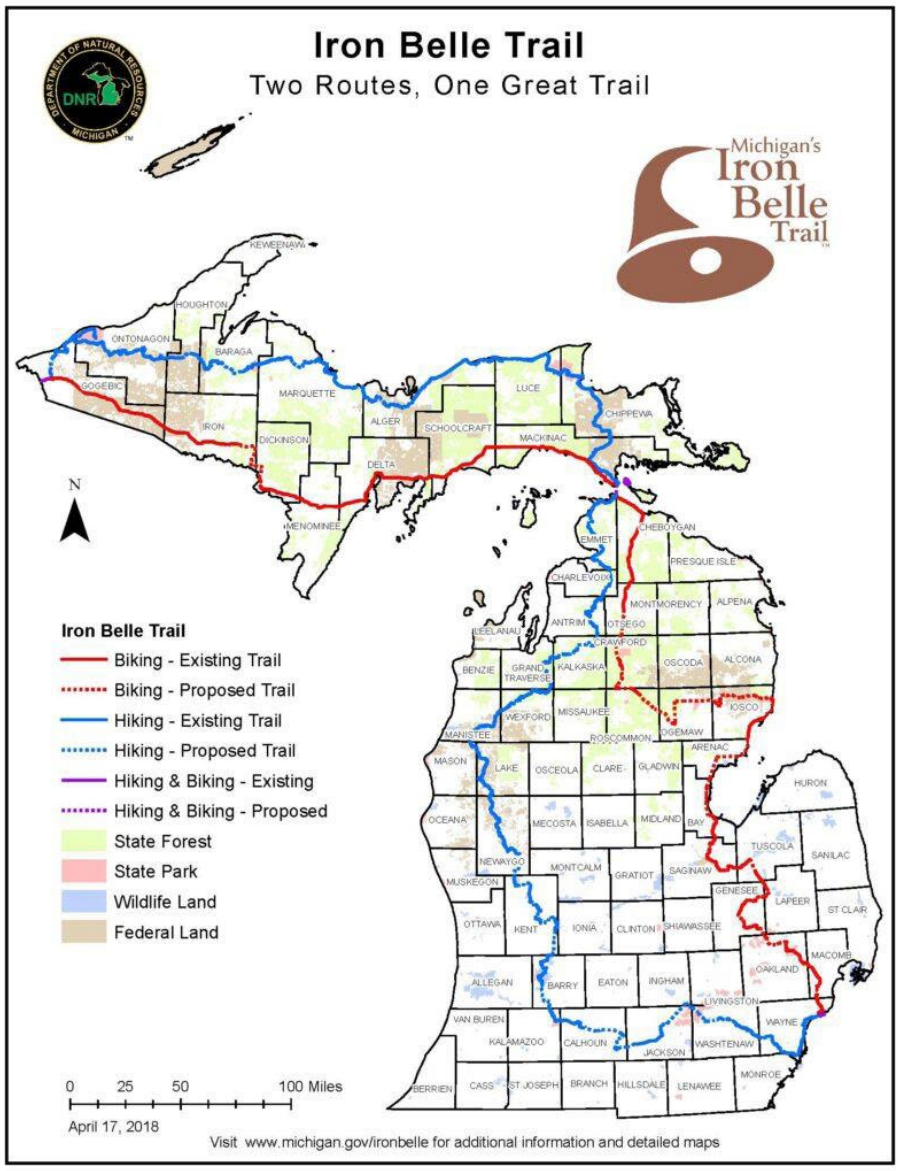
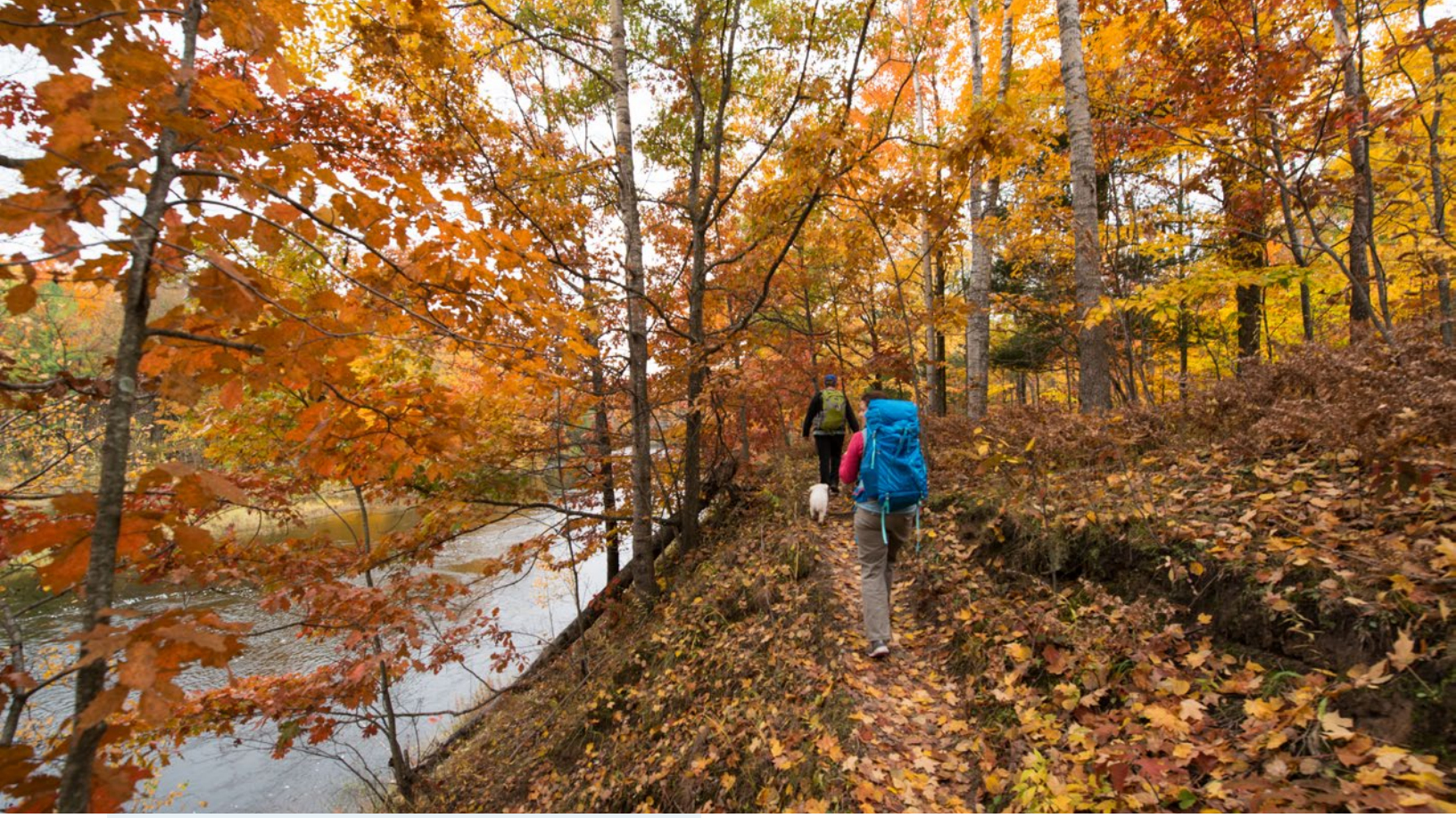


Figure 12: Map showing Iron Belle Trail route across the state of Michigan. Source: Michigantrails.org



Iron Belle Trail. Source: Michigan DNR (Flickr)

North Country Trail

As the longest National Scenic Trail in the United States, the North Country Trail spans 4,800 miles across eight states. In Michigan, it traverses the University Region through Hillsdale County, utilizing pathways such as the Baw Beese Trail to connect communities like Hillsdale and Jonesville before continuing north into Calhoun County. This trail is primarily a hiking trail, with certain sections featuring restrictions on bicycle use.[2]

Underground Railroad Bicycle Route

This 1,997-mile route commemorates the historic paths used by freedom seekers escaping slavery. Beginning in Mobile, Alabama, it passes through several states before entering Ontario, Canada. The Detroit alternate of this route traverses the University Region, passing through Monroe, Lenawee and Washtenaw counties, connecting to significant historical sites.[3] [4] As noted earlier, Washtenaw County's Border-to-Border Trail serves as a major connector of this trail route within the region.

2 https://northcountrytrail.org/the-trail/trail-maps/online/
3 https://www.adventurecycling.org/routes-and-maps/adventure-cycling-route-network/underground-railroad-ugrr/
4 https://michigantrails.org/iron-belle-trail/

Existing and Planned Active Transportation Facilities in the University Region

The active transportation network in the University Region has expanded significantly since the 2015 plan. Over the past decade, agencies and communities have implemented hundreds of miles of new facilities, including new shared-use paths, improved on-street infrastructure and new multimodal-exclusive bridge crossings. The terminology and design of bicycle facilities have also evolved, with a greater emphasis on safety and comfort for all users.

As of 2025, the region now has more than 1,800 miles of active transportation facilities, an increase of more than 600 miles since 2015. This includes substantial growth in shared-use paths and bike lanes, reflecting a shift toward higher-quality infrastructure. The following sections detail the existing network and planned improvements, highlighting progress made and opportunities for future expansion.

*Note that the 2015 ATP included Shiawassee County, which is no longer part of University Region.

Since 2015, the University Region has been building bicycle facilities with greater separation from motor vehicles:

+14 Miles
of Buffered Bike Lanes

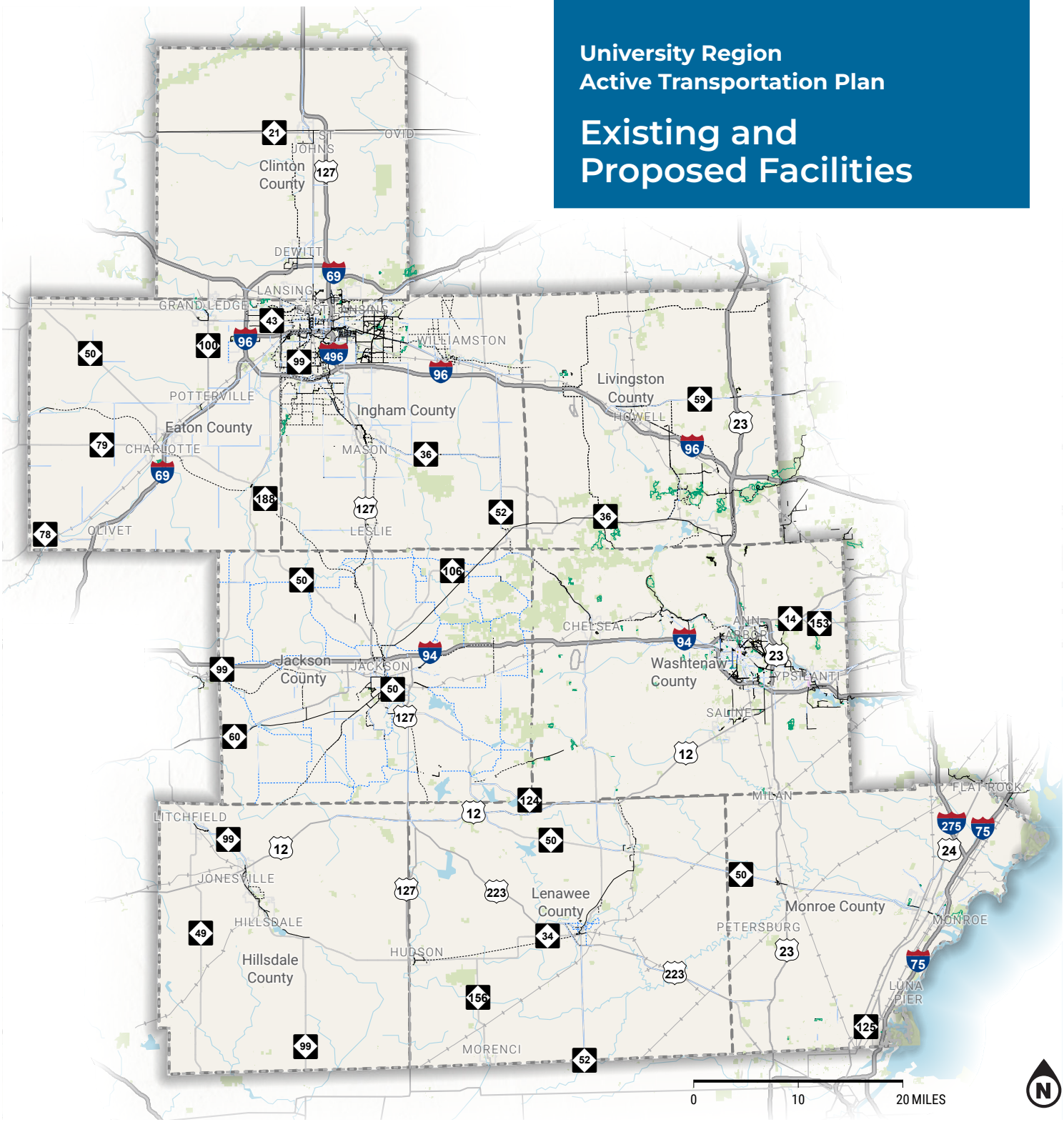
+8 Miles
of Separated Bike Lanes

Person biking on a sidepath next to a road with passing vehicles.

Green conflict markings in shared lane alongside a lane with cars.

University Region
Active Transportation Plan

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
- Railroads
- Parks
- University Region

Figure 13: Existing and Planned Facilities in the University Region. For more detailed maps, see Appendix B.

Table 3: 2015 Existing and Proposed Facilities*

Existing Facilities	Clinton County	Eaton County	Hillsdale County	Ingham County	Jackson County	Lenawee County	Livingston County	Monroe County	Shiawassee County	Washtenaw County
Shared-use Path	26	11	14	63	21	20	28	11	13	34
Paved Shoulder (More Than 4 Feet)	13	102	22	194	56	66	30	5	6	50
Sidepath	5	4	0	90	7	1	12	8	0	72
Marked Shared Lane	0	0	0	1	0	0	0	0	0	7
Bike Lane	13	8	0	65	20	1	0	7	1	109
Total Miles	**57**	**125**	**36**	**413**	**104**	**88**	**70**	**31**	**20**	**272**

Proposed Facilities	Clinton County	Eaton County	Hillsdale County	Ingham County	Jackson County	Lenawee County	Livingston County	Monroe County	Shiawassee County	Washtenaw County
Shared-use Path	67	94	38	139	224	41	9	14	2	40
Paved Shoulder (More Than 4 Feet)	179	77	0	123	10	21	0	0	0	0
Sidepath	5	2	0	42	5	0	18	0	0	9
Marked Shared Lane	0	0	0	1	0	0	0	0	0	8
Bike Lane	17	68	0	55	1	12	8	29	0	154
Total Miles	**268**	**241**	**38**	**360**	**240**	**74**	**35**	**43**	**2**	**211**

*Note that the 2015 ATP included Shiawassee County, which is no longer part of MDOT's University Region. Additionally, facility nomenclature has been updated in the 2025 plan.

2025 Existing and Proposed Facilities by County

This section provides a snapshot of existing and planned active transportation facilities in each county of the University Region. The inventory is based on available GIS data from local agencies, though some facilities may be missing if data was not provided. MDOT encourages partners to update and refine this information as new facilities are built.

Table 4: Existing and Proposed Active Transportation Facilities in the University Region[1]

Existing Facilities	Clinton County	Eaton County	Hillsdale County	Ingham County	Jackson County	Lenawee County	Livingston County	Monroe County	Washtenaw County	Total Miles
Shared-Use Path/ Trail	56	16	14	192	58	18	49	8	199	610
Separated Bike Lanes	0	0	0	1	0	0	0	0	7	8
Buffered Bike Lane	0	0.4	0	0	0	0	0	0	13	14
Bike Lane/Paved Shoulder (More Than 4 Feet)	46	147	16	247	104	61	24	33	183	860
Marked Shared Lanes	0	0	0	0	0	0	3	0	16	18
Other (Recreational Trail)*	7	8	0	21	0.4	0	94	11	112	253
Total	**108**	**172**	**31**	**461**	**162**	**79**	**169**	**52**	**529**	**1762**

Proposed Facilities	Clinton County	Eaton County	Hillsdale County	Ingham County	Jackson County	Lenawee County	Livingston County	Monroe County	Washtenaw County	Total Miles
Shared-Use Path/ Trail	34	53	18	380	81	27	172	0	15	779
Bike Lane/Paved Shoulder (More Than 4 Feet)	3	5	0	35	220	11	11	0	0	285
Total	**36**	**58**	**18**	**415**	**302**	**37**	**183**	**0**	**15**	**1064**

* Recreational trails are generally looped trails within parks or other green spaces and may also include foot trails or mountain bike trails. Data on these trails was not separated out in the 2015 plan and data on these trails in the 2025 plan is likely incomplete due to their limited transportation purpose.

1 This data is from the existing and proposed facility inventory required for this ATP update. Further and continuous updates will be required for consistent accuracy in consideration of ongoing planning and implementation initiatives across MDOT's University Region.

Table 5: Bike facilities on State Trunkline Network

	Miles of Facility on State Trunkline Network
Bike Lane/Paved Shoulder (More Than 4 Feet)	270
Separated Bike Lane	2.4
Shared-Use Path/Sidepath	58

Two people walking on a shared-use path.

