Will County

BIKEWAY PLAN

2016

Acknowledgements

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Will County Bikeway Plan Steering Committee

Active Transportation Alliance
Bolingbrook Park District
Channahon Park District
City of Joliet
City of Naperville
City of Wilmington
CWA Land Surveyors
Folks on Spokes
Joint Utility Locating Information for Excavators (JULIE)
Joliet Bicycle Club
Naperville Park District
Openlands
Plainfield Park District
Ride Illinois
Village of Channahon
Village of Mokena Citizen Advocate
Village of Plainfield
Village of Romeoville
Village of Shorewood
Will County Division of Transportation
Will County Governmental League
Will County Health Department
Will County Land Use Department

Table of Contents

Appendices

Figures

Tables

Chapter 1: Overview of the Will County Bikeway Plan

CONTEXT AND BACKGROUND

The Will County Bikeway Plan (Bikeway Plan) is Will County's first planning effort to develop a comprehensive countywide bikeway network, consisting of 14 strategic bikeway corridors throughout the county. In 2015, the Will County Division of Transportation (Will County DOT) began its ***Will Co****nnects 2040* planning initiative, which included a multimodal planning component. To enhance the non-motorized elements of this initiative, the Bikeway Plan was prepared collaboratively, with the Forest Preserve District of Will County (Forest Preserve District) as the lead agency and support from the Will County DOT. The Bikeway Plan is organized into four chapters:

- **Chapter 1** offers an overview of the context for the planning effort and describes how the Bikeway Plan was developed.
- **Chapter 2** describes the existing bikeway system, including major gaps in the countywide bikeway network. It also presents the results of the Level of Traffic Stress analysis to determine the suitability of on-street bikeways and summarizes key issues and needs identified through the planning process.
- **Chapter 3** introduces the recommended future countywide bikeway network and describes the planning approach and criteria used to develop 14 bikeway corridors within Will County. It also includes summary profiles for five selected bikeway corridors to kick-off planning activity and guide future planning within these corridors.
- **Chapter 4** recommends a core set of strategies to support implementation of the countywide bicycle network. It also includes bicycle facility design guidelines to assist the county and its partner agencies as they work to implement the countywide bikeway network.

1. Relationship to *Will Connects 2040*

The Bikeway Plan reflects the county's commitment to expanding travel choices as described in the county's long-range transportation plan, known as ***Will Co****nnects 2040*. ***Will Co****nnects 2040* sets priorities for future transportation investments over the next 25 years, identifying transportation-related needs and issues relevant to the county's long-term growth and laying the groundwork for multimodal investments to maintain and enhance our transportation system. The county recognizes bicycle transportation as an integral element of the county's future mobility, public health and environmental sustainability. Moreover, walkability and bikeability are important quality of life factors that help attract employers, employees, and new residents.

The Bikeway Plan was developed to complement and enhance the work conducted as part of ***Will Co****nnects 2040*. As a countywide document, the focus of the Bikeway Plan is on cross-county bikeway opportunities and is not intended to delve into localized municipal-level bicycle networks. Similar to the relationship between county highways and local streets and roads, county bikeways serve as arterial corridors to which local bikeway networks connect. The Bikeway Plan builds on existing bicycle and pedestrian assets throughout the county, including bikeway facilities located on Forest Preserve District lands. Similar to ***Will Co****nnects 2040*, the Bikeway Plan is intended to be a 'living document' and will be updated over time to remain relevant and consistent with ongoing planning efforts by our partners: non-governmental entities (e.g., Universities), municipalities and their

park districts, the Will County DOT, Illinois Department of Transportation (IDOT), the Illinois State Toll Highway Authority (Tollway), and transit agencies (Metra and Pace). This allows the Bikeway Plan to remain consistent with actions that are underway or planned by our bikeway partners and to make progress toward our goals for the comprehensive countywide bikeway network.

2. Role of the Forest Preserve District in Bikeway Planning

Like any transportation network, Will County's bikeway facilities often cross jurisdictions, which means that ownership and responsibility for bikeway facilities is fragmented. Bikeways typically require the involvement of multiple agencies and jurisdictions to build and maintain each layer of the bikeway network (national and state bikeways, countywide, and local). Through the development of the Bikeway Plan, Will County has established a cohesive countywide guide that supports bicycling and walking to expand travel options. All Countywide agencies play key roles in bikeway implementation within the County in the following ways:

- **Countywide Perspective**. While municipalities and park districts conduct bicycle planning at the local level, all County agencies can help to ensure greater bikeway coverage across the county via long-distance connectivity between cities and to facilities in surrounding counties.
- **Coordination and Collaboration**. Due to the inherent coverage and level of planning, County agencies are situated to coordinate and collaborate with many different levels of government and partners to implement bikeways that extend to all corners of the county. Better integration of bikeways in the transportation planning process can help to make progress toward a seamless bikeway network that intersects with streets and roads, transit stations and stops, and sidewalks.
- **Technical Assistance**. With its wealth of technical experts, County agencies are also poised to advise and assist other levels of government and partners in transportation and bicycle planning and design, as well as being assets for other information (e.g., counts, mapping, financing/grants, and prioritization, etc.).

3. Bikeway Plan Terminology

There are many terms used to describe different bikeway facility types, such as shared-use path, trail, bike path, bike lane, bike route, etc. To promote consistency and ease of understanding, the Bikeway Plan employs a general term – bikeway – to describe a variety of on-street and separated (off-street) bicycle facility types. Where a specific bikeway facility type is discussed, it is referenced accordingly. While there are many local, municipal-level bikeway networks in Will County, the term countywide network is referenced to describe inter-city and cross-county bikeways that provide connectivity throughout the county.

BIKEWAY PLANNING PROCESS

1. Stakeholder and Public Engagement

The bikeway planning process was conducted in conjunction with the ***Will Co****nnects 2040* planning initiative, which included extensive public outreach. . Input from key stakeholders was provided through a Steering Committee convened specifically for the Bikeway Plan, while public engagement opportunities helped to reach a wider audience as described below.

Steering Committee

The Steering Committee was charged with:

- Providing input and guidance on the development of project work;
- Reviewing materials and participate in meetings; and
- Serving as liaisons to respective organizations and constituencies.

The Steering Committee was composed of a diverse group of individuals and businesses associated with the bicycling community as well as representatives of governmental entities and advocacy groups. The Steering Committee met in-person two times during the planning process and was updated on work products at key milestones.

Public Input

To leverage and align planning efforts, the Bikeway Plan was developed in tandem and on a similar timeline as ***Will Co****nnects 2040*. This strategy allowed the Forest Preserve District to gather additional input than would have otherwise been possible to inform development of the Bikeway Plan.

Interactive exercise to gather input on priority bicycle links and connections.

Open House Input – Two rounds of Open Houses were held in 2015 (April – June) and 2016 (January), totaling ten meetings across the county (Joliet, New Lenox, Romeoville, University Park, and Wilmington). Display boards and interactive exercises were designed to solicit input, and Forest Preserve District staff were on hand to answer questions and engage in face-to-face dialogue with participants.

Online Input – Interactive online surveys were conducted in three phases and were accessible via smartphones, computers, and tablets. Each survey was posted online in three month intervals, totaling nine months of online engagement. During each survey phase respondents had an opportunity to share their opinions and provide input across different modes, including bikeways, roadways, transit, and freight. These surveys were an effective tool to involve interested individuals and stakeholders throughout the planning process and to gather valuable input about needs and preferences for the future countywide bikeway network.

The public had a chance to weigh in and provide input about which bikeway gaps are most important to address.

2. Guiding Framework (Vision and Goals)

The future countywide bikeway network presents a long-range vision for an interconnected and comfortable network of bicycle facilities throughout the county. Development of the Bikeway Plan vision and goals was guided by the Steering Committee. The vision and goals provide a forward-thinking framework for strategically enhancing the countywide bikeway network.

Vision

Bicycling is an integral part of the county's balanced multimodal transportation network, with seamless bikeways and trails that increase mobility to enable people of various ages and abilities to bicycle for any purpose in a safe and enjoyable environment.

Goals

Expand Transportation Choice – Make investments to enhance bicycling opportunities equitably across Will County so people may choose to bike for most trip purposes, remembering that some users rely on bicycling due to economic limitations, age, or other necessity.

Enhance Connectivity – Link communities in Will County and surrounding counties together with trails and on-street bikeways that overcome gaps and barriers posed by rivers, railroads, expressways, and disconnected development patterns to better connect people to transit opportunities and to where they live, work, and play.

Improve Safety – Enhance infrastructure and provide education and enforcement strategies to improve safety for bicyclists and other road users and foster the development of mutual respect between road users.

