



STATELINE AREA TRANSPORTATION STUDY

Pedestrian and Bicycle System Plan Update 2017

AMENDED INTO THE 2016-2040 SLATS
LONG RANGE TRANSPORTATION PLAN BY
THE SLATS POLICY BOARD, MAY 21, 2018

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Village of Rockton
Town of Beloit
Town of Turtle
Rockton Township
Rock County
Winnebago County
Wisconsin Department of Transportation
Illinois Department of Transportation

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Section I Introduction



Plan Vision

This plan creates a roadmap for a more connected Greater Beloit region. The project's study area encompasses the entire Stateline Area Transportation Study (SLATS) Metropolitan Planning Organization (MPO) area. Recommendations focus on regional connections, with projects to be constructed by local agencies-- i.e., the Cities and Towns, Counties, Townships, States, and other entities that make up the region.

The plan update provides a vision for cities and towns that are connected by bicycling and walking facilities throughout the SLATS MPO planning area. Trails, bike lanes, paved shoulders, sidewalks, and comfortable neighborhoods streets let residents and visitors explore the region safely and conveniently. The experience of walking and bicycling along the world class riverside path in Beloit is replicated with safe paths and streets throughout the greater Beloit area.

Plan Goals

- This plan will create an integrated, connected, and accessible network of transportation infrastructure built to the best practices in bicycle and pedestrian design.
- Plan implementation will support people of all ages and abilities.
- The plan's recommendations will enable trips to regional destinations and regional trail systems without the need of a car.
- The plan provides direction to cities and towns in the region to provide educational programming and activities for people of all ages.
- The town directs cities and towns in the region to maintain bicycle and pedestrian infrastructure to enable comfortable, year-round travel.
- The plan will enhance safety for residents and visitors when walking and bicycling. The plan will eliminate barriers to walking and bicycling through implementation of best practices in planning, design, and construction.
- The plan will help agencies in the region reduce traffic fatalities and serious injuries through a variety of countermeasures.

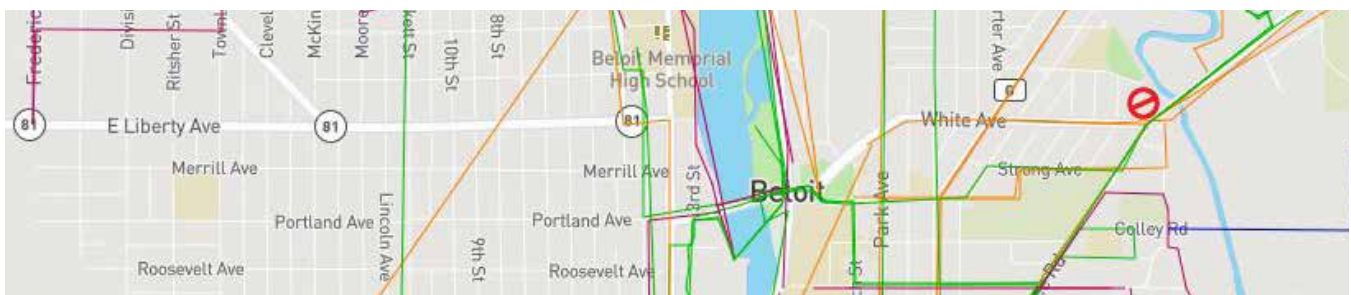


Figure 1. The project's online map was quickly covered in comments, thanks to enthusiastic area residents.

Plan Objectives

The plan’s objectives correspond with the Six Es of bicycle and pedestrian planning: engineering, education, encouragement, enforcement, evaluation (and planning), and equity. The sixth E, equity, encompasses the analysis and recommendations for all other categories.

- Use best practice design guidelines to reduce crashes on roadways, particularly to protect people walking and bicycling.
- Continue coordinating with agencies on either side of the stateline to result in continuous, well maintained walking and bicycling facilities.
- Overcome gaps and barriers to safe and easy walking and bicycling by expanding the current walking and bicycling system.
- Expand education opportunities for residents of all ages, across the entire MPO planning area.
- Organize public events to help residents walk and bike more often.
- Designate agency staff whose work involves walking and bicycling
- Investigate behaviors and types of streets correlated with high crash potential; work with law enforcement agencies to encourage safe walking, bicycling, and driving.
- Partner with law enforcement agencies to develop infrastructure options designed to eliminate traffic fatalities.
- Periodically monitor the plan’s implementation.
- Periodically monitor walking and bicycling activity throughout the region.
- Leverage the region’s advocates and walking and bicycling enthusiasts to assist with plan implementation.
- Municipalities should consider pursuing League of American Bicyclists Bicycle Friendly Community (BFC) recognition.

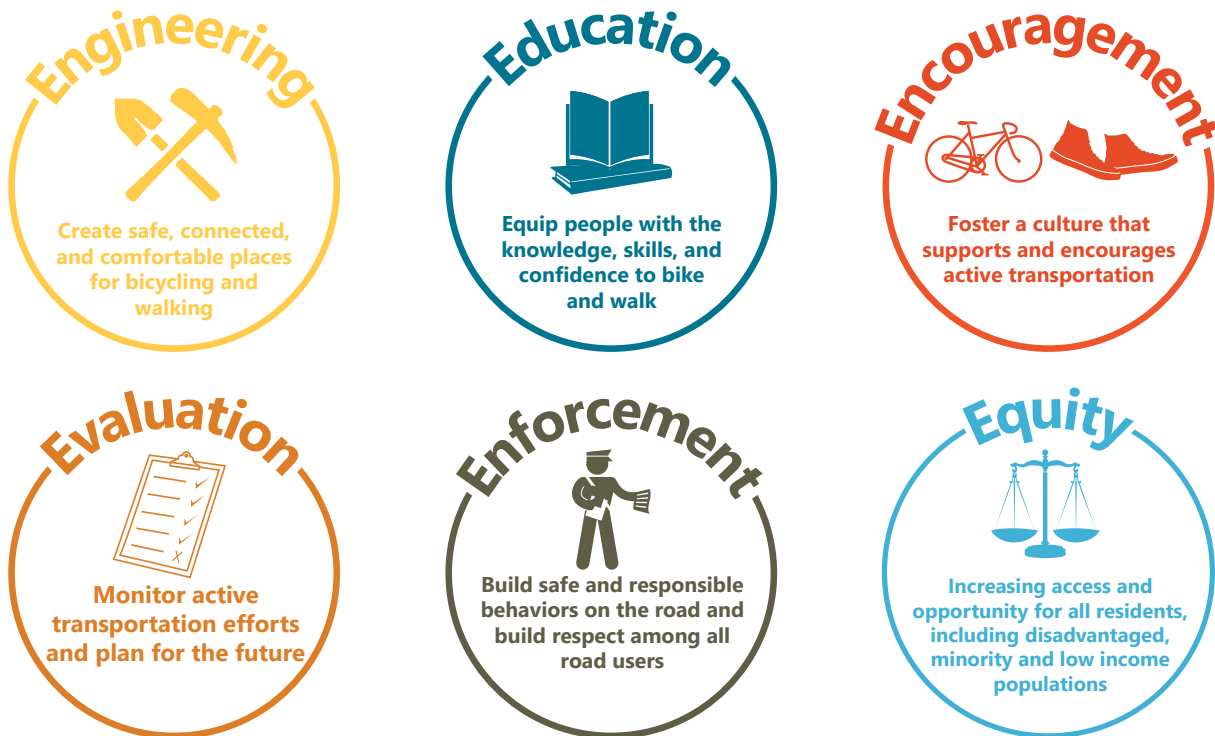
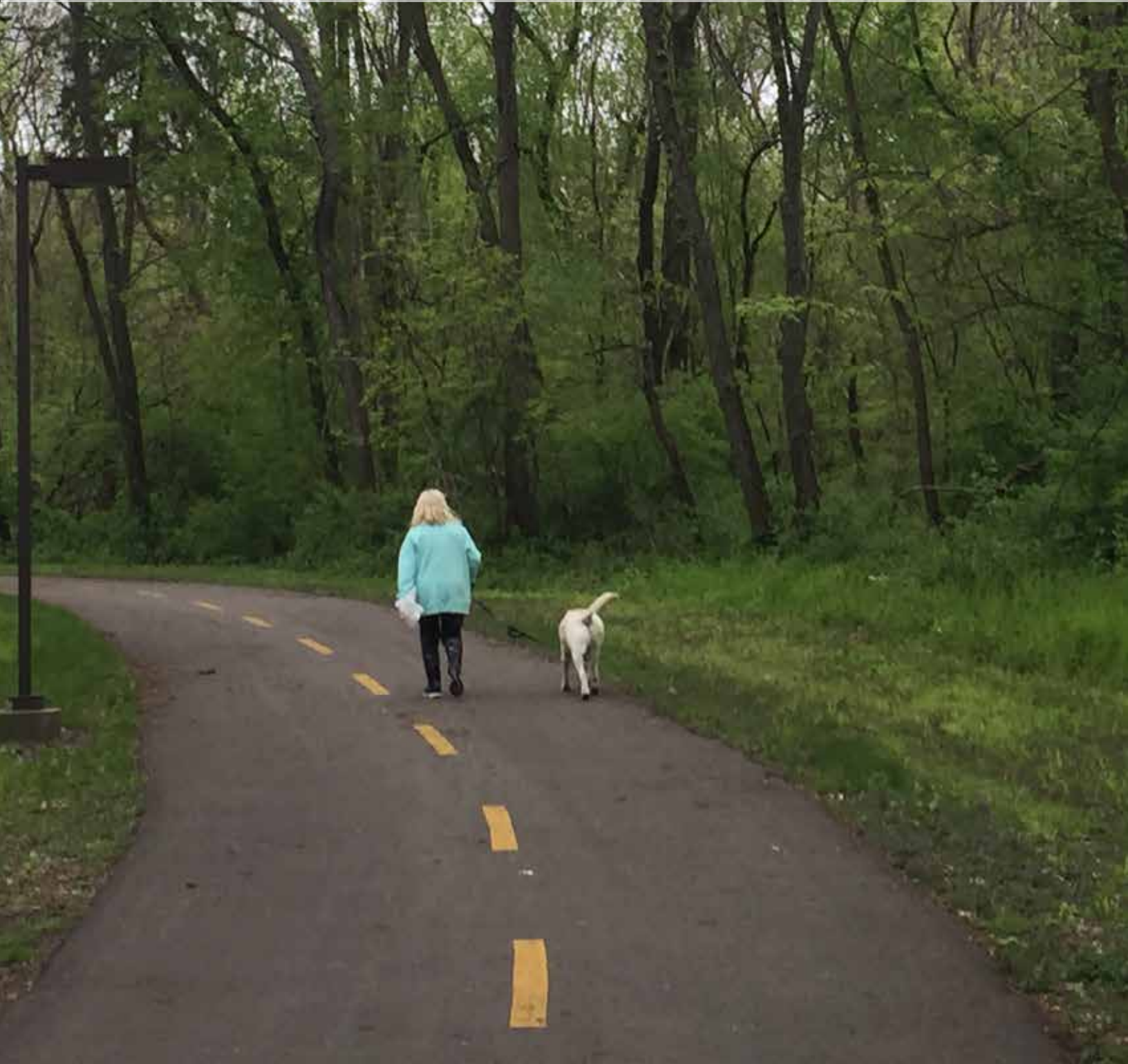


Figure 2. The Six E’s of bicycle and pedestrian planning.

Section II Existing System



Introduction

The Stateline Area Transportation Study (SLATS) is the federally designated Metropolitan Planning Organization (MPO) for the Beloit urbanized area as defined by the United States Census. This plan provides an update to the region’s bicycle and pedestrian plan.

The existing conditions analysis documents the current state of the bicycle and pedestrian infrastructure network since the SLATS Bicycle and Pedestrian System Plan Update (2010). The plan identifies key opportunities and challenges towards creating more walkable and bicycle-friendly regional connections.

A review of the transportation network includes a summary of the various types of streets that are found in the SLATS Region, ranging from rural to urban.

The section summarizes characteristics that make these streets comfortable or uncomfortable for people walking and bicycling.

Safety, demand, and equity analyses, along with current street characteristics, such as traffic volume, speed, and lane width, and public comments, set the stage for design inputs used to develop a regional network of walking and bicycling routes.

A summary of key findings from the existing conditions analysis is provided on the following page.



Figure 3. The City of Beloit downtown area’s vibrancy is fueled by local businesses, attractive streets, and public events that bring people together. Brick paving, public sculptures, and wayfinding kiosks were added after the 2008 Beloit Downtown Redevelopment Plan.

Summary of Findings

- Previous plans emphasize regional connections. They rely on signed bicycle routes and off street trails to build routes.
- Beloit has historically acted as the region's center. Downtown Beloit, South Beloit, and Rockton, as well as Rock Township at the northern end of the SLATS Region, are important areas to connect through regional walking and bicycling routes.
- The region lacks east-west connectivity. There is also a desire to improve north-south connections into downtown Beloit and the riverfront.
- Suggested bicycle routes installed since the 2010 bicycle system plan and the 2014 implementation study, are prime opportunities to upgrade to striped bike lanes where feasible. The programmed Park Avenue road diet will enhance connectivity at the state line and will illustrate the benefits of reallocating street space to balance the needs of people walking, bicycling, and driving.
- Residents desire places to walk and bike that feel like the riverfront: comfortable, separated from traffic, and scenic. They look for connections to the river as well as comfortable routes in their home communities.
- Equity is a key issue for the plan. Areas of high socioeconomic need must be included in system planning efforts.
- In Wisconsin, areas with the highest demand for walking and bicycling correlate with areas of high levels of socioeconomic need. The correlation is not as pronounced on the Illinois side of the study area.
- Residents' perceptions of barriers to walking and bicycling are echoed in mapping analyses that investigate streets' level of walking and bicycling comfort.
- Streets perceived as high-stress routes in urban areas have multiple lanes and high traffic speeds. High stress routes in rural areas lack space to separate people walking and bicycling from people driving at high speeds.
- Low-stress areas are primarily located in residential neighborhoods. However, residents must cross busy roads to reach important destinations.
- Group bicycle rides and events occur frequently in the region. Local groups fill an advocacy role and are knowledgeable of local lower stress bike routes that connect to destinations.
- Pedestrian crashes occur mainly at intersections of busy streets (i.e., arterials and collectors).
- Bicycle crashes occur mainly at intersections of busy streets that lack bicycle specific infrastructure, such as bike lanes. West Beloit is one exception. Many crashes in this area occurred on streets with low posted speed limits and low traffic volumes.
- The majority of bicycle and pedestrian crashes in the region resulted in injury.

Previous Plans Review

Previously prepared plans and other related documents were reviewed as part of the plan update. Some plans focused on using bike route signage and off street trails to identify preferred walking and bicycling routes.

Multiple plans mention the region’s lack of east-west connectivity. Adopted plans show a conceptual north-south connection from Janesville to Rockford. The connection is nearing completion. However, gaps along the route limit the extent to which low-stress walking and bicycling routes are available for continuous north-south travel.

Big Hill Park is an example of a destination to which connections are in development. The Rock Trail Coalition has worked to build community and public agency momentum towards developing off street connections to Big Hill Park.



Figure 4. Dashed blue lines represent on street bicycle connections (i.e., Bluff Rd). Dashed green lines represent off street connections (i.e., Hononegah Rd). Dark rose, pink, and beige outlines show proposed project phasing: near, mid, and long term, respectively (source: Stateline Area Bike System Implementation Plan, 2014).

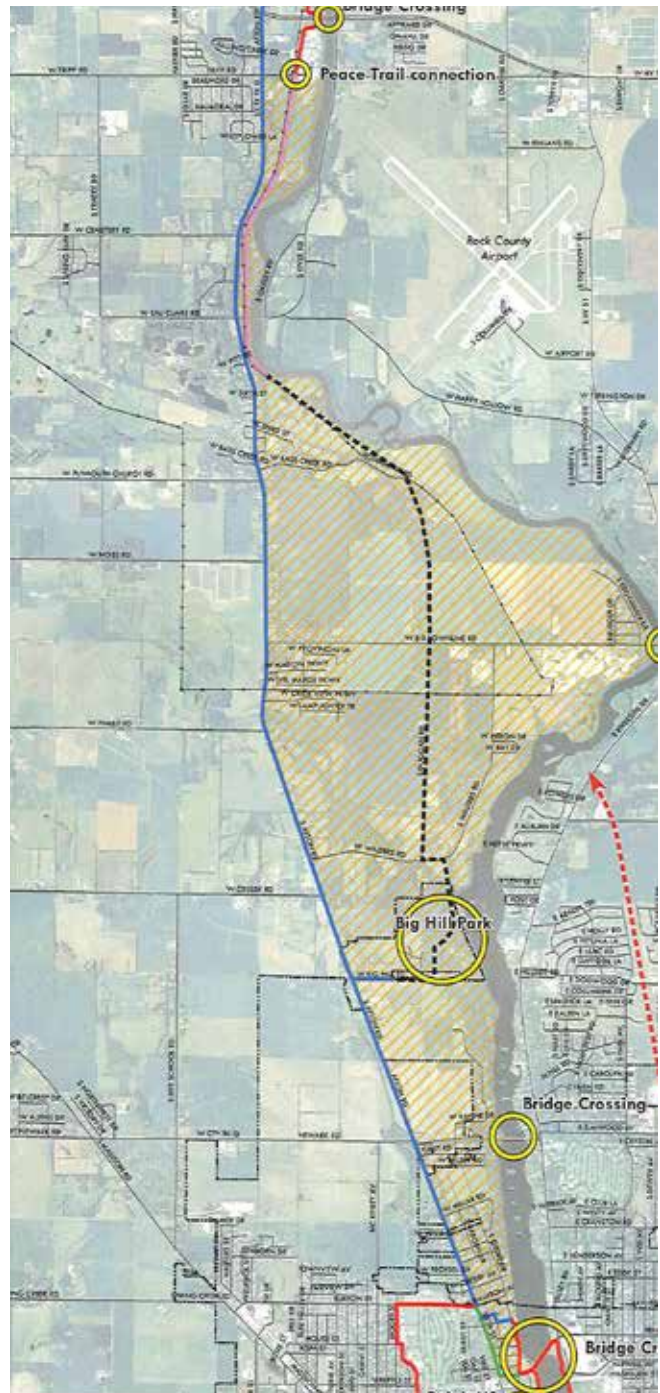


Figure 5. The blue line represents an existing north-south connection. Big Hill Park is circled as a destination and includes a new, proposed connection to the attraction, shown in black. (Source: Beloit to Janesville Bicycle Route Corridor Plan and Feasibility Study, 2012).

Desired routes for walking and bicycling radiate from downtown Beloit. Planned recommendations from adopted plans follow this pattern. The rural access routes, shown below (blue), add east-west and north-south routes between the major conceptual connections (pink). This 2017 plan update will propose context sensitive recommendations along streets with rural cross-sections. These recommendations will support people walking and bicycling in these areas.

Public input during the 2017 plan update process indicates that members of the public continue to think of regional connections as radiating from major population centers.

Downtown recommendations have had momentum for implementation. Downtown Beloit has installed brick pavers, sculpture, a kiosk, and other public amenities since the 2008 Beloit Downtown Redevelopment Plan. This plan update will discuss recommendations

to link high demand areas throughout the region. Recommendations will discuss opportunities to use transportation improvements to elevate the status of downtown areas in Illinois and Wisconsin.

Walking and Bicycling in the Stateline Area Today

Figure 8 shows existing trails, sidewalks, bike lanes, and paved shoulders throughout the Stateline area.

Most of the residents spoken to during this planning process, who indicated that they sometimes walk or bike in the region, said that they mainly use the region's trails or paths in parks. The region is gradually developing a more robust system for walking and bicycling.



Figure 6. Major regional desire lines indicate conceptual ways to connect to regional destinations. These lines are drawn in pink. Rural access routes fill in the conceptual desire lines and connect to rural areas (source: Stateline Area Bike and Pedestrian System Plan, 2010).

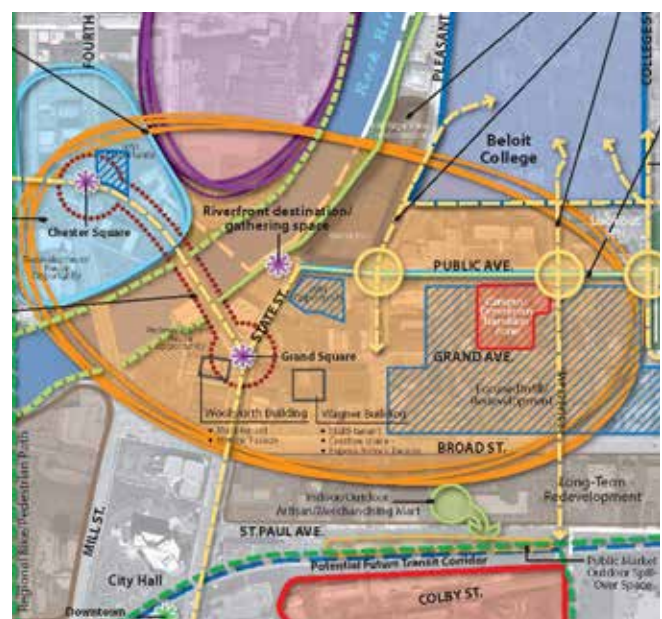


Figure 7. Plans for downtown Beloit show attention to transportation system planning in addition to land use and development aspirations (source: Beloit Downtown Redevelopment Plan, 2008).

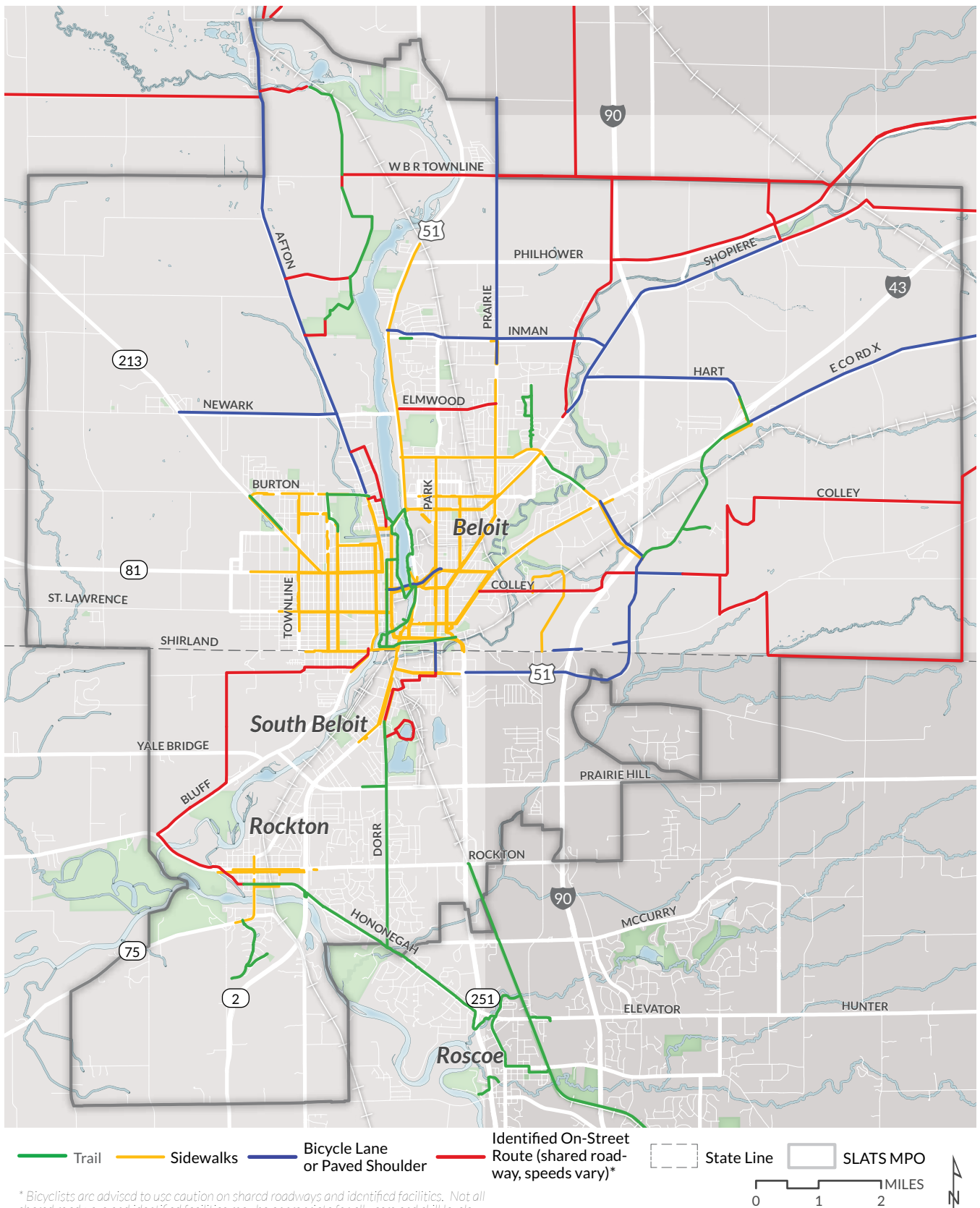


Figure 8. Existing Bicycling and Walking Facilities. Note: Identified on-street routes consist of recommended routes for on street bicycling and may or may not include wayfinding signage.

Figure 8 shows that although the majority of on street paved shoulders and bike lanes are located on the Wisconsin side of the state line, the Illinois side is served by off street trails that connect South Beloit, Rockton, and Roscoe.

Please note that the bicycle routes indicated on the map consist of recommended routes for on street bicycling. The routes may or may not include bicycle route wayfinding signage.