CLINTON 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

0 2 4 MILES

MDOT Michigan Department of Transportation

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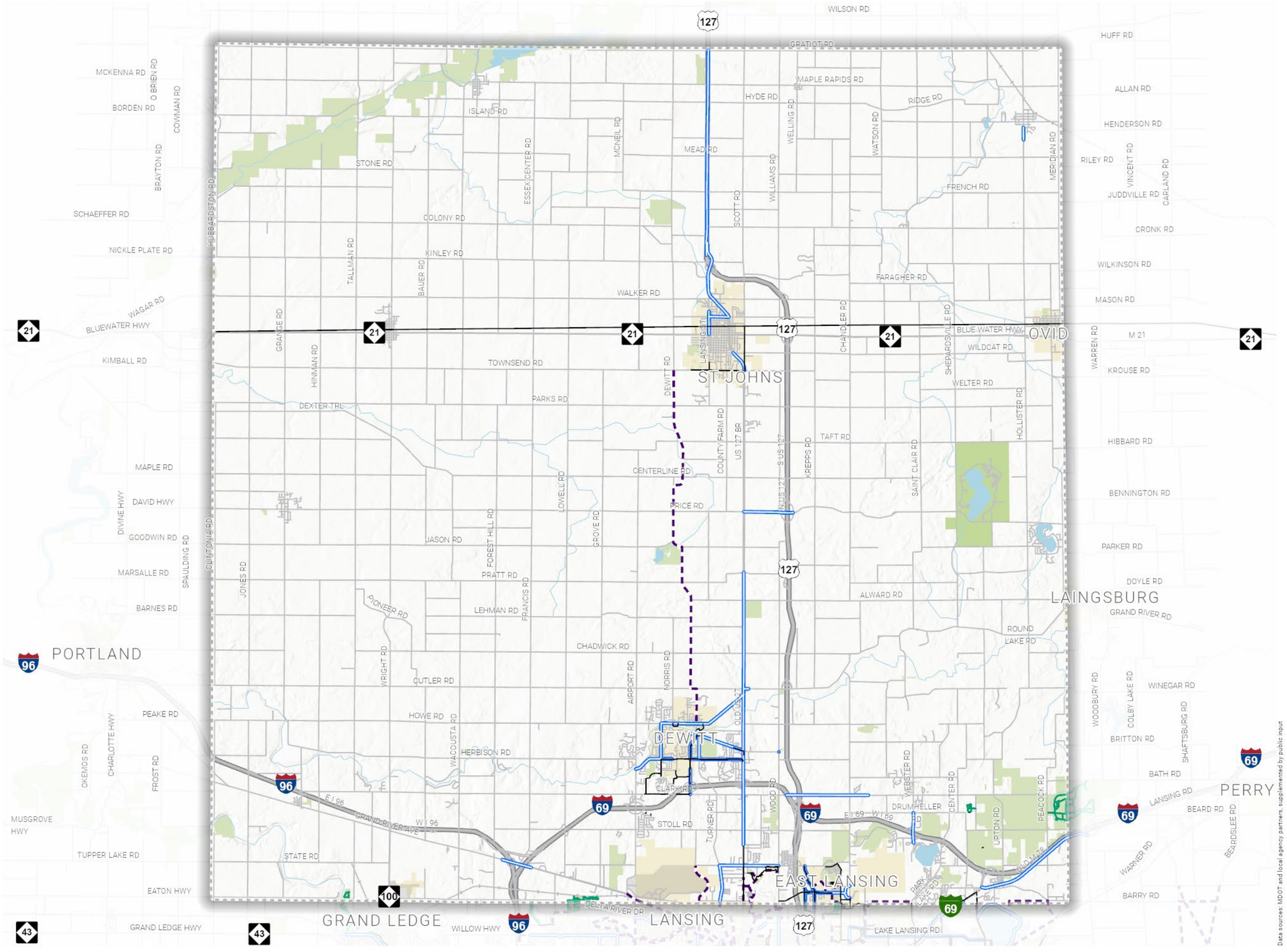


Data sources: MDOT and local agency partners, supplemented by public input

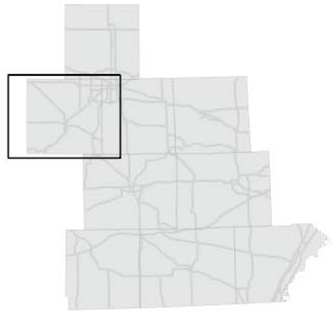
EATON COUNTY

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



0 2 4 MILES

MDOT Michigan Department of Transportation

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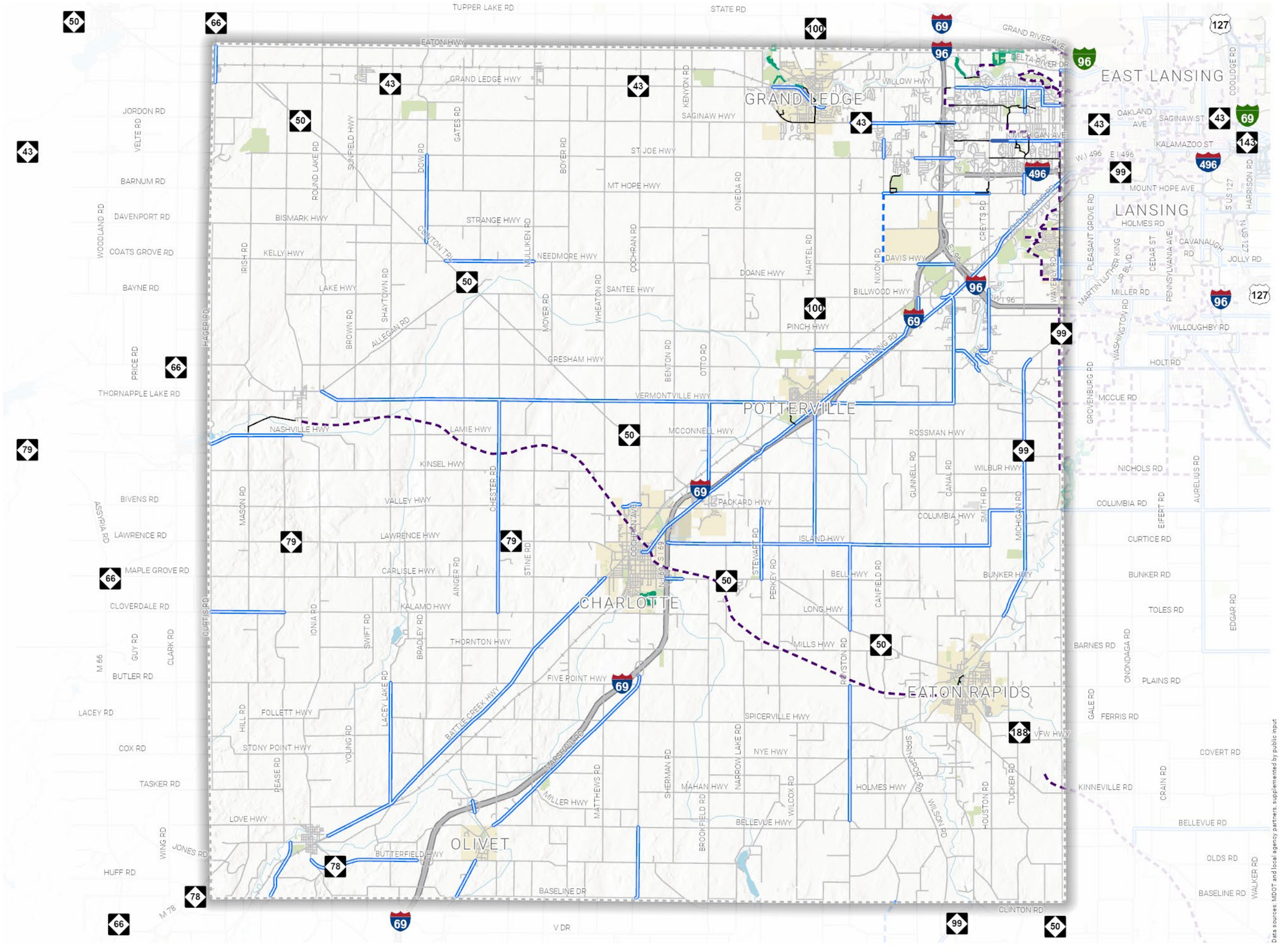

Data sources: MDOT and local agency partners, supplemented by public input

HILLSDALE 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

0 2 4 MILES

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MDOT Michigan Department of Transportation

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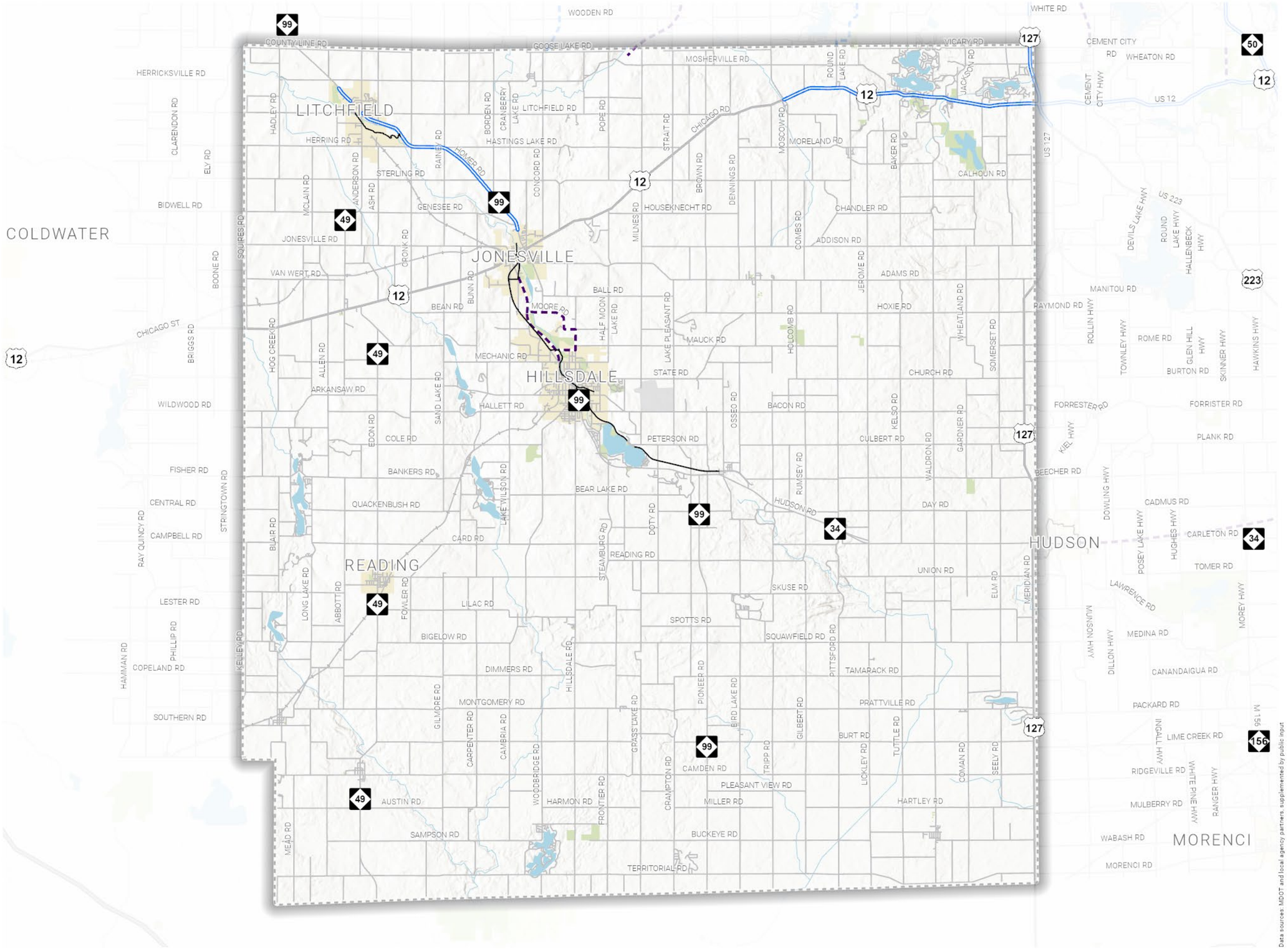


Data sources: MDOT and local agency partners, supplemented by public input

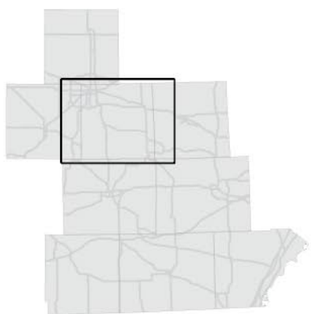
INGHAM COUNTY

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

UNIVERSITY REGION



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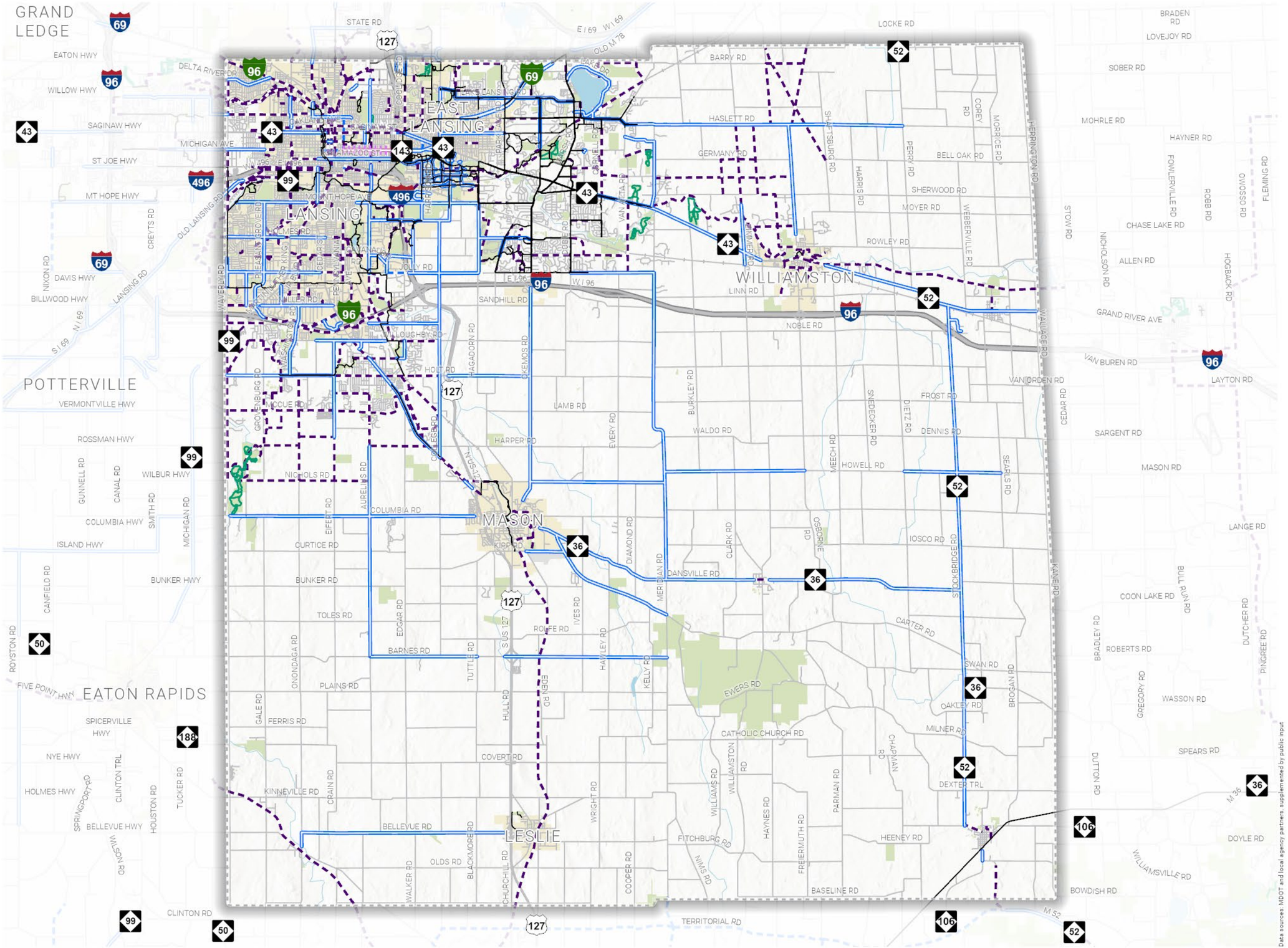


Data sources: MDOT and local agency partners, supplemented by public input

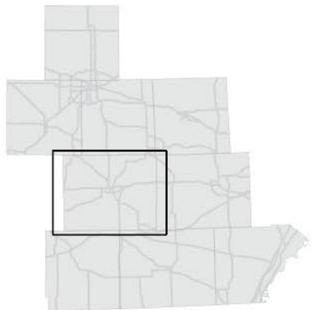
JACKSON COUNTY

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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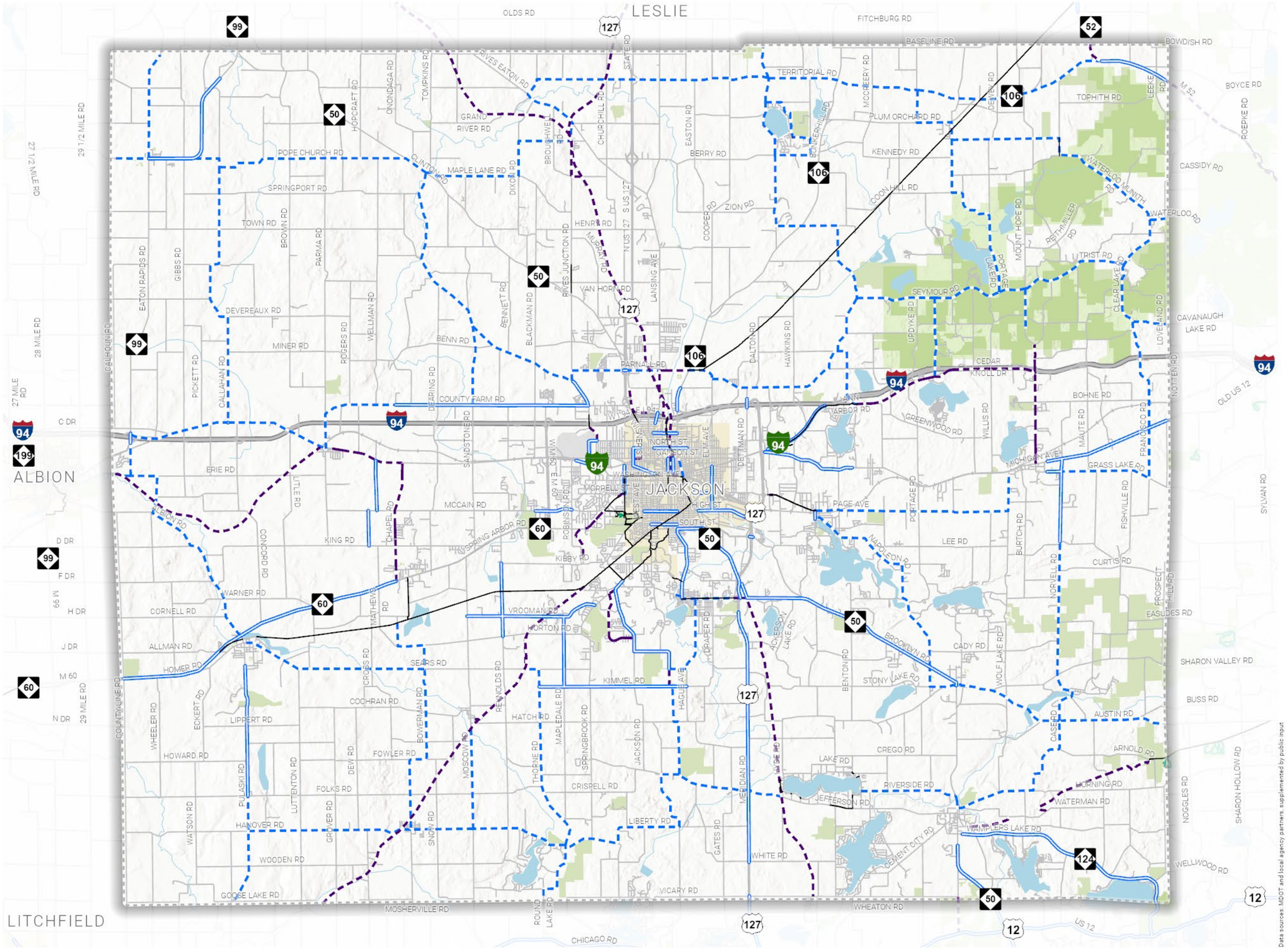