Enhance Bicyclist Comfort – Provide low-stress trails and on-street accommodations that reduce conflicts between bicycle and motor vehicle traffic and consider the needs and preferences of all users, from novice to experienced bicyclists.

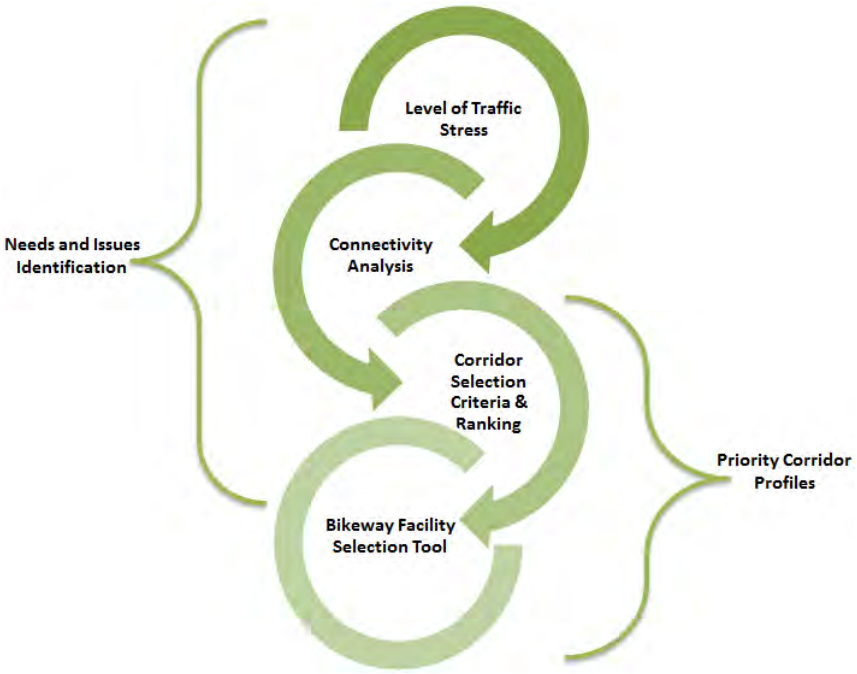
Promote Bicycling Benefits – Promote the benefits of bicycling to public health, the environment, community vitality,* and economic prosperity.

Implement Together – Coordinate and cooperate with all partners and agencies to implement the Plan and achieve a seamless bikeway network throughout Will County by proactively acquiring and preserving future trail and bikeway corridors, identifying new funding streams and partnerships, and leveraging existing funding sources.

*The term "community vitality" refers to the ability of a neighborhood, city, or county to sustain itself into the future, such as by providing a high quality of life to continually retain and attract residents, enabling ongoing citizen engagement and representation, nourishing an enduring culture, and preserving strong social networks between neighbors.

3. Technical Assessment

A host of work elements were conducted to formulate the recommendations contained in the Bikeway Plan. Both qualitative and quantitative data were used to inform development of the countywide bikeway network and the implementation strategy recommendations. The bikeway planning process is not linear; rather work elements build on each other or are conducted in tandem to inform and/or confirm results of other work elements. A summary of the technical assessments conducted as part of the bikeway planning effort in described below.



Level of Traffic Stress – Chapter 2 presents this analysis, which uses the existing roadway network to determine the "traffic stress" of a roadway segment to determine the suitability of on-street facilities for bicycling that would be comfortable for the entire population (including people that do not currently ride a bicycle, but have interest in doing so). Detailed information about this methodology can be found in Appendix A.

Connectivity Analysis – The connectivity analysis described in Chapter 2 is based on five separate analyses that illustrate the existing state of bikeway mobility in Will County. The connectivity assessment was used to define 14 strategic bikeway corridors throughout the county.

Corridor Selection Criteria and Ranking – The 14 cross-county corridors within Will County were evaluated using a set of selection criteria developed specifically for this Plan as described in Chapter 3. Based on the corridor rankings (see Appendix B), five corridors were selected to identify specific challenges and opportunities, recommend an appropriate bikeway facility type(s) and explore alternative solutions, and estimate probable costs.

Bikeway Facility Selection Tool – As described in Chapter 4, this tool was developed to support the appropriate bikeway facility type(s) for various roadway contexts. While bikeways may not be appropriate in all instances, the bikeway facility selection tool can be used as streets and roads are expanded or reconstructed to help determine what type of facility would be compatible with the context.

Chapter 2: Existing Conditions: Today's County Bikeway Network

EXISTING BIKEWAYS

Across Will County, more than 1,200 miles of bikeways have been constructed, programmed for construction, planned, or proposed over the past decades. Together, more than 50 entities—ranging in size from the federal government to individual homeowners associations—have played a role in building today's bikeway network. Some of the more notable bikeways in Will County include the I&M Canal Trail, the Wauponsee Glacial Trail, and the Old Plank Road Trail. Each of these makes interjurisdictional connections within the county while also linking to surrounding counties. In addition to enabling long-distance bicycle travel, these trails also provide exceptional recreation opportunities for biking and walking, wildlife observation, and simply being in nature. A major new bikeway—the Veterans Memorial Trail—will join these three in creating significant connections between communities, parks, employers, transit, schools, and many other destinations.

1. Existing Bikeway Types

A variety of bikeway facilities are present throughout the county. These can be broadly categorized into the two groups: separated bikeways and on-street bikeways. Within these groups, specific treatments such as paved shoulders or bicycle markings are often applied.

- **Separated Bikeways** – This category includes asphalt, concrete, and limestone trails and sidepaths (trails next to or along, but not on, streets and roads). This type of bikeway is the most common in Will County. Often the location and intended use of a trail influences the type of materials used to construct the bikeway. The concrete or asphalt surface accommodates biking and walking for a wide variety of users, from avid to casual bicyclists, people walking and jogging, and people with mobility impairments. Limestone screening trails have a durable, all-weather surface suitable for bicycle and pedestrian use. However, the use of narrow road bike tires on limestone trails is generally not ideal.
- **On-Street Bikeways** – This category includes any type of bikeway that is part of the roadway—such as signed bike routes, shared lane markings (also known as sharrows), paved shoulders, bike lanes, and buffered bike lanes. The vast majority of existing on-street bikeways in Will County are in the form of bike routes, and may be signed or simply designated on a map.

2. Bikeway Ownership

Jurisdiction for constructing and maintaining bikeways may be the responsibility of a single agency or shared between agencies. Three types of agencies primarily build and maintain the bikeways in Will County:

- **National, State, and IDOT Bikeways** –The Illinois Department of Natural Resources (IDNR) owns portions of the I&M Canal Trail—primarily the segment southwest of Joliet—and the United States Forest Service owns the trails in the Midewin National Tallgrass Prairie. These types of bikeways typically provide a high level of recreational value to users while also accommodating people who wish to bike long distances between cities.

- **Countywide Bikeways** – This category mainly consists of the bikeways built and maintained by the Forest Preserve District, but also includes bikeways built or maintained by the Will County DOT and IDOT. These bikeways often provide countywide or multi-city connectivity. These types of bikeways provide a greater level of connectivity between cities (intercity) and are intended to serve longer trips from one part of the county to another (cross-county). These bikeways can serve both recreational and transportation trip purposes.
- **Local Bikeways** – Bikeways owned by a broad variety of governmental and non-governmental entities (including municipalities, local park districts, school districts, universities, homeowners associations, businesses, and land developers). The focus of these bikeways is typically mobility within a city or neighborhood or between communities. These types of bikeways typically provide coverage within a highly localized area and often do not make connections with other cities by themselves, instead feeding into the rest of the network for longer trips.

3. Inventory of Existing Bikeways

Approximately 406 miles of bikeways exist in Will County, the vast majority of which (89 percent) are paved or limestone trails. While the Forest Preserve District owns the single largest bikeway network in the county, comprising approximately 25 percent of the total bikeway network, almost two-thirds of existing bikeways were developed by local entities, including municipalities, park districts, school districts, universities, homeowners associations, businesses, and land developers as shown in Table 1. Like many counties across the country, responsibility for implementing and maintaining bikeways often falls across a network of jurisdictions, and is typically not the responsibility of a single entity. As a result, implementing a connected bikeway network takes time, coordination, and commitment.

Table 1: Approximate Mileage of Existing Bikeways in Will County

Type	Concrete and Asphalt Trails	Limestone Trails	On-Street Bikeways	Total
National and State Bikeways	4 miles	27 miles	--	31 miles
County Bikeways	64 miles	39 miles	--	103 miles
Local Bikeways	225 miles	3 miles	43 miles	271 miles
Totals	293 miles	69 miles	43 miles	405 miles

Existing bikeways in Will County are shown on a map in Figure 1.