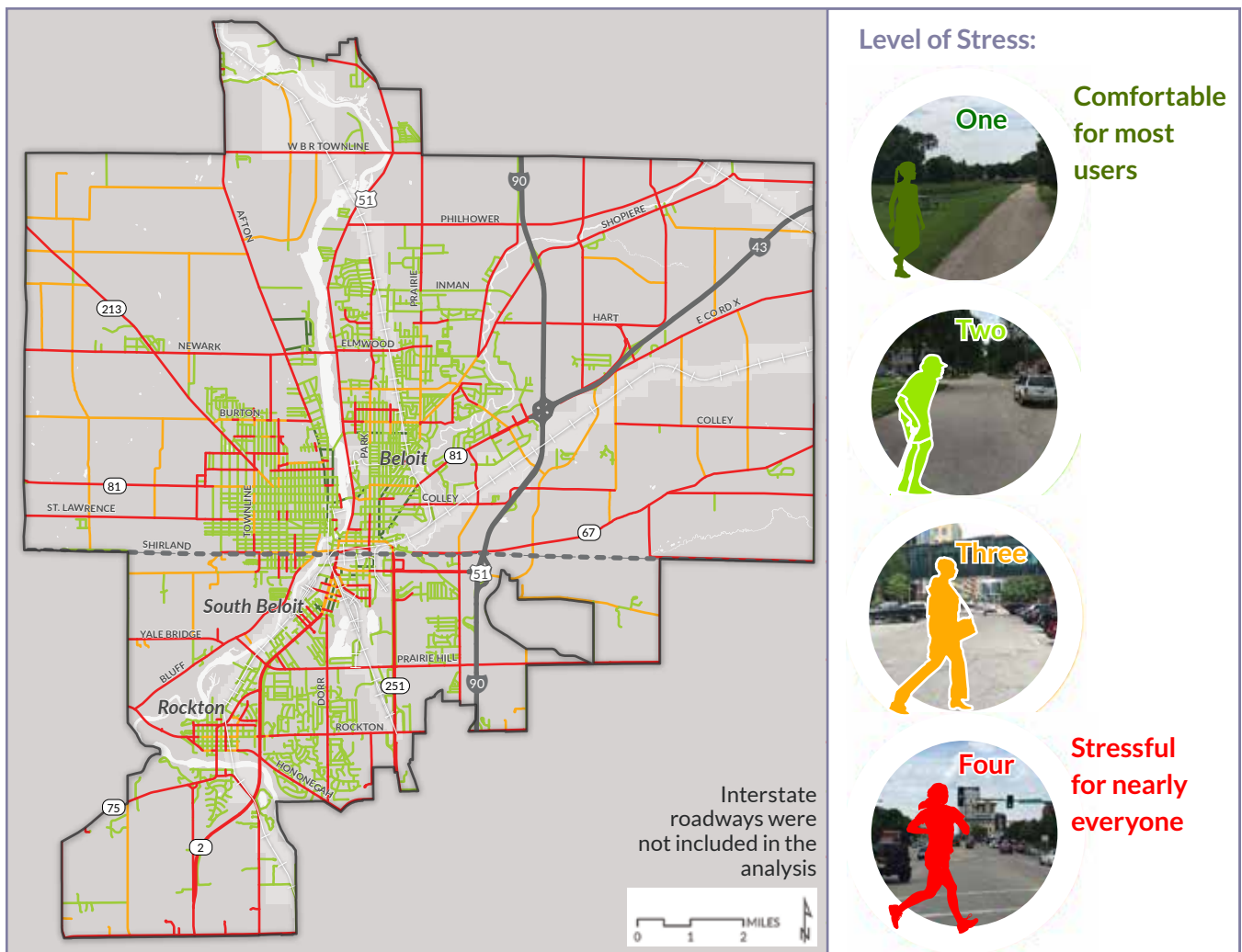


Figure 9. Pedestrian Level of Traffic Stress

What is it Like to Walk in the Region?

People feel comfortable walking when they have separation from car traffic. Residential streets may feel comfortable even without sidewalks if cars typically drive slowly and traffic volumes are low. As speeds and traffic volume increase, more separation is needed between people walking and car traffic. Many busy arterial and collector streets in the region were designed for quickly transporting people by car or goods by trucks. These streets are not comfortable for pedestrian travel unless there is a sidewalk. At especially busy roadways, a grass planting strip, parked cars, or some other buffer is needed between people walking and passing motorists.

Figure 9 shows that neighborhood streets and those closer to downtown areas are comfortable places for people to walk. Other streets, such as Prairie Hill, WI-81, and Philhower would need improvements to create a more comfortable environment for people to walk.

Plan recommendations show opportunities to improve existing walkways and create regionally significant routes. People are willing to walk a shorter distance than they are willing to bike. For this reason, plan recommendations will investigate pedestrian access to major regional destinations. Streets should be comfortable and safe for people of all ages and abilities to walk.

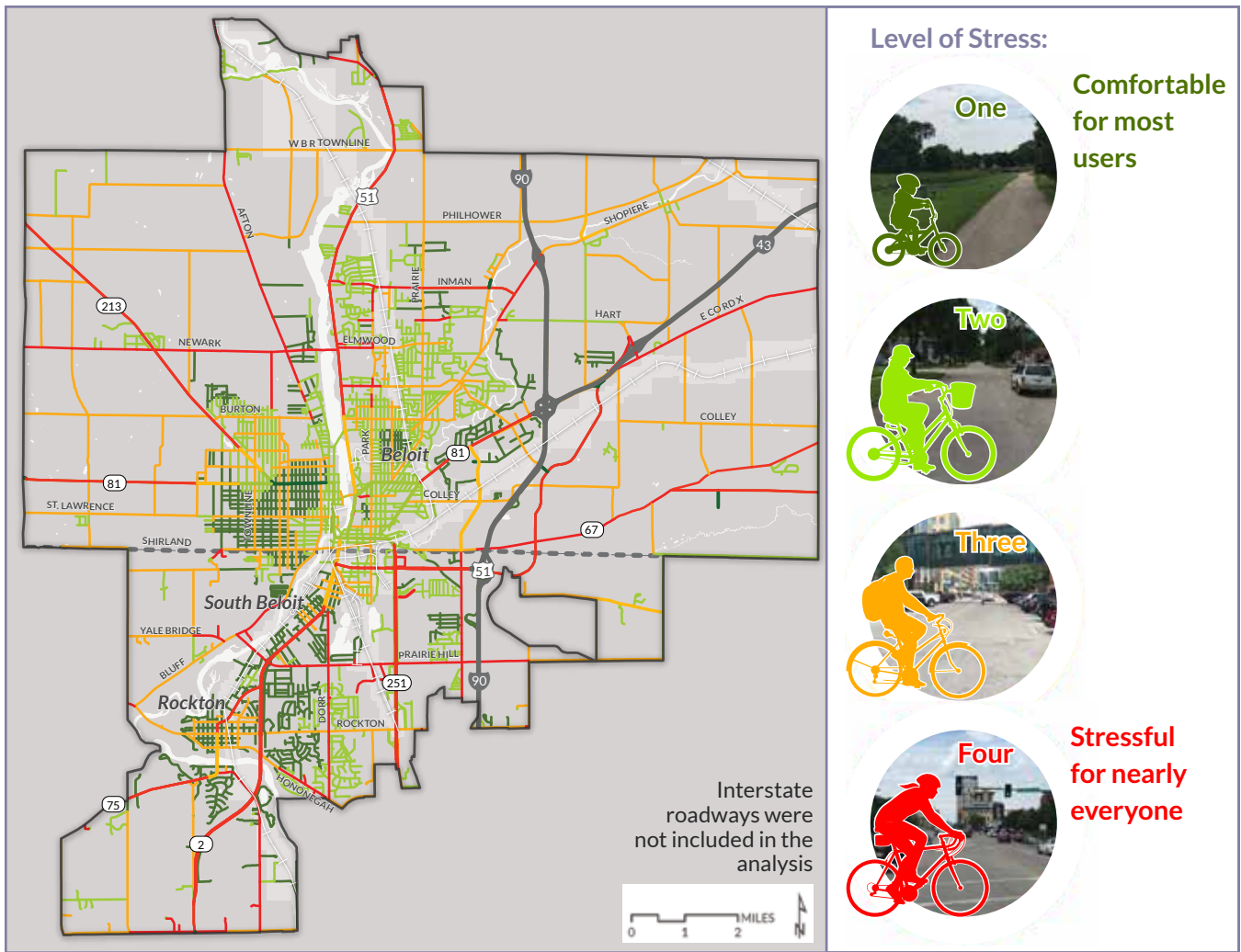


Figure 10. Bicycle Level of Traffic Stress

How Does It Feel to Bike in the Region?

Similar to walking, stress while bicycling increases as speeds and traffic volumes increase. The average person will only ride a bike if stress levels are low. This is why the region’s trails and residential streets are popular places for bicycling.

People bicycling need more separation from car traffic to feel safe when traveling on high speed, high traffic streets. People bicycling need less separation to feel safe when traveling on lower speed, lower traffic streets.

Figure 10 shows that streets such as 8th Street or Wisconsin Avenue, in Beloit, are comfortable places for

people to bike. Others would need improvements to invite people to use them to bike for routine trips.

As shown in Figure 10, several “islands” of low-stress roadways exist in residential neighborhoods. These routes may be comfortable for bicycling; however, their connectivity is lacking. They are intersected by major streets that are stressful for many bicyclists, effectively cutting off access to other areas. Options are limited for bicycling from one end of the study area to the other.

A strategy for reducing stress and improving connectivity in these areas will be to provide for (or increase) space for walking and bicycling. Strategic and targeted addition of infrastructure creates safe and comfortable walking and bicycling experiences across many types of streets in the study area.

Common Types of Urban and Rural Streets

The region features a mix of urban, suburban, and rural street types. The pictures on this page and the next show common street types and the relative ease to walk and ride bikes in these environments.

Key:

More Stress



Less Stress



Features: No centerline, typically high speed, low traffic volume.

Typical Stress Level:

Possible Improvements: A shoulder could be added, depending on space available and who owns the space.



Features: Centerline, two lanes, paved/gravel shoulder, typically high speed, low traffic volume.

Typical Stress Level:

Possible Improvements: Expand shoulder or add a buffer to existing shoulder if space is available.



Features: Centerline, four lanes, sometimes a bike lane, speed limit and traffic volumes vary. No sidewalks.

Typical Stress Level:

RURAL SETTING

Key:

More Stress



Less Stress

SUBURBAN SETTING



Features: Low-speed street in residential setting. Some feature sidepaths or sidewalks.

Typical Stress Level:

Possible Improvements: Speed management, construct or improve sidewalks/sidepaths

URBAN SETTING



Features: Two- or four-lane, busy and high-speed streets. Some feature sidewalks but often lack bike lanes.

Typical Stress Levels:

Possible Improvements: Potential for reallocating travel lane space to people walking or bicycling.



Features: Two-lane street with wide sidewalk and on street parking.

Typical Stress Level:

Possible Improvements: Maintain sidewalk, add shared lane markings. Redesign possible to add bike lanes.

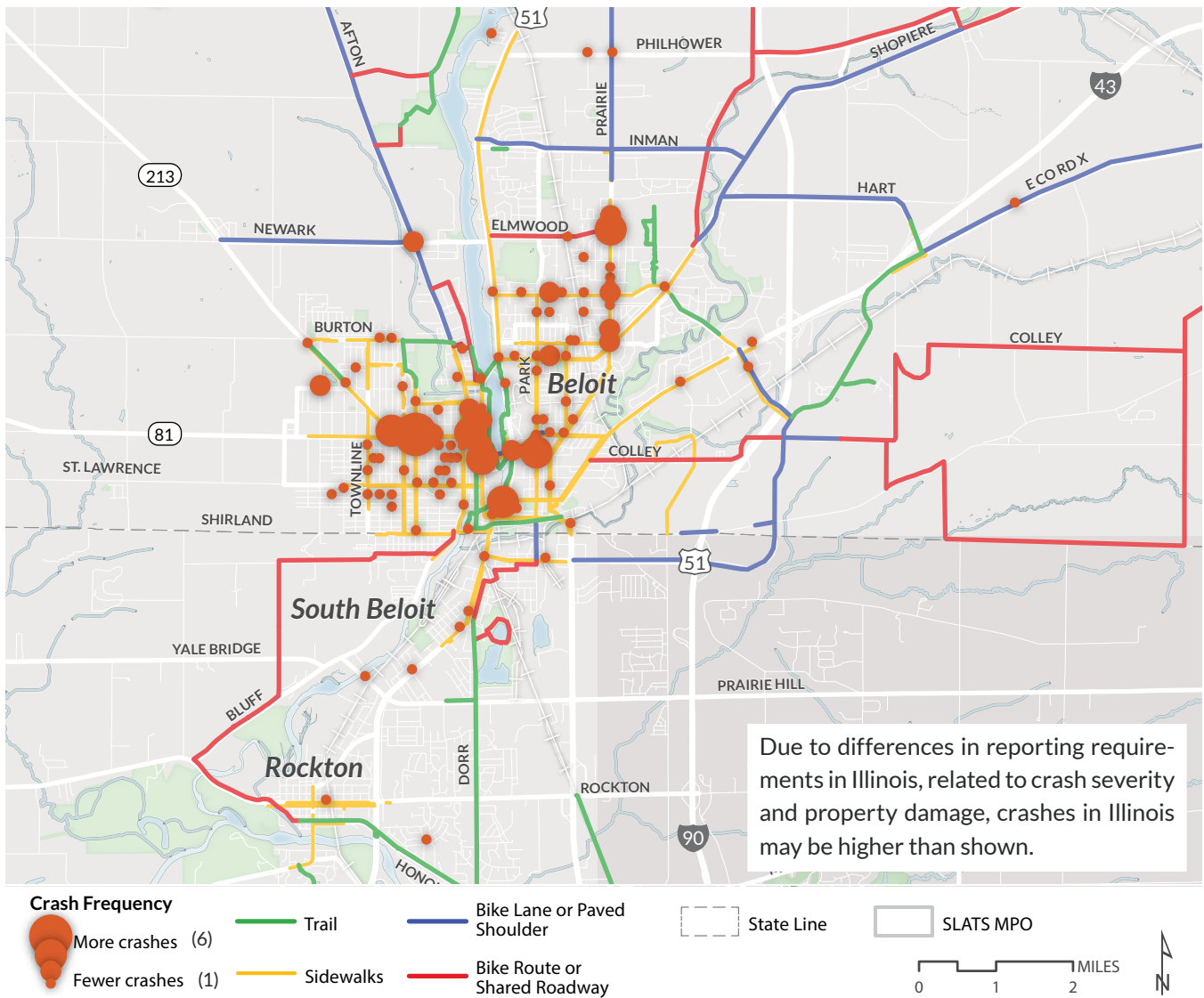


Figure 11. Crash Frequency, 2011-2016: People Walking or Bicycling

Existing Conditions: Safety, Equity, and Demand

Crash Review

Figures 11 and 12 show frequency and severity of crashes involving people walking and bicycling. National data suggest that motor vehicle speed is a major contributing factor in injuries or deaths to people walking or bicycling. In general, crashes occur most often on high-speed and high-volume roadways. While more crashes are reported in Wisconsin than in Illinois, this is due in part to differences in crash reporting between states.

Most of the crashes reported between 2011 and 2016 resulted in an injury to the person walking or bicycling. One fatal bicycle crash was reported in 2015. (Another pedestrian crash occurred in 2016 but occurred too recently to be included in the crash data provided by the State at the time of this plan.)

Streets that have high numbers of crashes are not the same streets that were previously identified for bicycle and pedestrian improvements.

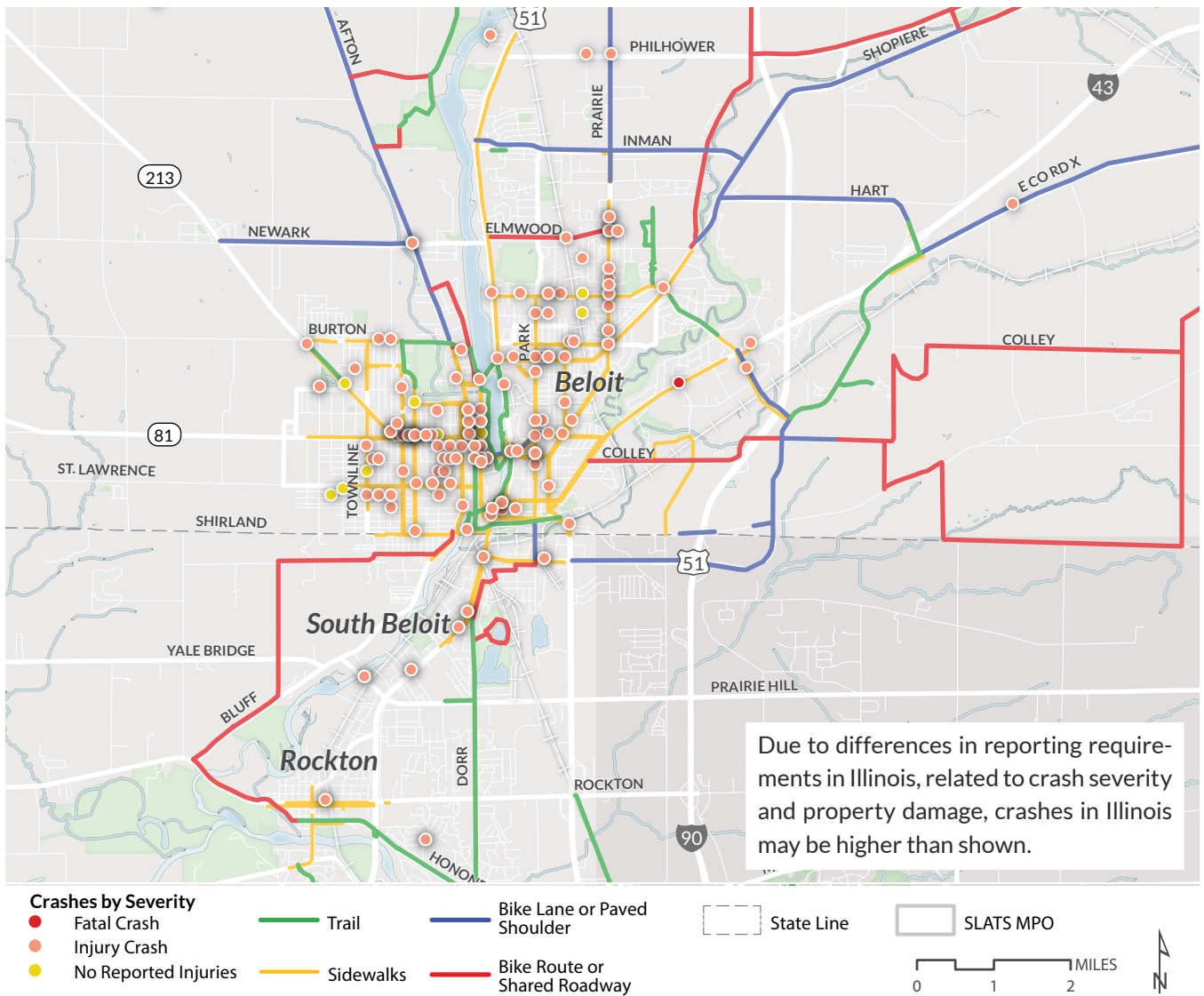
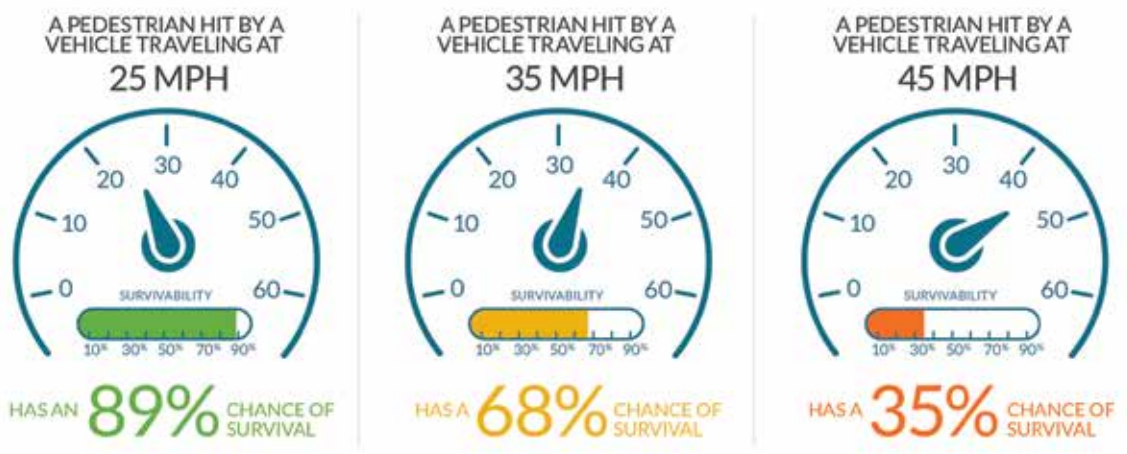


Figure 12. Crash Severity: People Walking or Bicycling



Tefft, B. C. Impact speed and a pedestrian's risk of severe injury or death. Accident Analysis & Prevention 50 (2013) 871-878.

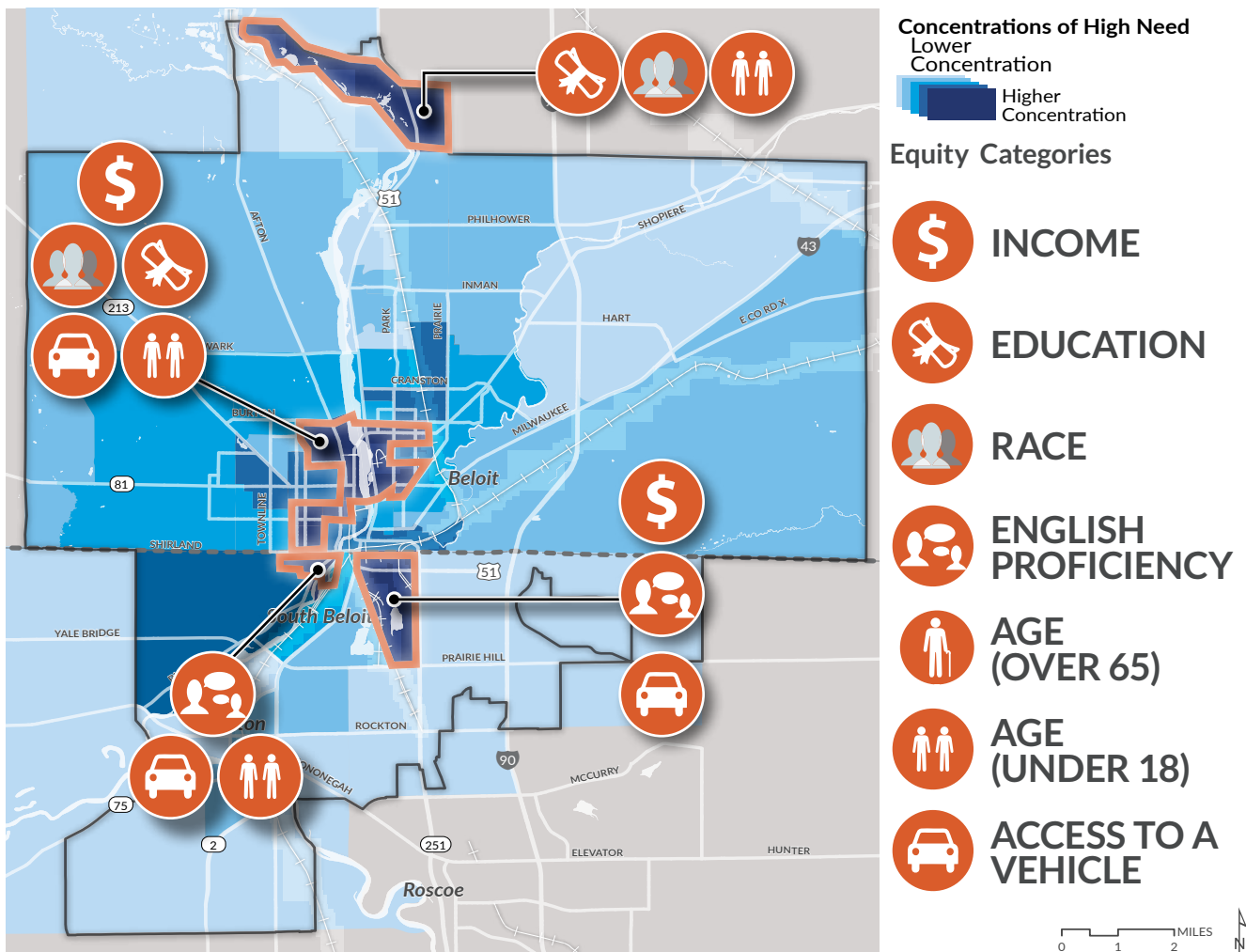


Figure 13. Composite Results of the Equity Analysis

Equity Analysis

An objective of this plan update is to provide an equitable distribution of infrastructure recommendations to serve the SLATS Region’s diverse population. This equity analysis identifies population groups for whom bicycle and pedestrian improvements can have a greater beneficial impact. Using US Census Bureau demographic data, the equity analysis identifies higher concentrations of traditionally underserved populations using the following metrics: age, household income, educational attainment, race, language English language proficiency, car ownership.

Figure 13 combines the individual demographic categories to create a composite equity score. The darkest areas show those with the greatest need for increased access to bicycle and pedestrian facilities. Figures 14 through 20 on the following pages display the concentration of each of the seven demographic characteristics analyzed to develop the composite equity score.

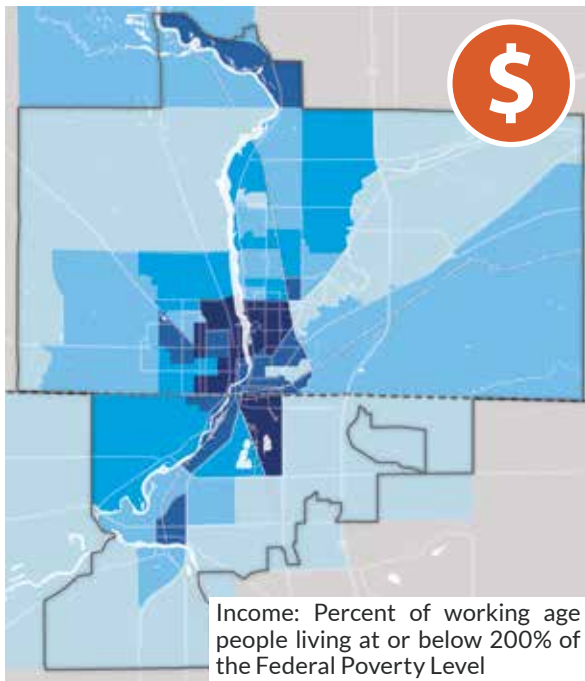


Figure 14. Northern areas of South Beloit along the Rock River and the railroad tracks, downtown Beloit straddling the river, and the northern MPO area, near Blackhawk Technical College show high concentrations of low income earners. Lower concentrations are found in rural areas and generally increase approaching the city cores.

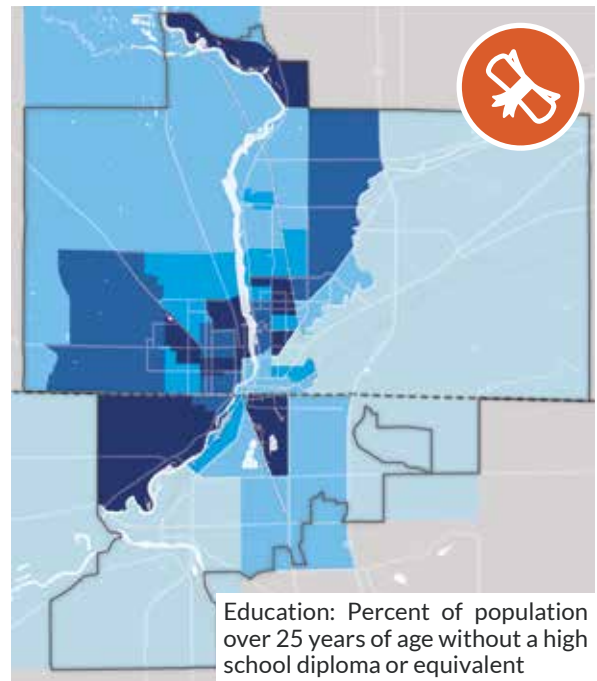


Figure 15. This figure shows areas of the region with a high concentration of residents without a high school diploma. The northern edge of South Beloit, west of the Rock River and east of the rail road tracks, downtown and the city core of Beloit, and the northern MPO area have high concentrations of these populations.