Data sources: MDOT and local agency partners, supplemented by public input

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)
- 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

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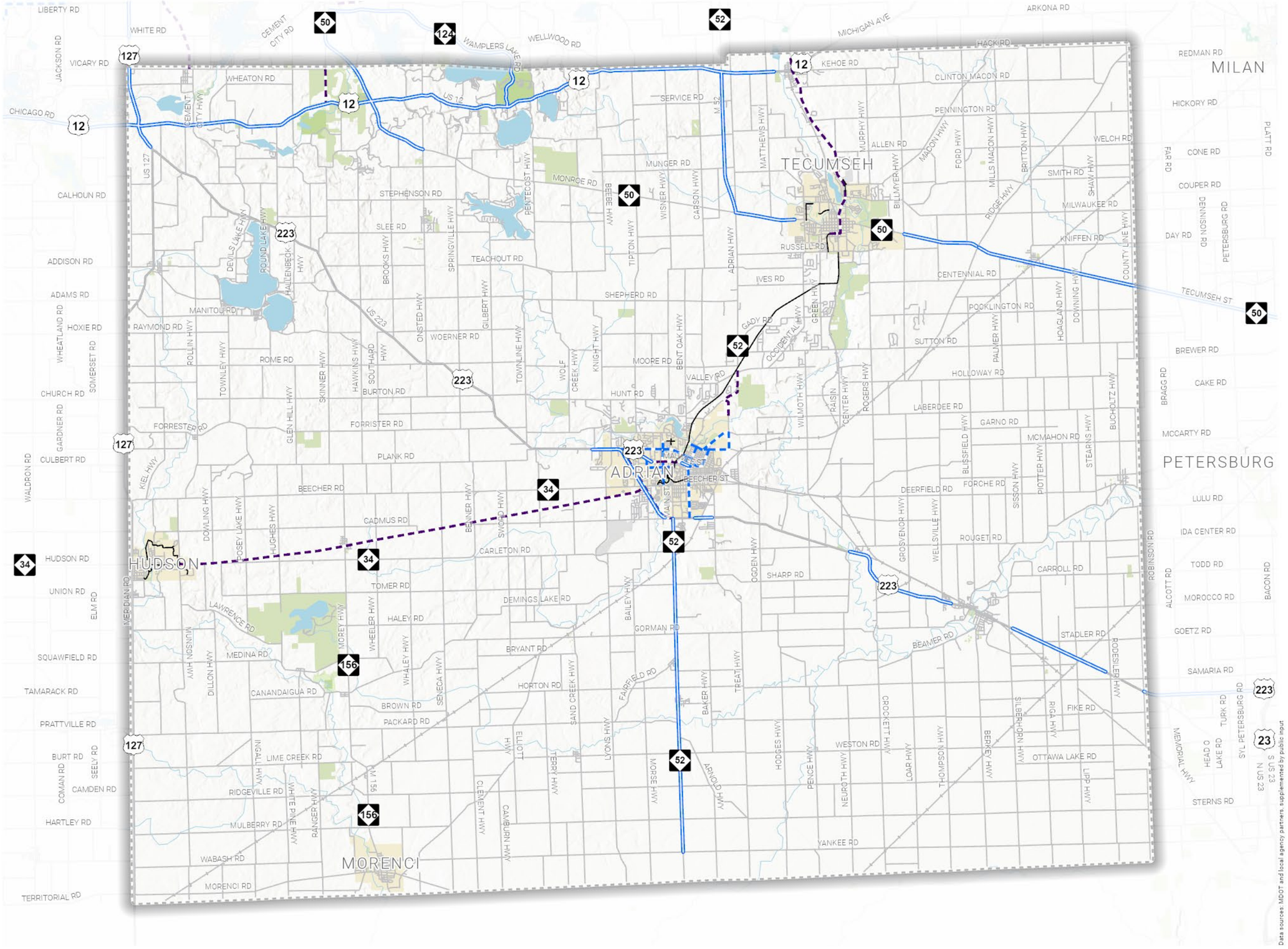

LIVINGSTON COUNTY

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)
- 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

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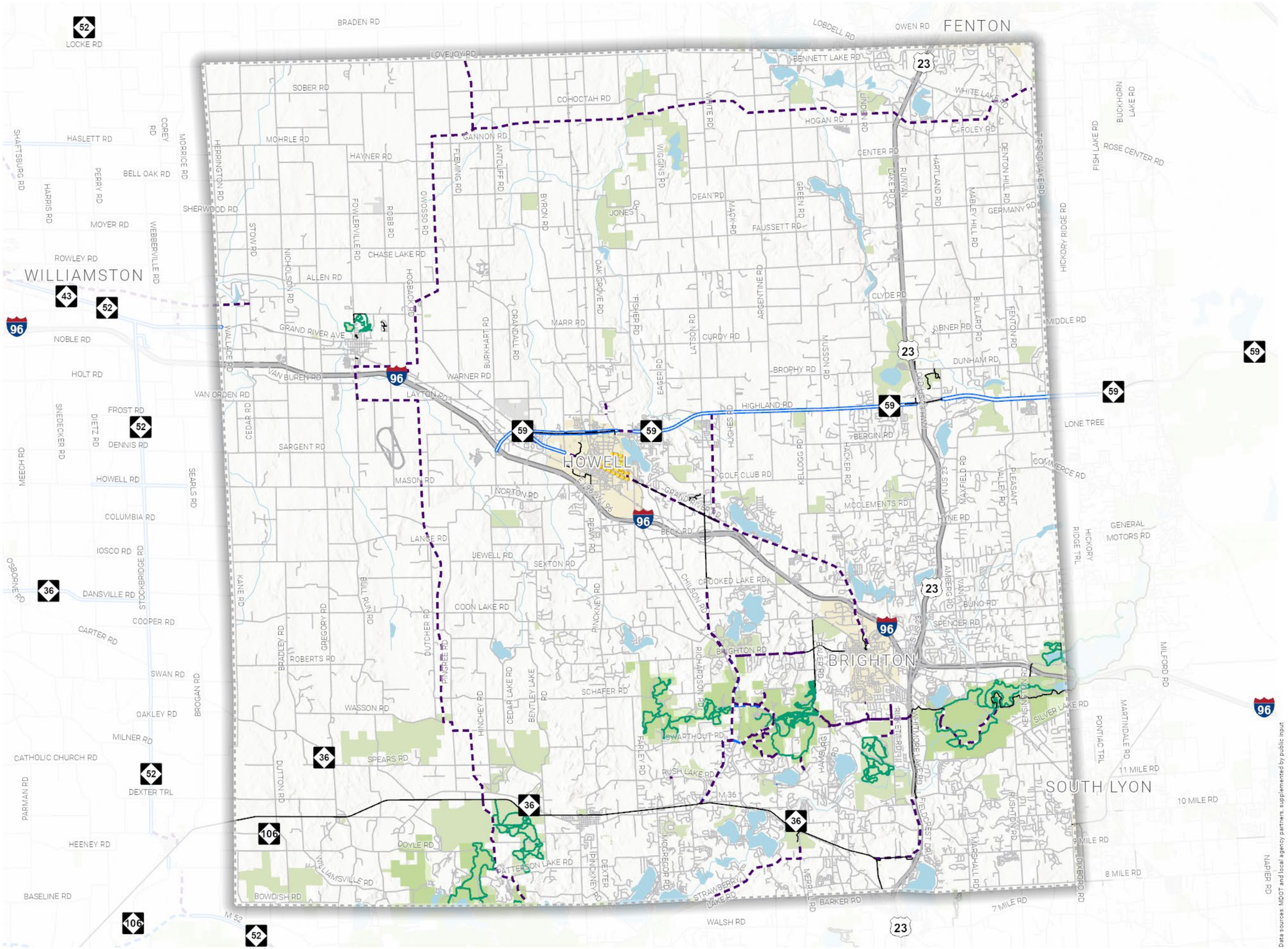


Data sources: MDOT and local agency partners, supplemented by public input

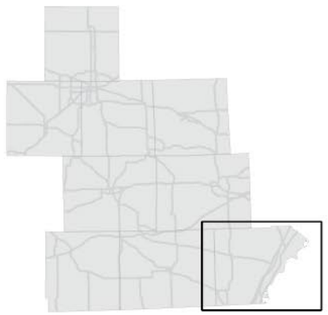
MONROE COUNTY

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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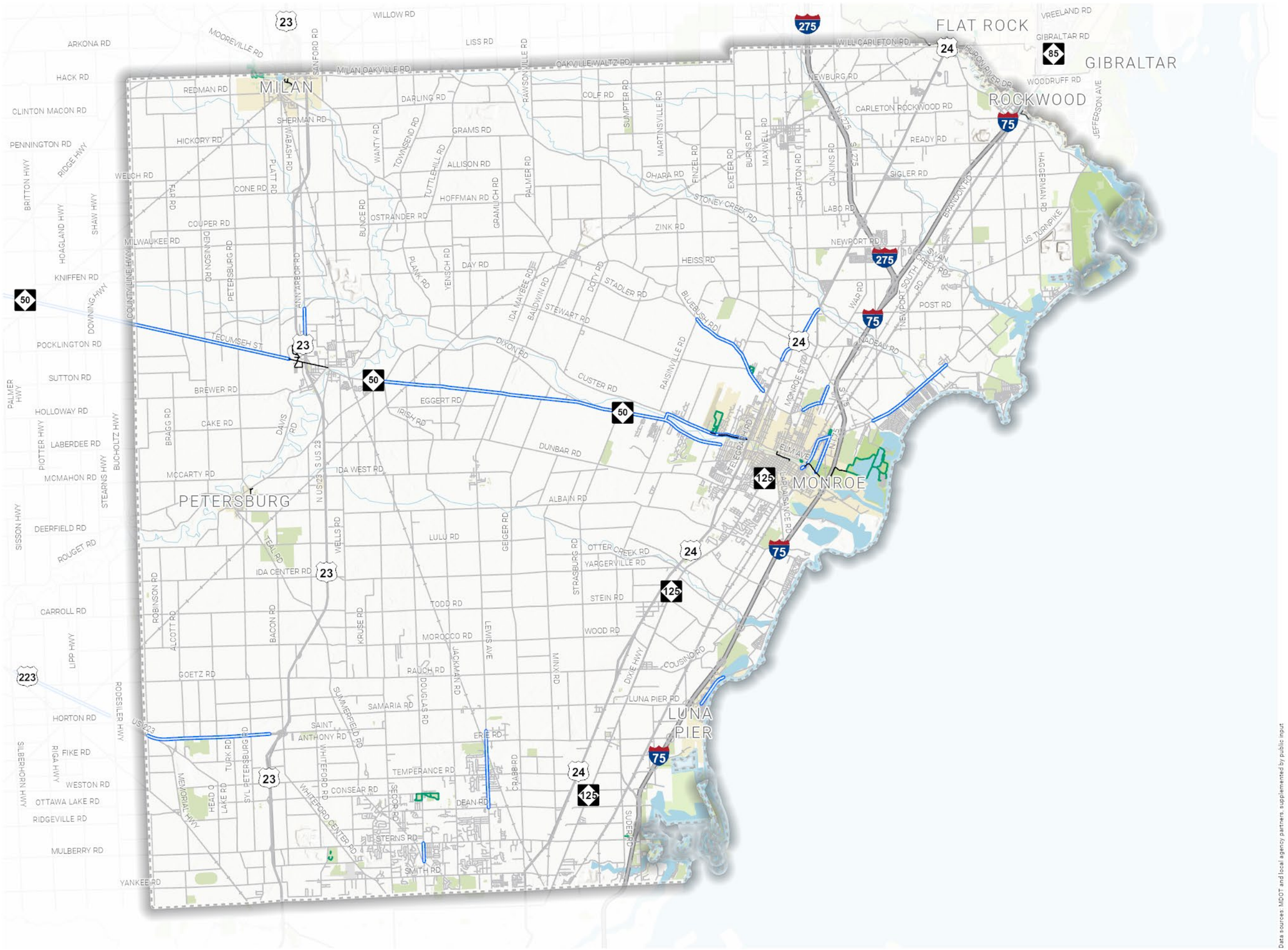

WASHTENAW COUNTY

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)
- 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

N

MDOT Michigan Department of Transportation

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

Understanding Existing Conditions through Data

Overview of the Existing Conditions Analyses

To inform the development of a safer and better-connected active transportation network, MDOT undertook a comprehensive evaluation of the University Region's roadway system. This effort focused on five key areas (Bicycle Level of Traffic Stress, Pedestrian Soft Barriers, Demand, Demographic and Crashes) alongside targeted assessments of transportation access and crash severity. Collectively, these analyses highlight critical patterns of risk and opportunity, offering data-driven insights to guide improvements in walking and biking conditions across the region's varied urban, suburban and rural landscapes. Below are the analyses and a question the analysis answers about the network.

- **Bicycle Level of Traffic Stress:** How comfortable or uncomfortable is a roadway to bike on given its physical characteristics like speed, number of lanes and bicycle facility type (if present)?
- **Pedestrian Soft Barriers Analysis:** How big of a barrier is a roadway for people trying to walk across it given its physical characteristics such as speed and number of lanes?
- **Demand Analysis:** Where are the places in the University Region with the most demand for biking and walking trips?
- **Demographic Analysis:** Where do demographics indicate underserved communities and greater need?
- **Crash Analysis:** How many bicycle or pedestrian-involved crashes has a roadway experienced in the last 10 years?

The analyses reveal a need to address gaps in comfort, access and safety for people walking and biking across the University Region. High-stress infrastructure in downtowns, demographic-related access disparities and patterns of severe crashes on arterial and collector roadways all point to a path forward: targeted investments in infrastructure that reduce risk, close connectivity gaps and prioritize communities with the highest need. Equipped with these findings, MDOT and its regional partners are well-positioned to build a more inclusive, safer and effective active transportation system. The following sections highlight key findings before the plan presents each analysis in more detail.

Person biking in a green-painted bike lane next to a large truck on a city street.

Bicycle Level of Traffic Stress (BLTS)

The Bicycle Level of Traffic Stress (BLTS) analysis estimates how comfortable a roadway is for people biking, based on factors that affect perceived safety. It helps identify gaps in the bike network and assesses which types of riders (based on skill and comfort) are likely to use a given segment.

The methodology is adapted from the 2012 Mineta Transportation Institute report, Low-Stress Bicycling and Network Connectivity. Each roadway segment is evaluated using characteristics such as speed limit, number of travel lanes and the presence and design of bicycle facilities. The analysis uses spatial data to assign a BLTS score to each roadway segment. Where segments have varying conditions, the most stressful (highest) score is used. Results highlight both low-stress areas and locations where improvements are needed to create a network that works for people of all ages and abilities. A detailed explanation of the BLTS methodology and results can be found in Appendix D.