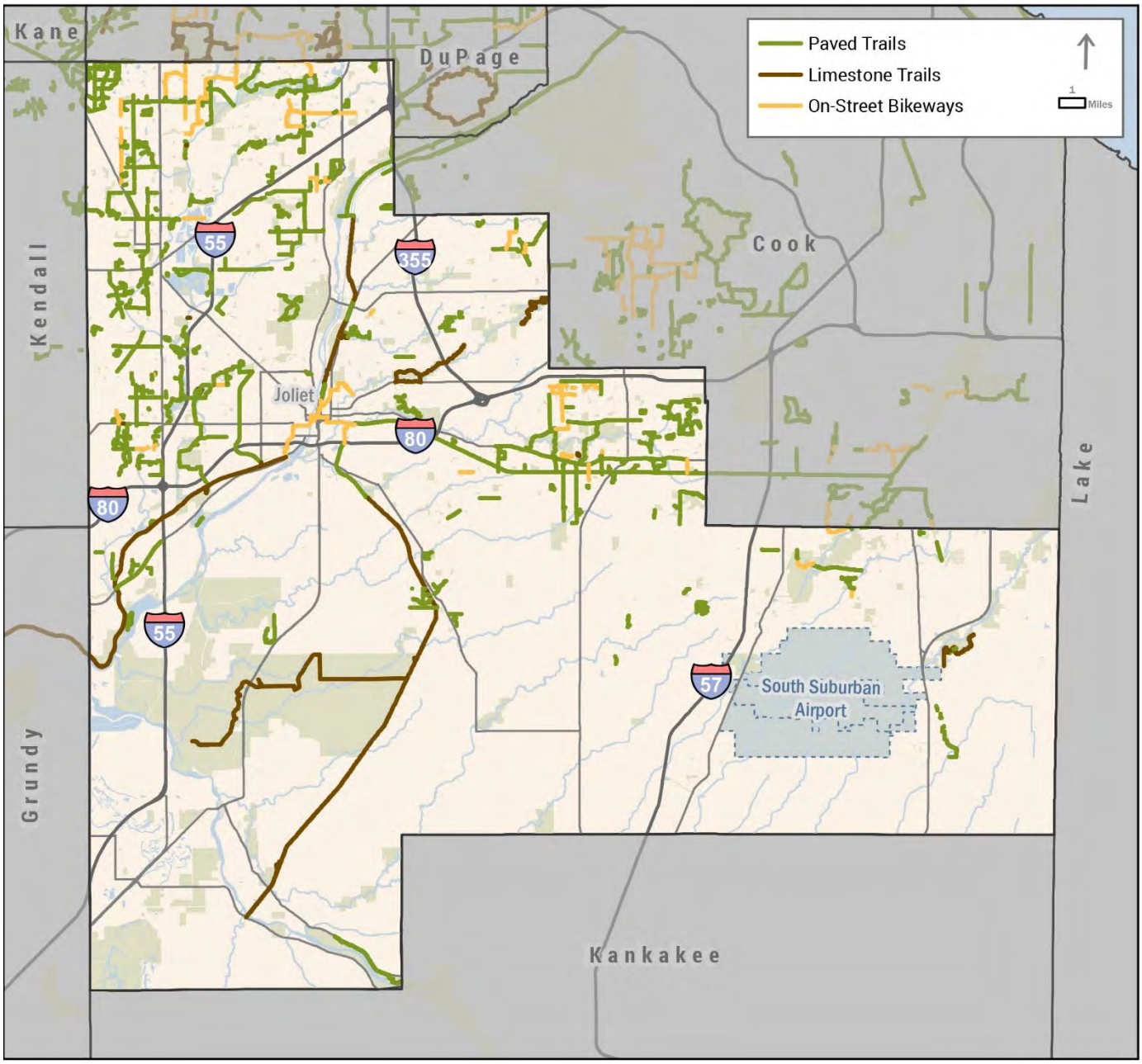


Figure 1: Existing Bikeways in Will County

4. Inventory of Future Local Bikeways

Numerous local entities (including municipalities, local park districts, and other small agencies and organizations) have planned, proposed, or programmed for construction 743 miles of bikeways across Will County. The term "programmed" means that funding has been identified for constructing the bikeway facility and progress is being made toward implementation. In Will County there are a number of major bikeways that are planned or programmed in the near future, including the 11-mile long Veteran's Memorial Trail (planned along I-355) and the 6.5-mile long 159th Street Bikeway (4.5 miles programmed within Will County). Other agencies with programmed bikeways include the Village of Diamond (0.5 miles in Will County), the Village of Romeoville (4.7 miles), and the Channahon Park District (0.9 miles).

As described in Table 2, bikeway implementation exists along a continuum, with projects at different stages of readiness. Though some bikeways are implemented as opportunities arise, such as with a scheduled roadway improvement, projects typically progress along this continuum over the long-term. For example, it is common for a project to go through years of planning, community discussion, and financial preparation before it is implemented. As shown in Figure 2, the area including Lockport, Homer Glen, Mokena, and New Lenox has the highest concentration of planned bikeways in Will County while the communities of Plainfield, Romeoville, Manhattan, and Green Garden have the highest concentration of proposed bikeways.

Table 2: Approximate Mileage of Future Local Bikeways in Will County

Type	Programmed	Planned	Proposed	Total
Explanation	Nearest to implementation. Typically funded or budgeted. Often referred to as "shovel-ready."	Typically unfunded and unbudgeted, but studied for feasibility. Usually has an established horizon for implementation.	Furthest from implementation. Typically shown on a plan, but without detailed analysis. Often part of a "vision."	
Totals	11 miles	86 miles	624 miles	743 miles