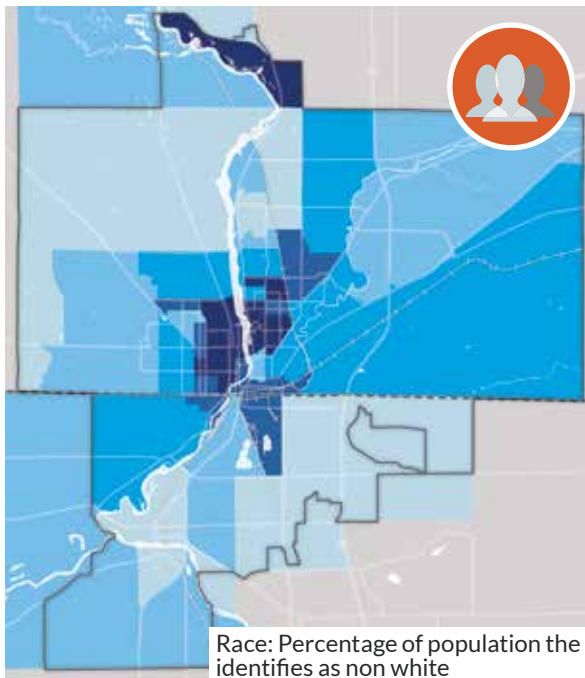


Figure 16. The Beloit city core and downtown, plus the area near Blackhawk Technical College have high concentrations of non-white populations. The more rural areas of the region have lower concentrations.

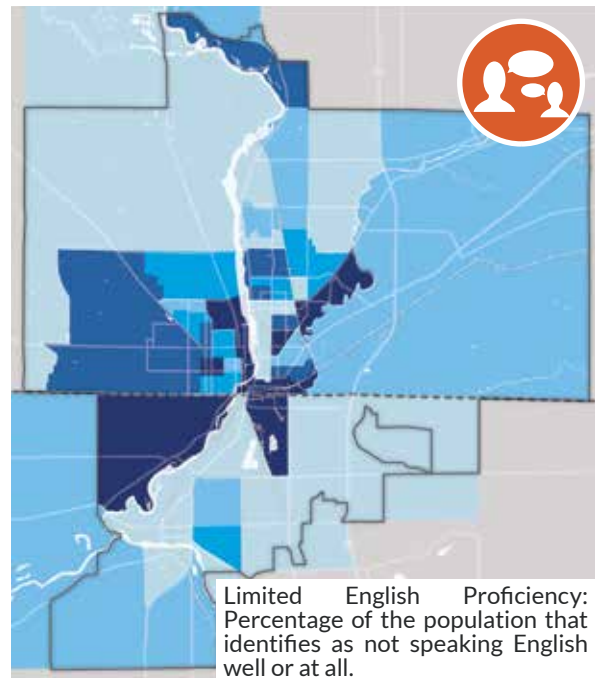


Figure 17. Areas in the northern portion of South Beloit, west of Turtle Creek on the eastern edge of Beloit, and some areas in the Beloit city core have a high concentration of populations with limited English proficiency.

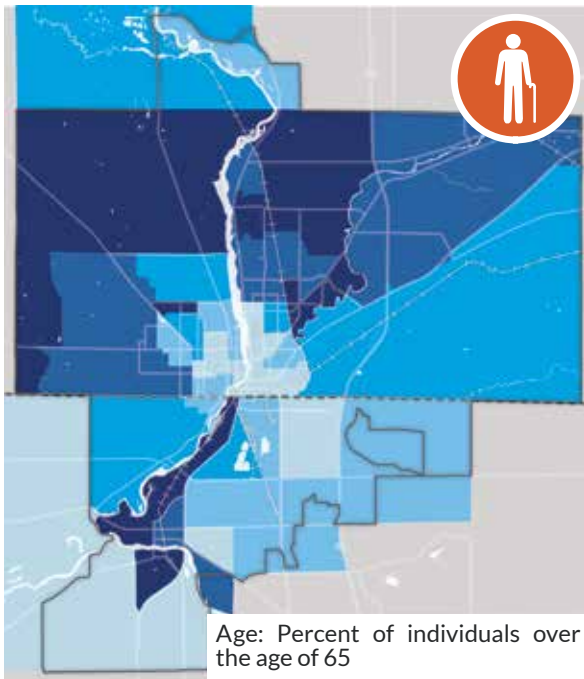


Figure 18. High concentrations of populations over 65 years old are found mostly in the rural areas of the region or on the fringes of cities as they transition to rural areas. Low concentrations of these populations are located in the Beloit city core.

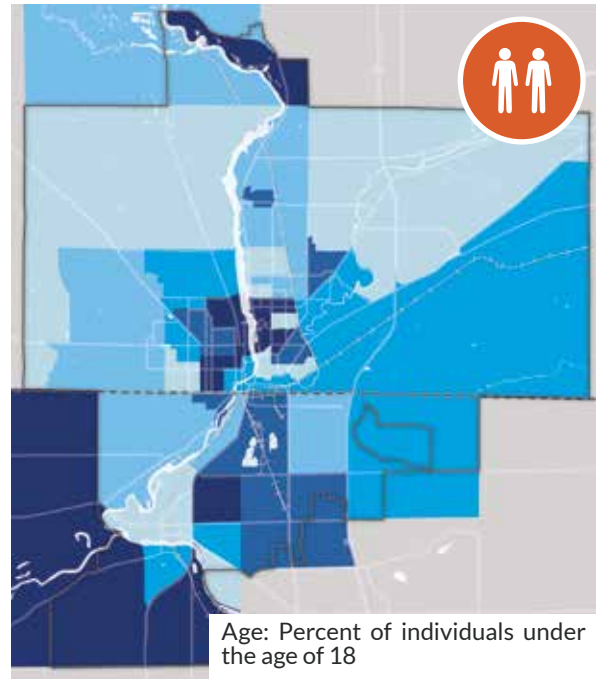


Figure 19. Areas of the region with high concentrations of people under 18 years old are located in the southwest portion of the region, in the Beloit city core, and near Blackhawk Technical College.

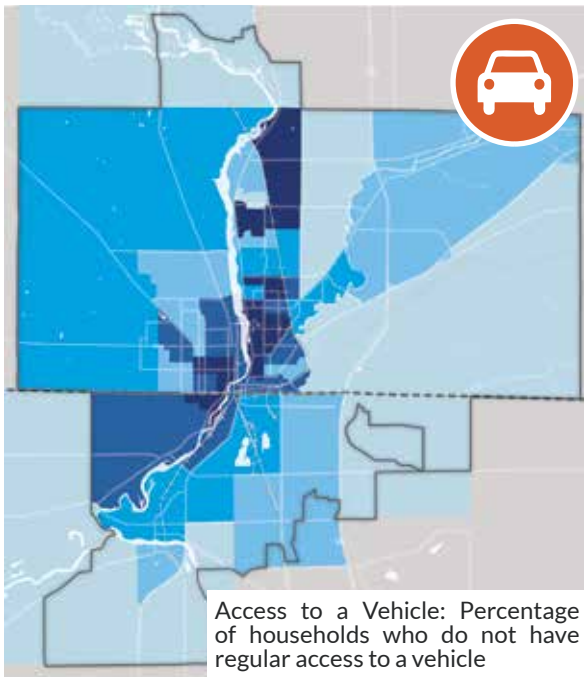


Figure 20. Populations with access to a car are shown in Figure 20. The Beloit city core and the area south of Philhower Road and north of Elmwood Avenue have high concentrations of people without access to a car.

How to Understand Maps Showing Data for Urban and Rural Areas

The region is composed of urbanized areas with many people living nearby in houses and apartment buildings; the region is also composed of rural areas with homes spread apart and with few people per acre. The presence of these different land uses in the same study area must be considered to understand a map. For example, a hypothetical Census block group has 100 people. If 25 people are living in poverty, 25% of the block group lives in poverty. If 25 people live in poverty in a block group with 1,000 people, then this represents 2.5% of the population. The Census block groups used in these analyses are compared to each other, not state or national averages. This provides relative concentrations, which helps to compare block groups within the region to each other.

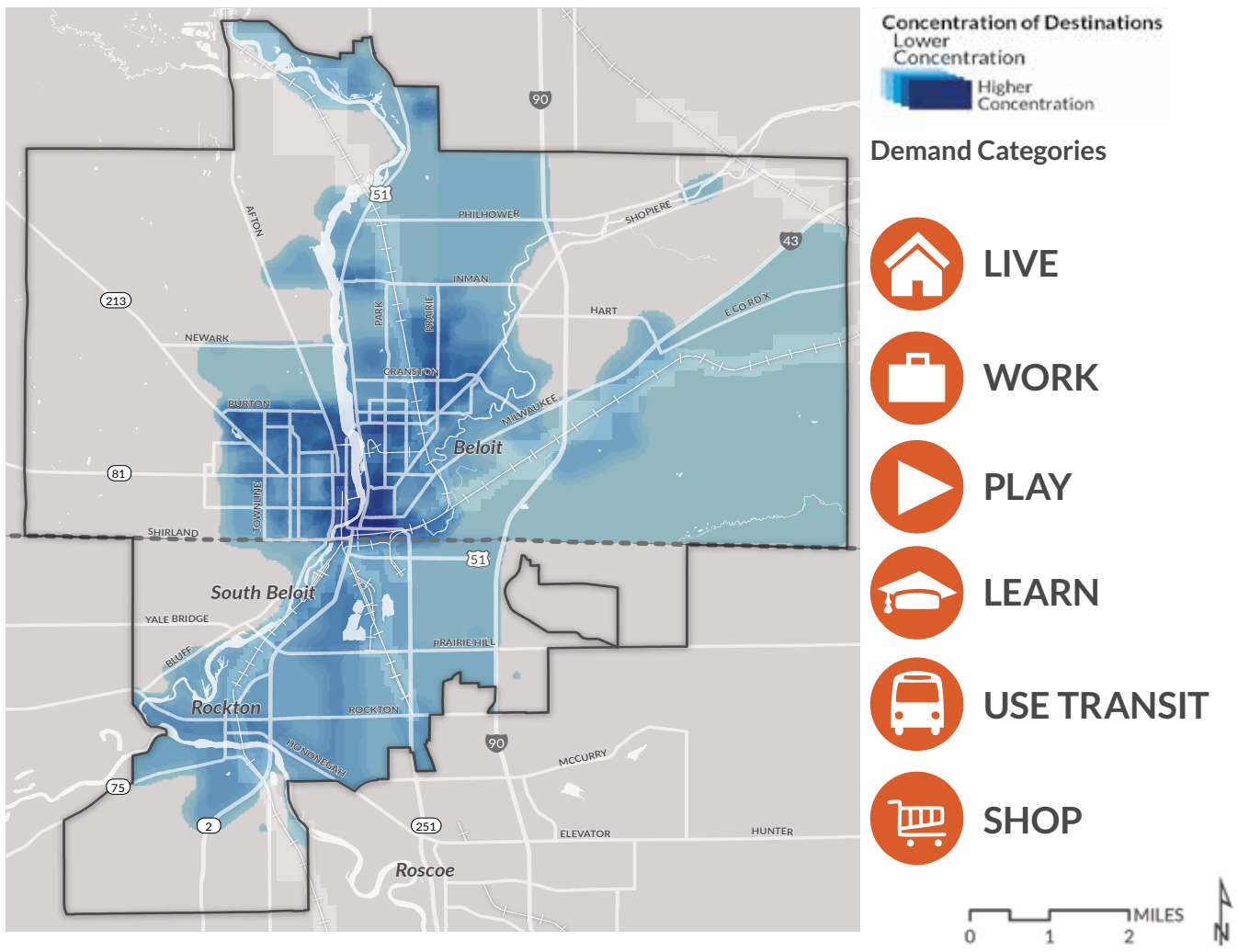


Figure 21. Where People Live, Work, Live, Play, Learn, Use Transit, and Shop

Walking and Bicycling Demand Analysis

Identifying major destinations where people live, work, play, learn, take transit, and shop helps create a walking and bicycling network that supports people as they make trips throughout their day.

The composite map, shown in Figure 21, shows where concentrations of destinations are in the region. Maps showing individual inputs are shown in Figures 22-27.

When looking for opportunities to improve walking and bicycling connections, this analysis helps to identify the areas of greatest interest.

This focus aligns with previous plans that have worked to improve urbanized areas throughout the region, while advancing an overall vision for the stateline area. It is also important to note opportunities for connecting to rural areas. Although these places may have lower populations, it is important to connect these residents to areas with more resources. For instance, the equity analysis found a relatively high concentration of elderly people living in rural areas of Rock county. A relatively high concentration of children live in unincorporated Winnebago county.

Recommendation development will consider these and other factors that act as caveats to the demand and equity analyses.

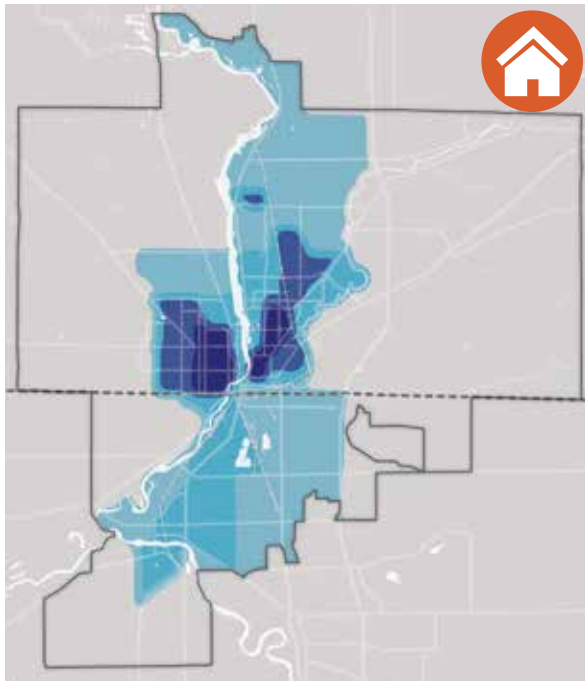


Figure 22. The image above shows areas of the region with higher population densities. Highest concentrations exist in the City of Beloit, particularly near the City's central area.

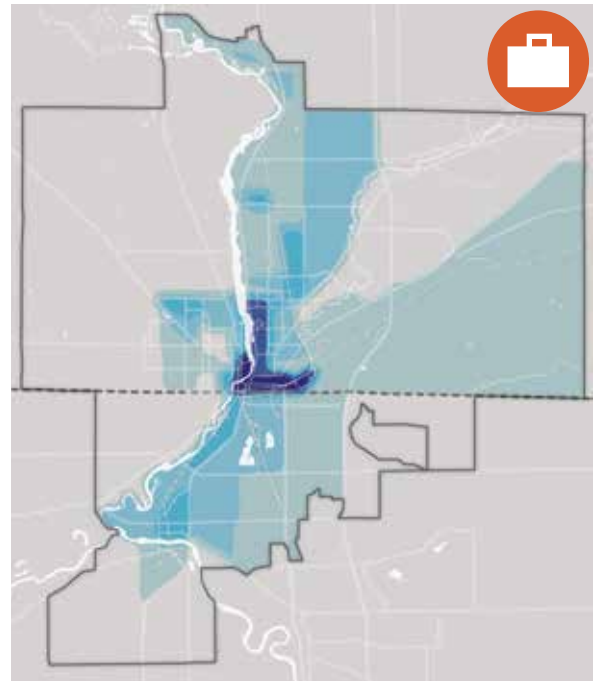


Figure 23. Densities of jobs in the region are shown above. Downtown Beloit and Beloit College, both east of the Rock River, are major job centers.

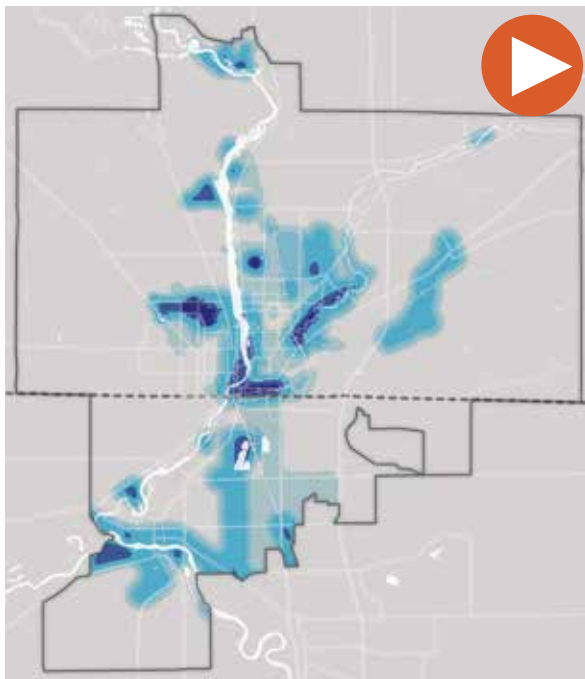


Figure 24. This figure shows where people spend their free time, including trails, park lands, and shopping centers. Winnebago County Forest Preserve and Turtle Creek Park are visible above.

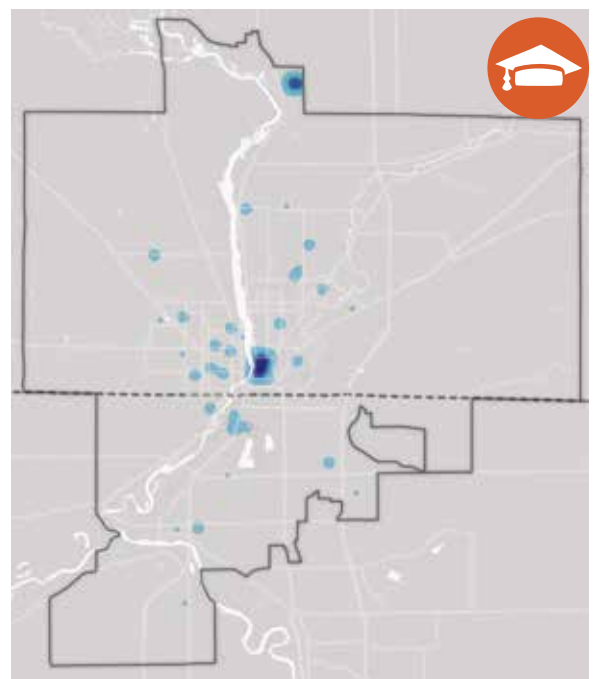


Figure 25. Schools are shown above, based on enrollment data. Blackhawk Technical College and Beloit College are schools with large student bodies, but elementary, middle, and high schools are also shown.

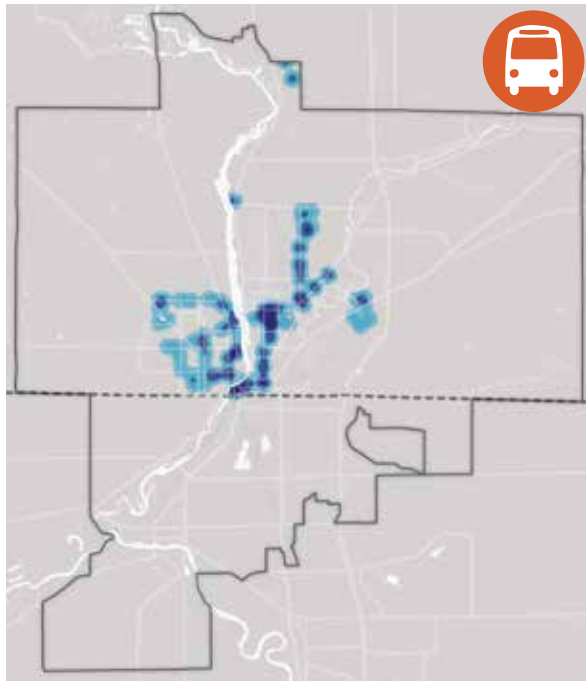


Figure 26. Transit service will attract people walking and biking. Concentrations of higher frequency or express service bus stops are shown in blue, with the assumption that these stops will attract more people walking and biking. (Note: Demand-response transit service in Illinois is not shown.)

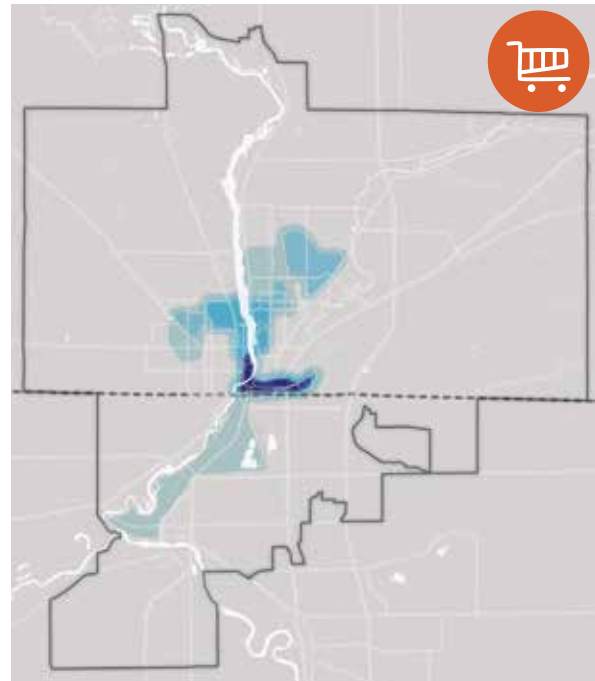


Figure 27. Retail concentrations show areas where people work at jobs in the retail industry. These areas are important from an economic perspective, but also from an entertainment perspective. The largest concentrations of these jobs are found north of the state line in the City of Beloit.

Community Engagement Activities

Public input opportunities were designed to meet with residents and stakeholders during daily activities, including the Beloit Farmers Market, Stateline YMCA, Latino Service Providers Coalition, and Community Action. Problem areas identified by the public helped to inform strategies and locations for recommendations to improve walking and bicycling.

Key Themes

- Community members want places to walk that are similar to the riverfront: separated from traffic, scenic, calm, and close to other destinations.
- Community members enjoy using the trails in Rockton and Roscoe. Most reach the trails by driving.
- Milwaukee Road was identified as a barrier to children reaching school from neighborhoods located to the west.
- Residents find that high-traffic, high-speed roadways discourage walking and bicycling. Calmer, residential streets that lack sidewalks are a challenge, as well.
- Residents' "desire lines" are consistent with recommendations from previous plans. Residents expressed an interest in traveling from municipalities in the study area into downtown Beloit.
- Survey responses indicate most respondents drive for most trips. Respondents' interest in improved walking and bicycling reflects national trends of increased interest in walking and bicycling.
- Respondents currently walk and bike for recreation. Routes drawn on the map and indicated in the survey show an interest in walking and bicycling for recreation and transportation.
- Residents note that barriers to walking and bicycling include infrastructure limitations but also driver behavior.



Figure 28. Public workshop attendees at the YMCA, September 2017.

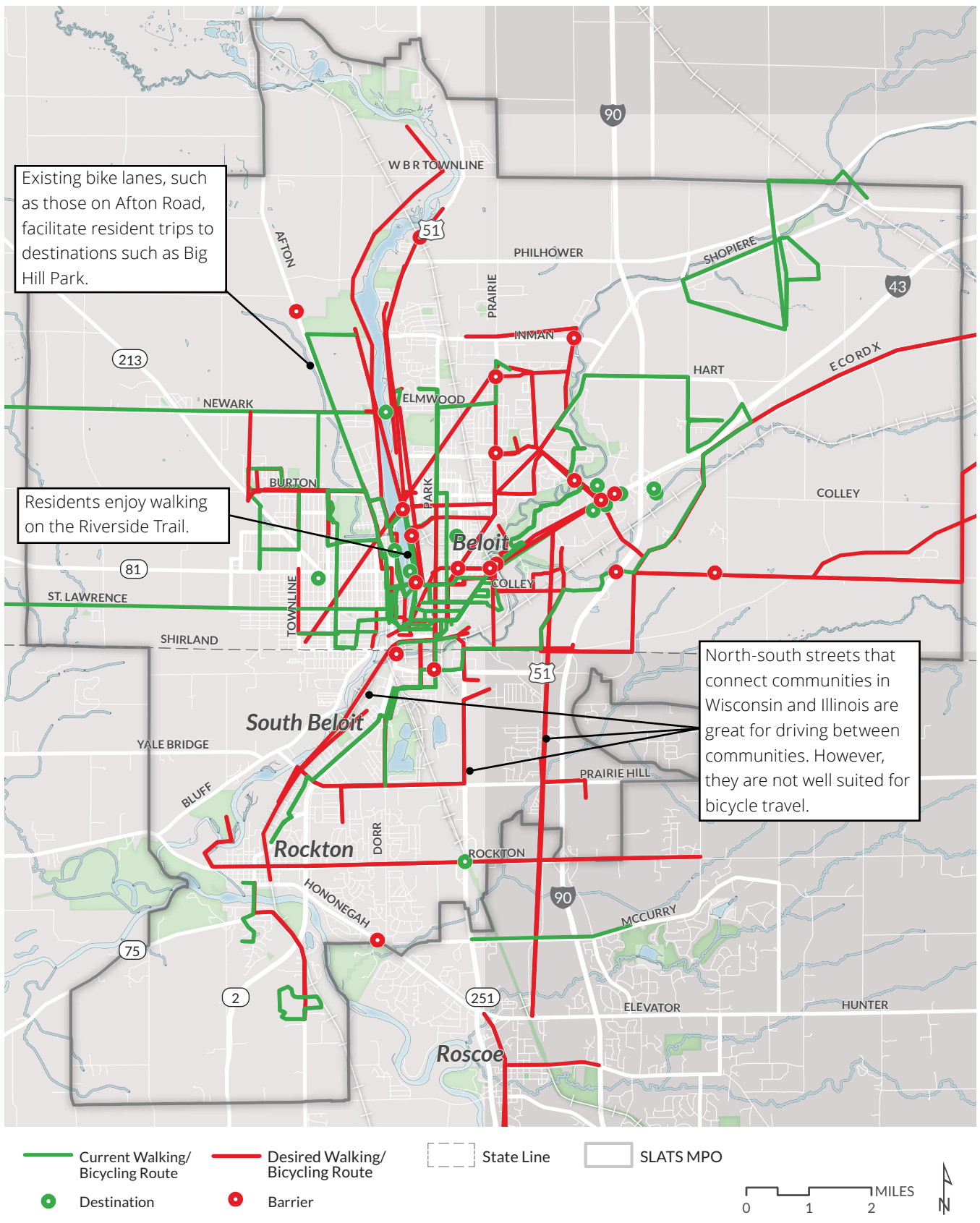


Figure 29. Community Engagement Summary Map

Priority Improvement Area Identification

Based on a review of previous planning efforts, the roadway safety and crash data analysis, walking and bicycling demand analysis, equity analysis, and community engagement activities, priority improvement areas were identified to guide the development of recommendations. This includes areas that possessed several local destinations or regional destinations, are located within an area of need based on the equity analysis, and/or intersections that contained more than one injury or fatal crashes during the five-year crash analysis period.