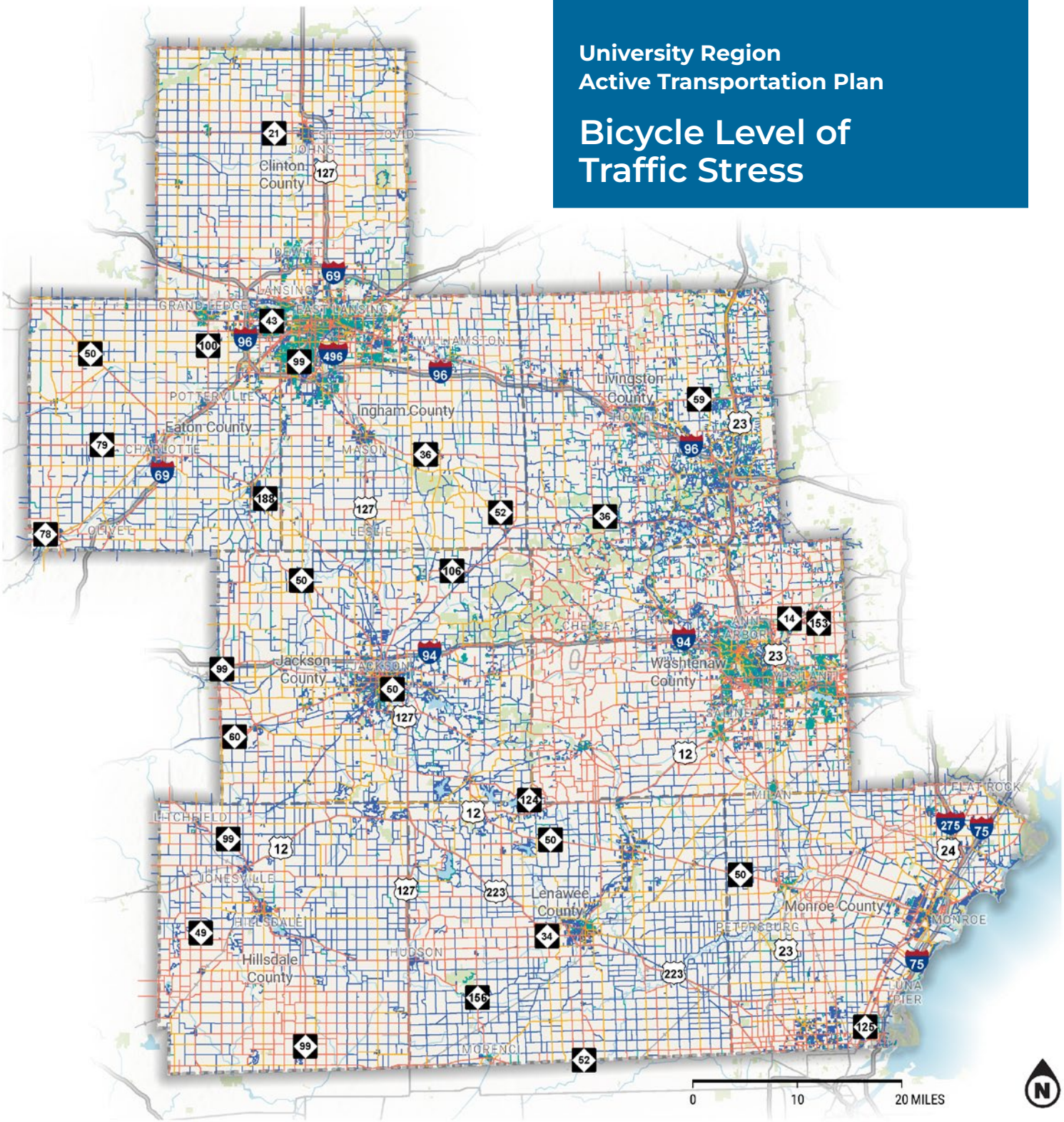
Key Findings of the BLTS

- High-stress conditions dominate key downtown and arterial corridors in cities like Ann Arbor, Lansing and Ypsilanti, largely due to speed, volume and lack of dedicated bicycling infrastructure.
- Trails and shared-use paths in cities such as Lansing offer lower-stress alternatives but are often indirect.
- Rural areas present the greatest challenges due to high-speed roads with no bike facilities; Hillsdale County exemplifies this issue.

Capital Area Transportation Authority (CATA) bus traveling down a multi-lane road with bike lane.

University Region
Active Transportation Plan

Bicycle Level of Traffic Stress



Bicycle Level of Traffic Stress
- 4 (Higher Stress)
- 3
- 2
- 1 (Lower Stress)

Railroads
Parks
University Region

Figure 14: Bicycle Level of Traffic Stress in the University Region. For more detailed maps, see Appendix D.

Pedestrian Soft Barriers

This analysis identifies "soft barriers," roadways where crossing conditions are uncomfortable for pedestrians, even if the route itself is otherwise walkable. These barriers can discourage walking and reduce overall connectivity in the active transportation network.

Unlike a full Pedestrian Level of Traffic Stress (PLTS) analysis, which requires detailed and consistent sidewalk data (presence, width, condition), the soft barrier approach focuses on roadway characteristics that influence crossing comfort. This makes it a more adaptable and scalable method, particularly helpful when looking at a regional level where sidewalk data is less available.

Soft barriers are classified as either minor or major, based on factors such as:

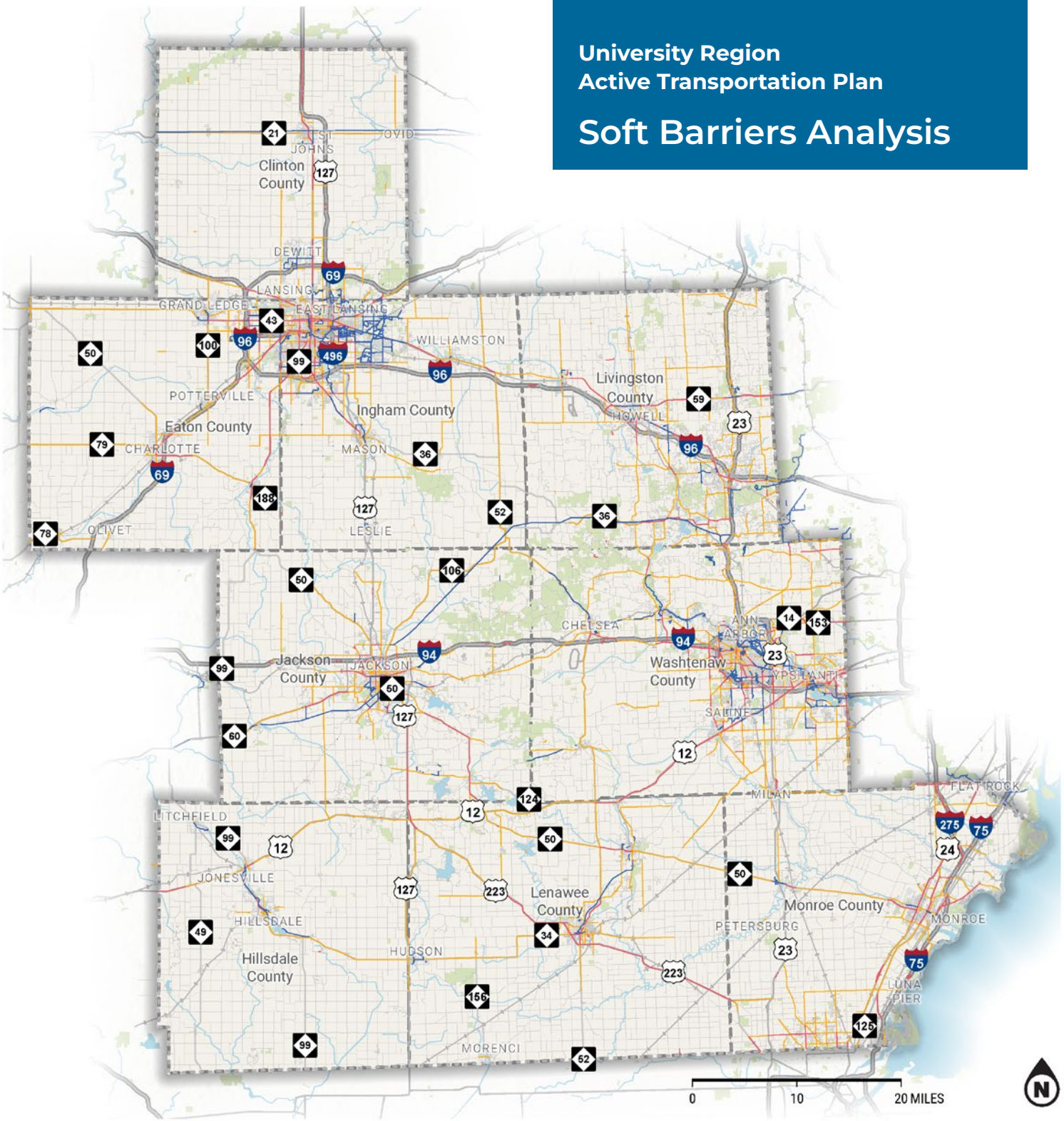
- Number of travel lanes.
- Posted speed limits.
- Average Annual Daily Traffic (AADT).

This approach relies on data available from MDOT's Roads and Highways (v24) Centerline Attribution Data, supplemented by attributes from OpenStreetMap (e.g., median types and speed limits). It allows for a more consistent regional analysis without requiring uniform sidewalk data, resulting in more meaningful insights for a multi-jurisdictional planning area like the University Region. A detailed explanation of the soft barrier analysis methodology and results can be found in Appendix E.

Key Findings of the Pedestrian Soft Barrier Analysis

- Major roads and highways create psychological and physical barriers in urban centers, especially where pedestrian infrastructure is insufficient.
- Barriers are most pronounced in cities like Adrian, Ann Arbor and Tecumseh; smaller towns such as Brighton experience fewer barriers due to less intense traffic environments.

Soft Barriers Analysis



Pedestrian LTS (Soft Barriers Analysis)
- Major Soft Barrier
- Minor Soft Barrier
- Not a Barrier
- Shared-Use Path/Sidepath

Railroads
Parks
University Region

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

Figure 15: Soft Barriers in the University Region. For more detailed maps, see Appendix E.

Demographic Analysis

Disadvantaged populations and the distribution of transportation investments vary between communities, so evaluating active transportation needs across demographic groups requires a flexible, data-informed approach. To support this analysis, a framework of six key dimensions was developed, which serves as the foundation for selecting and interpreting relevant datasets. All data used in the analysis is large-scale, publicly available, spatially attributable and analyzed at the census block group level.

The six dimensions of the active transportation demographic analysis include:

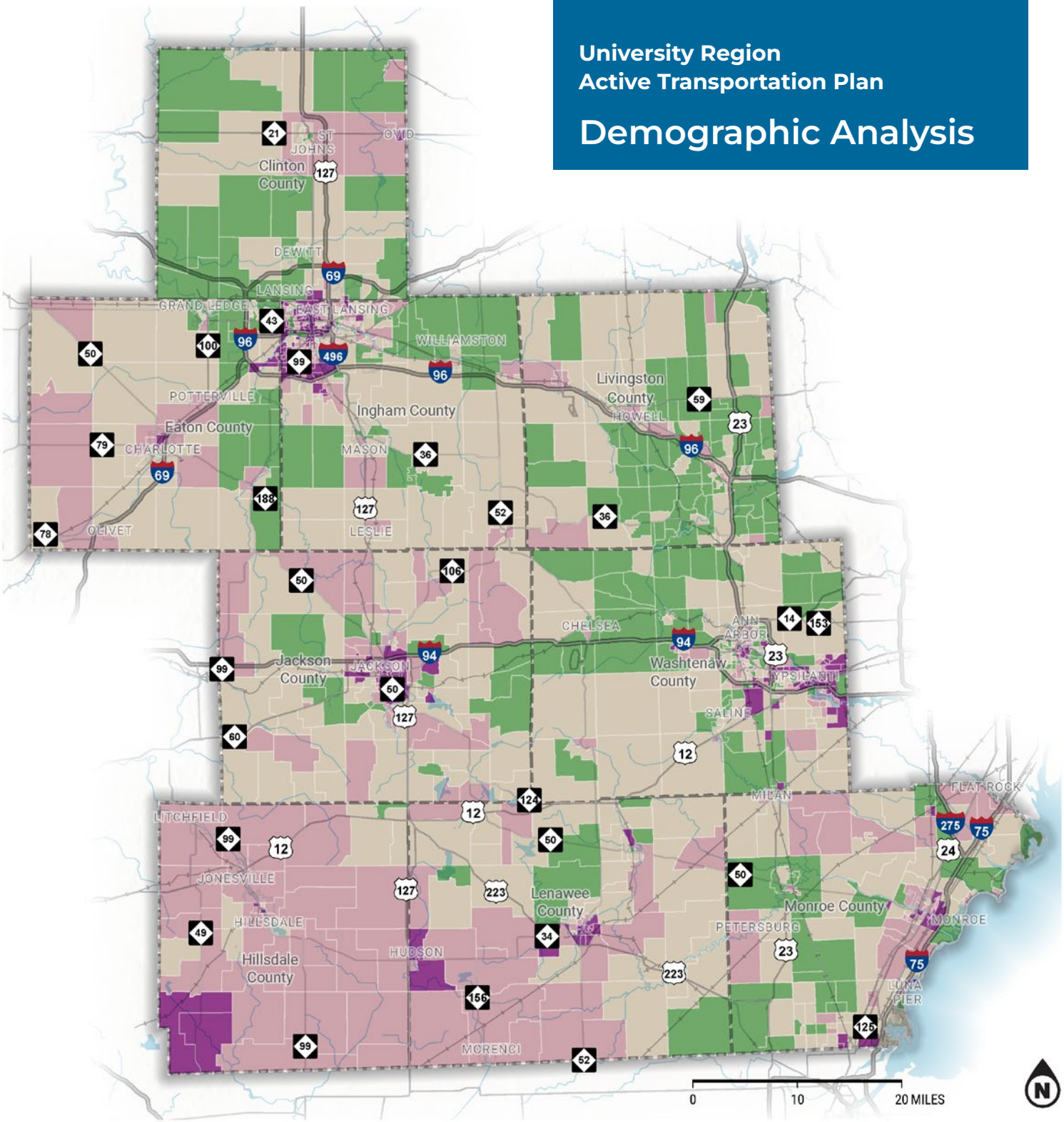
1. **Engagement:** Inclusion of communities historically excluded from decision-making. While no specific dataset was used to measure engagement in this analysis, the other dimensions inform engagement priorities.
2. **Opportunity and Accessibility:** Access to opportunities that support quality of life and upward mobility.
3. **Environmental Justice:** Exposure to pollution and environmental burdens from transportation and industry.
4. **Health and Safety:** Disparate health outcomes and risks related to the transportation system and built environment.
5. **Affordability:** Transportation and housing costs as a share of household income and their impact on displacement risk.
6. **Vulnerability:** Susceptibility to harm from disruptions like natural disasters or economic shocks, particularly among socially vulnerable populations.

Key Findings of the Demographic Analysis

- High-need communities are concentrated in urban centers but also appear in rural areas, particularly in the southwestern portion of the region.
- Counties like Hillsdale and Ingham have the highest median demographic index scores, while Livingston and Clinton counties score lowest.
- Historic disinvestment and systemic inequality have created lasting infrastructure and access gaps, reinforcing disparities in transportation access and safety.
- A map of state roadways intersecting with high-need areas highlights key corridors (e.g., US-12 in Ypsilanti, US-27 in Lansing) where active transportation investment would have high impact for the surrounding communities.

The project team compiled and ranked demographic-related datasets for each block group in the University Region. Variables were percentile-ranked, weighted based on their relevance and combined into a composite demographic index. Block groups were then categorized into five groups based on their scores, with higher scores representing areas of greater demographic need. A detailed explanation of the datasets, weighting, approach and results can be found in Appendix F.

Demographic Analysis



Demographic Need
Higher Need
Lower Need
Railroads
University Region

Figure 16: Demographic analysis in the University Region. For more detailed maps, see Appendix F.

Demand Analysis

The Demand Analysis assessed both existing and latent (suppressed) demand for walking and biking trips. Latent demand refers to trips that people might take by active modes (but currently do not) due to barriers such as lack of safe, comfortable or connected infrastructure.

The project team created a composite heat map by combining trip generators (places where people live and work) with trip attractors (destinations like schools, parks and shops). The result is a generalized picture of current and potential active transportation demand across the region.

This demand map can be used on its own or alongside other data, such as areas with high concentrations of short trips, to help identify gaps in the network and prioritize areas where new or improved infrastructure would have an immediate impact.

The demand analysis estimates demand based on 14 variables grouped into three main categories:

- **Built Environment:** Features such as intersection density and existing infrastructure for walking and biking.
- **Trip Generators and Attractors:** Including homes, jobs, schools, parks and retail.
- **Demographics and Travel Behavior:** Areas with existing concentrations of short trips that are ideal for walking or biking.

These variables are spatially analyzed to produce a map of areas with high potential for active travel. For a detailed explanation of the variables, weighting and analysis process, see Appendix G.

Key Findings of the Demand Analysis

- Walking demand peaks near transit-accessible commercial hubs and educational institutions.
- Bicycling demand spans larger areas, particularly where longer but feasible trips are common, highlighting gaps in the current network.
- Latent demand reveals potential for increased walking and biking with better infrastructure, especially along logical but currently unsafe travel corridors.