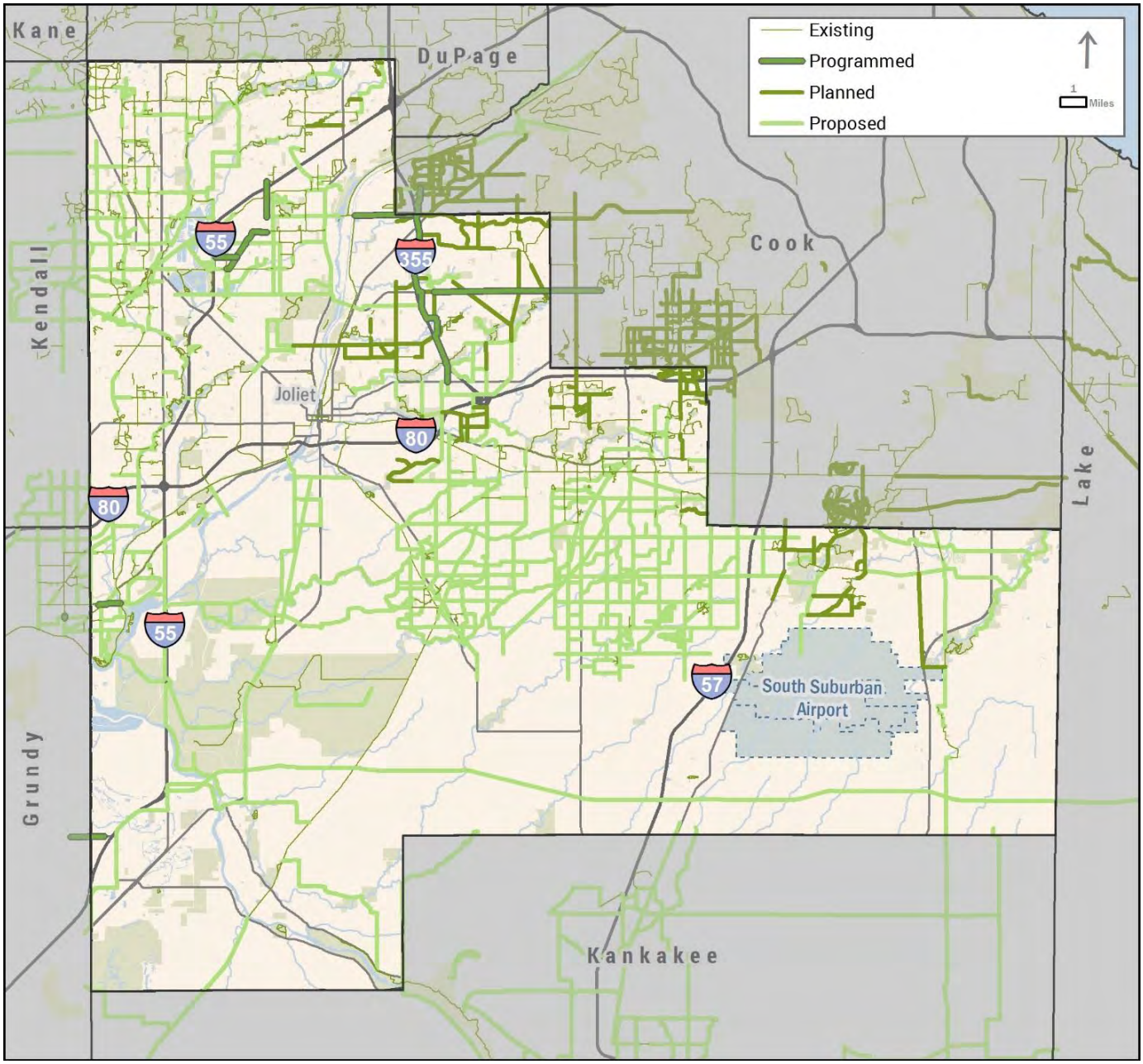


Figure 2: Future Local Bikeways in Will County

5. Notable Countywide Bikeway Corridors

Will County has a number of major bikeway corridors that provide long-distance cross-county connections and linkages to surrounding counties, to Chicago, and to the State of Indiana. Several of these corridors converge in Joliet and together they serve as the foundation for Will County's countywide bikeway network. Most of these corridors are built-out, owned and maintained by the Forest Preserve District or IDNR. Many miles of these trails have limestone screening surfaces, which provide a softer, more natural experience than paved surfaces; however, the use of narrow road bike tires on limestone trails is generally not ideal. These corridors are summarized in Table 3 and are shown in Figure 3.

Table 3: Existing Bikeways in Will County

Name	Approximate Corridor Length	Status	Prevailing Surface Type	Owners
I&M Canal Trail / Centennial Trail	25 miles*	Complete**	Limestone Screenings	IDNR, Forest Preserve District
Wauponsee Glacial Trail	22 miles	Complete	Limestone Screenings	Forest Preserve District
Old Plank Road Trail	14 miles*	Complete	Asphalt	Old Plank Road Trail Management Commission
Veterans Memorial Trail	11 miles	Planned	Asphalt	Forest Preserve District
DuPage River Trail	28 miles*	Approximately Halfway Complete†	Asphalt	Various Municipalities

*Portion within Will County

**The trail is not continuous through Joliet. Trail connections are made via on-street bikeways.

†Approximately 12 miles of trails exist within the Will County portion of this corridor, but there are numerous gaps between existing segments.

I&M Canal Trail and Centennial Trail

The I&M Canal Trail follows the historic Illinois and Michigan Canal, sitting atop the former towpath on which mules pulled freight barges back and forth between Chicago and the Illinois River at LaSalle-Peru. Today, people walk, bike, and run along this scenic corridor, which provides opportunities for wildlife viewing while connecting numerous communities in northwestern Will County with Chicago and other regional destinations outside of the county. The southern portion of the corridor is owned by the IDNR. The northern portion is predominantly owned by the Forest Preserve District, with a 1-mile segment owned jointly by the IDNR and Lockport Township Park District.

Wauponsee Glacial Trail

The Wauponsee Glacial Trail follows former railroad corridors connecting Joliet south through Manhattan, Symerton, and Wilmington to Custer Park. In addition to serving as an important transportation corridor between these communities and linking to Metra, various segments of the trail provide numerous recreational opportunities such as biking, walking, skiing, skating (paved portions), and bison viewing. Notably, the trail provides access to the Midewin National Tallgrass Prairie, which is the largest public open space in northeastern Illinois. The trail is owned and maintained by the Forest Preserve District.

Old Plank Road Trail

Linking numerous communities, the Old Plank Road Trail is an important transportation corridor for people biking and walking. Developed on a former railroad alignment, the corridor had originally been secured to build a wagon and horse road using wood planks, but the road was never built. The trail is jointly owned and managed by members of the Old Plank Road Trail Management Commission, which include the Forest Preserve District, the Village of Frankfort, Rich Township, the Village of Park Forest, and the Village of Matteson. The Forest Preserve District owns and manages 11.6 miles of the 14.2 miles of trail in Will County.

Veterans Memorial Trail

The Veterans Memorial Trail is a planned bikeway that has three components: an east-west trail that will be developed within the right-of-way of 135th Street connecting the Centennial Trail to the Veterans Memorial Tollway (I-355); and two separate north-south trails within, or adjacent to, the right-of-way of the I-355 from 127th Street in Lemont to U.S. Route 6 in New Lenox and Internationale Parkway in Woodridge to Bluff Road in Lemont. The District is currently in the design phase for both the remaining east-west and north-south components of the trail and has previously completed construction of the Veterans Memorial Trail from Internationale Parkway to Bluff Road in 2014. Construction funding is being identified for the remaining corridor. The trail will be constructed and maintained by the Forest Preserve District and local municipalities.

DuPage River Trail

The DuPage River Trail is a multi-county regional trail that is being developed through a partnership between the Forest Preserve District, Forest Preserve District of DuPage County, and 11 local agencies. When complete, the trail will extend 34 miles from the Blackwell Forest Preserve north of Warrenville in DuPage County south to the I&M Canal State Trail in Channahon. It will connect numerous communities to regional destinations and provide a wide array of recreational opportunities. The portion of the trail in Will County will total 28 miles, seven of which have already been developed by the Forest Preserve District as three separate segments.

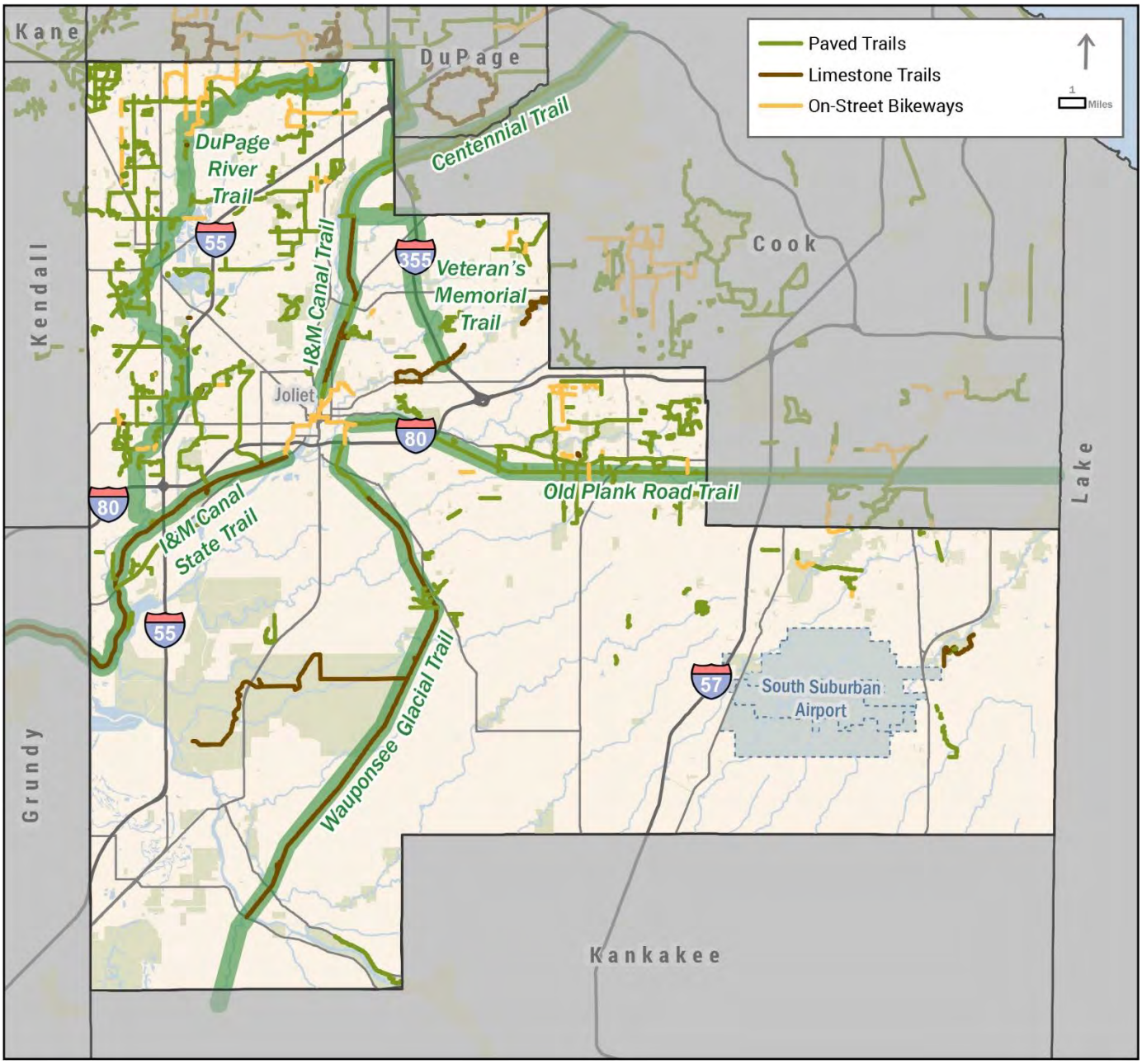


Figure 3: Notable Countywide Bikeway Corridors

SUITABILITY OF ON-STREET BIKEWAYS

Will County's roadway network was analyzed to determine the suitability of individual streets and roads for biking. This analysis indicates which streets and roads are suitable as-is for biking and which can be made suitable with the addition of on-street bikeway treatments like bike lanes. The primary factor that determines traffic stress is the interaction between bicyclists and motor vehicles.