Figure 30 identifies the intersections and roadways that were identified for consideration in the recommendations development process. This includes a one half-mile radius around key intersections, and corridors identified for new improvements, facility upgrades, or facility extensions.

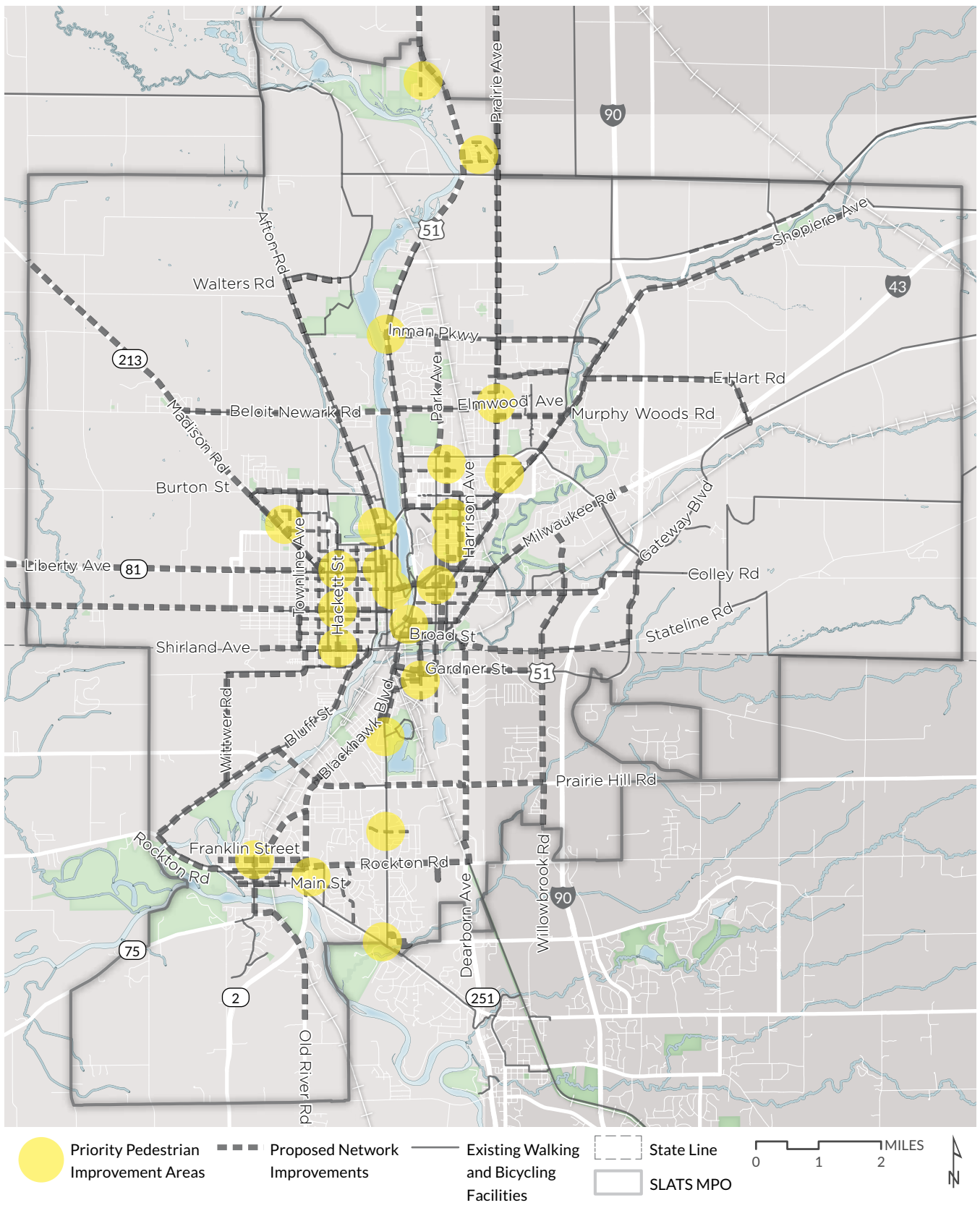
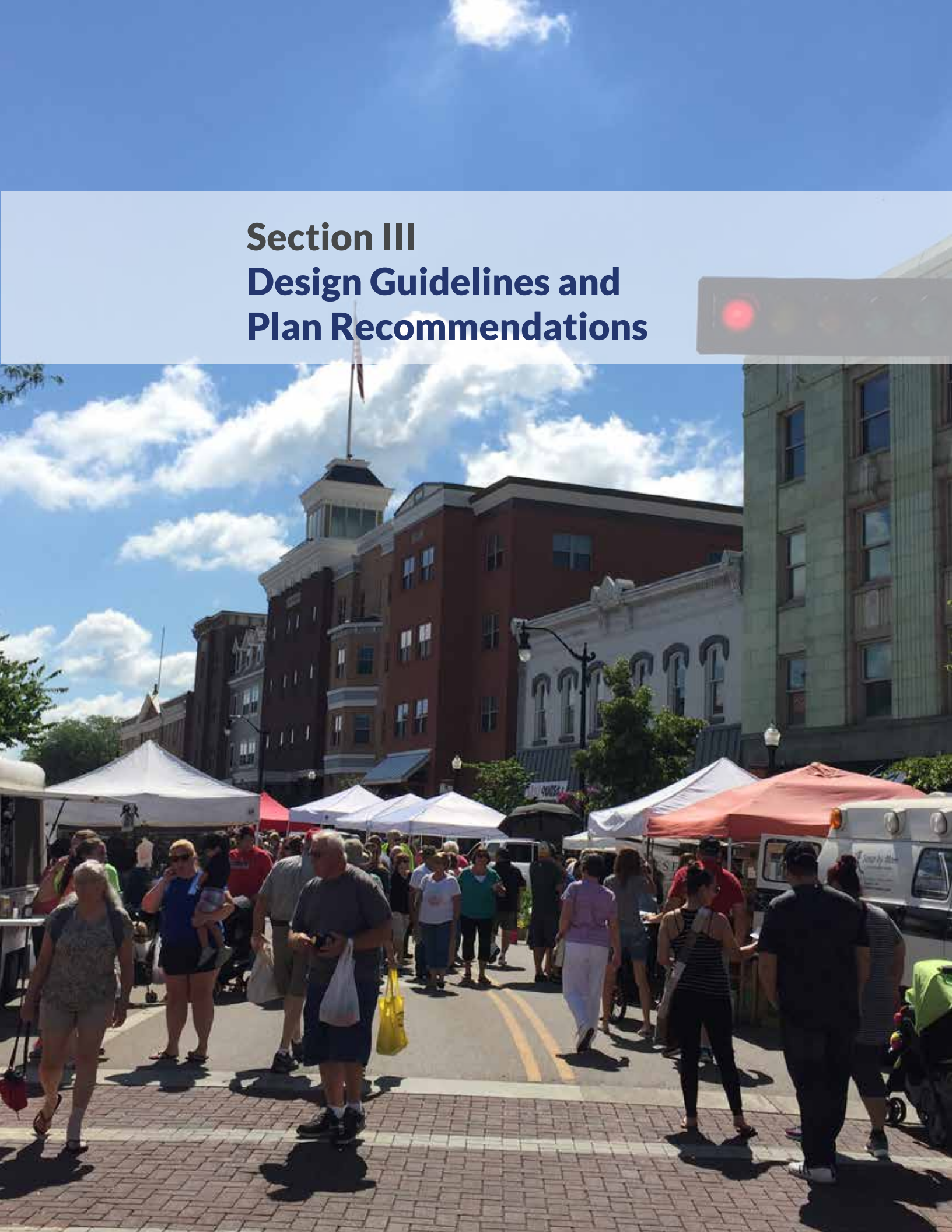


Figure 30. Priority Improvement Areas

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Section III

Design Guidelines and Plan Recommendations



Development of Recommendations

Safe and connected networks inspire residents and visitors to walk and bike more often. The Federal Highway Administration (FHWA) defines such a network as, “a series of interconnected facilities that allow nonmotorized road users of all ages and abilities to safely and conveniently get where they need to go.”¹ FHWA defines six principles of connected networks²:

- Cohesion
- Directness
- Accessibility
- Alternatives
- Safety and Security
- Comfort

Recommendations build upon the network analyses discussed in the existing conditions chapter. For development of a plan for the SLATS Region, recommendations emphasize regional connections. Network recommendations focus on creating regional routes, but require local coordination as many projects are implemented by local agencies. Regional active transportation networks

¹ Federal Highway Administration. *Case Studies in Delivering Safe, Comfortable, and Connected Pedestrian and Bicycle Networks*. 2015. Accessed December 2017. http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/network_report/network_report.pdf.
² Ibid.

should establish intra- and inter-city routes that are that link people to regional destinations.

Recommendations are subject to change and refinement as site conditions and development patterns change, and as other adjacent or intersecting projects are implemented. Additionally, projects may require additional study to achieve local support and mitigate issues related to roadway speed, traffic impacts, and right-of-way constraints.

Inputs

Figure 31 shows the inputs used during the recommendation development process. These inputs are reiterated in Figure 32 on the following page, which displays thematic maps representing integral components of the existing conditions analysis. In addition to identifying improvements from previously adopted plans, recommendations were developed using public comments related to walking and bicycling, a study area tour with local bicycle advocates, a review of traffic inputs (stress, crashes), and identifying areas of need based on the equity analysis.

Recommendations seek to improve east-west connectivity and help improve connections near the state line between Illinois and Wisconsin. Where feasible, the plan provides recommendations to upgrade existing signed bicycle routes to provide visual or physical separation



Figure 31. Recommendations were developed using the design inputs shown above.

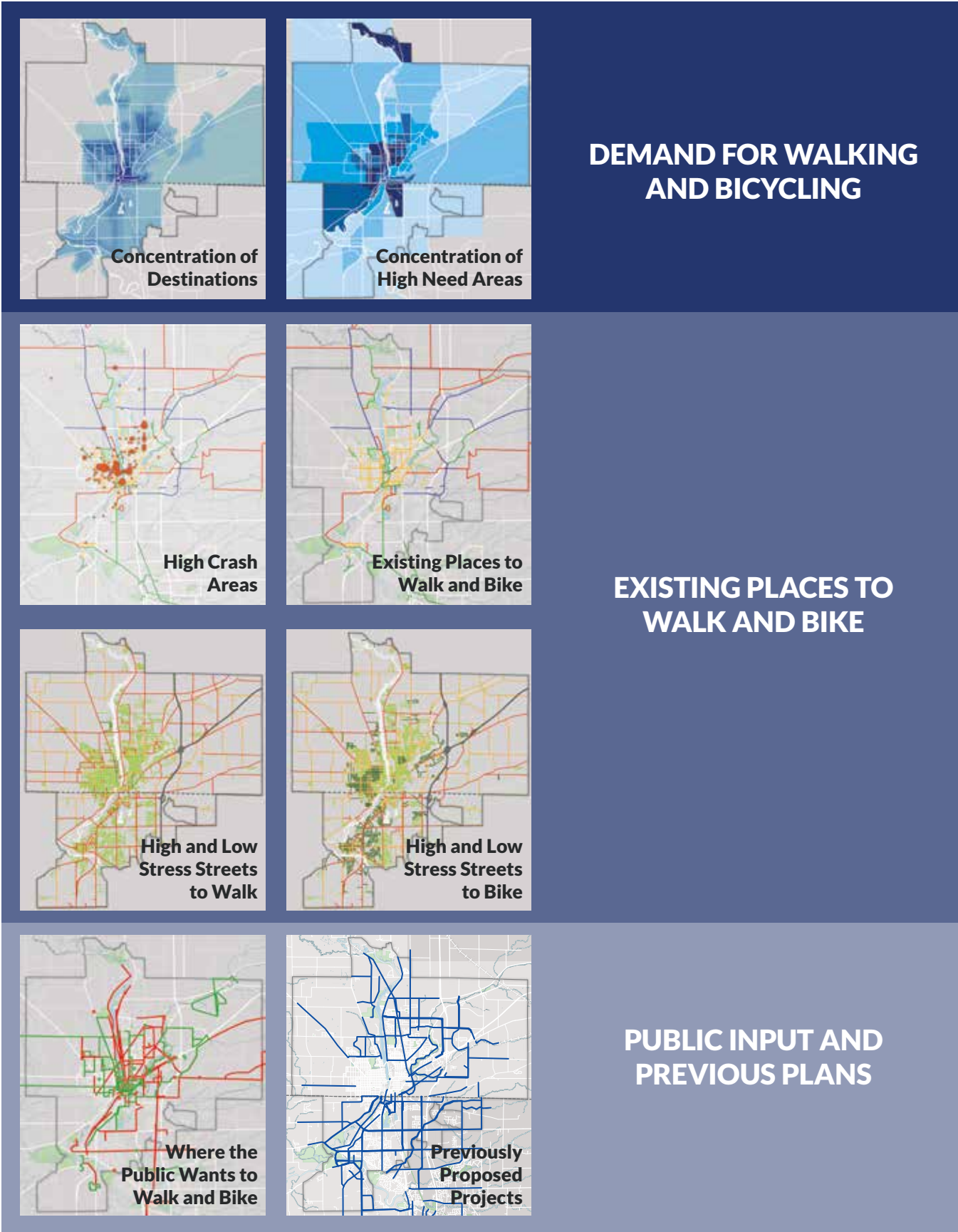


Figure 32. Inputs for the development of bicycle and pedestrian facility recommendations.

from automobile traffic, with the objective of improving the routes' accessibility for people of all ages and bicycling experience.

Recommendations identify low stress, residential streets to use as neighborhood greenways. These types of improvements offer alternatives to bicycling or walking next to streets with higher traffic. Intersection improvements are important along these corridors, since intersections may be difficult for people walking or bicycling to cross.

Intended Network Users

When it comes to designing streets, the term "design vehicle" is an important consideration. The National Association of City Transportation Officials (NACTO) describes the design vehicle as, "a frequent user of a given street" that dictates streets' characteristics. Instead of designing for the largest trucks,³ NACTO recommends adopting the delivery truck as a design vehicle within urban streets. These vehicles have an

³ NACTO. *Urban Street Design Guide*. Accessed December 2017. <https://nacto.org/publication/urban-street-design-guide/design-controls/design-vehicle/#footnotes>

inside turning radius of 22.5 feet and an outside turning radius of 29 feet.⁴ Although larger vehicles are accommodated through right turns at intersections, NACTO recommends designing intersections to promote turning speeds of five to 10 miles per hour. Infrequent, large trucks may still use the intersection.

So what does this mean for creating bicycle and walking networks? It means towns and cities can create streets that work better for all types of vehicles: from pedestrians to trucks. Street designers must accommodate these vehicles throughout the transportation system. However, some streets can prioritize certain users over others. When thinking of the design vehicle for a person walking or bicycling, planners must think of the needs of people from eight to 80 years old.

Network recommendations consider the need to create streets where young children can travel to school or to play with friends and family. They also think of how to accommodate residents as they age and experience physical or mental changes. Network recommendations aim to invite more people to walk and bike throughout the SLATS Region. Although the needs of confident

⁴ Ibid.

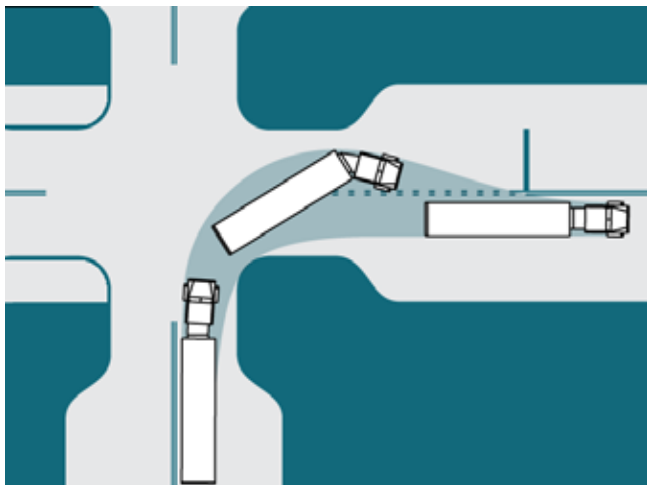


Figure 33. Tight turning radii reduce motor vehicle speeds around corners and create space for pedestrians. Trucks may still complete turns by traveling over the centerline. A recessed stop bar help provide space for this maneuver by increasing the distance between cars stopped in the opposing direction. (Image credit: nacto.org)

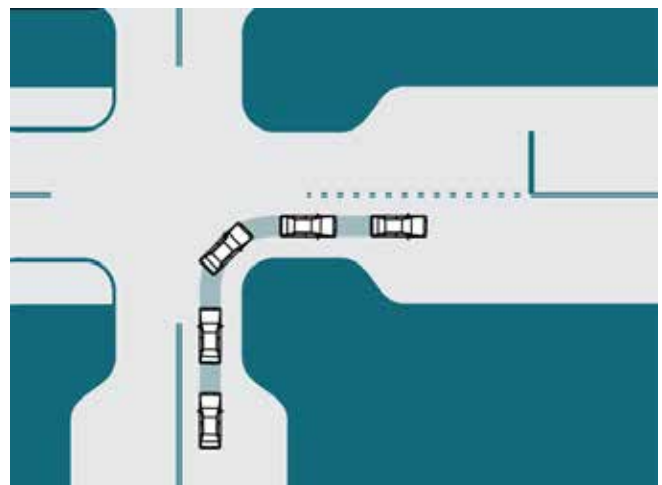


Figure 34. Cars and small trucks are encouraged to make turns at five to 10 miles per hour, which creates a more calm environment in which to walk and bike. (Image credit: nacto.org)

bicyclists are thought of when designing active transportation networks, the planning process must be inclusive of people who are currently hesitant to walk and bike for daily transportation and recreation.

Focus on Equity

A multimodal transportation system connects residents to job opportunities, social services, and more. As such, it must be geographically equitable and consider the needs of walking and bicycling in areas of need as indicated by the equity analysis. Public events to encourage walking and bicycling, especially on streets where new infrastructure is installed, should be offered in various neighborhoods and different times of the day and week to be inclusive. Partnerships with local organizations are a helpful way to serve diverse populations and engaging residents.

Implementation and Timing

The plan's implementation strategy identifies short, medium, and long term projects to implement the recommended network. Low-cost or projects that do not require significant further study or design are identified for near-term implementation. Other, long-term recommendations may require additional study and design. The needs of all roadway users, including the safety and comfort of people walking, bicycling, and accessing transit, must be balanced with roadway characteristics and corridor constraints.

Design and Placement Guidance

The next section provides guidance for including walking and bicycling facilities in transportation projects. Each facility type serves a function in creating a complete network. General design guidance is divided into the following sections:

- **Mixed Traffic Facilities:** People walking and bicycling can safely share roadway space with motorists. To picture this type of street, think of a quiet residential street where kids and parents can easily bike to and from school.
- **Visually Separated:** More space is required between people walking/bicycling and driving as traffic speeds or number of cars increase. To picture these types of tools, think of paved shoulders found in rural areas or the bike lane on Shopiere Road.
- **Physically Separated:** People walking and bicycling need separate space when a visual cue is not enough to feel safe from passing cars. Some tools are shared by people walking and bicycling, while sidewalks are reserved for pedestrians. The Hononegah path is one example.
- **Crossing Improvements:** Intersections are where all modes meet, and often are where pedestrians and bicyclists are most vulnerable. Guidance is provided to assist in improving crossings at midblock crossings and intersections.



Figure 35. On and off street walking and bicycling infrastructure must be safe and easily accessible by people of all ages and abilities.

Design Guidelines: A Toolbox of Infrastructure Options

The following tables provide design guidance for best practices in bicycle and pedestrian facility design. This toolbox combines best practices from the FHWA *Small Town and Rural Multimodal Networks Guide* and the NACTO *Urban Bikeway Design Guide*. Walking and bicycling infrastructure should be intuitive and appealing to people walking, bicycling, and driving. However, each facility should be installed in accordance with necessary signs and pavement markings consistent with the *Manual on Uniform Traffic Control Devices*.

Table 1 shows the general selection characteristics that may be used when selecting a facility type, and is based on posted speed, general average annual daily traffic volume (AADT), roadway functional classification, and general land use categories. More than one facility type may work on some corridors, and engineering judgment should be used when identifying treatments that are above or below the range of values shown in the table. In some cases, it may be possible to reduce speeds or volumes on a roadway to make a treatment feasible. Traffic studies may be necessary to finalize facility selection. Constructed facilities may use tools with more or less separation from car traffic than originally proposed in this plan.

Table 1. Infrastructure Selection Characteristics

	Posted Speed (MPH)*	Average Daily Traffic (ADT)*	Roadway Type			Land Use	
			Local	Collector	Arterial	Outside Developed Areas	Inside Developed Areas
Mixed Traffic Facilities							
Yield Roadway	0 - 30	0 - 2,000	●				●
Neighborhood Greenway	0 - 25	0 - 3,000	●				●
Advisory Shoulder	0 - 35	0 - 6,000		●		●	●
Visually Separated Facilities							
Paved Shoulder	25 - 55	1,500 - 12,000+		●	●	●	●
Bicycle Lane	0 - 40	0 - 9,000	●	●	●	●	●
Buffered Bike Lane	0 - 40	0 - 9,000	●	●	●	●	●
Contra-Flow Bicycle Lane	0 - 40	0 - 9,000	●	●	●	●	●
Pedestrian Lane	0 - 20	0 - 2,000	●	●			●
Physically Separated Facilities							
Shared Use Paths (Trails)	**	**				●	●
Sidepath	0 - 55	0 - 12,000+		●	●	●	●
Sidewalk	0 - 55	0 - 12,000+	●	●	●		●
Separated Bike Lane	0 - 55	0 - 12,000+		●	●		●

* This table shows general posted speed limit and traffic volume thresholds for the consideration of bicycle and pedestrian facilities. Engineering judgment should be used when considering facilities beyond this range. Consult the NACTO *Urban Bikeway Design Guide* and the *Small Town and Rural Multimodal Networks Guide* for additional information.

** Shared Use Paths (trails) are fully separated from motorized vehicle traffic rights-of-way; facility selection is not primarily based on speed and volume thresholds. Care should be taken for where shared use paths (trails) cross roadways.

Mixed Traffic Facilities



Mixed traffic facilities are roadways shared by people walking, driving, and biking and are best suited for low speed, low volume roadways. Many roadways in the region may already be shared roadways.

Visually Separated Facilities



Visually separated facilities use pavement markings to make space for people bicycling and walking, and are suitable on roadways where mixed traffic may not provide enough comfort or separation.

Physically Separated Facilities



These designs offer the most separation from drivers. They use physical obstacles, curbs, or planting strips. The goal is to use design changes to make high traffic volume, high speed streets feel comfortable.

Figure 36. Examples of infrastructure included in mixed traffic, visually separated, and physically separated facility categories.

Yield Roadway



A yield roadway is designed to serve pedestrians, bicyclists, and motor vehicle traffic in the same slow speed travel area. Yield roadways serve bidirectional traffic and no lane markings are used to differentiate space.

Posted Speed Limit (MPH)	Traffic Volume (ADT)	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 30	0 - 2,000	●				●

Neighborhood Greenway (Also Known As Bicycle Boulevard)



A bicycle boulevard is a low-stress facility that is designed to give priority of movement to bicyclists operating in a shared roadway environment. This is achieved through the installation of a combination of traffic calming elements to keep speeds and volumes low. This includes, but is not limited to miniature traffic circles, curb extensions or bump outs at intersections, speed humps, diverter islands, medians that restrict automobile through movements while accommodating bicyclists (shown).

Posted Speed Limit	Traffic Volume (ADT)	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 25	0 - 3,000	●				●

Advisory Bike Lane or Advisory Shoulder



An advisory makes space for bicyclists on a roadway otherwise too narrow for a bike lane. Shoulders are delineated with a dashed lines. (Colored pavement is optional). Motorists drive in this space when no bicyclists are present and use the center area of the roadway when passing bicyclists. They can be installed on roadways with or without on-street parking. The roadway must not have a marked centerline.

Note: Advisory shoulders are experimental and subject to approval by FHWA. In order to install advisory shoulders, an approved Request to Experiment is required as detailed in Section 1A.10 of the MUTCD.

Posted Speed Limit (MPH)	Traffic Volume (ADT)	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 35	0 - 6,000		●		●	●

Additional Mixed Traffic Amenity: Wayfinding Signage



Wayfinding signs can be helpful for providing guidance and direction information on mixed traffic facilities to help guide users along a network of low-stress facilities. They help increase visibility of facilities and assist with navigation to destinations.

Speed	Volume	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
Varies		●	●	●	●	●

Mixed Traffic Facilities - Corridor Implementation Strategies

Some streets in the SLATS Region currently function well as mixed traffic streets. In most residential neighborhoods, it is generally comfortable for families to walk and bike. The level of changes needed on a roadway to provide this experience vary according to the level of traffic stress.

In general, more infrastructure treatments are needed along a yield roadway or neighborhood greenway if a street has a higher posted speed limit and higher average traffic volumes than are typically recommended along neighborhood greenways.

Neighborhood Greenway Corridor Design

Wayfinding Signage and Pavement Markings

Some streets may only need wayfinding signage to act as inviting walking and bicycling routes. Streets with speed limits below 25 MPH, without speeding issues, and with an average of 3,000 cars per day or fewer (1,500 cars preferred) can use this treatment. See page 45 for more about wayfinding.

Speed Management Strategies

NACTO's Urban Bikeway Design Guide recommends using traffic calming along neighborhood greenways to keep average vehicle speeds under 22 miles per hour. The following strategies can be implemented to reduce traffic speeds along neighborhood greenways:



Speed hump / table



Mini roundabouts



Curb extensions



Raised crosswalk



Chicane

Volume Management Strategies

Cities and towns can use the following tools to reduce traffic volumes along neighborhood greenways:



Partial road diverter



Full closure



Diagonal diverter

Neighborhood Greenways: Intersection Design

Unsignalized Intersection Design Strategies

Speed Limit: <35MPH; Travel Lanes: < 3



Raised intersection



Intersection markings



Stop signs on intersecting street



Bicycle forward stop bar
(Image source: nacto.org)



Advance warning signs



Curb extensions

Speed Limit: >35MPH; Travel Lanes: >=3



Active warning beacon



Hybrid beacon



Median refuge island

Signalized Intersection Design Strategies



Bike box



Partial closure



Bicycle signal detection

Advisory Shoulders or Advisory Bicycle Lanes

Advisory shoulders are a great tool for streets that would benefit from bike lanes or sidewalks, but are too narrow to fit dedicated lanes for motorized and nonmotorized vehicles. These facilities are bicycle priority areas delineated by broken white lines, separate from a center one-lane, two-way travel area. Motorists may only enter the bicycle zone when no bicycles are present. Motorists may overtake bicyclists with caution due to potential oncoming traffic. Streets with advisory shoulders typically have posted speed limits at or below 35 miles per hour and no more than 6,000 motor vehicles per day. However, exceptions exist throughout the country. Roadways with advisory shoulders or advisory bicycle lanes should not have centerlines.