Pedestrian Demand Analysis

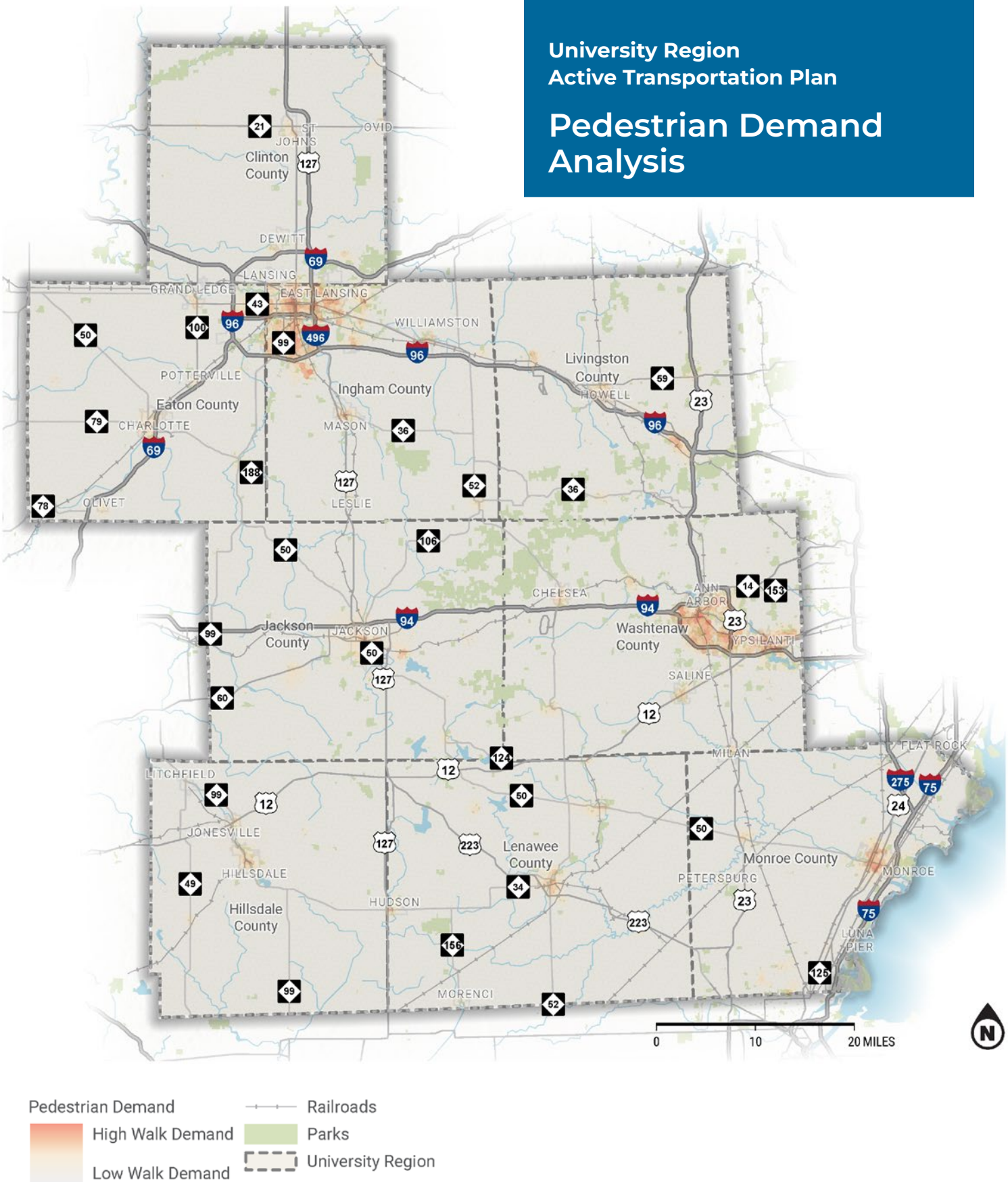


Figure 17: Pedestrian Trip Demand in the University Region. For more detailed maps, see Appendix G.

Bike Demand Analysis

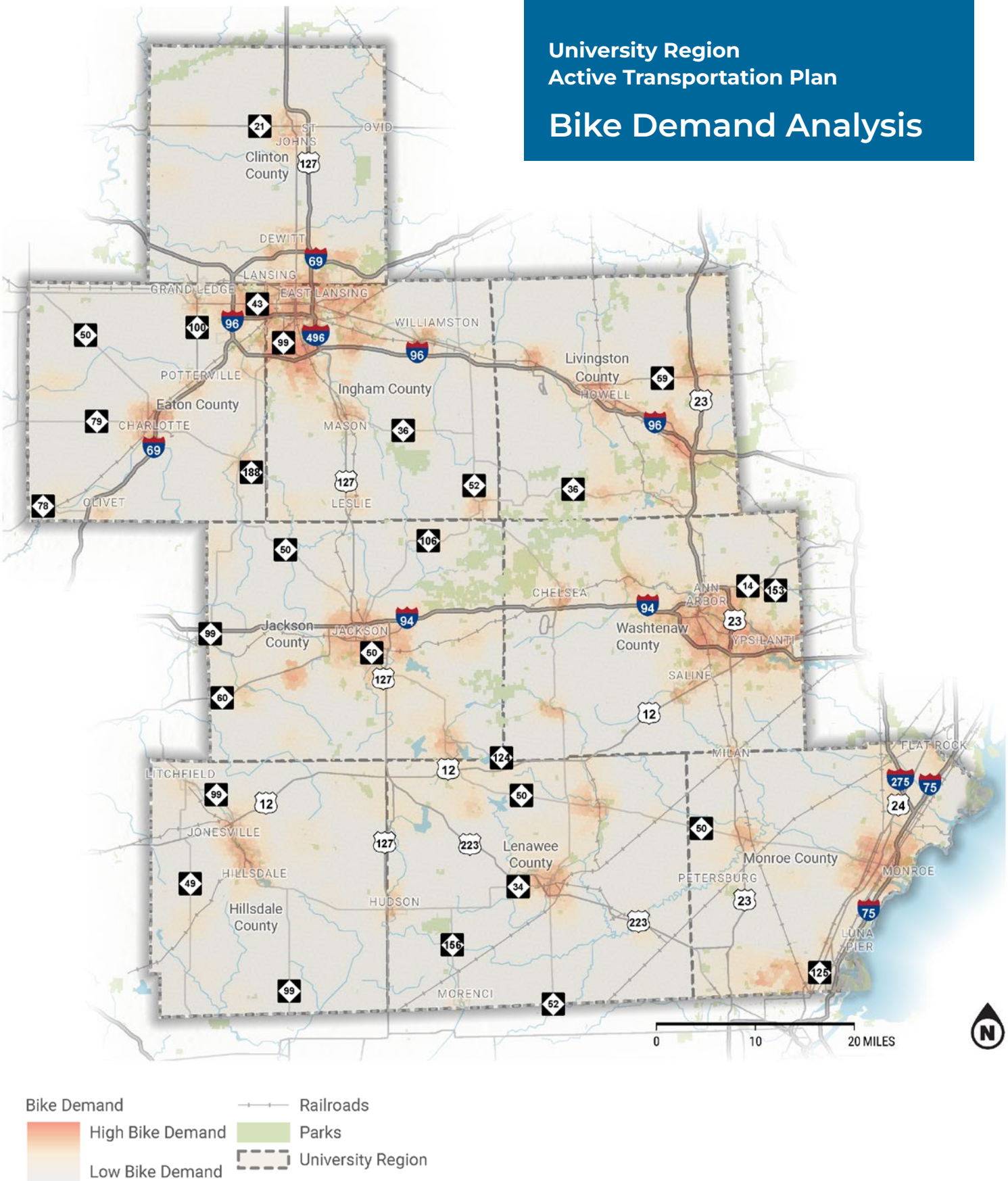


Figure 18: Bike Trip Demand in the University Region. For more detailed maps, see Appendix G.

Crash Analysis

To identify the most critical areas for pedestrian and bicyclist safety improvements in the University Region, a severity-weighted crash analysis was conducted. This method focuses on crashes that resulted in a fatality or serious injury, recognizing that not all crashes have equal impact on communities or infrastructure priorities.

The analysis begins by preparing two primary datasets: recent crash data for pedestrian and bicycle incidents (2017–2021) and a cleaned, region-wide street centerline dataset. The roadway network is first refined to improve analysis accuracy. Divided roadways are consolidated and the network is segmented into standardized lengths: shorter segments (one-half mile) in urban areas where crashes are more frequent and longer segments (1 mile) in rural areas.

Each crash is then assigned a severity weight based on the most serious outcome involved. Fatal crashes receive the highest weight, followed by serious or minor injury crashes and then property-damage-only incidents. This weighting approach reflects the societal cost of different crash outcomes and helps prioritize locations where the most harm is occurring, not just where crashes are most frequent.

Crashes are then spatially aligned (or "snapped") to the nearest road segment to encourage accurate matching with the network, especially in wide corridors or places where GPS data may be slightly offset. The total crash severity score for each road segment is then calculated by summing the severity of all crashes that occurred within that segment. The result is a severity-weighted index that highlights roadways with the highest concentration of serious and fatal crashes involving people walking or biking. This index helps identify corridors where targeted investments and design changes could most effectively reduce harm and save lives. A full explanation of the Crash Analysis results and methodology can be found in Appendix H.

Key Findings of the Crash Analysis

- **In 2011–2021, 6,177 bicycle/pedestrian crashes occurred in the region,** with 85 percent resulting in injury or death.
- **Fatal crashes are disproportionately high on principal arterials and collectors**, particularly outside of intersections where speeds are higher.
- **Arterials and collectors account for 72 percent of all bicycle and pedestrian collisions.**
- **68 percent of crashes occurred in large, urbanized areas**, underscoring the importance of focusing safety interventions in high-density contexts.
- **Severity scores, developed to highlight priority corridors**, identify areas in Ann Arbor, Ypsilanti, Lansing, Monroe and Jackson as hotspots for fatal and severe injury collisions.
- **Bicyclist Risk:** Ann Arbor's Packard Street and E Huron Street, Lansing's S Cedar Street and E Grand River Avenue and Jackson's E Michigan Avenue are among the roads of greatest concern for cyclists.
- **Pedestrian Risk:** High-severity corridors include Hill Street and W Washington Street in Ann Arbor, Saginaw Highway in Lansing and E Michigan Avenue in Ypsilanti.
- **Severity scores help pinpoint high-return investments**: corridors where infrastructure improvements could significantly reduce serious and fatal injuries.

University Region
Active Transportation Plan

Pedestrian Crash Analysis

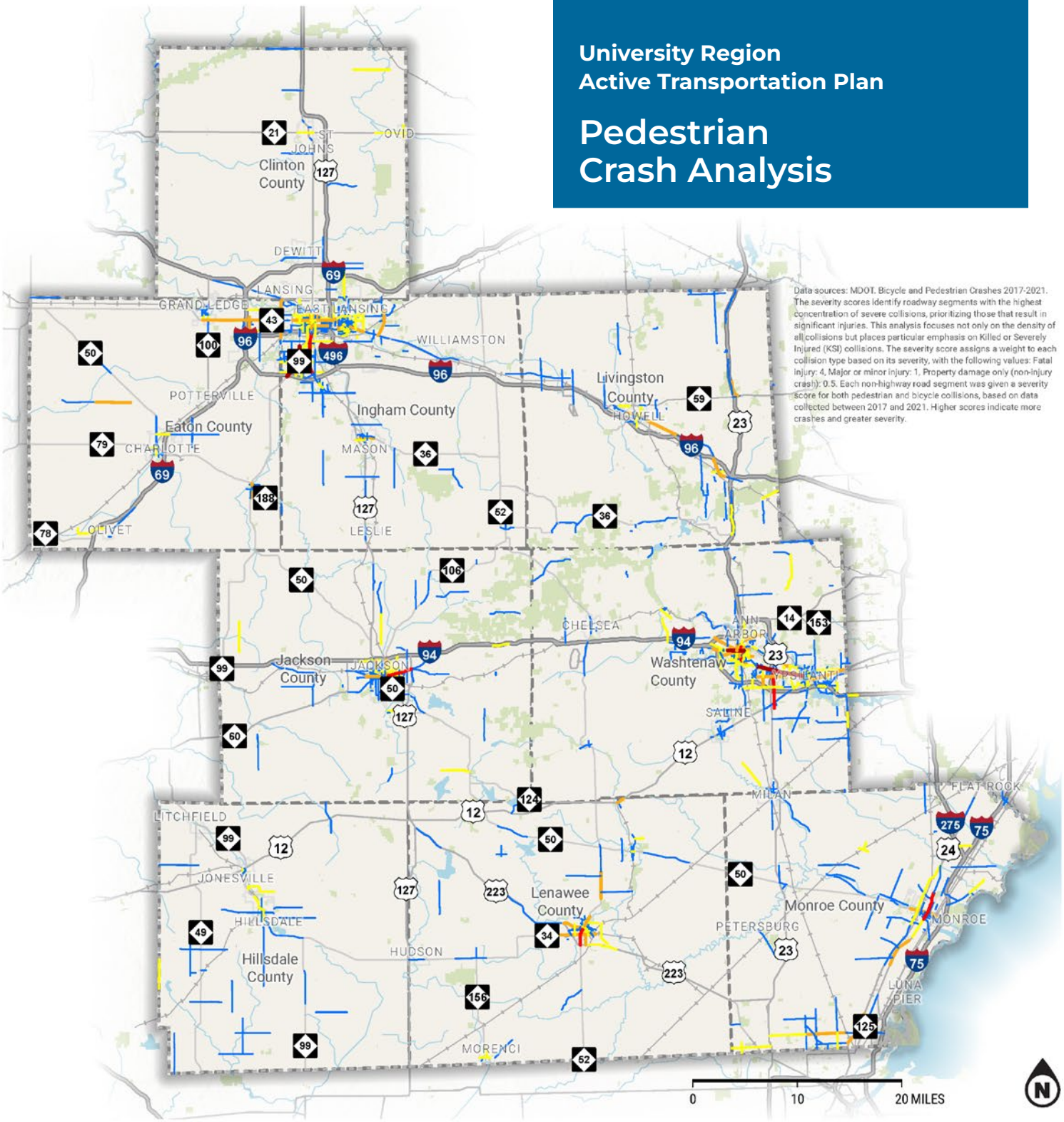


Figure 19: Severity-weighted Pedestrian Crash index in the University Region. Higher scores indicate roadways with higher concentrations of severe crashes involving people walking. For more detailed maps, see Appendix H.

Bicycle Crash Analysis

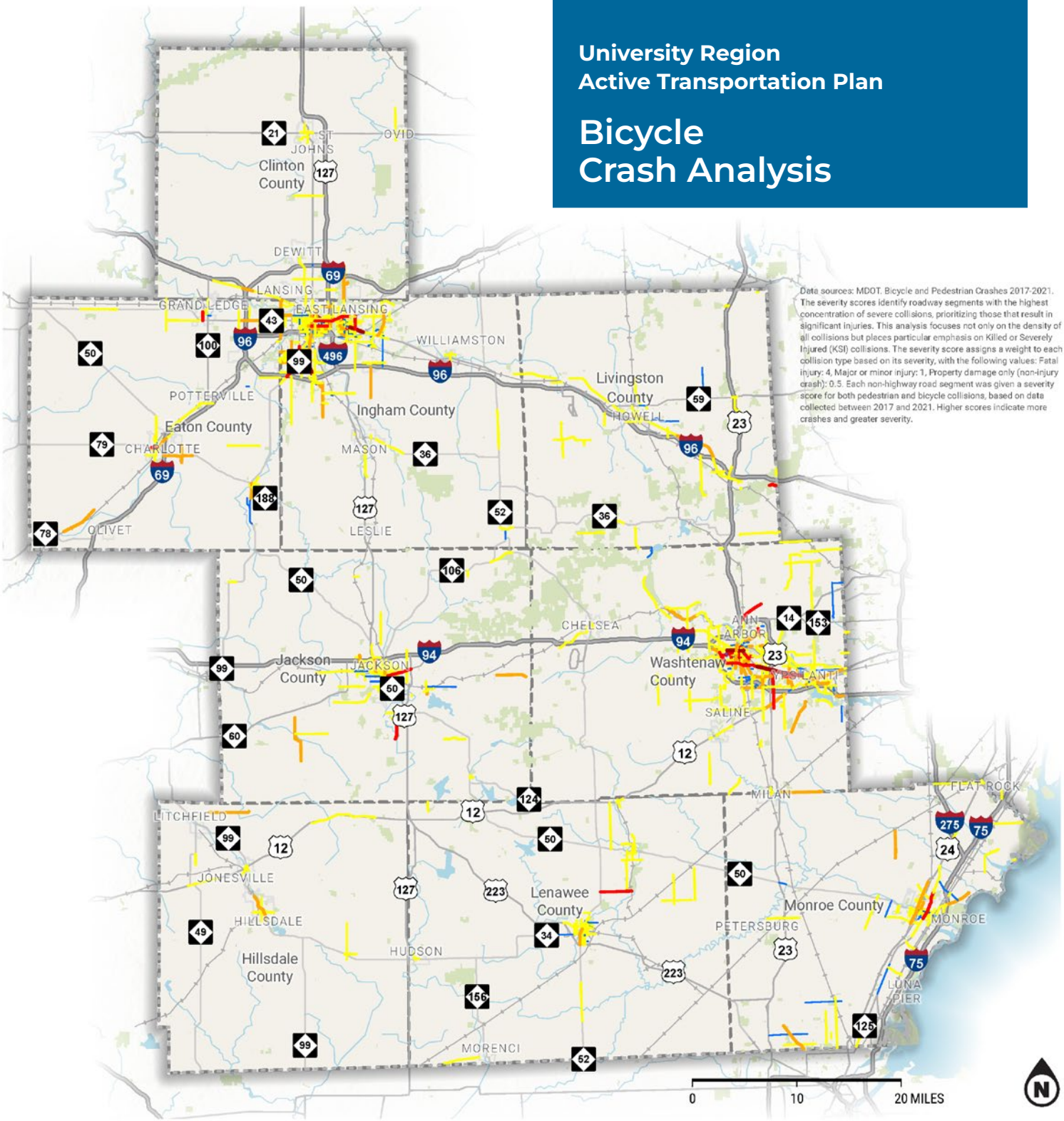


Figure 20: Severity-weighted Bike Crash index in the University Region. Higher scores indicate roadways with higher concentrations of severe crashes involving people biking. For more detailed maps, see Appendix H.

Chapter 4

University Region Proposed Strategic Network

University Region Proposed Strategic Network

Understanding the Proposed Network

The ATP introduces a set of proposed active transportation corridors based on the results of the analyses conducted in this plan. These proposed corridors are intended to serve as a guiding framework, not a prescriptive plan, for identifying opportunities to enhance regional connectivity and safety for people walking, biking and rolling across the nine-county University Region.

The proposed corridors were selected through a data-informed process grounded in the four core analyses of the existing conditions phase: crashes, demographics, demand and traffic stress. These analyses highlight where investments in active transportation could yield the most benefits and offer a starting point for planning regional connectivity.

Purpose of the Strategic Network

The proposed network is not a prescriptive solution but offers a regional reference point to:

- **Identify corridors** where future planning and investment discussions may be considered.
- **Guide coordination** among MDOT, local governments and regional planning partners.
- **Highlight regional connection opportunities** and address high-need areas.

Implementing infrastructure along any proposed segment will require continued coordination between MDOT's regional and central offices, local jurisdictions and other key partners. This process includes identifying appropriate facility types, refining alignments and segment designations and developing funding and phasing strategies. Local planning efforts may differ from this plan as they may apply alternative evaluation criteria or prioritization methodologies tailored to the local context.