1. Defining the "Typical Bicyclist"

Since different types of bicyclists have different levels of comfort interacting with motor vehicle traffic, it is important to define the "typical bicyclist" for this analysis. An analysis performed by the Portland Office of Transportation[1] supplemented with survey-based research[2] indicates that people (whether or not they regularly ride a bicycle) fall into one of the four categories shown in Figure 4, based on their traffic stress tolerance or comfort, confidence, and willingness to interact with motor vehicle traffic. The findings are that the majority of people (classified as "interested but concerned") have little tolerance for interacting with motor vehicle traffic and most are very worried about being struck by a motor vehicle while biking.

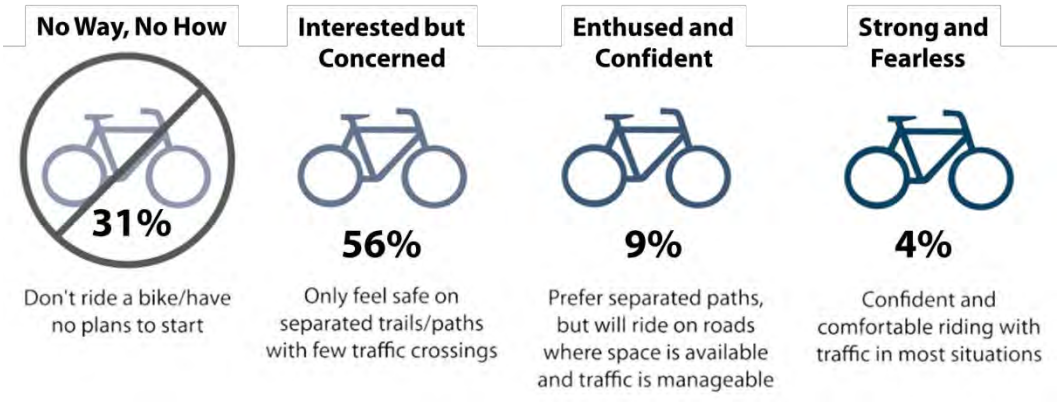


Figure 4: Categories of People Based on Traffic Stress Tolerance

The research and thinking surrounding this method for classifying the general population by traffic stress tolerance posits that the "Interested but Concerned" portion of the population is not bicycling very often, at least not on streets with little separation between bicycles and cars because of the lack of separation. The research goes on to determine that the majority of the population that currently or might bicycle (the

[1] *Geller, R. "Four Types of Cyclists." Portland Office of Transportation. (https://www.portlandoregon.gov/transportation/article/264746)*

[2] *Dill, J. and N. McNeil. (2013, January) "Four Types of Cyclists? Examining a Typology to Better Understand Bicycling Behavior and Potential." Paper presented at the Annual Meeting of the Transportation Research Board.*

"Interested but Concerned" and "Enthused and Confident" categories) are concerned about interactions with motor vehicles, which indicates that separation from motor vehicle traffic is the most important factor to consider to encourage more people to bicycle.

Separation is achieved by providing different types of bikeway facilities depending on the traffic context (speed and volume of motor vehicle traffic). Many people can feel comfortable bicycling on low speed streets with very little motor vehicle traffic, even without a dedicated bicycle facility. On the other hand, higher speeds and higher volumes of motor vehicle traffic necessitate the provision of bikeway facilities that provide additional separation in order to be comfortable for the majority of the bicycling public. Figure 5 illustrates the relationship between bicycle facility types and traffic context. Each of the example images presents a low level of traffic stress for casual bicyclists.

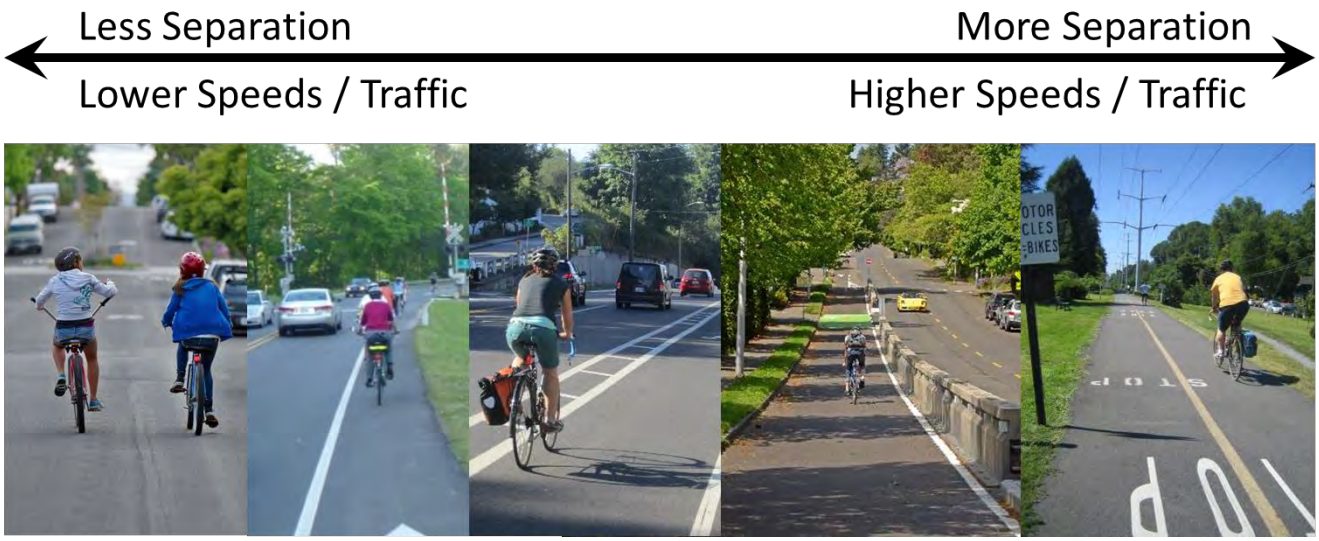


Figure 5: Relationship between Bikeway Facility Type and Traffic Context

2. Level of Traffic Stress Methodology

Traffic stress was analyzed for all streets and roads in the county using a combination of the Level of Traffic Stress (LTS) model, which was developed by the Mineta Transportation Institute, and the Bicycling Conditions for Rural Roadways model, which was developed by the Wisconsin Department of Transportation (WisDOT and used by several other state DOTs. The traffic stress analysis was based on available data, including speed limits, traffic volumes, pavement width, presence of on-street parking, and presence of bike lanes. Table 4 shows the rating scale used in this Plan that is a combination of the two models noted above. The detailed methodology used for the LTS analysis is described in Appendix A.

Table 4: Traffic Stress Analysis Rating Scale

Level of Traffic Stress Rating	Bicycling Conditions for Rural Roadways Rating	Description
LTS 1	n/a	Little to no traffic stress. Generally suitable for the entire population.
LTS 2	Good	Little traffic stress. Suitable for most adults, even those with little confidence or experience interacting with motor vehicles (e.g., the "Interested but Concerned").
LTS 3	Moderate	Moderate traffic stress. Uncomfortable and unappealing for some, but suitable for more experienced bicyclists.
LTS 4	Poor	High traffic stress. Only suitable for very skilled and confident bicyclists.

3. Level of Traffic Stress Analysis Findings

The LTS model identifies the traffic stress that may be experienced along each part of the roadway network. It also serves as a tool to help develop interconnected networks of low-stress bikeways that will appeal to the majority of the population (the "Interested but Concerned" and "Enthused and Confident" groups).

The analysis (see Figure 6) shows that a substantial portion of Will County's street and road network has low levels of traffic stress (LTS 1 and LTS 2). However, most of these low-stress roadways are local neighborhood streets that do not provide intercity or cross-county connections. On the other end of the spectrum, Will County's busier roadways rate as high stress (LTS 4), which is expected since traffic stress is directly associated with traffic volume. These high-stress roadways include several roads that are the primary or only paved connection between two communities, such as Wilmington-Peotone Road.