Advisory Shoulder Corridor Design

- A** Dashed white lines are added to provide six foot shoulders (minimum five feet). This creates space for people to walk and bike.
- B** Adding the dashed lines to the street edges creates one center lane for two-way travel by cars and trucks. The automobile zone should be configured narrowly enough so that two cars cannot pass each other in both directions without crossing the advisory lane line.
- C** Roadways with advisory shoulders or advisory bicycle lanes should not have centerlines.

The center lane width varies from 10 feet (practical minimum width, as outlined by FHWA) to 18 feet (absolute maximum width, as outlined by FHWA).

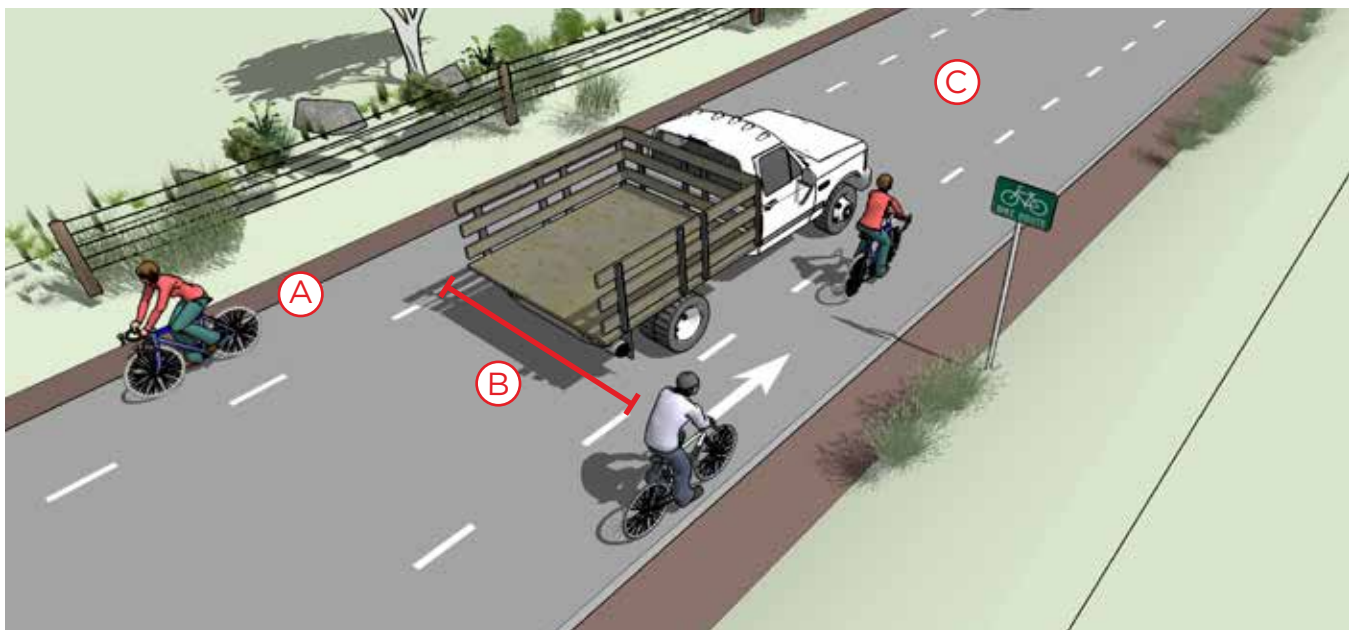


Figure 37. Annotated example of an advisory shoulder.

Walking and Bicycling Wayfinding Signage

Wayfinding provides navigational assistance to bicyclists, pedestrians, and trail users, including information about destinations, and travel distances. Wayfinding systems are comprised of fundamental wayfinding elements and enhanced off street navigational elements, such as kiosks and mile markers.

Wayfinding Principles



1. CONNECT PLACES

Facilitate travel between destinations and provide guidance to new destinations.



2. KEEP INFORMATION SIMPLE

Present information simply, using clear fonts and simple designs, so that it can be understood quickly.



3. MAINTAIN MOTION

Be legible and visible for people moving so that they can read the signage without stopping.



4. BE PREDICTABLE

Standardize the placement and design of signs so that patterns are established and the signage becomes predictable.



5. PROMOTE ACTIVE TRAVEL

Encourage increased rates of active transportation by helping people to realize they can use the bikeway and pedestrian network to access the places they want to go.

Fundamental Navigational Elements

Fundamental wayfinding elements consist of decision signs, confirmation signs, and turn signs. These signs are intended to be implemented on both on street and off street facilities. Since they will be applied on street, they should conform with MUTCD requirements. Signage elements should include distance to destination information, including both mileage and estimated travel time.

Enhanced Navigational Elements

Enhanced navigational elements provide additional wayfinding assistance beyond decision, confirmation, and turn signs for on street and off street bikeway networks. Signs included in this category are: 1) mile markers, 2) gateway markers, 3) interpretive signage, 4) pavement markings, and 5) map kiosks. Pavement markings are an ideal tool to provide navigational assistance along a neighborhood bikeway or trail route, while reducing sign clutter. Map kiosks, which tend to be located at trailheads and downtown locations, provide people with information about the surrounding area, amenities, and bikeway and trail routes. Kiosks may also include orientation maps. Since this signage is installed off street, there is more flexibility in terms of design.



Figure 38. Wayfinding fundamental navigational elements (MUTCD consistent)

Visually Separated Facilities

Paved Shoulder



Paved shoulders on the edge of roadways can serve as a functional space for bicyclists and pedestrians to travel in the absence of other facilities with more separation. While they are not for the exclusive use by bicyclists, they are a good first step toward improving on-street bicycling conditions.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
25 - 55	1,500 - 12,000		●	●	●	●

Bicycle Lane



Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and optional signs. A bike lane is located directly adjacent to motor vehicle travel lanes and follows the same direction as motor vehicle traffic.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 40	0 - 9,000	●	●	●	●	●

Buffered Bicycle Lane



Buffered bike lanes provide a painted buffered space between the bike lane and a parking lane or travel lane to increase the space between people bicycling and people driving.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 40	0 - 9,000	●	●	●	●	●

Contra-Flow Bicycle Lane



Contra-flow bike lanes allow bicycle users to travel against the flow of traffic while traveling in a bicycle lane. These types of lanes work best in low speed and low traffic volume environments. They are best suited for short distances to help prevent wrong-way riding when the route would otherwise be too long or convoluted.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 40	0 - 9,000	●	●	●	●	●

Pedestrian Lane



The pedestrian lane is an experimental design treatment that reserves space on a roadway for the exclusive, two-way movement of pedestrians. Marked as distinctly separate from a bike lane (bicyclists would travel in the roadway with automobiles), pedestrian lanes provide an accessible alternative on roadways on which sidewalks are otherwise infeasible.

Note: Advisory shoulders are experimental and subject to approval by FHWA. In order to install advisory shoulders, an approved Request to Experiment is required as detailed in Section 1A.10 of the MUTCD.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 20	0 - 2,000	●	●			●

Visually Separated Facilities - Corridor Implementation Strategies

Visually separated facilities use painted markings to denote dedicated space for people walking, bicycling, and driving.

These types of infrastructure treatments are most appropriate along roadways with low to moderate traffic volumes. Posted speed limits should be moderate (generally no higher than 35 to 45 miles per hour for most facilities) along streets with visually separated facilities. For roadways with higher posted speeds, physical separation is recommended.

Corridor Design



Roadway Resurfacing

Streets are routinely resurfaced to create smooth travel lanes. Because major streets are resurfaced using a recurring schedule, this offers opportunities to narrow travel lanes and restripe the street with bike lanes during the resurfacing process.

Matching bike lane planning and design schedules in advance of summer construction schedules can lead to lower cost construction.

Infrastructure tools that can use this approach include:

- Bike lane (unbuffered and sometimes buffered)
- Paved shoulder
- Pedestrian lane
- Advisory shoulder
- Advisory bike lane



Image Credit: Simon Blenski, City of Minneapolis/FHWA, *Incorporating On-Road Bicycle Networks into Resurfacing Projects*



Reconfiguring a roadway to narrow travel lanes and add a center turn lane and bike lanes. Image Credit: Randy Dittberner, Virginia Department of Transportation/FHWA *Incorporating On-Road Bicycle Networks into Resurfacing Projects*

Roadway Reconfiguration

This method of making a street more accessible for people walking, bicycling, and driving involves narrowing existing travel lanes and/or using existing travel lanes for other features (i.e., two way center turn lane, pedestrian refuge island/upgraded crossing, bike lanes).

This approach is sometimes accomplished during roadway resurfacing (see previous page).

This approach works well when travel speeds and the average number of cars using the street are relatively low.

Infrastructure tools that can use this approach include:

- Bike lane
- Pedestrian lane
- Buffered bike lane
- Physically separated bike lane
- Advisory shoulder
- Paved shoulder
- Sidepath

Roadway Widening

Sometimes, the best way to add bicycle and pedestrian facilities is to repave a street to add additional width to fit these facilities. The needs of people walking and bicycling should be considered if a street is scheduled to be widened to fit additional travel lanes for motor vehicles.

Infrastructure tools that can use this approach include:

- Bike lane
- Buffered bike lane
- Physically separated bike lane
- Paved shoulder

Intersection Design

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and other modes in order to advance traffic flow in a safe and efficient manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way and facilitating eye contact and awareness with other modes. Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals.

The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.



Bike lanes at right-turn only lanes



Bike box



Combined bike lane/turn lane



Colored pavement markings through conflict areas



Intersection crossing markings

Physically Separated Facilities

Shared Use Path (Trail)



A shared use path provides a travel area separate from motorized traffic for bicyclists, pedestrians, skaters, wheelchair users, joggers, and other users. Shared use paths can provide a low-stress experience for a variety of users using the network for transportation or recreation.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
--	--	--	--	--	●	●

Sidepath



A sidepath is a bidirectional shared use path located immediately adjacent and parallel to a roadway. Sidepaths can offer a high-quality experience for users of all ages and abilities as compared to on-roadway facilities in heavy traffic environments, allow for reduced roadway crossing distances, and maintain rural and small town community character.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 55	0 - 12,000+		●	●	●	●

Physically Separated Facilities

Sidewalk



Sidewalks provide dedicated space intended for use by pedestrians that is safe, comfortable, and accessible to all. Sidewalks are physically separated from the roadway by a curb or unpaved buffer space.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 50	0 - 12,000+	●	●	●		●

Separated Bike Lane



A separated bike lane gives bicyclists the experience of riding in a separated path while riding along a street. These types of facilities are comfortable and inviting for people who do not typically ride bicycles. Separated bike lane design continues to advance and includes lanes on one or both sides of the street.

Speed (Preferred mph)*	Volume (Preferred ADT)*	Network			Land Use	
		Local Roadway	Collector Roadway	Arterial Roadway	Outside built-up areas	Within built-up areas
0 - 55	0 - 12,000+		●	●		●

Physically Separated Facilities - Corridor Implementation Strategies

Physically separated facilities include sidepaths, separated bike lanes, and trails. The physically separated facilities recommended in this plan mostly focus on sidepaths. A sidepath is a path that runs parallel to a roadway and is used by people walking and bicycling. When designed correctly, sidepaths give the experience of riding along a trail, but could be located in rural or suburban areas.

Many types of physical barriers are used across the country to create separated bike lanes. These barriers include concrete curb, planters, parked cars, or flexible bollards. Separated bike lanes could also be raised at a grade slightly higher than the adjacent travel lanes.

Sidepath Corridor Design

Shared use paths placed within road right-of-way also may be referred to as sidepaths. Sidepaths are for both bicycle and pedestrian travel. Due to operational concerns regarding driveways and turning vehicles, it is important to consider the frequency and volume of roadway crossings that pose potential conflicts with sidepaths. However, as roadway rights-of-way may be the only corridors available, design of sidepaths should seek to mitigate potential conflicts.



Figure 39. Example sidepaths.

Retrofitting Sidewalks

Where space is available, it may be appropriate to retrofit an existing sidewalk into a sidepath. While sidewalks are often used as bicycling routes in the SLATS Region, they are not ideal for bicycle traffic. Sidepaths are wider and allow for bidirectional bicycle travel. This may be appropriate where high volumes of bicyclists and pedestrians are expected to be present, and/or when motor vehicle speeds and volumes create unsafe conditions for on street bike lanes

Shared Use Paths as a Network Complement, Not Substitute

Wisconsin and Illinois state law states that bicyclists have the same rights and responsibilities as all other roadway users. The presence of a shared use path does not legally prohibit a bicyclist from traveling in a bike lane or a shared roadway unless otherwise specified by local ordinance. Therefore, shared use paths should be treated as a complement to the on-road bicycle network; not a substitute for it.

Crossing Design

Crossing design varies based on whether the crossing occurs along a low or high-speed roadway. The diagrams below identify the design treatment differences in each case.

Setback Crossing

A setback crossing of 25 feet separates the path crossing from merging/turning movements that may be competing for a driver's attention. This type of crossing is preferred along high speed roadways, as the setback allows a turning driver to completely exit the traveled way and yield to people walking or bicycling before crossing the path. Note the stop bar placed after the crossing, indicating that a motorist may need to stop a second time before entering the higher speed roadway.

Adjacent Crossing

In an adjacent crossing, a separation of 6 feet places people walking and bicycling in the light of sight for turning motorists. This type of crossing is recommended along lower speed roadways where motorists can more easily yield before preparing to turn. Note the presence of one stop bar and one set of yield markings.

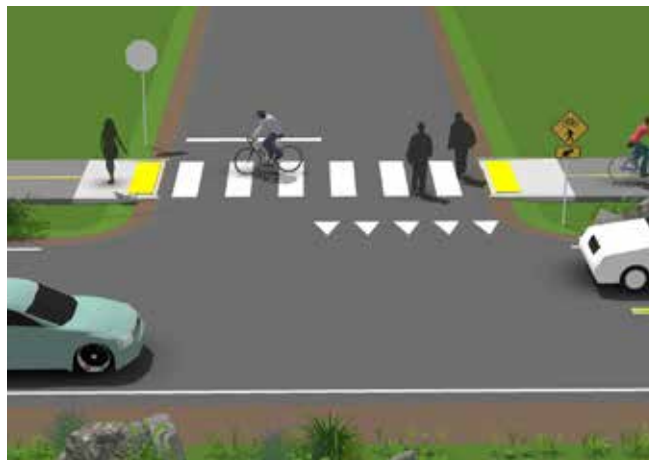
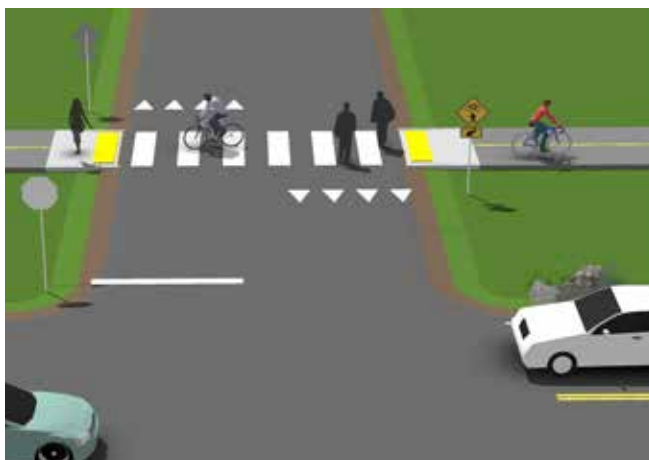
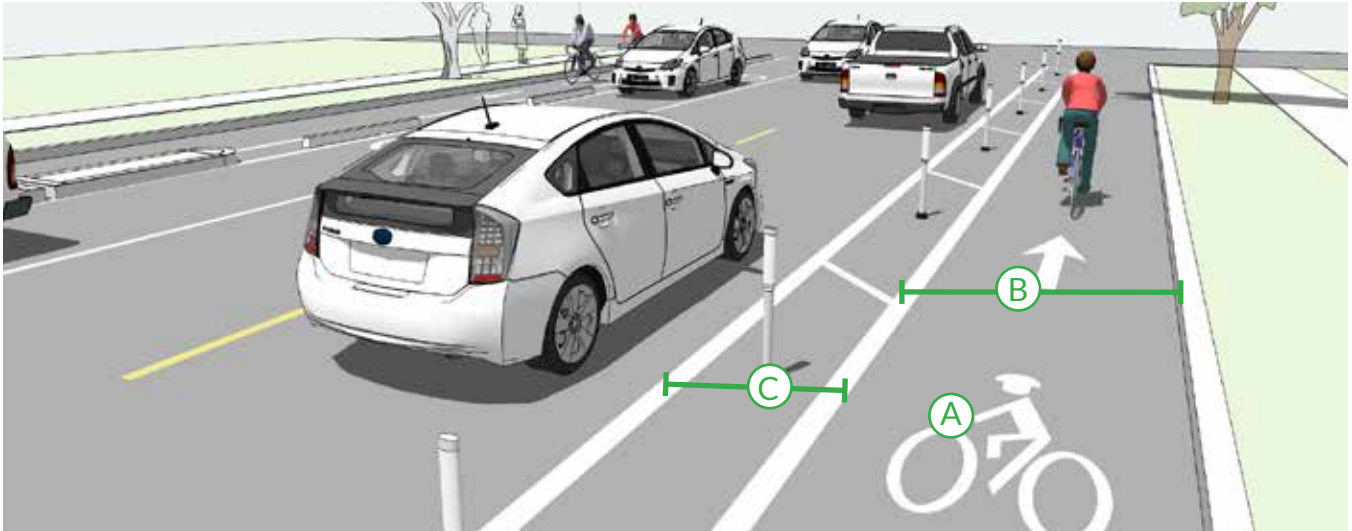


Figure 40. Example crossings: setback and adjacent to turning movements.

One Way Separated Bike Lane Corridor Design

- (A)** Pavement markings, symbols and/or arrows must be placed at the beginning of the separated bike lane and at intervals along the facility consistent with MUTCD Section 9C.04)
- (B)** 7-foot width is preferred (5-foot minimum). Minimum 3-foot buffer adjacent to parking. Minimum 18-inch buffer adjacent to travel lanes (NACTO, 2012). Delineators should be placed in the buffer.
- (C)** If buffer area is 4 feet or wider, a white chevron or diagonal hatch markings should be used.



Two Way Separated Bike Lane Corridor Design

- Works best on the left side of one-way streets.
- 12 ft operating width preferred (10 ft minimum) width for two-way facility.
- In constrained an 8 ft minimum operating width may be considered.
- Adjacent to on street parking a 3 ft minimum width channelized buffer or island shall be provided to accommodate opening doors (NACTO, 2012) (MUTCD 3H.01, 3I.01).
- A separation narrower than 5 ft may be permitted if a physical barrier is present (AASHTO, 2013).
- Additional signalization and signs may be necessary to manage conflicts.



Physical Barriers for Separated Bike Lanes

Separated bikeways may use a variety of vertical elements to physically separate the bikeway from adjacent travel lanes. Barriers may be robust constructed elements such as curbs, or may be more interim in nature, such as flexible delineator posts.

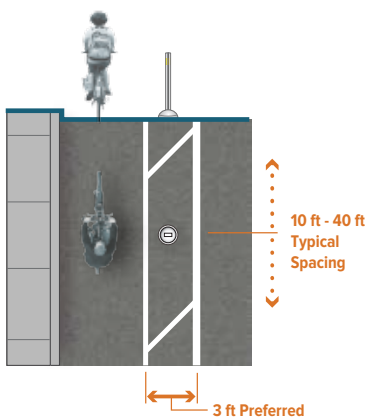
Appropriate barriers for retrofit projects:

- Parked Cars
- Flexible delineators
- Bollards
- Planters
- Parking stops

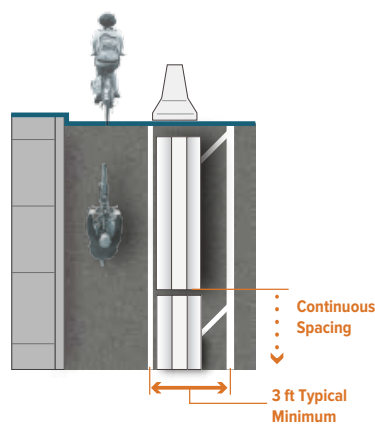
Appropriate barriers for reconstruction projects:

- Curb separation
- Medians
- Landscaped Medians
- Raised separated bike lane with vertical or mountable curb
- Pedestrian Safety Islands

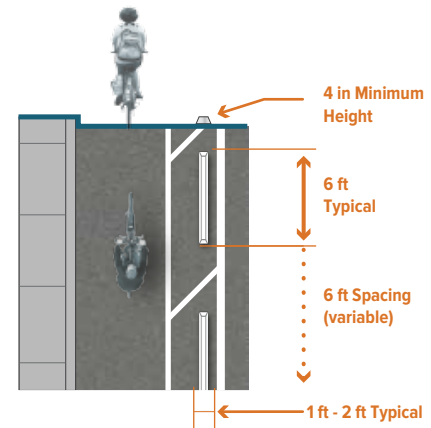
Delineator Posts



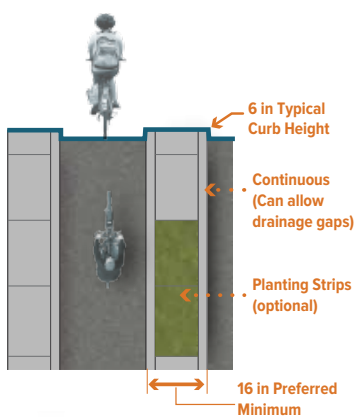
Concrete Barrier



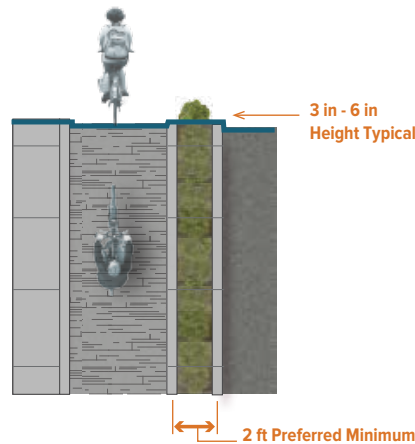
Parking Stops



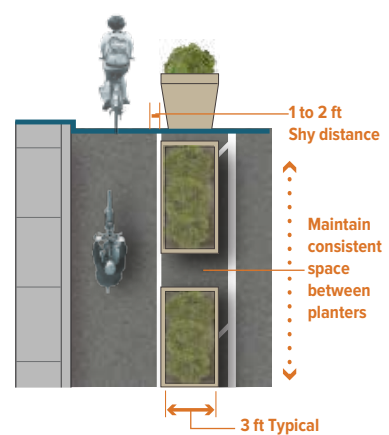
Raised Median



Raised Lane



Planters

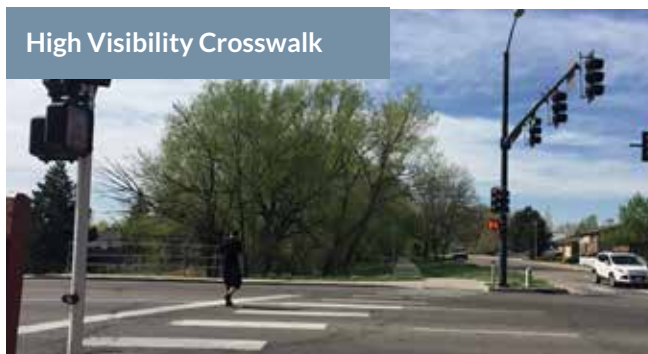


Intersection and Midblock Crossing Strategies

As corridors are improved with new walking and bicycling facilities, it is important to consider how the intersections are treated. Crossing improvements should be coordinated with corridor improvements. For instance, locations that should include colored intersection crossing markings should be designed when planning to implement bicycle lanes, rather than implemented separately. Crossing improvements fall into two broad categories: intersections and midblock crossings.

Intersections




Signalized intersections are typically the preferred crossing location for pedestrians, since traffic is stopped in one direction and motorists generally expect crossing pedestrians. However, vehicular turning speed, visibility, crossing distance, and signal timing can be great barriers for pedestrians on roadways that are designed to primarily accommodate vehicular traffic.



Midblock Crossings

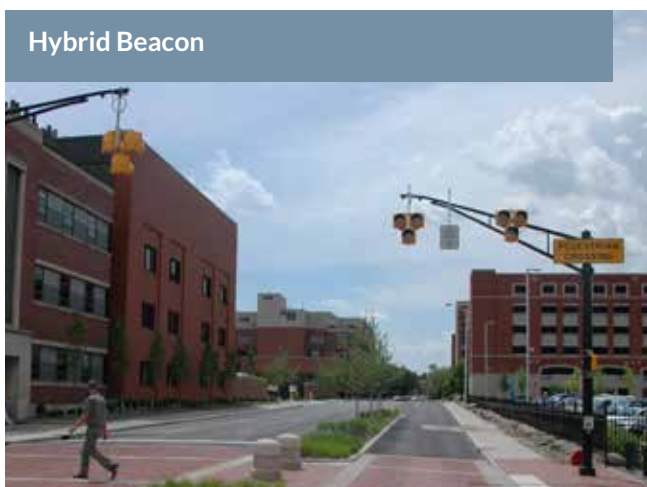
A midblock crossing consists of a marked crossing area, signage, and other roadway design elements to slow or stop traffic. The approach to designing crossings at unsignalized locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, and road width. Midblock crossing improvements may be enhanced with beacons, curb extensions and pedestrian refuge islands. The chart below provides contextual guidance for selecting midblock crossing improvements.

	Local Streets		Collector Streets			Arterial Streets							
	2 Lanes	3 Lanes	2 Lanes	2 Lanes with Refuge Island	3 Lanes	2 Lanes	2 Lanes with Refuge Island	3 Lanes	4 Lanes	4 Lanes with Refuge Island	5 Lanes	6 Lanes	6 Lanes with Refuge Island
High Visibility Crosswalk	Candidate for Improvement	Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Not Recommended	Potential Candidate for Improvement	Potential Candidate for Improvement	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Crosswalk, Signage and Yield Markings	Potential Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Stop Sign	Candidate for Improvement	Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Not Recommended	Not Recommended	Not Recommended	Not Recommended	Not Recommended
Active Warning Beacon	Not Recommended	Potential Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Not Recommended	Candidate for Improvement	Not Recommended	Not Recommended	Not Recommended
Hybrid Beacon	Not Recommended	Not Recommended	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement
Full Traffic Signal	Not Recommended	Not Recommended	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement
Grade Separation	Not Recommended	Not Recommended	Potential Candidate for Improvement	Potential Candidate for Improvement	Potential Candidate for Improvement	Not Recommended	Potential Candidate for Improvement	Potential Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement	Candidate for Improvement

Candidate for Improvement 
 Potential Candidate for Improvement 
 Not Recommended 

The Federal Highway Administration report *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations* provides guidance on where to install crosswalk markings, taking into consideration posted speed, roadway width, and average daily traffic.¹ General crosswalk marking guidance recommends that crosswalks should be marked at signalized intersections to identify the preferred crossing location for pedestrians, and to alert motorists to the presence of the crosswalk. A standard crosswalk consisting of two transverse lines is sufficient at most signalized intersections. However, high visibility crosswalks, as shown in the figure below, should be considered for installation along generators of pedestrian activity, such as parks, should be marked along school walking routes, and may be installed at uncontrolled or unsignalized crossings.