University Region
Active Transportation Plan

Strategic Active Transportation Network

Figure 21: The proposed strategic network for the University Region. The proposed corridors offer a starting point for planning regional connectivity.

Building on Previous Planning Efforts

- **Renaming the proposed regional corridors.** This plan renames the "prioritized corridors" from the previous ATP as the University Region Proposed Strategic Network to better reflect their purpose: highlighting key connections that support a regional vision. These corridors are informed by the data analyses conducted in this plan and are intended to guide planning efforts, not serve as a prescriptive set of projects.
- **Completing the connections through (and across) main streets.** This plan includes local segments of MDOT roadways, such as state highways that also serve as downtown main streets, to recognize the importance of pedestrians on these facilities. 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.
- **Adding decision-making capacity.** This plan enhances the University Region Proposed Strategic Network with data from its crash, demographic and demand analyses. Roads were divided into 250-foot sections and analyzed on seven metrics. It also adds planned and existing facility information to the corridors and segments the network into project-sized pieces.

Corridor Evaluation Methodology

To evaluate the corridors, the project team relied on the seven metrics related to crashes, demographics, demand and traffic stress produced in the existing conditions phase. The seven metrics are listed below:

1. **Pedestrian severity-weighted crash index**
2. **Bicycle severity-weighted crash index**
3. **Demographic index**
4. **Pedestrian trip demand index**
5. **Bicycle trip demand index**
6. **Pedestrian Level-of-Traffic Stress** (Soft Barriers Analysis)
7. **Bicycle Level-of-Traffic Stress**

For each corridor, the project team sampled the values from these seven analysis layers at locations along the corridor. The median value of the metric sampled along the corridor was then given a score of 1-5 depending on how it compared to all the other corridors (i.e., depending on which quantile its value fell into). Higher scores indicated places with higher needs, according to these metrics.

These seven metric scores were then summed to produce a composite score for each corridor. Since each metric was equally weighted, the composite score ranged from a minimum of 7 (all analysis metric values were in the lowest quantile compared to all corridors) to a maximum of 35 (all analysis metric values in the highest quantile compared to all corridors).

The purpose of the composite score is to make the analysis results more actionable and to guide MDOT and partners in prioritizing enhancements for walking and biking.

Each corridor includes the following attributes:

- **Identification:** Unique Corridor ID, Roadway Name/Highway Number, Jurisdiction
- **Plan Inclusion:** 2015 and 2025 ATP designations, Statewide Significance (if applicable)
- **Traffic Data:** Maximum/Minimum AADT
- **Existing and Planned Facilities:** Current and proposed bicycle infrastructure
- **Scoring Metrics** (1-5 points maximum):
  - **Pedestrian Crash Score:** Reflects severe crashes; corridors in the top 20 percent of crash frequency receive a 5, while those in the bottom 20 percent receive a 1.
  - **Bike Crash Score:** Reflects severe crashes; corridors in the top 20 percent of crash frequency receive a 5, while those in the bottom 20 percent receive a 1.
  - **Pedestrian Demand Score:** Measures trip generators and attractors; corridors with the highest concentration of destinations and trip origins receive a 5, while those with the lowest receive a 1.
  - **Bike Demand Score:** Measures trip generators and attractors; corridors with the highest concentration of destinations and trip origins receive a 5, while those with the lowest receive a 1.
  - **Demographic Score:** Highlights areas with higher investment needs; corridors in communities with the highest demographic-based needs (e.g., economic opportunity, housing burden, demographics) receive a 5, while those in the lowest 20 percent receive a 1.
  - **Bike Level of Traffic Stress (LTS) Score:** Assesses comfort and barriers; corridors with the highest stress due to high speeds, multiple lanes and lack of bike infrastructure receive a 5, while those with the least stress receive a 1.
  - **Pedestrian Level of Traffic Stress (Soft Barriers Analysis) Score:** Assesses comfort and barriers; corridors that pose as Major Barriers were given a 5, while those that are not a soft barrier received a 1.
  - **Composite Analysis Score:** Aggregates crash, demographics, demand and traffic stress scores, providing a data-driven prioritization tool where higher scores indicate corridors with greater need for improvements.

    Note: The composite score is a starting point for regional planning discussions, highlighting corridors with higher needs based on all the analyses conducted for this plan, including crashes, demographic, demand and traffic stress. For more detailed information regarding the methodology used to develop the proposed strategic network, see Appendix I.

University Region
Active Transportation Plan

Strategic Active Transportation Network

Figure 22: The proposed strategic network for the University Region. The scores of these regional connections help highlight where investments in active transportation could yield the highest benefits in terms of level of traffic stress, demand, crashes and demographics.

How to use the University Region Proposed Strategic Network

The University Region Proposed Strategic Network is intended to guide MDOT, county and local road agencies and other partners in creating a more cohesive and connected regional system for walking and biking. It includes both state-owned and locally owned roadways, acknowledging that while state highways often provide the most direct regional connections, nearby local routes may offer more comfortable or practical options for active transportation.

The proposed network builds on corridor concepts from the 2015 ATP. It identifies locations where MDOT facilities (and key local connectors) could be enhanced to improve safety, accessibility and connectivity across jurisdictional boundaries.

As a planning tool, the network is designed to support collaboration and conversation rather than mandate decisions. It serves as:

- A **visual and analytical tool** to guide planning discussions at the regional and county levels.
- A **reference point** for identifying corridors that align with safety, access and connectivity goals.
- A **foundation** for future investment strategies, project scoping and grant applications.

Corridors identified through this process should be regularly revisited and refined. Local knowledge, updated data and shifting planning priorities may inform adjustments to promote alignment with real-world conditions and community goals.

Suggested Ongoing Coordination

To ensure the proposed network remains relevant, accurate and actionable, MDOT and its partners should:

- **Collaborate with local and regional stakeholders** to refine segment priorities and develop context-sensitive design solutions.
- **Maintain and update a shared GIS inventory** of existing and proposed active transportation facilities across jurisdictions.
- **Periodically reassess the proposed segments,** integrating new data, community feedback, implementation progress and emerging funding opportunities.

This approach promotes a living network network model to be flexible and adaptable, grounded in analysis and responsive to the needs and realities of communities throughout the University Region. The University Region Proposed Strategic Network is a starting point to support decision-making, not a directive. Through collaborative use, MDOT and its partners can work together to close infrastructure gaps, improve safety and build a more inclusive and connected regional active transportation system.

County Connection Opportunities

The project team enhanced the University Region Proposed Strategic Network with data from the crash, demographic and demand analyses. The result is a composite analysis score for each corridor on the University Region Proposed Strategic Network. This score represents a cumulative measure based on seven factors (each of which has a total possible score of 5) relating to crashes, demographics, demand and the level of traffic stress induced by roadway conditions for people walking and biking. The score is not intended to serve as a final decision-making tool but as a starting place for planning discussions as they relate to the regional network, highlighting the corridors that may exhibit more urgent needs based on their contexts and crash histories. [1]

Highest Scoring Corridors of the Proposed Strategic Network by County

Clinton County

- **Corridor 2:** Old US-27/ US-127 BR (Whitmore Street) in St. Johns.
- **Corridor 3:** M-21 (State Street/Blue Water Highway) in St. Johns.

Eaton County

- **Corridor 38:** I-69 BL (Lansing Road), M-50 (Cochrane Avenue), M-79 (Lawrence Avenue) in Charlotte.
- **Corridor 12:** M-43 (Saginaw Highway) in Waverly.
- **Corridor 10:** M-100 (Bridge Street/Jefferson Street/Clinton Street) in Grand Ledge.

Ingham County

- **Corridor 16:** I-96 BL (Cedar Street/Larch Street) in Lansing.
- **Corridor 15:** M-43/I-69 BL (Saginaw Street/Oakland Avenue) in Lansing.
- **Corridor 57:** M-52, M-106 (Main Street/Clinton Street) in Stockbridge.
- **Corridor 18:** M-99 (Martin Luther King Jr. Boulevard) in Lansing.

Livingston County

- **Corridor 47:** Grand River Avenue in Howell.
- **Corridor 49:** Grand River Road in Howell, Brighton.

Jackson County

- **Corridor 70:** M-50 (West Avenue) in Jackson.
- **Corridor 72:** I-94 BL (Louis Glick Highway) in Jackson.
- **Corridor 73:** I-94 BL (Michigan Avenue) in Jackson.

Washtenaw County

- **Corridor 126:** M-17 (Washtenaw Avenue) in Ypsilanti.
- **Corridor 129:** E Michigan Avenue in Ypsilanti.
- **Corridor 127:** US-12, M-17 (Huron Street/Hamilton Street) in Ypsilanti.

Hillsdale County

- **Corridor 88:** M-99 (Carleton Road/Broad Street) in Hillsdale.

Lenawee County

- **Corridor 103:** M-34 (Beecher Street), M-52 (Main Street) in Adrian.
- **Corridor 102:** US-223 (Maumee Street) in Adrian.
- **Corridor 100:** M-50 (Chicago Boulevard) in Tecumseh.

Monroe County

- **Corridor 109:** M-125 (Monroe Street) in Monroe.
- **Corridor 113:** N Dixie Highway in Monroe and Monroe County.

1 For more information on the methodology behind the analysis scores behind the regional active transportation network, see Appendix J.

CLINTON COUNTY

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

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MDOT Michigan Department of Transportation

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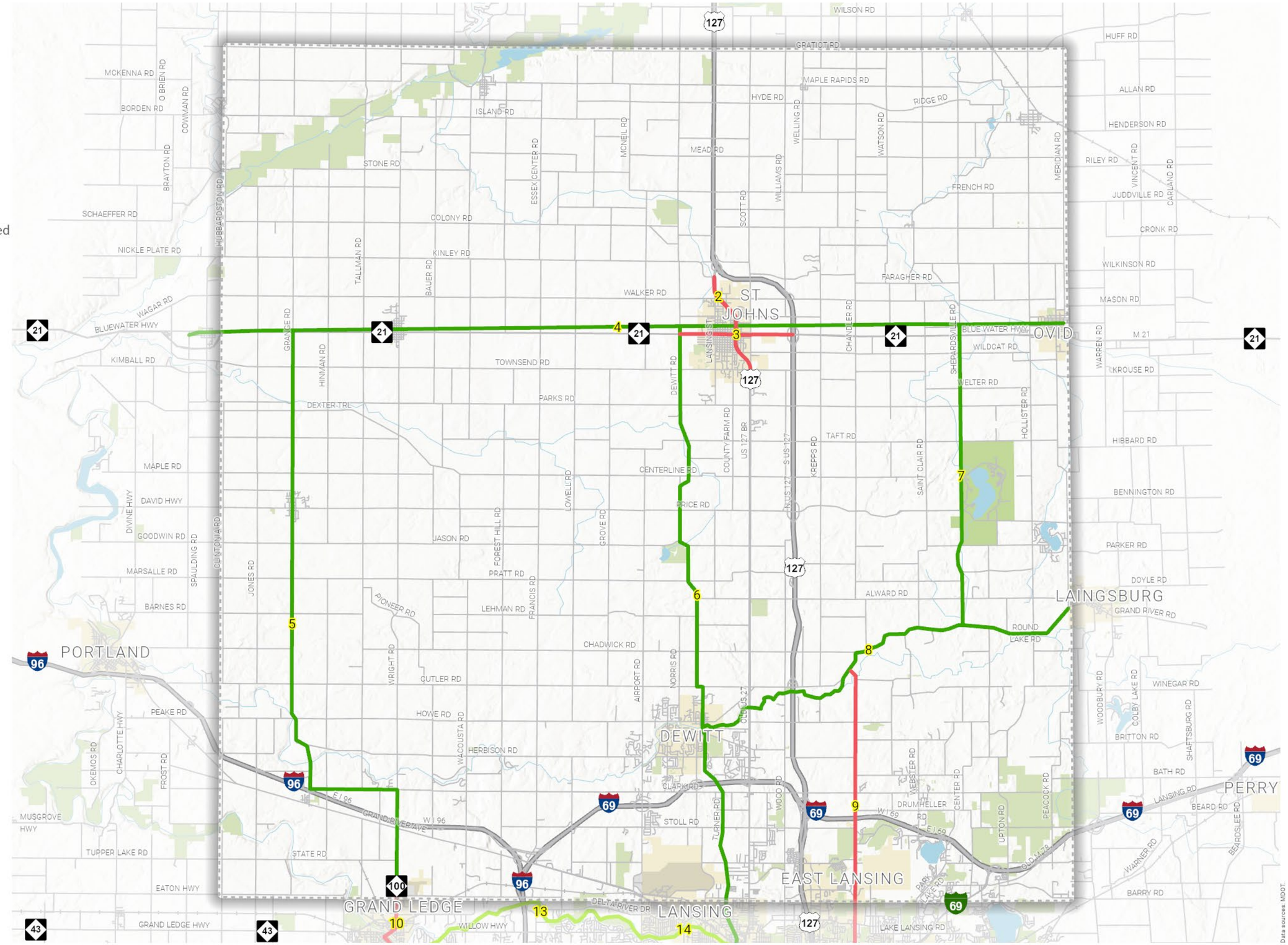

Data sources: MDOT

EATON COUNTY

STRATEGIC NETWORK

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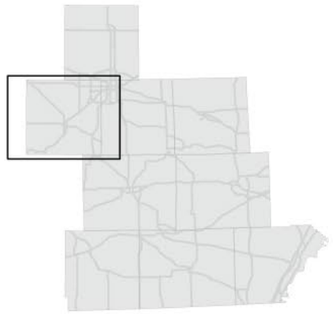
UNIVERSITY REGION



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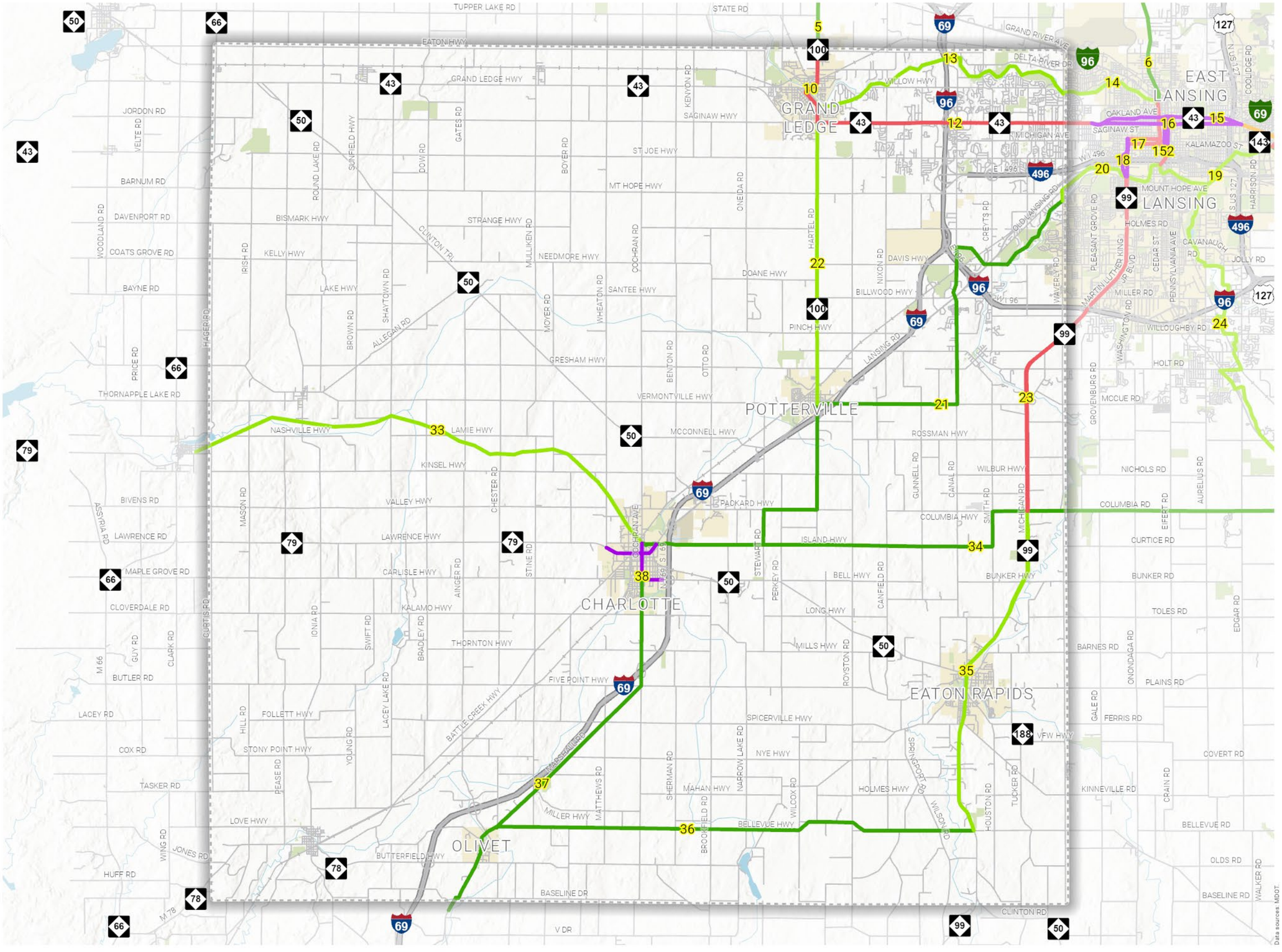

INGHAM COUNTY

STRATEGIC NETWORK

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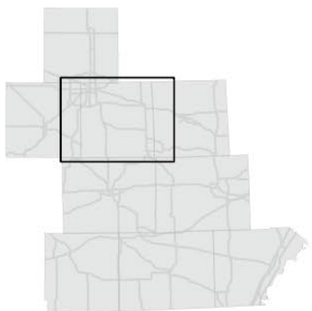
UNIVERSITY REGION



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MDOT Michigan Department of Transportation