A limitation of this analysis is that the available data does not differentiate paved from unpaved roads. Therefore, while many roads in the southern half of Will County rate very good for biking, the vast majority of these are unpaved. Since unpaved roads pose challenges to narrow-tired road bikes, there is in fact a lack of low-stress paved connections in more rural parts of the county.

Findings from the LTS analysis suggest that while there are many low-stress roadways in Will County, these roadways do not always provide meaningful cross-county connections. Therefore, many bikeways of countywide significance will need to be located along busier roadways, in which case they will need to provide a higher level of separation between people biking and motor vehicle traffic. In most cases, full separation in the form of a paved path or trail will be necessary. In other cases, alternative parallel routes for on-street bikeways can be linked together along moderate-traffic local streets. However, some form of delineation—such as striped bike lanes—will be needed. In rural areas, paved shoulders may be adequate, especially for users that are more avid cyclists and are comfortable biking alongside higher-speed traffic.

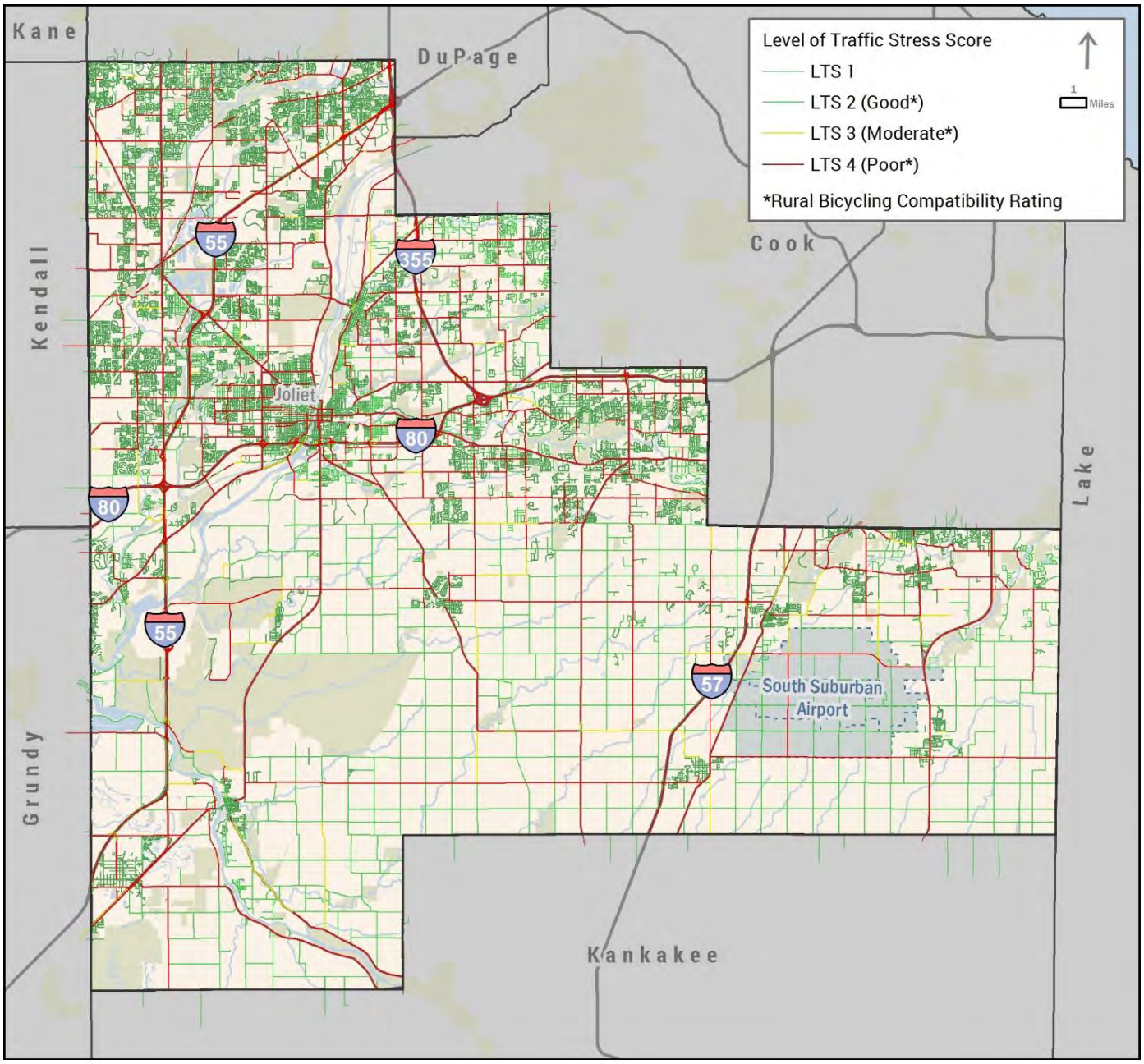


Figure 6: Traffic Stress on Streets and Roads in Will County

CONNECTIVITY ANALYSIS

Building upon the inventory of existing bikeways and the LTS analysis, a connectivity analysis was performed to identify gaps and missing connections in the existing countywide bikeway network. The connectivity analysis is based on five separate analyses that combine to present an image of the existing state of bikeway mobility in Will County. The steps to assess bikeway connectivity include:

1. **Existing Bikeways and Low-Stress Roadways** – assembling the existing bikeways and low-stress streets and roads as identified by the traffic stress analysis into one layer.
2. **Major Bikeway Gaps** – identifying gaps between existing bikeways, between pockets of low-stress streets and roads, and disconnected development patterns.
3. **Transit Gaps** – studying the accessibility of Metra stations relative to the existing bikeway network and network of low-stress streets and roads.
4. **Barriers** – pinpointing barriers created by expressways, rivers, active railroads and other physical features that make closing bikeway gaps more challenging.
5. **Community-Identified Priority Connections** – mapping missing connections or links identified as priorities during the stakeholder involvement process.

These steps are explained in further detail and illustrated via thematic maps on the following pages.

1. Existing Bikeways and Low-Stress Roadways

The first step in performing the connectivity analysis is to assemble the existing bikeways and low-stress streets and roads as identified by the traffic stress analysis into one layer, as shown in Figure 7. Pockets or "islands" of good connectivity begin to appear, as do spaces between without suitable bikeway or low-traffic street connections. As might be expected due to population and employment patterns, the northern portion of the county emerges as having a higher level of connectivity.