Crosswalk marking guidance at unsignalized crosswalks should consider the factors of average daily traffic, posted speed, and number of lanes to determine how to mark the crossing. At crossings with four or more lanes, an average daily traffic of 12,000 or greater, or at any crossing with a posted speed of 40 miles per hour or greater, it is recommended that additional treatments, such as median refuge islands, active warning beacons, signs, and geometric improvements to shorten crossing distances should be included at the crossing in addition to the pavement markings.



1 FHWA. *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*. 2005. <https://www.fhwa.dot.gov/publications/research/safety/04100/04.cfm>

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Infrastructure Recommendation Maps and Tables

Figures 41 through 45 show the recommended infrastructure plan for bicycle and pedestrian facilities. Due to the regional scale of the map, individual recommendations maps were created for:

- Recommended Bicycle Network (composite; sidewalks shown separately)
- Mixed Traffic Recommendations
- Visually Separated Recommendations
- Physically Separated Recommendations
- Regional Sidewalk Recommendations

To accompany the maps and provide recommended project details, infrastructure plan tables are included with each category map and provide the following details:

- Specific Project Type (e.g. Bike Lane, Buffered Bike Lane)
- General Project Limits (generally written from west to east or from south to north)
- Agency or Agencies of Jurisdiction for Implementation
- Implementation Notes (to assist in project justification, feasibility, and development)

Recommended Bicycle Network

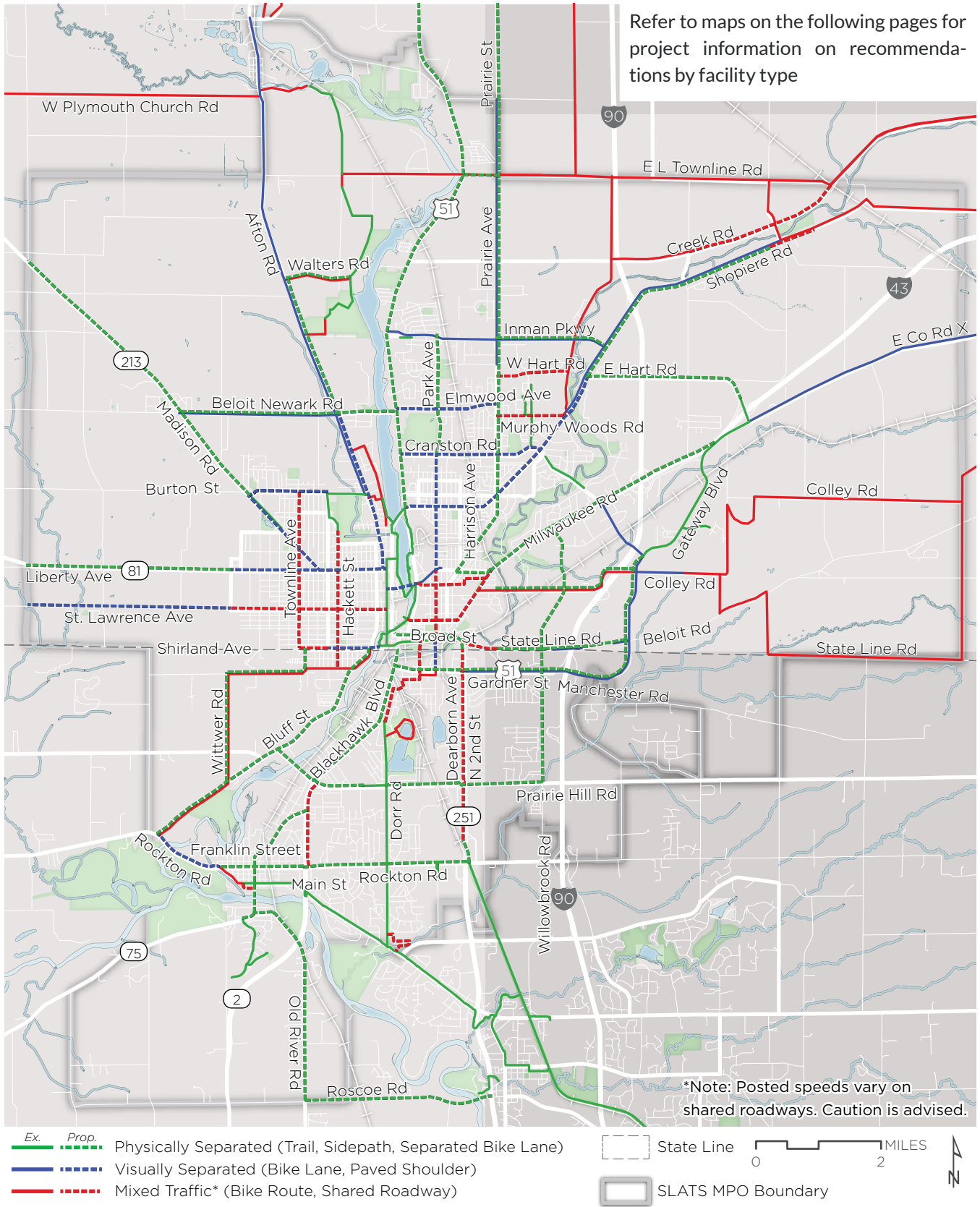


Figure 41. Recommended bicycle network

Mixed Traffic Recommendations

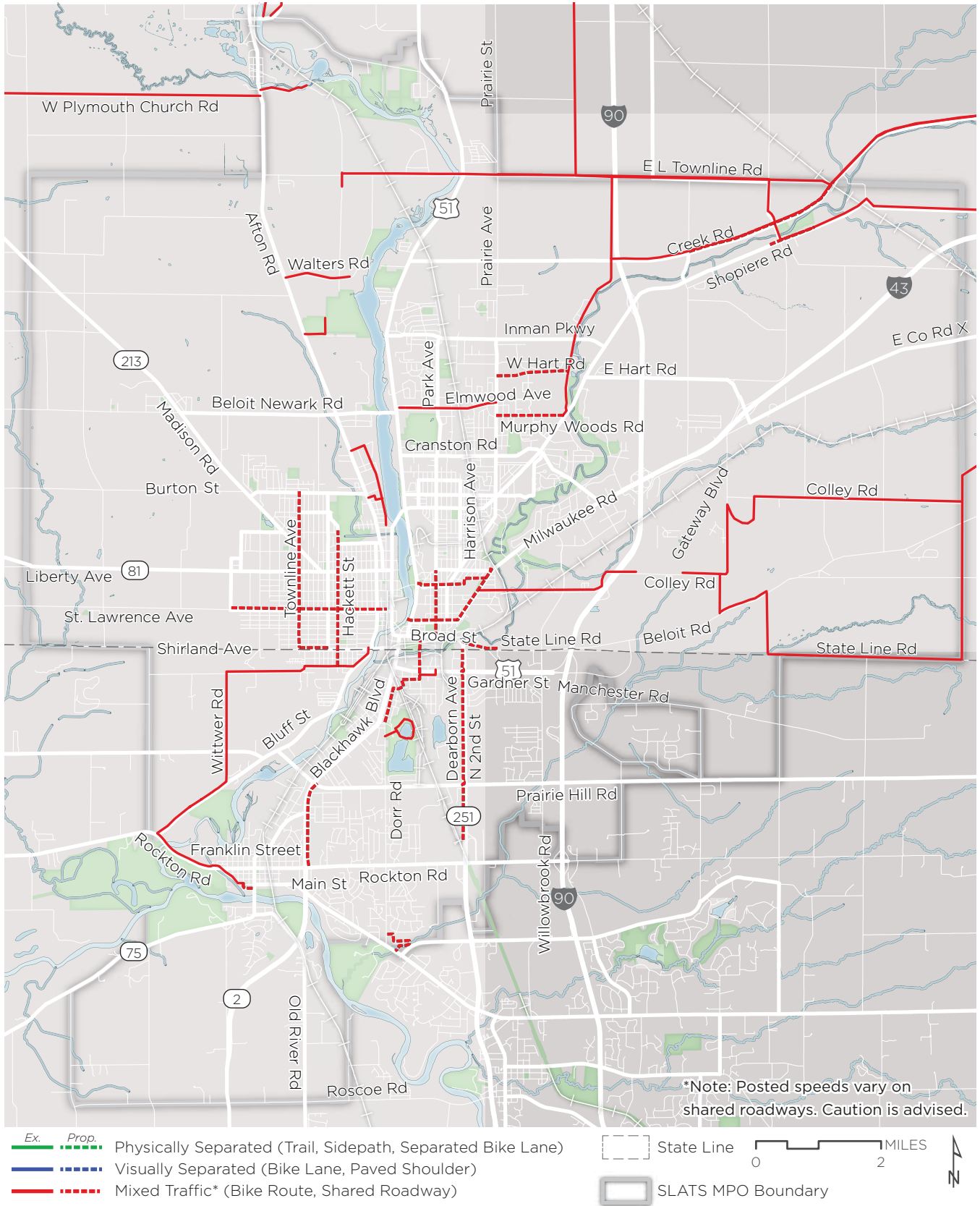


Figure 42. Mixed traffic recommendations

Mixed Traffic Recommendations

Mixed traffic recommendations are illustrated in Figure 42 and listed below in Table 2. As with all recommended facilities identified in this plan, the mixed traffic recommendations should be designed according to current standards for bicycle and pedestrian facility design and incorporate relevant guidance to address important design elements such as intersections and approaches, on-street parking, and transitions between facility types. Additional information and references to available facility design resources are included in the Design Guidelines section of the plan. If specific implementation considerations were identified during the planning process, they are included in the “Implementation Notes” column in the table.

Table 2. Mixed Traffic Recommendations

Project Location	Jurisdiction	Implementation Notes
Neighborhood Greenway		
City Center Bicycle Link (Burr Oak Avenue to St. Paul Avenue)	City of South Beloit, City of Beloit	Implement traffic calming elements and intersection improvements throughout.
Murphy Woods Road (Prairie Avenue to Shopiere Road)	City of Beloit, Town of Turtle	Traffic volume management may be required Transition to sidepath at Prairie Avenue and to bike lanes at Shopiere Road. Intersection improvements at Jerry Thomas Parkway and Criswell Boulevard.
W. Hart Road (Prairie Avenue to Creek Road)	City of Beloit, Town of Turtle	Wayfinding recommended.
Saint Lawrence Avenue (Townline Avenue to 5th Street)	City of Beloit	Connect to 5th Street sidepath.
Woodward Avenue, Partridge Avenue, Strong Avenue	City of Beloit	Intersection improvements at Prairie / Wisconsin. Explore opportunities to reduce traffic speeds and volumes.
Saint Lawrence Avenue (S West Street to Townline Avenue)	City of Beloit	Wayfinding recommended at intersections.
Stateline Road (US 51 to Manchester Road)	City of Beloit	Connect to Dearborn Avenue and proposed sidepath east of Manchester Road.
Creek Road (S Lathers Road to E L-T Townline Road)	Town of Turtle	
Shared Lane Markings		
Woodward Avenue (US 51 to Wisconsin Avenue)	City of Beloit	Intersection improvements at Prairie Avenue and Park Avenue.
Park Avenue (Broad Street to White Avenue)	City of Beloit	On-street parking and lack of available curb-to-curb width restrict implementation of bicycle lanes, but shared lane markings will provide link between proposed bicycle lanes to the north and buffered bicycle lanes to the south.
Shopiere Road (County Road J) (through residential area)	Rock County	Implement traffic calming along Shopiere Road.

Project Location	Jurisdiction	Implementation Notes
Signed Route		
Milwaukee Road (Bushnell Street to White Avenue)	City of Beloit	Intersection improvements at Milwaukee Road north of White Avenue.
City Center Bicycle Link (Hononegah Road to Dorr Road)	Village of Roscoe, Roscoe Township	Wayfinding recommended.
Stone Bridge Extension (Stateline Road to E Rockton Road)	City of South Beloit, Roscoe Township	Crossing improvements at Prairie Hill Road and Gardner Street.
Prairie Hill Road Extension (Nazarene Drive) (Rockton Road/ County Road 9 to Prairie Hill Road)	Village of Rockton, City of South Beloit	Connect to Rockton Road path at southern termini and to Prairie Hill Road at northern termini. Intersection improvements at Prairie Hill Road.
Townline Avenue (Burton Street to Reed Avenue)	City of Beloit, City of South Beloit	Intersection improvements at Madison Road.
Hackett Street (Rood Avenue to Whipple Street)	City of Beloit, City of South Beloit	Wayfinding recommended at major intersections.
Bushnell Street (Riverfront Recreation Path to Milwaukee Road)	City of Beloit	Intersection improvements to connect to new Ironworks Bridge on west end. Wayfinding recommended.
Hawick Street (Main Street to path)	Village of Rockton	Wayfinding needed to path and proposed Race Street bikeway.
Shirland Avenue (Townline Avenue to Moore Street)	City of Beloit, City of South Beloit	Transition from bike lanes east of Moore Street.

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Visually Separated Recommendations

Visually separated recommendations are illustrated in Figure 43 and listed below in Table 3. As with all recommended facilities identified in this plan, the visually separated recommendations should be designed according to current standards for bicycle and pedestrian facility design and incorporate relevant guidance to address important design elements such as intersections and approaches, railroad crossings, on-street parking, and transitions between facility types. Additional information and references to available facility design resources are included in the Design Guidelines section of the plan. If specific implementation considerations were identified during the planning process, they are included in the “Implementation Notes” column in the table.

Table 3. Visually Separated Recommendations

Project Location	Jurisdiction	Implementation Notes
Bike Lanes		
Liberty Avenue (WI 81/WI 213) (McKinley Avenue to 5th Street)	City of Beloit	
Shirland Avenue (Moore Street to Mill Street)	City of Beloit, City of South Beloit	Investigate opportunities to implement pedestrian refuge islands with restriping project.
Portland Avenue (5th Street to Pleasant Street)	City of Beloit	Provide connection to 5th Street trail. Upgrade existing bicycle lanes to buffered bicycle lanes on bridge.
6th Street (US 81 to Burton Street)	City of Beloit	Wayfinding recommended to Poole Court and WI 81. Consider physical separation with street parking.
Henry Avenue/Shopiere Road (Riverside Drive to Prairie Avenue)	City of Beloit	4-lane to 3-lane road diet conversion from Riverside Drive to Royce Avenue required to accommodate bicycle lanes.
Shopiere Road (County Road S) (Cranston Road to Murphy Woods Road)	City of Beloit	4-lane to 3-lane road diet conversion required to accommodate bicycle lanes.
Burton Street (S Madison Road to Moore Street)	City of Beloit	Parking restrictions would be needed to install bike lanes; otherwise consider shared lane markings.
Cranston Road (Riverside Drive to Shopiere Road)	City of Beloit, Town of Beloit	
Park Avenue (White Avenue to Cranston Road)	City of Beloit	Remove parking to accommodate bike lanes. Transition to physically separated bikeway north of Cranston Road.
Buffered Bike Lanes		
Liberty Avenue (WI 81/WI 213) (West Street to McKinley Avenue)	City of Beloit	Narrow vehicle lanes to accommodate bikeway.
Madison Road (WI 213) (Liberty Avenue to Burton Street)	City of Beloit	4-lane to 3-lane road diet conversion required to accommodate buffered bicycle lanes between Townline Avenue and Burton Street.
Afton Road (County Highway D) (W County Road Q to Burton Street)	Rock County	Upgrade existing shoulder bike lanes to buffered bike lanes by narrowing vehicle lane widths. Transition to side-path north of W County Road Q.

Project Location	Jurisdiction	Implementation Notes
Buffered Bike Lanes		
Shopiere Road (County Road S) (Murphy Road to E Hart Road)	City of Beloit	Implement 4-lane to 3-lane road diet to upgrade existing accommodate buffered bicycle lanes. Transition to physically separated bikeway north of East Hart Road.
Park Avenue (Gardner Street to Broad Street)	City of Beloit, City of South Beloit	Transition to shared lane condition at Gardner Street and Broad Street intersections.
Shopiere Road (County Road S) (Prairie Avenue to Cranston Road)	City of Beloit	Reallocate parking and travel lane space to accommodate bikeway.
Paved Shoulder		
Saint Lawrence Avenue (S County Road H to S West Street)	Town of Beloit	Wayfinding recommended at intersections. Extend to County Road H to connect to existing signed route.
Elmwood Avenue (S Riverside Drive to Prairie Avenue)	City of Beloit, Town of Beloit	Consider contra-flow bike lane in one-way section between the river and Park Avenue.
Rockton Road (Bluff Road to Race Street)	Village of Rockton, Winnebago County	Connect to proposed bikeways along Bluff Road and Union Street.

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Physically Separated Recommendations

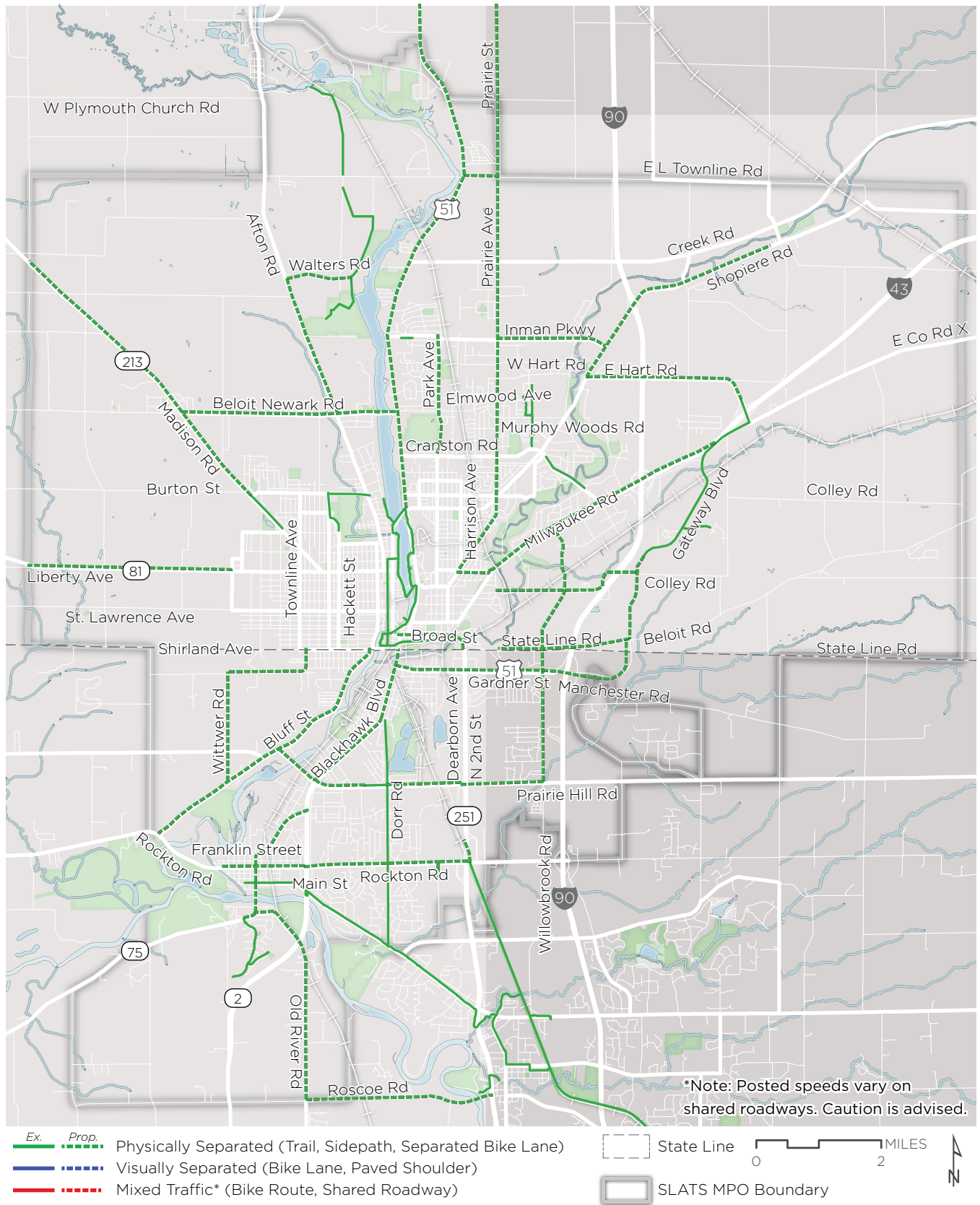


Figure 44. Physically separated recommendations

Physically Separated Recommendations

Physically separated recommendations are illustrated in Figure 44 and listed below in Table 4. As with all recommended facilities identified in this plan, the physically separated recommendations should be designed according to current standards for bicycle and pedestrian facility design and incorporate relevant guidance to address important design elements such as intersections, roadway crossings, railroad crossings, access management, and transitions between facility types. Additional information and references to available facility design resources are included in the Design Guidelines section of the plan. If specific implementation considerations were identified during the planning process, they are included in the “Implementation Notes” column in the table.

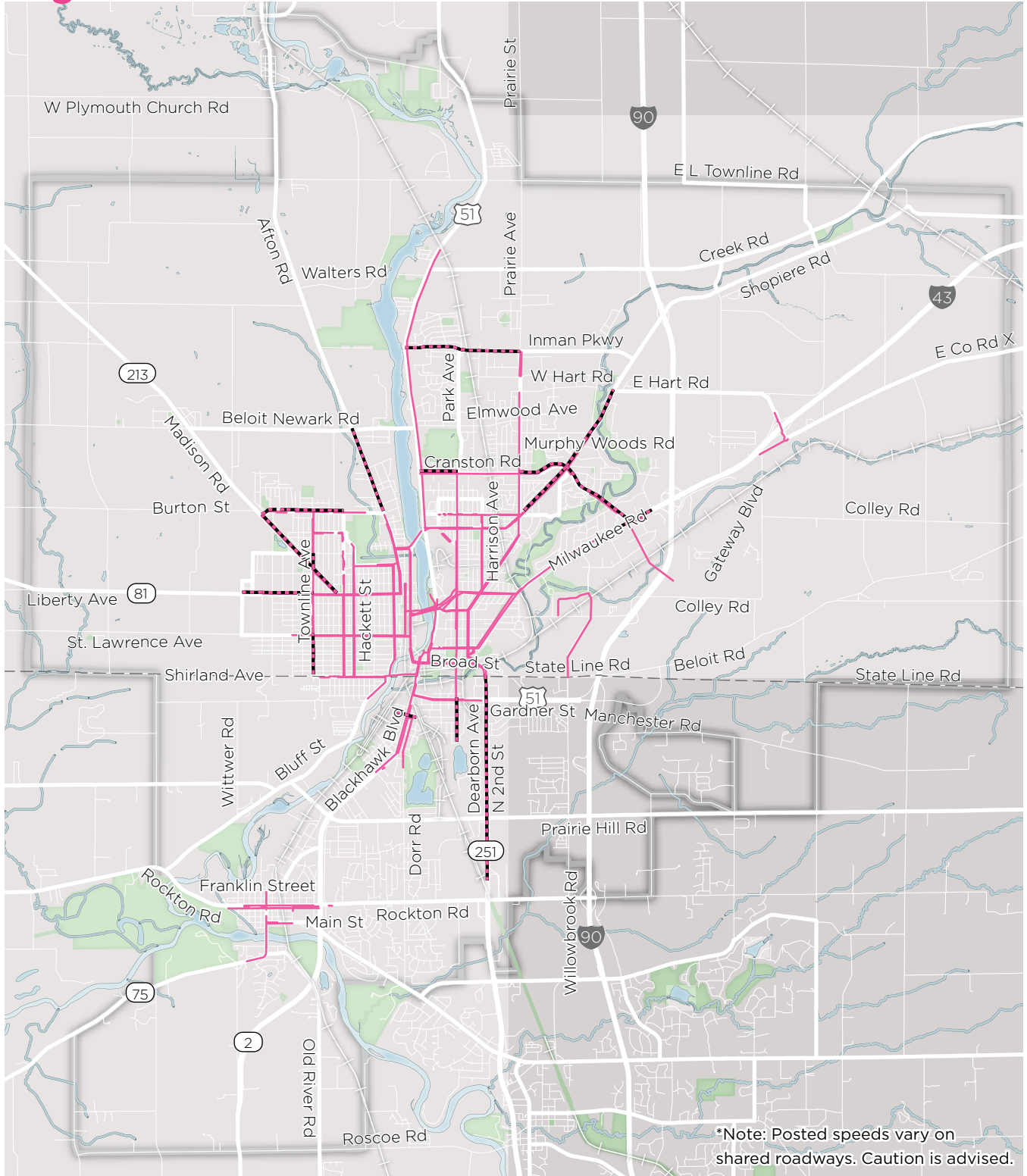
Table 4. Physically Separated Recommendations

Project Location	Jurisdiction	Implementation Notes
Separated Bike Lanes		
Blackhawk Boulevard (Burr Oak Avenue to Stateline)	City of South Beloit, State of Illinois	Driveway and access management will be critical element of bikeway design. Explore options for using shoulder / parking area and green space.
Prairie Avenue (County Highway G) (North of E Huebbe Pkwy)	Rock County	Narrow center turn lane to accommodate separated bike lane. Consider sidepath north of Philhower Road.
Sidepath		
US 51 (Henry Avenue to MPA Limits)	Rock County, State of Wisconsin	
Milwaukee Road (WI 81) (Milwaukee Road to I-90)	City of Beloit	Milwaukee Road improvements will take into account crossing improvements to mitigate potential conflicts related to roadway traffic.
Willowbrook Road (Prairie Hill Road to Milwaukee Road)	City of South Beloit, City of Beloit	Willowbrook corridor will include crossing improvements to mitigate potential conflicts related to roadway traffic.
Blackhawk Boulevard (IL 75) (Prairie Hill Road to Burr Oak Avenue)	City of South Beloit, State of Illinois	Long term recommendation. Driveway and access management will make installation of a safe bikeway challenging.
Rockton Road (County Highway 9) (IL 2 to N 2nd Street)	Village of Rockton	
Prairie Hill Road (Dorr Road to Willowbrook Road)	Winnebago County	
Stateline Road (Manchester Road to Gateway Boulevard)	City of Beloit, Town of Turtle	
Gateway Boulevard (E WI 67 to Cranston Road)	City of Beloit	
Prairie Avenue (County Highway G) (Cranston Road to White Avenue)	City of Beloit	Sidepath on one or both sides.
Prairie Avenue (County Highway G) (E Huebbe Parkway to E Cranston Road)	City of Beloit	Sidepath on one or both sides. Transition to on-street bikeway at West Hart Road.