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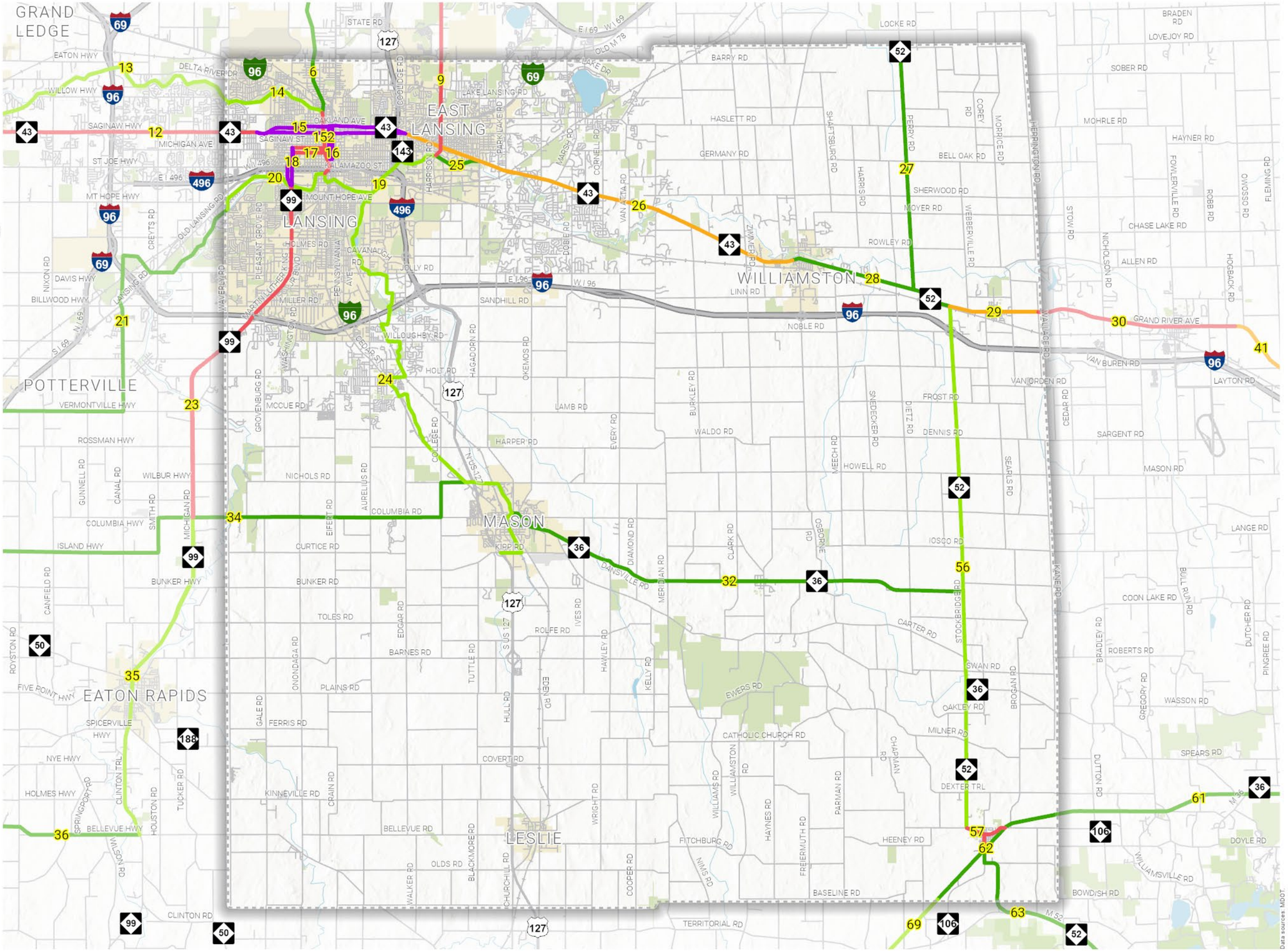

LIVINGSTON COUNTY

STRATEGIC NETWORK

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

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UNIVERSITY REGION

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MDOT Michigan Department of Transportation

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JACKSON COUNTY

STRATEGIC NETWORK

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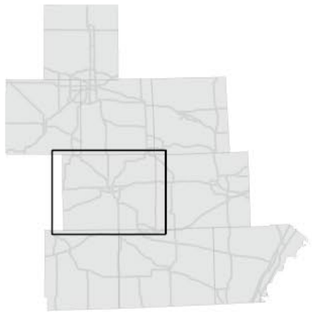
UNIVERSITY REGION



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Data sources: MDOT

WASHTENAW COUNTY

STRATEGIC NETWORK

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

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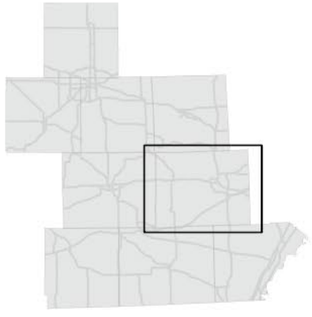
UNIVERSITY REGION



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HILLSDALE COUNTY

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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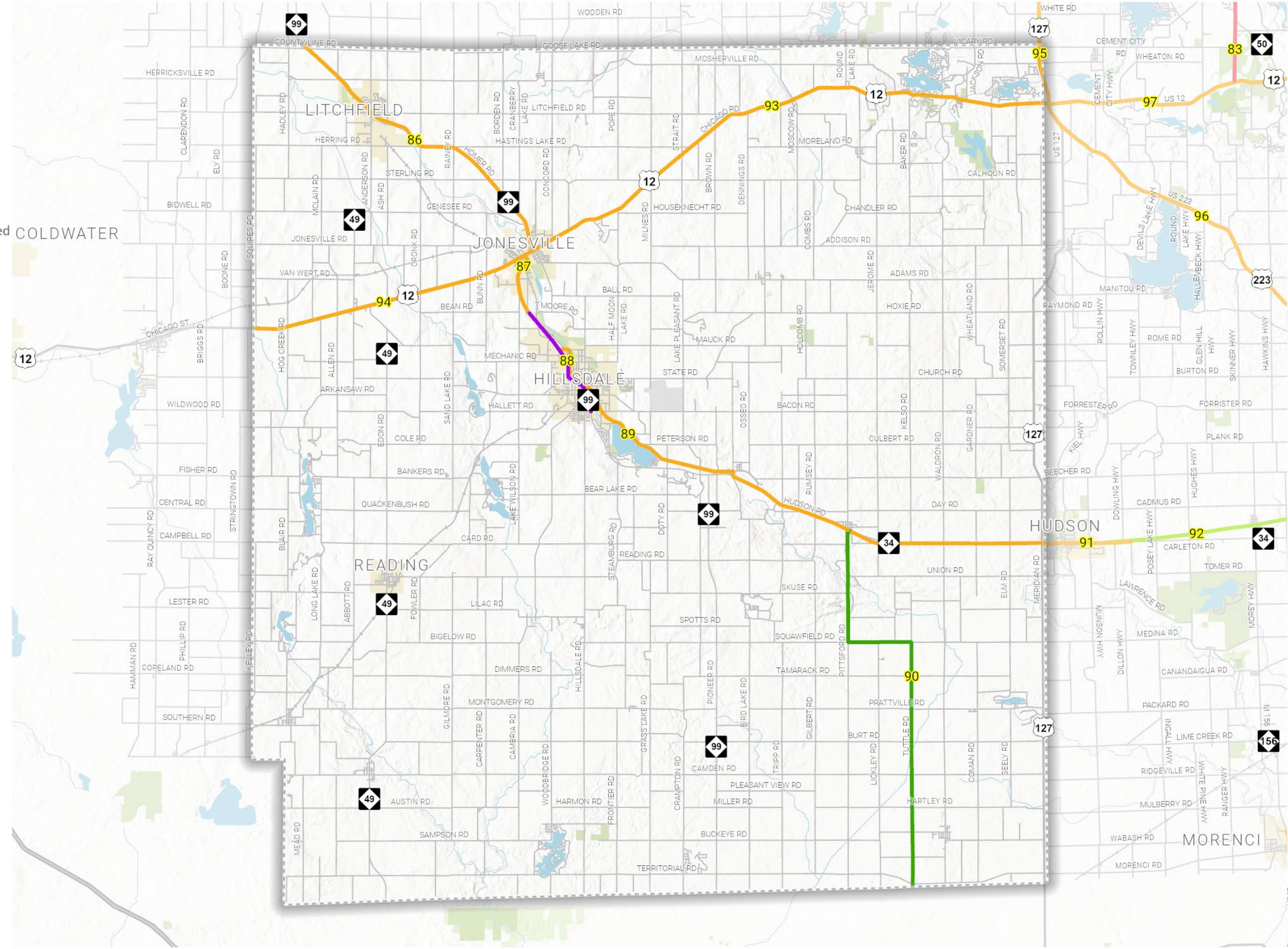

UNIVERSITY REGION

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LENAWEE COUNTY

STRATEGIC NETWORK

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

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UNIVERSITY REGION

0 2 4 MILES

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MDOT Michigan Department of Transportation

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MONROE COUNTY

STRATEGIC NETWORK

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

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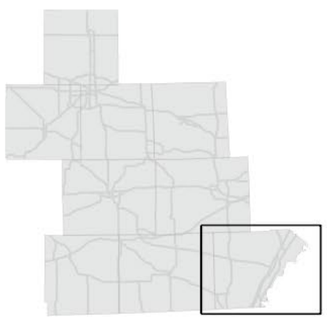
UNIVERSITY REGION



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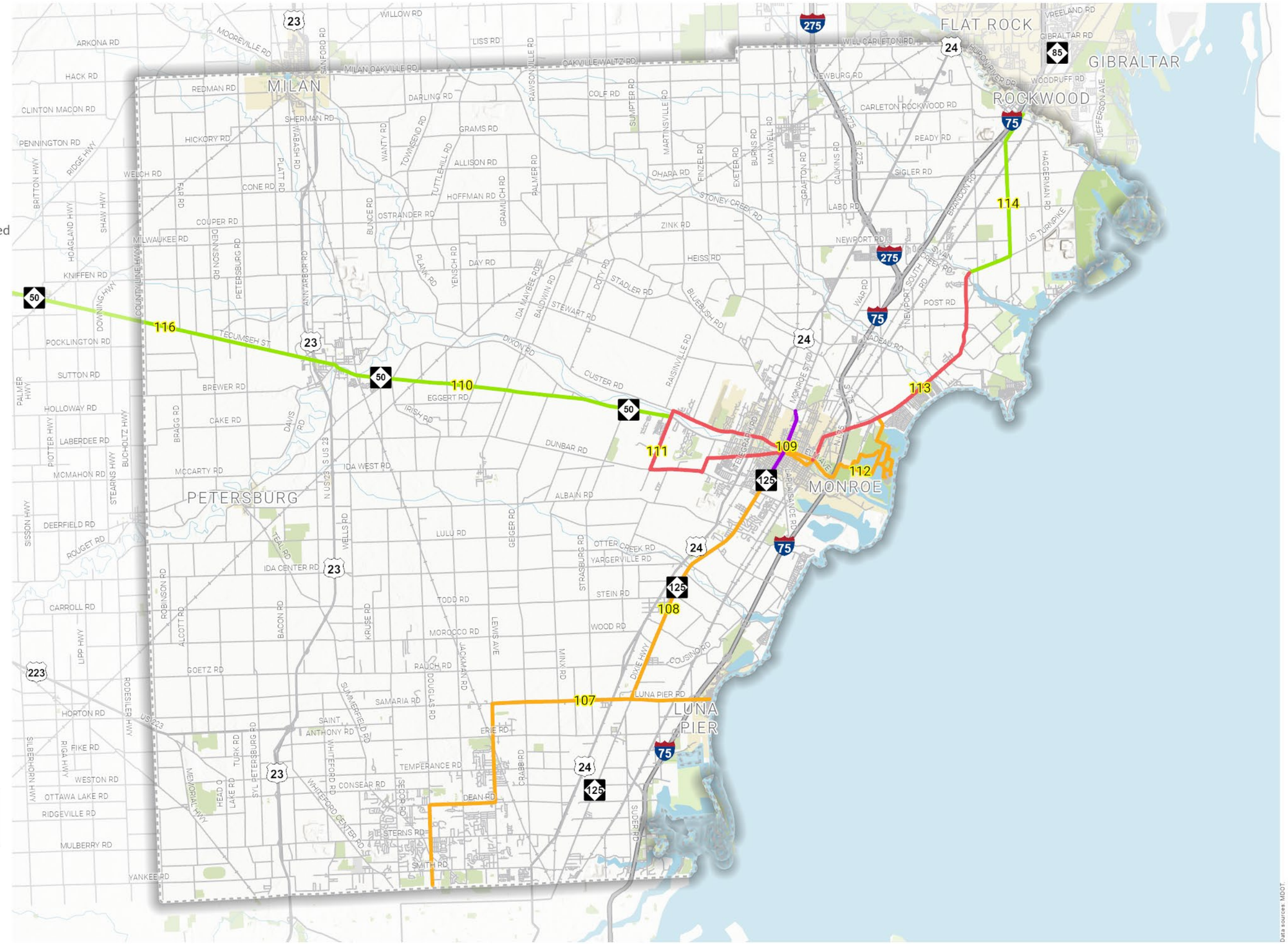

Two people riding bicycles on a shared-use path.

Chapter 5

Where Do We Go from Here?

Where Do We Go from Here?

This chapter outlines a set of recommended strategies and tools for MDOT and its partners to consider as they implement the ATP. While not intended to be prescriptive, these strategies offer practical guidance to strengthen regional coordination, prioritize investments and build momentum toward a safer, more connected and more accessible active transportation system.

The first section draws upon recommendations from both the MM2045 Statewide ATP and the Strategic Highway Safety Plan (SHSP). These statewide frameworks offer a foundation of priority actions across key focus areas (policy, infrastructure design, data evaluation, education and interagency coordination) that MDOT and its local partners can adapt to fit their specific needs.

The next section emphasizes the importance of maintaining and enhancing the region's GIS inventory of existing and proposed active transportation facilities, along with the University Region Proposed Strategic Network. Regular data updates, strong governance structures and transparent information sharing are vital to encourage that planning and investment decisions reflect current conditions and community priorities.

This chapter also encourages the use of consistent facility typologies across jurisdictions. A shared vocabulary for bicycle and pedestrian infrastructure can enhance regional data coordination, streamline project development and improve public understanding of planned investments. Consistency in terminology helps align expectations among agencies, stakeholders and the public.

To support these efforts, staff developing regional, county and city long-range transportation plans (as well as those pursuing infrastructure grants) are encouraged to reference both the University Region Proposed Strategic Active Transportation Network and the existing and proposed facility maps provided in this plan. These tools can help identify logical project additions and strengthen applications by aligning with regionally prioritized corridors and facility types. Incorporating elements of the strategic network into future projects reinforces shared goals around connectivity, safety and access, while maximizing the value of available funding. Proactive use of these resources can help encourage that active transportation remains integrated into broader mobility planning efforts and implementation frameworks across the region.

Finally, maintenance considerations are included to support long-term stewardship of the region's active transportation infrastructure. These suggestions draw on best practices and case studies to help local agencies establish projects, programs and policies that work toward networks that are as safe, comfortable and accessible as possible over time.

These suggested strategies and tools are intended to support continued dialogue and collaborative action among MDOT, local governments and regional partners. Thoughtful application of these recommendations can help the region advance a more dynamic, resilient and inclusive active transportation system, one that evolves alongside changing data, funding opportunities and community needs.

Considerations from MM2045 and the Strategic Highway Safety Plan

This section focuses on the strategies needed to create the safe, accessible and connected active transportation network envisioned by this plan.

This plan advances previously initiated steps by identifying gaps in the bicycle and pedestrian network and determining focus areas for each of the nine counties in the University Region by applying the findings from the data in Chapter 2.

These strategies and practice areas may enhance the livability, economic and societal vitality and recreational opportunity in the University Region by focusing on vulnerable roadway users.

The following strategies are based on public comments gathered during the planning process, as well as the results of analyses on existing conditions. They are also aligned with previously established strategies from Michigan's MM2045 ATP (2021) and the Strategic Highway Safety Plan (2023).

University Region residents and stakeholder participating in a public open house.

Policy, Planning and Coordination

- **Regularly review and update policies and guidance to recognize the needs of pedestrians and bicyclists** at all stages of project development. (MM2045)
- **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. (SHSP)
- **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. (SHSP)
- **Conduct regular reviews of policies related to data collection to promote pedestrian- and bicycle-related data** is collected, used and disseminated. (MM2045)
- **Strengthen communication between MDOT and partner agencies** (e.g., Michigan Department of Natural Resources, Michigan Department of Health and Human Services) to support active transportation, healthy lifestyles and recreation planning. (MM2045)
- **Recognize successful pedestrian and bicycle safety initiatives** by identifying existing and new research practices, programs or initiatives that are successful or innovative. (SHSP)

Data and Evaluation

- **Support and promote the TZD National Strategy.** (SHSP)
- **Utilize U.S. Census Bureau American Community Survey journey-to-work data** to establish baselines for walking and bicycling, while recognizing its limitations. (MM2045)
- **Improve access to data and best practices** to evaluate alternatives, conduct outreach and adopt effective policies and plans. (MM2045)

Infrastructure and Design

- **Implement low-cost engineering treatments to increase pedestrian safety and improve access and mobility** along and across roadways. (MM2045)
- **Expand connected bicycle and pedestrian networks in cities, metro areas and rural areas** to improve safety and increase access, prioritizing network connectivity. (MM2045)
- **Expand bicycling and walking infrastructure to support tourism and attract new visitors.** (MM2045)
- **Eliminate gaps and barriers in the bicycle and pedestrian network in conjunction with larger transportation improvement projects.** (MM2045)
- **Establish or update multimodal inventories along roadways and promote project planning and design processes** address local Complete Streets needs. (MM2045)
- **Establish methods and approaches for assessing bicycle and pedestrian network needs, identifying gaps and targeting improvements**. (MM2045)

Pedestrian crossing sign at a marked crosswalk with autumn trees in the background.