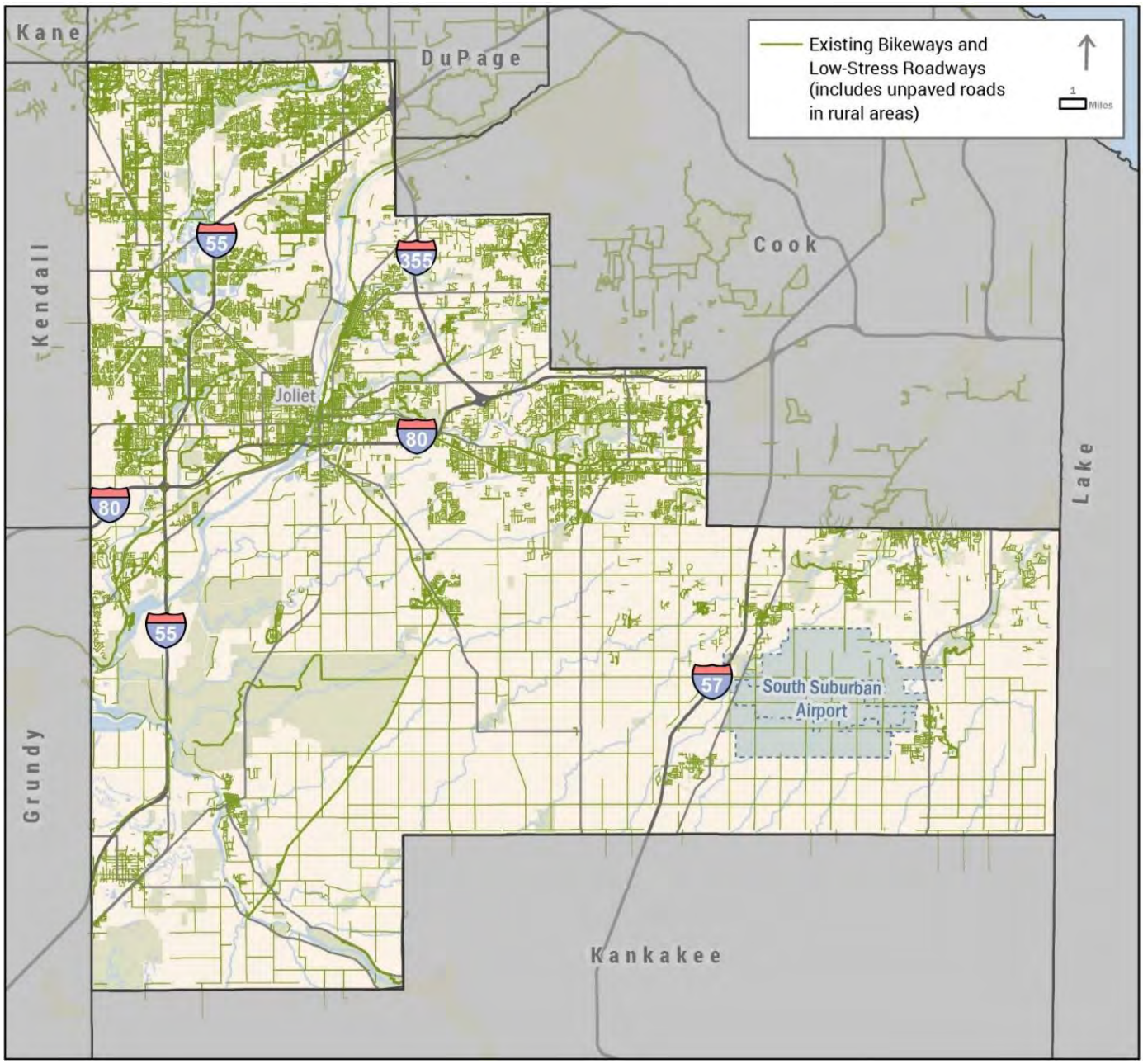


Figure 7: Existing Bikeways and Low-Stress Roadways

2. Major Bikeway Gaps

The next step in performing the connectivity analysis is to identify major gaps between existing bikeways. Missing links in the bicycle network can make travel challenging. For example, network gaps can make accessing other modes of travel (e.g., transit) difficult or can make it make it problematic to move seamlessly between bicycle facilities. These major gaps may reflect missing segments of trail, spaces between pockets or islands of low-stress roadways, areas between disconnected development patterns, or some combination of the three. Results show gaps are apparent and numerous, as they are in other growing northeast Illinois counties. Only the more significant gaps are highlighted in Figure 8. However, it is important to recognize that smaller gaps are numerous throughout the county, often occurring at the first and last mile of a trip. While some of these gaps can be addressed through the county bikeway network, most fall within the purview of local bikeway network and the municipal agencies responsible for their implementation.

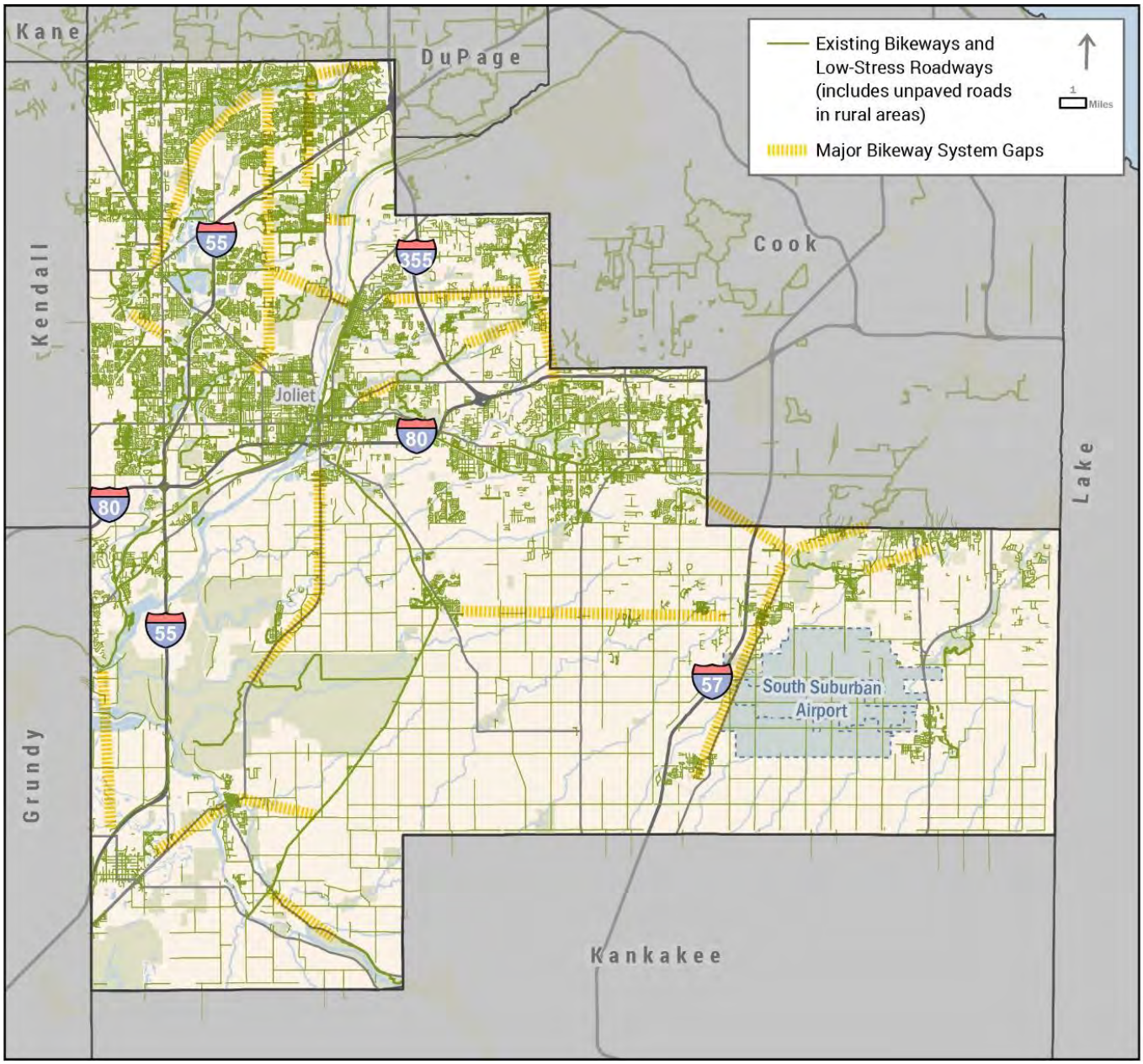


Figure 8 : Major Bikeway Gaps

3. Transit Access Gaps

Connectivity between modes, such as between the bicycle network and the transit network, is an important feature of a robust multimodal transportation system. With four Metra lines in Will County, many residents have good roadway access to commuter rail. Some Metra stations have very good access from the bikeway network, such as the Manhattan station, which is adjacent to the Wauponsee Glacial Trail. Others, however, have limited access for various reasons (see Figure 9).

- **Joliet** – Crossing the Des Plaines River on US-30 is a challenge for bicyclists. The bridges themselves have wide sidewalks that bicyclists can use, but the roadway approaches do not have a bikeway facility. Bike lanes, buffered bike lanes, or separated bike lanes are needed.
- **Laraway Road** – This station is located in a developing area and is accessed via Laraway Road, which is currently not comfortable for biking.
- **Hickory Creek** –To access the station one must bike along 191st Street or US-45 to access, neither of which are comfortable for biking.
- **University Park** – The station is only accessible from Governor's State University via a path leading to Stuenkel Road. Even then, there is a gap of approximately 150 feet from where the path terminates to the Metra parking lot driveway. The station is completely inaccessible to the industrial and employment area to the west except by the most confident of bicyclists.

The Pace fixed route bus system is also available in Will County, providing service to Bolingbrook, Romeoville, Lockport, Homer Glen, Crest Hill, Joliet, and University Park. Access to most of the Pace routes in Will County is provided via regular posted stops along the route.[3] This results in an acceptable-to-good level of access along most Pace bus routes.

Pace operates four express bus routes through its Bus on Shoulder program on I-55, providing service to Chicago from Plainfield, Bolingbrook, and Romeoville accessed from four Park-n-Ride locations. In contrast with Pace's fixed route service, the express routes can only be accessed at Park-n-Ride locations. The Plainfield and Canterbury (Bolingbrook) locations have good bicycle access. The Old Chicago (Bolingbrook) and White Fence Farm (Romeoville) locations, while located within 1.5 and 1 mile of the Centennial Trail respectively, have limited access to the existing bikeway network except by a few low-stress streets.

[3] Currently some Pace routes have flag service where passengers can board or alight the bus at any intersection along the route where the driver deems it is safe to do so. Pace is moving away from this practice and will eventually convert flag service to posted stop operations.