Project Location	Jurisdiction	Implementation Notes
Sidepath		
Liberty Avenue (WI 81/WI 213) (S County Road H to S West Street)	State of Wisconsin	Transition to on-street bikeway at West Street.
Madison Road (WI 213) (S Johnson Road to Burton Street)	State of Wisconsin	Warning signs at rural crossings.
Stone Bridge Extension (along railroad)	Winnebago County, State of Illinois	Provide median refuge at midblock trail crossing of Rockton Road.
Prairie Hill Road (IL 2 E to De la Tour Drive)	Winnebago County	Connect to existing shared use path at South Beloit High School.
South Bluff Street (W Rockton Road to Shirland Avenue)	City of South Beloit, Rockton Township	Connections to recommended bikeways along Rockton Road and Shirland Avenue.
Prairie Hill Road (IL 2 E to S Bluff Road)	Winnebago County	
Gardner Street (Blackhawk Boulevard to Willowbrook Road)	City of South Beloit	4-lane to 3-lane road diet likely necessary between Blackhawk Boulevard and 2nd Street/251 to obtain width for sidepath development. Road diet with buffered bicycle lanes may be considered as alternative to sidepath.
Park Avenue (Cranston Road to East Inman Parkway)	Town of Beloit	Install conflict markings and reduce turning radii at intersections along corridor.
Beloit Newark Road (County Highway Q) (Madison Road to S Riverside Drive)	Rock County	Incorporate buffered bicycle lanes into future bridge reconstruction.
E Hart Road (Shopiere Road to Clinic Road)	Town of Turtle	Connect to existing sidepath on south side of E Hart Road at Clinic Road.
Fischer Road (Shirland Avenue to Wittwer Road)	Rockton Township	Connect to recommended bikeways on Shirland Avenue and Wittwer Road.
Wittwer Road (S Bluff Road to Fischer Road)	Rockton Township	Connect to proposed bikeway on Bluff Street and address intersection offset.
Union Street (County Highway 9) (Kocher Street to IL 2)	Village of Rockton, Winnebago County	
Inman Parkway (County Highway BT) (Prairie Avenue to E County Road S)	Rock County	
Blackhawk Boulevard (Williamson Parkway to Nazarene Drive)	Village of Rockton, State of Illinois	At northeastern project limit, provide for crossing of IL 2 to reach the proposed signed route on Nazarene Drive.
Broad Street (Mill Street to Carpenter Street)	City of Beloit, City of South Beloit	Connection to recommended Stone Bridge Trail via Dearborn Avenue bikeway.

Project Location	Jurisdiction	Implementation Notes
Sidepath		
Shopiere Road (County Road S/ County Road J) (Hart Road to Smith Road)	Rock County	
Afton Road (County Highway D) (Walters Road to W County Road Q)	Rock County	Transition to visually separated facility (buffered bike lanes) south of W County Road Q.
Old River Road (County Highway 64) (Ferry Street to Roscoe Road)	Winnebago County	
Russell Street (Blackhawk Boulevard to S Ferry Street)	Village of Rockton, Winnebago County	
Colley Road (Brewster Avenue to Gateway Boulevard)	City of Beloit, Town of Turtle	
Walters Road (Afton Road to S Duggan Road)	Town of Beloit	
Roscoe Road (from Old River Road to 2nd Street/IL-251)	Winnebago County	
Manchester Road / IL 75 (from Willowbrook Road to Beloit Road)	City of Beloit, Town of Turtle	
Townline Road (from US 51 to County Road G)	Town of Beloit, Town of Rock	
White Avenue (from Prairie Avenue to Milwaukee Road)	City of Beloit	South side preferred for sidepath placement. Intersection improvements needed at White Avenue and Milwaukee Road.

Regional Sidewalk Recommendations



*Note: Posted speeds vary on shared roadways. Caution is advised.

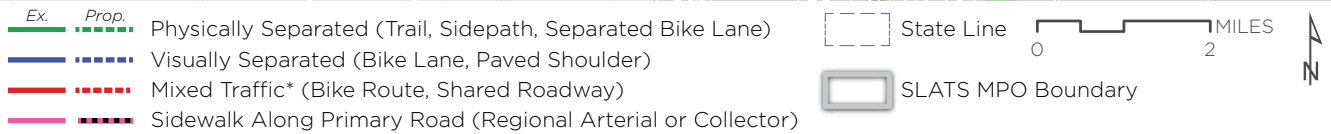


Figure 45. Pink lines show recommendations for expanding the region's sidewalk network.

Regional Sidewalk Gap Infill Recommendations

Sidewalk gaps that were identified on regional collector or arterial roadways within the SLATS Region are identified in the table below and shown in Figure 45. For all regional sidewalk recommendations, improvements include the filling of gaps on both sides of the roadway (as noted in the table), as well as ADA-compliant curb ramps and marked crosswalks at all intersections and crossings. If specific implementation considerations were identified during the planning process, they are included in the “Implementation Notes” column in the table.

Table 5. Sidewalk Recommendations

Project Location	Jurisdiction	Implementation Notes
Madison Road (WI 213) (Frederick Street to Liberty Avenue)	City of Beloit	Sidewalk on southwest side.
Park Avenue (Caswell Street to Gardner Street)	City of South Beloit	Sidewalk infill gap.
Dearborn Avenue (North of Carpenter Street to Stone Bridge Trail Extension near Rockton Road)	City of Beloit, City of South Beloit	Sidewalk on west side adjacent to frontage parcels. Project extends to southern terminus of Dearborn Avenue and connects to recommended Stone Bridge Trail Extension project.
Liberty Avenue (Townline Road to Frederick Street)	City of Beloit	Sidewalks on south side to fill existing gap.
Liberty Avenue (Frederick Street to Masters Street)	City of Beloit	Sidewalk on south side to fill gap.
Liberty Avenue (Masters Street to West Street)	City of Beloit	Transition to sidepath at West Street.
Shopiere Road (Crane Avenue to East Hart Road)	City of Beloit	Sidewalks on both sides to fill gaps. Transition to proposed sidepath north of East Hart Road.
Burton Street (Madison Road to 380' west of Fir Drive)	City of Beloit	Sidewalk on south side.
Burton Street (Fir Drive to Aspen Drive)	City of Beloit	Sidewalk on north side.
Burton Street (Aspen Drive to Sun Valley Drive)	City of Beloit	Sidewalk infill on both sides to close gaps.
Burton Street (400' east of Fir Drive to McKinley Avenue)	City of Beloit	Sidewalk on south side.
Burton Street (McKinley Avenue to Moore Street)	City of Beloit	Sidewalk on south side. Transition to path on east side of Moore Street.
Elmwood Avenue (Doner to Northwestern)	City of South Beloit	Sidewalk infill.
Cranston Road (Riverside Drive to Park Avenue)	Town of Beloit	Sidewalk on north side to fill gap.
Cranston Road (Prairie Avenue to Milwaukee Road)	City of Beloit	Sidewalk to fill gap in eastern Beloit.

Project Location	Jurisdiction	Implementation Notes
Townline Avenue (Shirland Avenue to Euclid Avenue)	City of Beloit	Sidewalk on both sides to fill gaps.
Townline Avenue (Euclid Avenue to Saint Lawrence Avenue)	City of Beloit	Sidewalk on west side to fill gap.
Townline Avenue (Madison Road to Whipple Street)	City of Beloit	Sidewalk on both sides to fill gaps.
Afton Road (Burton Street to Newark Road)	City of Beloit, Rock County	Sidewalk on both sides. Transition to sidepath at Newark Road.
Inman Parkway (US 51/Riverside Drive to Prairie Avenue)	Town of Beloit	Sidewalk on both sides to fill gaps. Transition to sidepath east of Prairie Avenue.
Milwaukee Road (Lee Lane to Freeman Road)	City of Beloit	Sidewalk infill on both sides to fill gaps.

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Educating and Encouraging SLATS Area Residents to Walk and Bike More Often

The SLATS Region has great potential for strategies that enhance walking and bicycling and the infrastructure recommendations in this report. These changes include education, outreach, and encouragement. At the end of this section, there are specific policy recommendations for each municipality that will help support the added bike and pedestrian network.

Create Bicycle and Pedestrian Coordinator Position

The SLATS MPO and local jurisdictions should explore the creation of a bicycle and pedestrian coordinator to serve as point person for bicycle and pedestrian policy, planning, project development, design, construction, maintenance, and related matters. In addition to providing expertise at a planning or engineering level, a bicycle and pedestrian coordinator can serve as a liaison to the public, between departments, and for schools and social service providers on bicycle and pedestrian issues. This position could be a new position or filled by current staff.

Bicycle Friendly Communities

The League of American Bicyclists offers a certification for communities that improve conditions for recreational and transportation related bicycling. The Bicycle Friendly Communities certification offers a road map for improving infrastructure, educational and encouragement programs and enforcement to improve and increase riding in that community.

The SLATS Region has a strong biking community and would benefit from the improvements suggested in the BFC certification. While each community must apply individually, the survey process for certification is straightforward and can be conducted by anyone

affiliated with the community applying. By applying, the application process gives measurable feedback on the strengths and challenges each community. This is a low cost way to measure the biking quality of the region and to set intermediate goals to improve that quality.

Implement Bike and Walk to School Days at Regional Schools

Begin with a goal of involving 1-2 schools in each district, pulling from the 12 responding schools. Encourage as many schools as possible to participate with a target goal of 12 schools total. Target Fall of 2018 to launch. The bike/ped coordinator can serve as the regional manager with the schools themselves being responsible for planning and executing the events at their school. The bike/ped coordinator can provide assistance that will unify the event regionally by creating the event flyers, banners, press releases, coordinating the invitation of local officials, proclamations, and volunteers. Holding a monthly meeting of a coordinating steering committee that includes law enforcement, school representatives, city staff, public health reps, bicycle clubs, etc. beginning in August will support a successful outcome.

Provide Schools with an In-school Curriculum for Safe Walking and Biking

The League of American Bicyclists has a variety of educational materials for children of all ages. For the SLATS Region, good focus ages are 7, 10 and 15 (2nd, 5th and 10th Grades). At 7, children begin to walk by themselves to school (if possible); at 10, kids begin to ride to school as this age corresponds with Junior High and can include going farther distances; at 15 teenagers begin to learn to drive. Making this curriculum available to schools is a good first step in encouraging greater walking and biking in schools, as access to this kind of content is often limited. In Illinois, all three ages can take advantage of www.bikesafetyquiz.com, a website that includes a quiz for younger kids, teenagers and adults.

Conduct Outreach at New Infrastructure

Providing context and education for any new facility can be enhanced by allowing the public to answer questions face to face about that facility.

For each project, budget staff time to spend up to 8-16 hours (total for all staff) to stand at major intersections during rush hour and speak to commuters about the new facilities. Different days of the week have different commuters, so doing all of the outreach within a week is better than doing the same day several weeks in a row. Getting to at least three intersections is also ideal, as people may not be able to talk at one or two intersections. Picking visible locations where people will be willing to talk is the best policy, as new infrastructure can often change the way people get around and this outreach will help encourage them to use it.

Review the Network Bike Map on a Regular Schedule

A Bike Network map can be a tremendous tool for a region or municipality when planning bike facilities. The SLATS Region might not require a yearly update, but reviewing it on a yearly basis will help keep the map current with the network as it both are updated. With online and mobile resources more available, small updates can be made online and larger updates can be included on the paper edition in 2 to 4 year intervals.

Regional Count Program

Count programs use automated equipment or short-term volunteers to collect data. A regional bicycle and pedestrian count program would help the region benchmark existing bicycling and walking levels. Such a program would also help understand regional crash trends and could help communities be more competitive for grant funding opportunities.



Figure 46. A sign in Seattle instructs people how to use new separated bike lanes (Image source: theurbanist.org)



Figure 47. Conducting outreach in tandem with walking and bicycling improvements results in streets that work better for all users.

Cycling Without Age

The Rock County Council on Aging is starting a program to give senior citizens free rides in bicycle-operated rickshaws, called “trishaws”. The program lets seniors continue going on bicycle rides as they age and encourages social outings with other seniors and with volunteer trishaw operators. The program should continue growing over time through grant opportunities or other funding sources.

Review of Existing Walking and Biking Policies

Each community in the SLATS Region has its own policy position when it comes to bicycling and pedestrian rights. Both Illinois and Wisconsin have their own approach when it comes to the rights and duties of road users. This means that each community will have to modify its municipal code to accommodate any infrastructure changes.

With the installation of new facilities, municipalities must assess their vehicle codes to account for changing roadway behavior. Below, find general recommendations for each community. Tables 6 and 7 show specific recommendations.

Note: In the Wisconsin communities, any additions to the bikeway network will have to be added by ordinance. Consequently, the following changes do not include any specific bikeways that would be added by such an ordinance.

City of Beloit

The City of Beloit needs several changes to its municipal code to accommodate the potential increase in bicycle and pedestrian facilities:

- Change the definitions in the municipal code for bike routes and bikeways. Right now they are defined through City Council.

- Add language that allows bicycles on shared paths. The current language requires signage to denote paths where cyclists can share space with pedestrians.
- Remove the language specifying pedestrian right-of-way in bike facilities.

Town of Turtle

- No changes at this time

City of South Beloit

- No Changes at this time

Village of Rockton

- Redefine bikes as vehicles. The current language codifies bicycles as toys, and does not have a separate definition for bicycles.
- For the sections of code that prevent bicycles on sidewalks, make sure that there is a corresponding road that bikes can ride on.

Table 6. City of Beloit Municipal Code

Code #	Current Language	Recommended Language	Justification
13.8 (1)	<p>DEFINITIONS. In this section, the following words and phrases shall have the designated meanings:</p> <p>Bicycle. Every device propelled by the feet acting upon pedals and having wheels, 2 of which are not less than 14 inches in diameter.</p> <p>Bicycle lane. That portion of a roadway set aside by the City Council for the exclusive use of bicycles and other modes of travel where permitted under §349.23(2)(a), Wis. Stats., and so designated by appropriate signs and markings.</p> <p>Bike route. Any bicycle lane, way or highway which has been designated by the City Council and is identified by appropriate signs and markings.</p> <p>Bicycle way. A path or sidewalk, or portion thereof, designated for the use of bicycles by the City Council.</p>	<p>No change, included for reference</p> <p>No change, included for reference</p> <p>Bicycle lane. That portion of a roadway set aside by the City Council for the exclusive use of bicycles and other modes of travel where permitted under §349.23(2)(a), Wis. Stats., and so designated by appropriate <u>signs and markings. Bike lanes can be set aside by means of</u> paint, curbs, or bollards or <u>other traffic separation devices.</u></p> <p>Bike route. Any bicycle lane, way or highway which has been designated by the City Council and is identified by appropriate signs and markings.</p> <p>Bicycle way. A path or sidewalk, or portion thereof, designated for the use of bicycles by the City Council.</p>	<p></p> <p>Defining a bike lane with such a narrow focus and without specifics will lead to confusion when dealing with jurisdiction. While the council approves of and adopts all infrastructure, it does not define it.</p> <p>See above</p> <p>See above</p>
13.8 (4) (c)	<p>No bicycle shall be operated upon any public sidewalk or paths in public parks, except as are designated as "bicycle way," in subsection (5).</p>	<p>No bicycle shall be operated upon any public sidewalk or paths in public parks, except as are designated as "bicycle way," in subsection (5).</p> <p><u>A person operating a bicycle upon a sidewalk, or across a roadway or shoulder on a crosswalk, shall yield the right-of-way to any pedestrian and shall give an audible signal when necessary before overtaking and passing any pedestrian. No person shall ride a bicycle upon a sidewalk within a business district unless permitted by local authorities.</u></p>	<p>Banning bikes from sidewalks and sidepaths is limiting and discourages riding (and requires lots of maintained signage on trails), however, enforcing this is important, so the new language will allow continued enforcement where there is pedestrian/ bicycle conflict.</p>

City of Beloit Municipal Code, Continued

Code #	Current Language	Recommended Language	Justification
13.8 (5) (a)	The portions of roadways designated as bike routes portrayed on the map titled, "Beloit Bike Trails" dated May 1978, with revisions thereto, are set aside as bicycle routes for the use of bicycles as permitted by §349.23(2)(a), Wis. Stats.	The portions of roadways designated as bike routes portrayed on the map titled, "Beloit Bike Trails" dated May 1978, by ordinance with revisions thereto, are set aside as bicycle routes for the use of bicycles as permitted by §349.23(2)(a), Wis. Stats.	This change removes any reliance on a specific map and makes any changes made by city council as current.
13.8 (5) (d)	Bicycles shall yield to pedestrians on the bicycle lane or way.	No change, included for reference	

Table 7. Village of Rockton Municipal Code

Code #	Current Language	Recommended Language	Justification
71.13 (A)	(A) Traffic laws applying to persons riding. Traffic laws apply to all persons riding skateboards, roller skates, coasters, roller blades, in-line skates, bicycles and similar devices. Every person riding such devices upon a roadway, sidewalk or designated bicycle path shall be granted all of the rights and be subject to all of the duties applicable to pedestrians by this title, as amended, and by state law, except as to special regulations in this section and except as to those provisions of this title and state law which by their nature can have no application.	(A) Traffic laws applying to persons riding. Traffic laws apply to all persons riding skateboards, roller skates, coasters, roller blades, in-line skates, bicycles and similar devices. Every person riding such devices upon a roadway, sidewalk or designated bicycle path shall be granted all of the rights and be subject to all of the duties applicable to pedestrians by this title, as amended, and by state law, except as to special regulations in this section and except as to those provisions of this title and state law which by their nature can have no application.	Under state law, bicycles are vehicles. By putting bicycles into this category, drivers and cyclists might not be held liable in the case of a crash. Adopt language that replicates most of what section 71.13 covers, but apply it only to bicycles.

Stage Bike Rodeos, Community Bike Rides, Open Streets

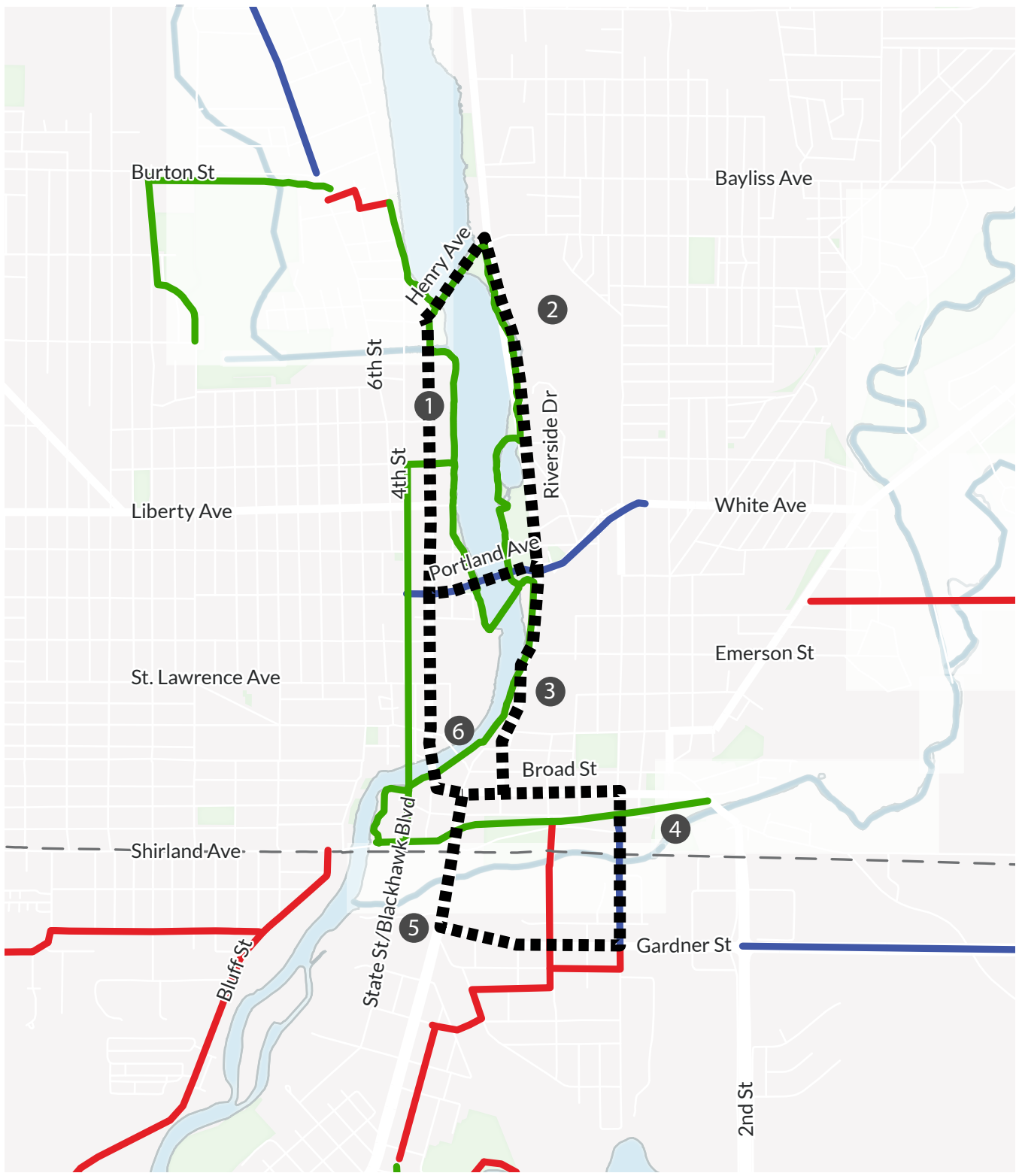
Events highlighting biking in the region will help promote the current state of infrastructure and safety. Schools and community organizations can host bike days and have rides and rodeos around their area. As with education, please consult the League of American Bicyclists for best practices when developing events. Members of the Stateline Spinners could assist at events as ride marshals or in other roles.

In addition to rides and bike days, scheduling an Open Streets event would help promote walking and biking. Open Streets events shut down stretches of major streets and open them to walking, biking and other active play. Open Streets events usually link parks or public spaces to encourage walking and bicycling during the event and after. These events are often called “active block parties” because they bring communities together and highlight what the community has to offer. Beloit could be the center of these events, as the downtown is regularly shut down for the farmers market and residents won’t have to reorient themselves for a larger event.

See the map on the following page for a suggested Open Streets route.



Figure 48. An open streets event, group bike ride, and bike rodeo (open streets image source: lajakids.com)



Proposed Open Street Destinations

- 1) Beloit Memorial HS
- 2) Eclipse Center
- 3) Beloit College
- 4) Turtle Creek Park
- 5) Nature at the Confluence
- 6) Stateline Family YMCA

- ■ ■ Proposed Route
- Trail

- Bicycle Lane or Paved Shoulder
- Bicycle Route

0 1 2 MILES

— State Line



Section IV Implementing System Improvements



Project Prioritization

As a region, it is important to focus on implementation of recommendations that achieves regional objectives. Improved connectivity, better east-west travel, meeting demand, and serving areas of greatest need are of key importance.

In order to help sort the various recommendations, the following prioritization method was used to identify which projects are regional priorities. Projects were assigned a score based on how many of the criteria they

met in the categories shown below. Projects were eligible to receive a total score of up to 14 points, and the highest priority projects based on these criteria scored 11.

Some facilities along the same corridor may score differently, as a sidepath may serve as a regional connection but filling a sidewalk gap serves another. The prioritization results are intended to identify support for improvements based on a variety of regional needs. As such, flexibility is preserved that allows the region to be opportunistic when considering projects for implementation. The prioritization matrix of projects is included in Appendix B.

Equity and Demand (E/D)	<ul style="list-style-type: none"> Is the project located in an area with a high concentration of social equity needs? 	<p>“With all of the hotels in this area, there should be better pedestrian access to the restaurants and shopping across the street.”</p>
	<ul style="list-style-type: none"> Is the project located in a high demand area for bicycling and walking? 	

Regional Connections (RC)	<ul style="list-style-type: none"> Does the project connect to an existing regional trail within SLATS planning area? 	<p>“Connect the Wisconsin trail system with the Illinois trail system.”</p>
	<ul style="list-style-type: none"> Does the project upgrade or extend the length of an existing facility? 	
	<ul style="list-style-type: none"> Does the project close a key gap in the network? 	

Comfort and Safety (S)	<ul style="list-style-type: none"> Were safety concerns along existing the existing roadway (i.e., are people kept away from traveling here) noted? 	<p>“This bridge needs to be more bike friendly.”</p>
	<ul style="list-style-type: none"> Is the project located in a high crash area? 	
	<ul style="list-style-type: none"> Is the project located on a street with a high Bicycle Level of Traffic Stress (BLTS) rating? 	
	<ul style="list-style-type: none"> Is the project located on a street with a high Pedestrian Level of Service (PLOS) rating? 	

Use and Local Support (U/LS)	<ul style="list-style-type: none"> Is the project recommended in a previously adopted plan? 	<p>“I’m looking forward to the pedestrian bridge over the river at Ironworks.”</p>
	<ul style="list-style-type: none"> Was the project mentioned by several residents, stakeholders, or steering committee members? 	

Readiness (R)	<ul style="list-style-type: none"> Can the project be constructed within the existing roadway’s ROW (i.e., part of restriping/resurfacing project)? 	<p>“On Park Ave...there is a painted bike lane on both sides. However, ...most lines are not visible.”</p>
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Accessibility (A)	<ul style="list-style-type: none"> Does this project improve safety and connectivity to schools and other public facilities? 	<p>“All the [Peace Trail] segments...ought not to remain nameless, but all ought to be named the Peace Trail, and signed as such.”</p>
	<ul style="list-style-type: none"> Does this project modify a previous completely non-accessible route with a fully accessible pedestrian or bicycle route? 	



Prioritization: Honoring Past Plans and Public Input

Project prioritization exercises help planners make decisions about project phasing. Projects score points based on the criteria outlined above. Similar to the recommendation development process, this method honors comments heard from the public, past plans, and opportunities to create a safer and more connected region.

Regional Priorities

Recommended infrastructure projects that received a prioritization score of 10 or higher were classified as high-priority, reflecting their ability to meet multiple objectives and provide significant benefit. These projects are listed in the table below, and additional detail is shown in the prioritization matrix in Appendix B.

Implementation Considerations

Prioritization Scoring in Capital Improvement Program and Funding Evaluation

Sidewalk and bikeway prioritization scoring can be integrated into CIP project evaluation or other planning and funding processes to expand implementation opportunities. For example, capital program projects that align with and include sidewalk or bikeway projects, especially high priority projects, could receive additional points when evaluating potential CIP projects.

Project prioritization can also be used to strengthen applications for outside sidewalk, bikeway, and general roadway funding.

Project Phasing

It is likely that some projects will be implemented in phases due to factors such as funding constraints, right of way limitations, or opportunities for projects to be implemented in coordination with other roadway work. Whenever possible, phased projects should have logical termini (ideally an intersecting pedestrian or bicycle facility) and remaining segments should be re-scored to reflect the new context.