Facility Type Terminology

A consistent and shared terminology for bicycle and pedestrian facilities is foundational to building a cohesive and connected active transportation network across the University Region. Given the number of jurisdictions, agencies and partners involved in planning, designing and maintaining infrastructure, clearly defined and commonly understood facility types help promote alignment in regional decision-making, project development and public communication.

Standardizing terminology supports:

- **Regional coordination** by creating a common language across agencies;
- **Streamlined project implementation** through consistent expectations for design and maintenance;
- **Improved funding competitiveness** by aligning with state and national standards;
- **Inclusive infrastructure design** that prioritizes safety, comfort and access for users of all ages and abilities; and
- **Effective community engagement** by helping the public understand what to expect from various facility types.

Three young people with backpacks walking on a shared-use path.

Facility Types and Associated Benefits

Agencies and municipalities are encouraged to reference these definitions when developing plans, applying for funding or coordinating across jurisdictions. While the design and application of specific facilities may vary based on local context and constraints, the use of standardized terminology supports coordination and consistency across projects and agencies.

For additional detail on facility types, definitions and terminology standards, refer to MDOT's Bicycle and Pedestrian Terminology document.[1] This resource reflects guidance informed by national references, such as the National Association of City Transportation Officials (NACTO), the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA), and promotes alignment with commonly accepted planning and design language.

Bicycle Facilities

Bike Lanes

Designated, on-street lanes marked with pavement striping and signs for exclusive bicycle use, located adjacent to motor vehicle lanes.

Buffered Bike Lanes

On-street bicycle lanes with painted buffer space between the bicycle lane and adjacent motor vehicle travel or parking lanes.

Separated Bike Lanes

Bicycle lanes physically separated from motor vehicle traffic using vertical elements such as curbs, flexible posts or planters.

Sidepaths

Bidirectional shared-use paths located parallel to roadways and separated from the roadway by a buffer or curb, serving both bicyclists and pedestrians.

Shared-Use Paths

Facilities designed to accommodate both bicyclists and pedestrians, located outside the roadway and fully separated from motor vehicle traffic.

Bicycle Boulevards

Shared lanes on local streets where bicycles and motor vehicles share the travel way. Typically applied on streets with lower vehicle speeds and volumes and may include pavement markings, signs and traffic calming elements. Intended as an alternative to higher-traffic routes using the existing street network.

Paved Shoulders

Additional paved width adjacent to the vehicular travel lane. May be used by bicyclists in areas without dedicated bicycle facilities, particularly in rural or constrained roadway contexts.

1 http://www.Michigan.gov/MDOT/-/Media/Project/Websites/MDOT/Travel/Safety/Road-User/Bicycling/Planning/Bicycle-Pedestrian-Terminology-Booklet.pdf

Pedestrian Facilities

Sidewalks

Walkways located adjacent to roadways and physically separated from the travel lane, designed for pedestrian use along the public right of way.

Marked Crosswalks

Pavement markings used to indicate designated pedestrian crossing locations, typically at intersections or mid-block locations.

Note: Crosswalks legally exist at most intersection legs whether they are marked or not. Markings indicate the intended path for pedestrian travel and signal to motorists where crossing activity may occur.

Pedestrian Refuge Islands

Raised or delineated areas located in the center of a roadway, typically between opposing lanes of traffic. Constructed using curbing, striping or other physical materials to provide a location within the roadway for pedestrians to occupy.

Mid-block Crossings

Marked pedestrian crossings placed at locations between roadway intersections. Typically include pavement markings and signs and may incorporate curb ramps or other accessibility elements.

Three people crossing a wide intersection near a construction zone with bike and traffic signs visible in the background.

Paved Shoulders

Paved areas adjacent to travel lanes that may be used by pedestrians where sidewalks are not present. These are not dedicated pedestrian facilities but may accommodate walking depending on width, traffic conditions and roadway context.

Crossing Enhancements

Pedestrian Hybrid Beacons (PHB)

Signal systems activated by pedestrians, consisting of a series of lights that control motor vehicle traffic at mid-block or uncontrolled crossings.

Rectangular Rapid Flashing Beacons (RRFB)

User-activated flashing light systems installed at marked pedestrian crossings to alert drivers to the presence of crossing pedestrians at uncontrolled locations.

Active Transportation Maintenance Considerations

Bicycles and micromobility devices (with smaller wheels and narrower tires) are more sensitive to debris, surface defects and environmental conditions such as ice, gravel and standing water. As a result, maintaining high-quality surface conditions is critical to the long-term functionality and safety of active transportation infrastructure.

Routine maintenance for bicycle and pedestrian facilities includes pavement striping, sweeping, repairing protective barriers, removing snow and ice, trimming vegetation and maintaining utility features such as grates. When pavement overlays are completed, this presents an opportunity to improve the smoothness of transitions over features like grates, bridge decks and longitudinal joints. The following summarizes key maintenance considerations, drawing from best practices outlined in the NACTO Urban Bikeway Design Guide (2025):

Markings

- **Pavement markings, including colored areas, should be placed outside vehicle wheel paths where feasible to reduce wear.** Markings in areas with frequent vehicle-bicycle or vehicle-pedestrian interaction (such as intersections and turning zones) should receive prioritized maintenance.
- **Bikeway markings should be refreshed on a regular schedule, especially at intersections and other high-use locations where clear guidance is critical.** Using durable materials, such as resin-bonded aggregate or pigmented asphalt and recessing markings below the pavement surface can reduce maintenance needs and extend marking visibility.

Constructed Medians, Durable Barriers, Flexible Delineators and Other Modular Materials

- **Examples of materials in this category include concrete medians, precast or modular barriers** (e.g., ZEBRA or Armadillo units), **flexible delineator posts and surface-mounted curbs or bollards** used to physically or visually separate active transportation users from motor vehicle lanes.
- **Physical infrastructure used to separate bikeways from motor vehicle traffic is subject to wear and damage over time.** Constructed medians can be made more visible by adding vertical elements such as signs or reflectors, which may help reduce vehicle impacts. Durable barriers offer a semi-permanent alternative and can be installed or removed using specialized crews and equipment. Standardizing barrier types and anchoring systems across a jurisdiction can simplify maintenance and reduce costs. Flexible delineators typically require replacement on an annual or more frequent basis due to weathering and impact.

Sweeping

- **Design separated bike lanes wide enough to accommodate sweeping equipment.** Sharp curves may be difficult to sweep with a machine. Raised bikeways may collect less debris than street-level bikeways but still accumulate debris.

Managing Vegetation

- **Regularly trim back vegetation to prevent encroachment into the bicycle or pedestrian ways.** Avoid planting trees that produce nuts, fruits and large seeds that can drop into the bicycle or pedestrian way.

Patching, Repaving and Utility Grates

- **Promote pavement inspections** to occur after trenching activities are completed and, if excessive settlement has occurred, to require mitigation prior to the expiration of the project's warranty period.
- **Repaired patches of trenches** and cuts into bicycle or pedestrian ways should span the entire width of the infrastructure impacted.
- **Apply non-skid surfacing to metal utility plates and encourage they are recessed and securely fastened to the pavement surface whenever possible.** If plates cannot be recessed, install temporary asphalt ramps to reduce vertical drop-offs using a ramp length of approximately 2 feet in the direction of travel and 1 foot on the opposing (non-traveled) edge to provide a smoother transition for all users.
- **Promote smooth surfaces for the interim and final surfaces of a repaired section.** If the cut or plate transverses the bicycle or pedestrian way, such lips must be no more than one-half inch. Final repairs must be rectangular in shape. When preparing the final surface, apply a tack coat on all surfaces, including vertical surfaces.
- **Orient stormwater grate openings perpendicular to the path of travel or use grid pattern grates** to prevent the grate from catching wheels of bicycles, micromobility vehicles or personal assistive mobility devices.

Railway Tracks

- **Minimize lips and gaps between tracks and bikeways.**
- **Prioritize seamless material transitions** and durable surfaces, preferably concrete, around tracks that cross bikeways. (Asphalt installed over the track bed is not sufficiently durable.)
- **Consider the use of flangeway gap fillers in urban contexts** where rail vehicles will not be traveling fast.
- **Design bikeways to cross tracks at as close to 90 degrees as possible.** Where the bikeway and railroad tracks cross at an angle less than 90 degrees, use a "bend-out" design to redirect the bikeway out and then across the rails at a safer angle. Try to avoid angle bikeways across railroad tracks at anything under a 60-degree angle. To avoid the risk of slipping on the rails, the bikeway should be fully straightened out at least 6 feet ahead of the rails.

Bridge Decks

- **Open metal decking on bridges can be slippery and hazardous**, especially for people on bicycles, walking or using micromobility devices with small and narrow wheels. Installing lightweight fiberglass or steel plates for people on bikes and micromobility devices can provide a non-skid surface while minimizing the additional weight load on a bridge.

Winter Maintenance

- **Maintaining bike and pedestrian ways in the winter** can be grouped into three major activities:
  - **De-icing:** Spreading salt or liquid ice melt to prevent ice and snow accumulation.
  - **Snow clearing, pushing, blowing or sweeping** snow off the bikeway or pedestrian ways onto another part of the street.
  - **Snow removal:** Loading excess snow into a dump truck for transportation to a snow disposal site.

Winter Bikeway Maintenance Best Practices

Winter maintenance needs are influenced by the type of bicycle or pedestrian facility and the presence and design of any vertical or physical separation elements.

Plan Roadways with Sufficient Right of Way

In new or reconstructed roadways with existing or planned bike lanes, street designs should include dedicated snow storage space within the right of way. A snow storage strip, typically the space between the curb and sidewalk or between the bike lane and parked cars, provides an area to pile snow cleared from the roadway and bike lanes without obstructing pedestrian pathways. This strip should be wide enough to accommodate typical snowfall, enabling effective plowing of the roadway, bike lanes and sidewalks. For bike lanes and buffered bike lanes, using the snow storage strip for plowed snow aligns with standard operations. In regions with frequent or heavy snowfall, it is important to define minimum strip widths during the design phase based on local snow accumulation patterns.

Use the Wide Bike Lane Buffer

In areas with limited right of way where only a curb-tight sidewalk is present, meaning the sidewalk is directly adjacent to the curb with no buffer, there is typically no space available for snow storage between the roadway and pedestrian zone. In these situations, municipalities may consider using the painted buffer between the motor vehicle lane and the bike lane as a snow storage area. This approach requires the roadway snowplow to push snow to the right into the buffer, while a separate plow clears the bike lane by pushing snow to the left. This method can be useful where snow cannot be stored between the bike lane and the sidewalk; however, it introduces the potential for snowmelt to flow across the bike lane and refreeze, creating hazardous conditions. If this strategy is used, a follow-up deicing operation should be planned to address meltwater refreezing.

A bicyclist on a snowy street during winter weather conditions.

Recessed Thermoplastic Pavement Markings

Milling the area of pavement 3 millimeters in depth where thermoplastic pavement markings are applied has shown to be effective in reducing damage because of snowplows in a 2010 study.[2] Minneapolis, Minnesota, mills the area of pavement where thermoplastic bike lane pavement markings are placed to help reduce damage because of snowplows. While this method increases the cost of installation, it may save in long-term maintenance costs (and help preserve safety conditions along the roadway).

Edge-of-roadway Visual Cues

Pavement markings, striping, sidewalk curbs and other types of travel delineators installed at ground level serve as good indicators of the bicycle travel path when the ground is clear, but after a snow event, these lose their utility and, in some cases, can become hazards, making the travel path difficult to navigate.

For this reason, it is important to provide other visual cues to indicate the bicycle travel way for those riding bicycles and for snowplow operators. Possible locations for snow storage include the buffer area of separated bikeways, in the place of parked cars in parking-separated bike lanes and along the furnishing zone of the sidewalk. Piling snow in these locations all help to visually define the path of travel and help snowplow operators identify curblines. This becomes especially critical when the bike facility bends in or out around curb extensions, median islands or other transitions.

Small Snowplow Vehicles

When typical snowplows are too wide to fit within a separated or buffered bicycle lane, regional partners can consider using smaller, more specialized vehicles. These specialized small snowplows are becoming particularly important for bikeways that have confined travel ways.[3]

Many communities that experience harsh winter climates maintain a fleet of these specialized small snowplows, which are sometimes referred to as “downsized street maintenance vehicles” since they can be repurposed for other uses throughout the year.

Where used, communities have found that smaller vehicles are effective for cleaning and plowing separated bike lanes, sidewalks and shared-use paths.[4] They can also supplement maintenance activities on other public facilities, such as narrow streets, parking lots, garages, basketball courts and pedestrian malls.

In addition to making the transportation network more accessible during the winter, cities report operating cost savings and reduced emissions stemming from the greater fuel efficiency of smaller vehicles.[5] On the other hand, utilizing existing maintenance vehicles such as pickup trucks with mounted snow blades may prove to be much more cost-effective and time-efficient than purchasing smaller vehicles that operate at slower speeds and have smaller plow blades. Regardless, the design of shared-use pathways and bicycle facilities will need to consider how the snow removal vehicles will access the facility.

2 Hirasawa, Masayuki, Azuma Takemoto, Satoshi Kasai, and Hisashi Aita. “Development of Recessed Pavement Markings That Incorporate Rumble Strips.” Journal of the Eastern Asia Society for Transportation Studies, Vol. 8, 2010. Accessed February 12, 2025. http://www.easts.info/publications/journal_proceedings/journal2010/100292.pdf.

3 Andersen, M., and T. Golly. “How Cities Clear Snow from Separated bike lanes: A Starter Guide.” Streetsblog USA, February 11, 2016.

4 “Downsized Street Maintenance Vehicles: Case Studies.” NACTO, 2018. Accessed February 12, 2025. https://nacto.org/wp-content/uploads/191017_Volpe_CaseStudies_updatedEOD-3.pdf.

5 “Downsized Street Maintenance Vehicles: Case Studies.” NACTO, 2018. Accessed February 12, 2025. https://nacto.org/wp-content/uploads/191017_Volpe_CaseStudies_updatedEOD-3.pdf.

Small Snowplow Vehicle Classes

Due to their wide-ranging application, downsized street maintenance vehicles come in many different shapes and sizes. Many small utility vehicles such as pick-up trucks, tractors, ATVs, mini-loaders, bombardiers, skid-steers and even lawn mowers can be equipped with snow removal devices.

Typically, these small vehicles are either equipped with snowplows, snow brushes (effective for removing light snow) or snow blowers (effective for heavy snow). Many small snow removal vehicles can also be equipped with de-icing applicators as well, such as briners and drop spreader salters. Even more specialized attachments can include rotary sweepers and power washers, which extend the vehicle's utility year-round.

The combination of vehicle and attachment will change the clearance width and turning radius of the unit, affecting where it can be used. Among the options currently available on the market, clearance widths range from 4 to 12 feet, with many vehicles being approximately 5 to 5.5 feet. NACTO reports a good rule of thumb for estimating the right size plow for a bike lane: the biggest one that isn't too big.[6]

The downsized street maintenance vehicle fleet size and composition differ for every community and depend on climate, use cases and existing (and planned) active transportation network size. Boston, for example, owns 21 compact sweeping and plowing vehicles from six different vendors (each providing unique functions and utility), largely because of the number of pedestrian plazas in the city combined with its bike network. Salt Lake City, however, needs only one sweeper for its separated bike lanes (3 miles) and two compact plows for the rest of its bike network. The City of Waterloo in Canada (population, about 120,000) maintains its network of sidewalks, trails and separated bicycle lanes with eight trackless compact plows (in addition to other larger vehicles).

6 "Downsized Street Maintenance Vehicles: Case Studies." NACTO, 2018. Accessed February 12, 2025. https://nacto.org/wp-content/uploads/191017_Volpe_CaseStudies_updatedEOD-3.pdf.

Conclusion

The MDOT University Region ATP is intended to provide a forward-looking framework to guide **investment**, **collaboration** and **action** toward a transportation system that is **safer**, **more connected** and **more inclusive** for all users.

Grounded in data, shaped by public and stakeholder input and informed by statewide guidance, the plan seeks to equip the University Region and its partners with the tools to advance walking, biking and rolling across the nine-county region.

Through engagement, regional analysis and strategic planning, this plan has identified both the opportunities and challenges present in the University Region. The Proposed Strategic Network, supporting GIS framework and implementation strategies offer a shared roadmap for aligning local, regional and state-level efforts to improve access, mobility and connectivity.

This plan is designed to help MDOT's University Region and its partners deliver infrastructure and programs that reflect residents' lived experiences, address transportation-related disparities and contribute to healthier, more connected communities.

It marks not the end of the planning process, but the beginning of a long-term commitment to advancing active transportation across the region.

Three people biking on a tree-lined shared-use path (or sidepath.)

An adult walking hand-in-hand with two children under an overpass in an urban area.

Key Takeaways

The following key takeaways summarize foundational insights and overarching themes that emerged throughout the planning process. These points reflect where the region stands today, what challenges and opportunities lie ahead and how MDOT and its partners can move forward in building a more accessible and people-centered active transportation network.

Public Demand and Support: Residents want safer, more connected options for active transportation. There is strong community support for improvements, especially in areas with infrastructure gaps, safety concerns and underserved populations.

Data-Informed Conditions Review: The plan's five core analyses (Bicycle Level of Traffic Stress, Pedestrian Barriers, Demand, Demographic and Crash) identify where improvements could be most needed and where investments may have the greatest impact.

Regional Collaboration is Essential: Given the region's complex jurisdictional landscape, coordination among MDOT, local governments, MPOs and other partners is critical to implement a cohesive and connected network.

Implementation Requires a Flexible Toolkit: The strategies in this plan are designed to be adaptable. They provide best practices and suggested tools (not mandates) to guide planning, design and funding decisions in ways that reflect local context and priorities.

Connectivity is Key: Communities with high needs often face the most significant barriers to safe and comfortable active transportation. Considering these areas should promote a more just and inclusive network.

Maintenance Matters: Long-term success depends not only on building infrastructure but also on maintaining it. Addressing seasonal needs, such as winter snow removal and standardizing maintenance practices is key to encouraging year-round usability and safety.

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