Prioritization Matrix Maintenance

The Prioritization Matrix included in the Appendix should be updated at regular intervals (e.g. annually) to track project progress and reflect changes that may impact individual factors and overall project scores.

Table 8. Regional Priority Projects

Project Segment and Limits	Recommended Facility	Score
Park Avenue (Cranston Road to E Inman Parkway)	Sidepath	11
Cranston Road (Riverside Drive to Shopiere Road)	Bike Lanes	11
Park Avenue (White Avenue to Cranston Road)	Bike Lanes	11
Park Avenue (from Broad Street to White Avenue)	Shared Lane Markings	11
US 51 (Henry Avenue to MPA Limits)	Sidepath	10
Prairie Hill Road (IL 2 to De la Tour Drive)	Sidepath	10
Gardner Street (Blackhawk Boulevard to Willowbrook Road)	Sidepath	10
Beloit Newark Road (County Highway Q) (S Madison Road to S Riverside Drive)	Sidepath	10
Shopiere Road (County Road S) (Prairie Avenue to Cranston Road)	Buffered Bike Lanes	10
Elmwood Avenue (S Riverside Drive to Prairie Avenue)	Paved Shoulder	10
Blackhawk Boulevard (Williamson Parkway to Nazarene Drive)	Sidepath	10
Inman Parkway (US 51/Riverside Drive to Prairie Avenue)	Sidewalk	10

Annual crash data, for example, may impact safety score outcomes, or a planned project may become a gap after other facilities are implemented nearby.

Prioritization scores are intended to provide guidance about high need or high impact projects, but the methodology encourages flexibility to allow the region to be opportunistic with capital improvement programming opportunities.

Incorporating pedestrian and bicycle projects into roadway resurfacing, restriping, and reconstruction activities provides an opportunity to implement active transportation improvements at a lower cost than as standalone projects. SLATS municipalities should leverage opportunities to integrate planned sidewalk and bikeway improvements with routine or capital projects, regardless of the prioritization score.

Early Action Demonstration Projects

Some project recommendations involve roadway reconfigurations, traffic calming, or other low-cost improvements that can be installed as a temporary or pilot installations. This provides the region with the ability to test new applications over a weekend or for a period up to two weeks using temporary pavement markings, removable signs, and temporary landscaping (e.g. small planters that can be easily removed).

Projects that were identified for demonstration projects are those that:

- Received a score of 7 or higher in the overall prioritization process
- Received a point in the “Project Readiness” category, meaning the project fits within the existing roadway pavement or right-of-way
- Received both points (2) in the “Use and Local Support” category
- Have a planning level cost estimate less than \$500,000

Based on this process, projects that may be able to implemented in the short term include:

1. **Buffered bike lanes on Shopiere Road from Murphy Road to East Hart Road. This project consists of a 4-lane to 3-lane road diet to incorporate buffered bike lanes within the existing cross section. This project could be expanded further south to include additional segments of Shopiere Road for which buffered bicycle lanes are recommended.**
2. **Bike lanes on Henry Avenue/Shopiere Road from Riverside Drive to Prairie Avenue. This project will likely require a 4-lane to 3-lane road diet conversion between Riverside Drive and Royce Avenue.**
3. **City Center Bicycle Link neighborhood greenway in the City of South Beloit from Burr Oak Avenue to St. Paul Avenue.**
4. **Sidewalk infill along Burton Street from Madison Road to Moore Street.**

Project Implementation Example Locations

While most of the regional priorities are sidepaths, a variety of project types are recommended for improving walking and bicycling in the region. To provide a broader sample of project examples at a variety of costs, regional priorities and other project recommendations were reviewed in the context of upcoming roadway and sidewalk improvement projects in approved municipal Capital Improvement Programs (CIP).

An assortment of project types, and geographic location within the SLATS Region were identified to select projects representative of these recommendations. From these, shorter sections of five projects were selected to develop planning concepts at a scale to show how improvements would be installed.

Opportunity 1: Separated bike lanes on Blackhawk Boulevard

Project Description:

Separated bike lanes are recommended on Blackhawk Boulevard from Charles Street north to the Wisconsin State Line. Due to the presence of driveways, the river crossing near the confluence, and the presence of commercial land uses along the corridor, a two-way separated bike lane is recommended.



Figure 49. Original aerial showing approximate project area

Opportunity 1: Separated bike lanes on Blackhawk Boulevard

Concept:

The concept plan and photosimulation below highlight a short segment of Blackhawk Boulevard at Gardner Street in South Beloit, south of the Wisconsin State Line. The proposed two-way separated bike lane includes a precast curb to provide a vertical separation element between bicycle and automobile traffic. Reallocating roadway space and narrowing travel lanes would be done at the time of construction.



Figure 50. Plan view of the proposed two-way separated bike lane



Figure 51. Photosimulation of a two-way separated bike lane on the west side of Blackhawk Boulevard.

Opportunity 2: Sidepath along Old River Road

Project Description:

A sidepath is recommended along the west side of Old River Road. To provide a connection at the Rockton Athletic Fields, a sidepath crossing is proposed near the entrance. As a potentially popular sidepath, this improvement shows how a crossing improvement at the entrance to the Athletic Fields can incorporate a median refuge island.

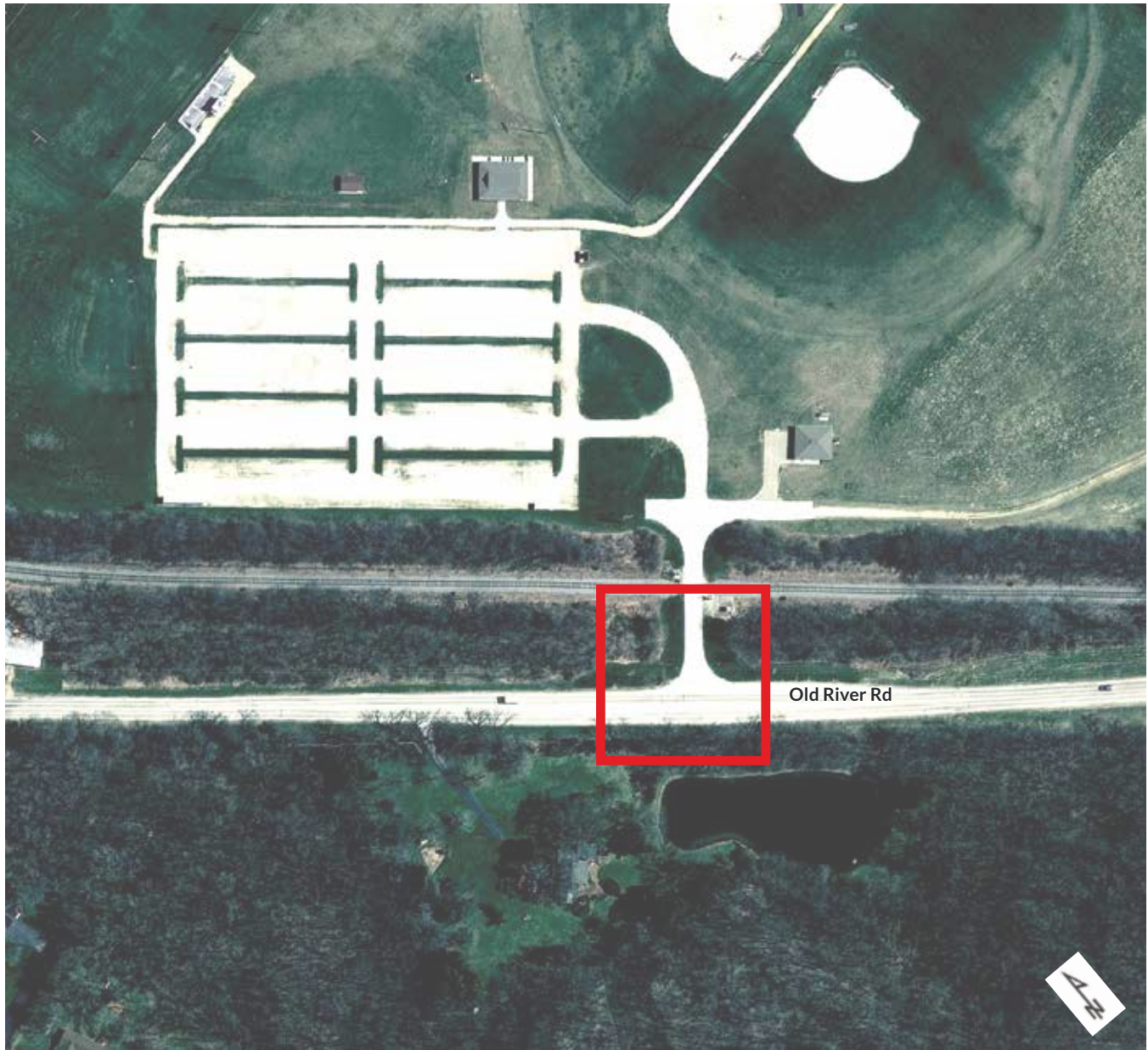


Figure 52. Original aerial showing approximate project area

Opportunity 2: Sidepath along Old River Road

Concept:

The full recommendation for this facility is a shared use path from Westport Drive to Roscoe Road, but this visualization shows how the crossing would provide access to the Rockton Athletic Fields.



Figure 53. Visualization concept of improvement

Opportunity 3: Traffic calming and shared roadway improvements in Shopiere

Project Description:

Traffic calming and shared roadway improvements are recommended to slow traffic along County Highway J between County Highway S/Butterfly Road and Buss Road in Shopiere. Due to an interest improving pedestrian comfort when crossing the roadway, curb extensions, high visibility pavement markings, and signage is recommended to slow vehicles and increase yielding compliance.



Figure 54. Original aerial showing approximate project area

Opportunity 3: Traffic calming and shared roadway improvements in Shopiere

Concept:

Traffic calming infrastructure applied at this location show the addition of curb extensions that are equal in width to the parking lane, which keeps a stretch of roadway clear to make it easier to see pedestrians at the crossing. Pairing these with a high visibility crosswalks and advance warning signs can improve crossing conditions. A pedestrian lane is provided on both sides of the roadway to serve as a place for pedestrians to walk to reach the crossing.



Figure 55. Visualization concept of improvement



Figure 56. Photosimulation of concept improvement

Opportunity 4: Neighborhood greenway along Saint Lawrence Avenue

Project Description:

A neighborhood greenway is recommended along Saint Lawrence Avenue between 8th Street and 4th Street in Beloit. Rather than just install shared lane markings (or restrict parking to one side of the street to create space for bike lanes), select traffic calming improvements are recommended to create a traffic-calmed shared roadway environment at this location.

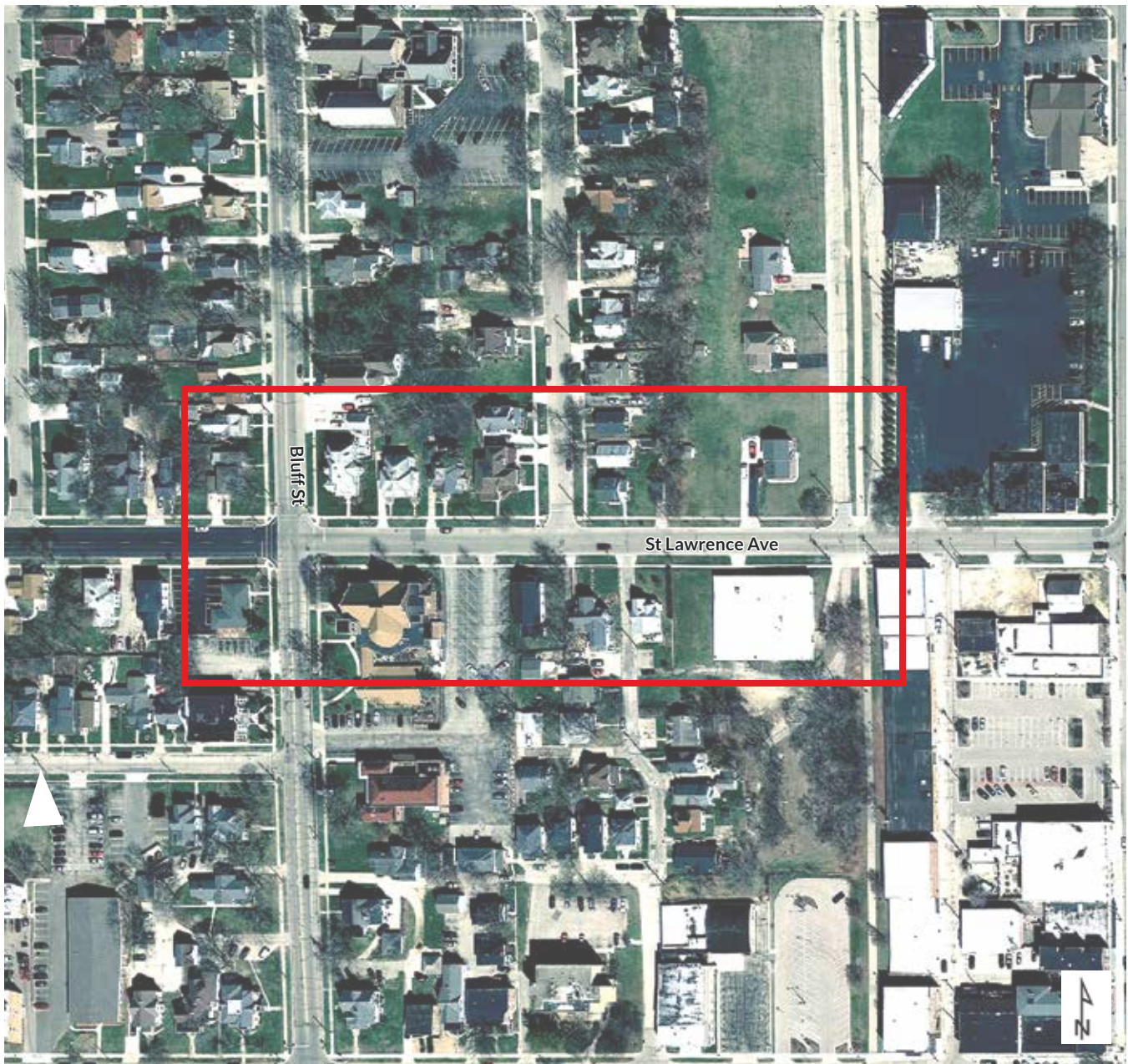


Figure 57. Original aerial showing approximate project area

Opportunity 4: Neighborhood greenway along Saint Lawrence Avenue

Concept:

Neighborhood greenways can use a variety of treatments to slow vehicle speeds and make the roadway more inviting for bicyclists of all ages and abilities. Project elements could include curb extensions, miniature traffic circles, and addition of street trees shown in this concept.



Figure 58. Visualization concept of improvement

Opportunity 5: Sidpath along S Riverside Drive

Project Description:

A sidepath is recommended along South Riverside Drive (US 51) from Henry Avenue to Cranston Road. This stretch has a constrained right-of-way due to open drainage. A proposed sidepath along this segment would be done when the drainage is converted from open drainage to closed (curb and gutter) drainage and landscape trimming to provide room for a sidepath.



Figure 59. Original aerial showing approximate project area

Opportunity 5: Sidpath along S Riverside Drive

Visualization Concept:

The range for sidepaths can vary greatly due to the need for converting the drainage from open (ditches and swales) to closed (curb and gutter). The widening of the sidepath at intersections helps increase the visibility at the crossing and provides



Figure 60. Visualization concept of improvement

Cost Estimates

Public agency staff should refer to this section of the plan for approaches to reducing the cost of installing walking and bicycling infrastructure along and across streets under their jurisdiction.

Staff can also use this section to view cost estimates for infrastructure tools. Refer to the plan’s funding sources table to learn more about financing options for the recommendations included in this plan.

Coordinating with Resurfacing Projects

As discussed in the Design Guidelines: A Toolbox of Infrastructure Options section of this plan, there are multiple approaches to improving streets for walking and bicycling. For example, bike lanes can be installed by narrowing a street’s travel lanes, repurposing a travel lane for other uses (also known as a “road diet”), or widening the street to install bike lanes or paved shoulders.

The first two methods are most often undertaken when a street is eligible for routine resurfacing. Cities and towns follow resurfacing schedules to plan for when streets receive fresh coats of pavement. Coordinating the addition of walking and bicycling facilities to coincide with resurfacing schedules saves towns and cities money. The cost of painting a bicycle lane, for instance, is easier to incorporate in a project budget when the street is already scheduled to have its surface repaved and pavement markings restriped.

Federal Highway Association (FHWA) released the Workbook for Building On-Road Bicycle Networks through Resurfacing Projects to help communities take advantage of such projects. Wisconsin Department of Transportation (DOT) representatives (Pat Fleming, Tom Heydel, Chris Squires, and Rob Stafford), City of Madison, WI staff (Chris Petykoswki and Arthur Ross), and City of Chicago, IL staff (Mike Amsden) contributed local knowledge to the project.

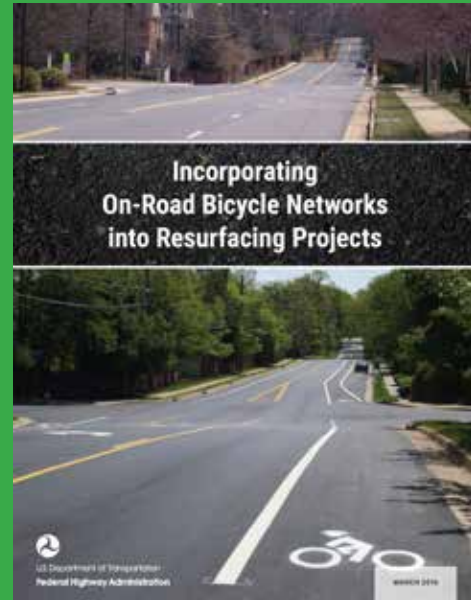


Image and resource: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf

Cost Estimates by Type of Infrastructure

Cost estimates are an essential planning tool used for programming capital improvements and drafting applications for external funding sources. Cost estimates were developed for each project based on initial planning-level examples of similar constructed projects and industry averages.

All facility designs and associated cost estimates proposed in this plan are conceptual in nature and should undergo final engineering design and review in order to arrive at detailed project costs.

These costs do not include costs for right-of-way acquisition or project design, which can include planning, public process, facility design, and other background work required to implement the project. These additional costs can generally be estimated at 25% of the facility construction cost.

Project costs are housed in the Prioritization Matrix, which is included as an Appendix.

Table 9. Mixed Traffic Cost Estimates

Facility Type	Per Mile Cost Estimate (Lower Limit)	Per Mile Cost Estimate (Upper Limit)
Signed Route	\$9,000	\$15,000
Shared Lane Marking	\$12,000	\$20,000
Advisory Shoulder	\$15,000	\$20,000
Neighborhood Greenway	\$70,000	\$130,000
Traffic Calming (bumpouts, median island, raised crossing)	\$115,000	\$175,000

Table 10. Visually Separated Cost Estimates

Facility Type	Per Mile Cost Estimate (Lower Limit)	Per Mile Cost Estimate (Upper Limit)
Bike Lanes	\$40,000	\$75,000
Buffered Bike Lanes	\$60,000	\$120,000
Paved Shoulder	\$145,000	\$955,000

Table 11. Physically Separated Cost Estimates

Facility Type	Per Mile Cost Estimate (Lower Limit)	Per Mile Cost Estimate (Upper Limit)
Separated Bike Lane (on-street)	\$300,000	\$500,000
Separated Bike Lane (off-street)	\$2,450,000	\$4,255,000
Sidewalk (assumes both sides)	\$225,000	\$350,000
Sidepath	\$350,000	\$1,500,000
Trail	\$400,000	\$1,800,000

Implementation Considerations

The SLATS Region is home to a number of citizen-led organizations that have succeeded in constructing off street trails for walking and bicycling. The following initiatives are examples of their success.

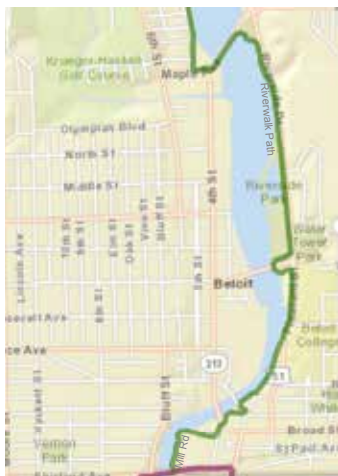


Hononegah Recreation Path

A 12 person citizen committee funded the path through a combination of crowdsourcing and working with legislators to obtain Build Illinois State grant money.

The residents were also successful in helping Winnebago County and Roscoe and Rockton Townships create inter-governmental agreements to maintain the path.

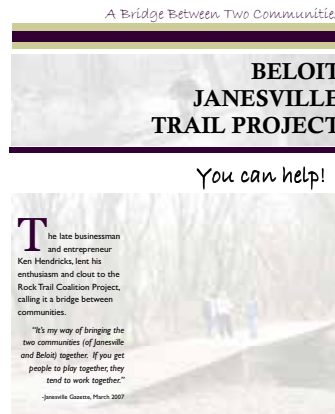
In total, the committee worked with 12 governmental organizations over more than five years to construct the path. Portions of the adjacent roadway were owned by multiple parties. The committee found opportunities to divide repair and ownership responsibilities between the State and County.



Rock River Trail Bike Route

The Rock River Trail is 320 miles long from Rock Island, IL to Theresa, WI. The trail officially opened June 3, 2017 and invites residents to use the trail by hiking, bicycling, driving, riding horses, paddling, and flying.

Forty-one river communities are found along the route. The trail's funding was mostly secured through private donations. The Rock River Trail is a 501(c)(3) organization. The National Park Service, County and local level Parks Departments, and others helped provide consultation and support for the trail.



Beloit-Janesville Peace Trail and Big Hill Park Paths

The non-profit Rock Trail Coalition, Inc. works to link the Hononegah trail system in Roscoe/Rockton through Beloit

to Janesville. As of this plan's publication, the Peace Trail, in northern Beloit, is considered complete. Traveling north from Big Hill Park, the trail includes an off street path on Walters Rd and a combination of on and off street alignments on Duggan Rd to the Rock River. The trail also includes paved paths within Big Hill Park. First convened in 1992, the Rock Trail Coalition has inspired residents to get involved ever since. The Coalition has helped Rock County and local municipalities defray trail costs through a combination of fundraisers, volunteer construction projects, and Wisconsin Department of Natural Resources (DNR) grant money with matching funds from Rock County that included contributions from the Coalition.

Maintenance and Operations

The examples above are successful in part because of their focus in involving multiple decision makers around a single project or focus area. All decision makers must be engaged throughout the project planning, funding, and design process. To install a successful project, advocates must also address the future trail's maintenance funding and responsibilities. Intergovernmental agreements may be needed in order to ensure consistent maintenance along a facility where multiple units of government are involved.

Coordinating CIP Projects to Implement the Plan

As discussed in the design guidelines and recommendations section of this plan, timing walking and bicycling improvements to coincide with general roadway construction projects can lead to reduced costs of adding new walking and bicycling facilities.

City of Beloit

The following streets are included in this plan's recommended project list. The streets are also contained in the City of Beloit's Capital Improvements Plan (CIP) for 2018-2023.

Streets are listed even if extents differ from the current CIP.

2018 CIP Projects

- Shopiere Road
- Gateway Boulevard

2018 Maintenance Projects

- Ridge Road
- Townline Avenue
- 8th Street
- Middle Street
- Portland Avenue
- Stateline Road

2019 to 2023 CIP Projects

- Henry Avenue
- Keeler Avenue
- Prairie Avenue
- Willowbrook Road
- Henry Avenue
- Liberty Avenue

- Townline Avenue
- Emerson Street
- Merrill Street
- St. Lawrence Avenue
- Merrill Street
- Strong Avenue

2019 to 2023 Maintenance Projects

- Broad Street
- Henderson Avenue
- Keeler Avenue
- Milwaukee Road
- Strong Avenue
- Summit Avenue
- Grand Avenue
- Whipple Street
- 8th Street
- Highland Avenue
- Harrison Avenue
- Merrill Street
- Portland Avenue
- Ritscher Street
- Grand Avenue

Projects and Pavement Quality

Jurisdictions within the SLATS Region should only install on street bicycling or walking facilities on streets that are in a state of good repair.

What about streets that could offer an excellent walking or bicycling connection but are currently in need of repair? The flow chart below graphically depicts how to ensure that new facilities offer good surface quality. This approach offers a flexible way to install walking and bicycling projects.

Although this plan outlines suggested streets for improvements, municipalities are not limited to these suggested corridors and intersections. Bicycling and walking infrastructure may be added during routine resurfacing projects, street reconstructions, development plans, utility construction, and other projects.



Figure 61. Opportunities for including walking and bicycling improvements in routine projects.

Model Complete Streets Policy Language

To support improved walking and bicycling within the region, SLATS municipalities should consider the adoption of Complete Streets policies that identify a commitment to investing in Complete Streets at the municipal level. Model policies, ordinances, or resolutions can be adopted depending on local preference as demonstration of a commitment to a municipal culture that encourages walking and bicycling.

Several agencies, including the United States Department of Transportation, National Complete Streets Coalition, and Smart Growth America support the adoption of complete streets policies to help improve the process whereby Complete Streets are planned, designed, and constructed in communities across the country. Having a policy in place helps to provide decision-makers several levels of government maintain focus on improving transportation networks for all users, especially for people walking and bicycling.

Complete Streets policies are designed to remain flexible while also encouraging cultural, procedural, and administrative change at the municipal level. Smart Growth America maintains a Policy Atlas of communities across the country that have adopted or otherwise formally recognized complete streets policies as ordinance adopted by formal resolution by a government agency, as an internal or departmental policy, as an amendment to or part of a local transportation or comprehensive plan, or as a component of a design manual¹.

To assist SLATS municipalities in making a choice best suited to their needs, one (1) Complete Streets ordinance and two (2) Complete Streets resolutions have been provided, as taken from the National Policy & Legal Analysis Network to Prevent Childhood Obesity (NPLAN). As stated in the introductory text for each, ordinances and resolutions differ slightly in their

¹ Policy Atlas. Smart Growth America. <http://old.smart-growthamerica.org/complete-streets/changing-policy/complete-streets-atlas/>. 2016.

wording, which allows SLATS municipalities consider which is best suited for adoption by City Council, Town or Village Board.

In general, resolution language is worded so as to be easier to adopt, contain more encouraging language (e.g., “should consider” as opposed to “shall consider”), and provide introductory and advanced options based on the size and complexity of municipal staff that would be involved in developing Complete Streets.

The model ordinance, rather, is more targeted toward infrastructure-specific actions tied to a municipality’s commitment to implement a bicycle and pedestrian plan as it pertains to roadways and rights-of-way that travel through its area of land use jurisdiction (note that while this also applies to roadways that are outside of municipal jurisdiction, coordination is required for these types of projects).

The model ordinance, introductory model resolution, and advanced model resolution are included in the appendix.