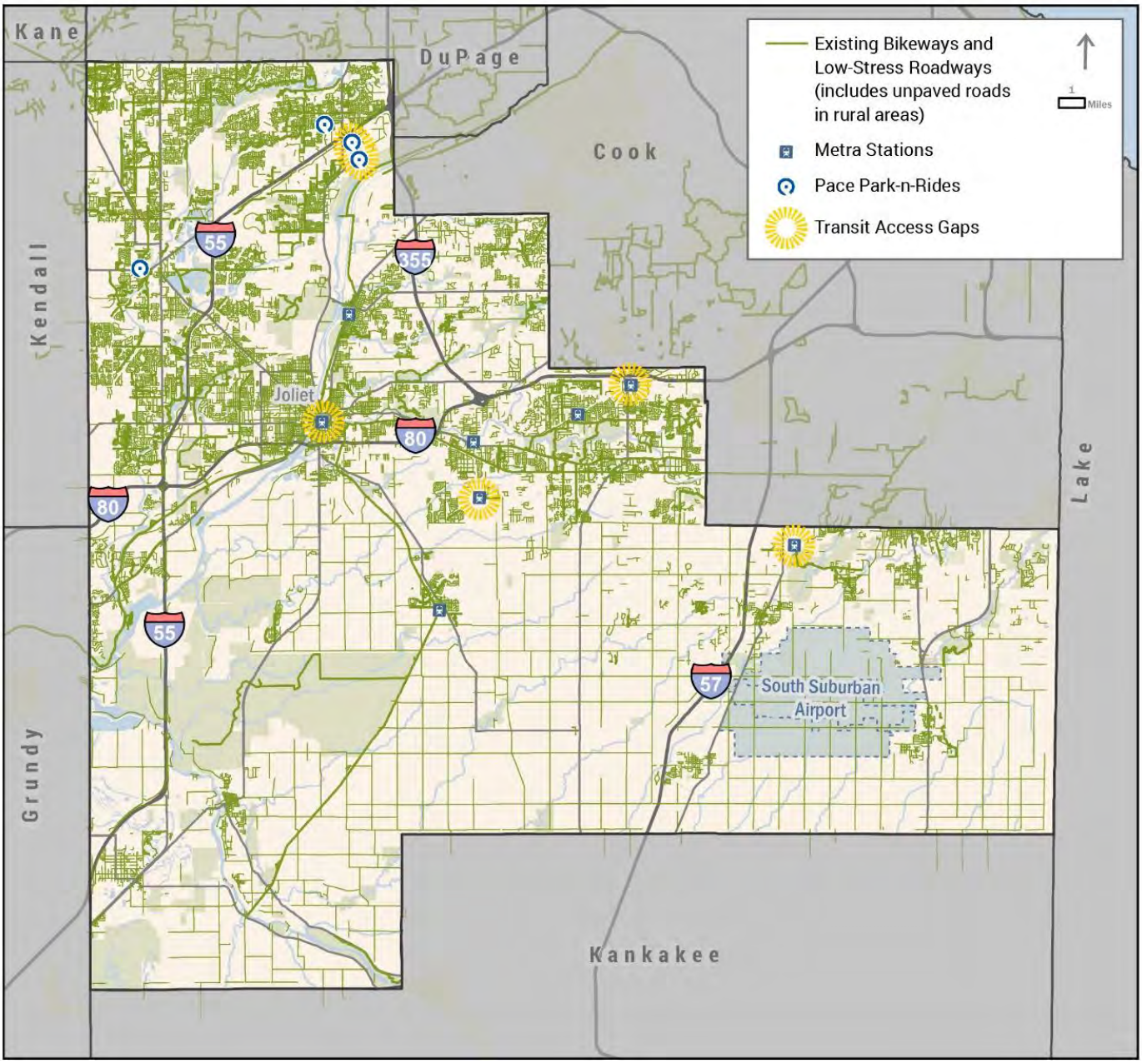


Figure 9: Transit Access Gaps

4. Barriers

The fourth step in performing the connectivity analysis is to identify barriers created by expressways, rivers, active railroads and other physical features that make closing bikeway gaps more challenging. Skirting such obstacles often requires an indirect route that adds significant time and distance to a trip. Even where roadway crossings exist, they still constitute a barrier if the bridge or underpass does not have bicycle accommodations in place. As shown in Figure 10, the most significant barriers are along the Des Plaines River corridor, which includes the river, Sanitary and Ship Canal, I&M Canal, multiple railroads, and state highways.

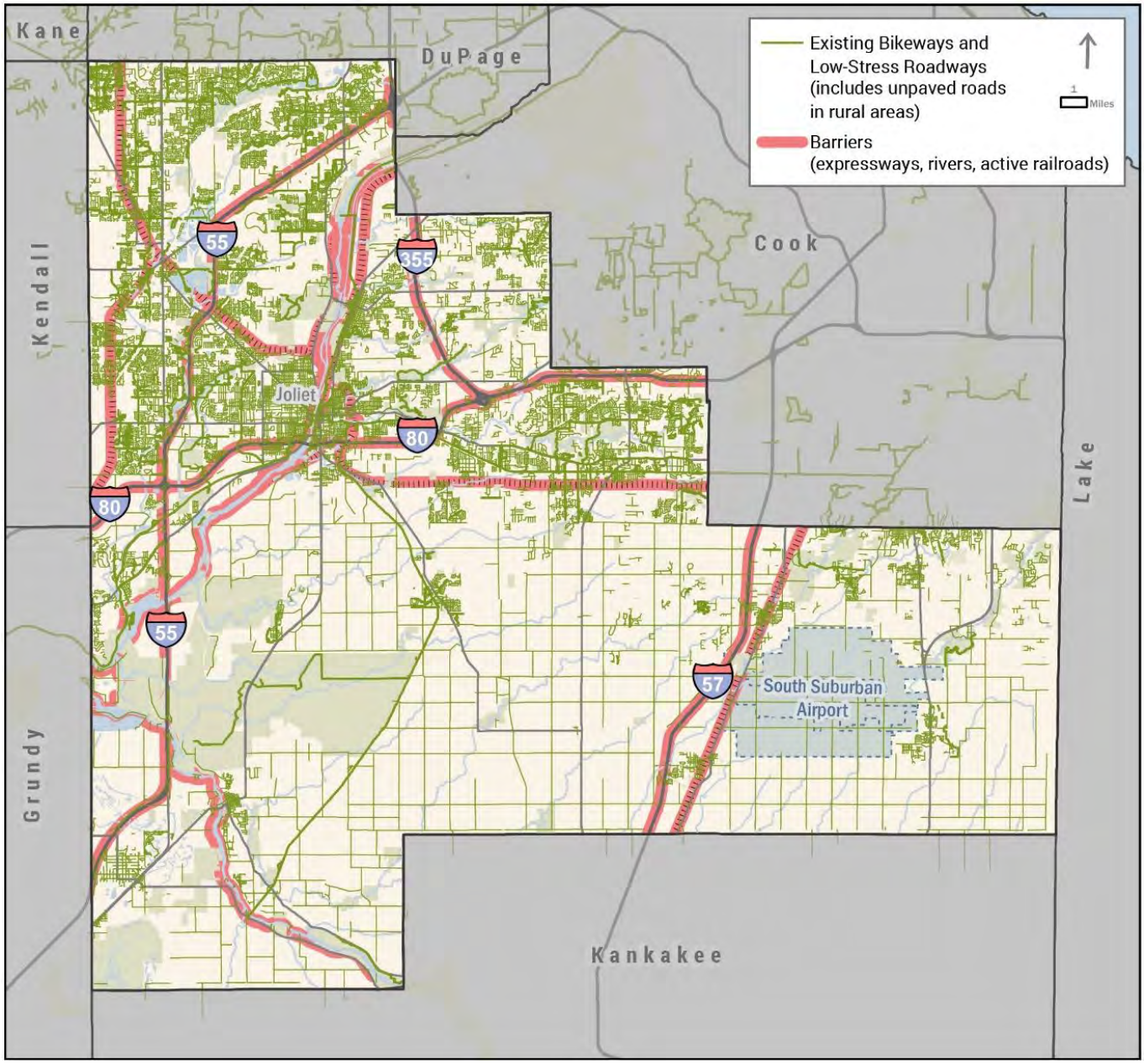


Figure 10: Barriers

5. Community-Identified Priority Connections

The final step in performing the connectivity analysis is to identify missing connections or links identified by the community as priorities through the public involvement process. As previously described, a number of different exercises were used to gather information and engage the public. Participants at the first round of Open Houses were asked to draw straight lines between what they believe are the most important destinations in Will County. Figure 11 indicates the summarized results of that exercise from these five Open Houses. Wider lines indicate more people identified that connection between destinations as a priority.

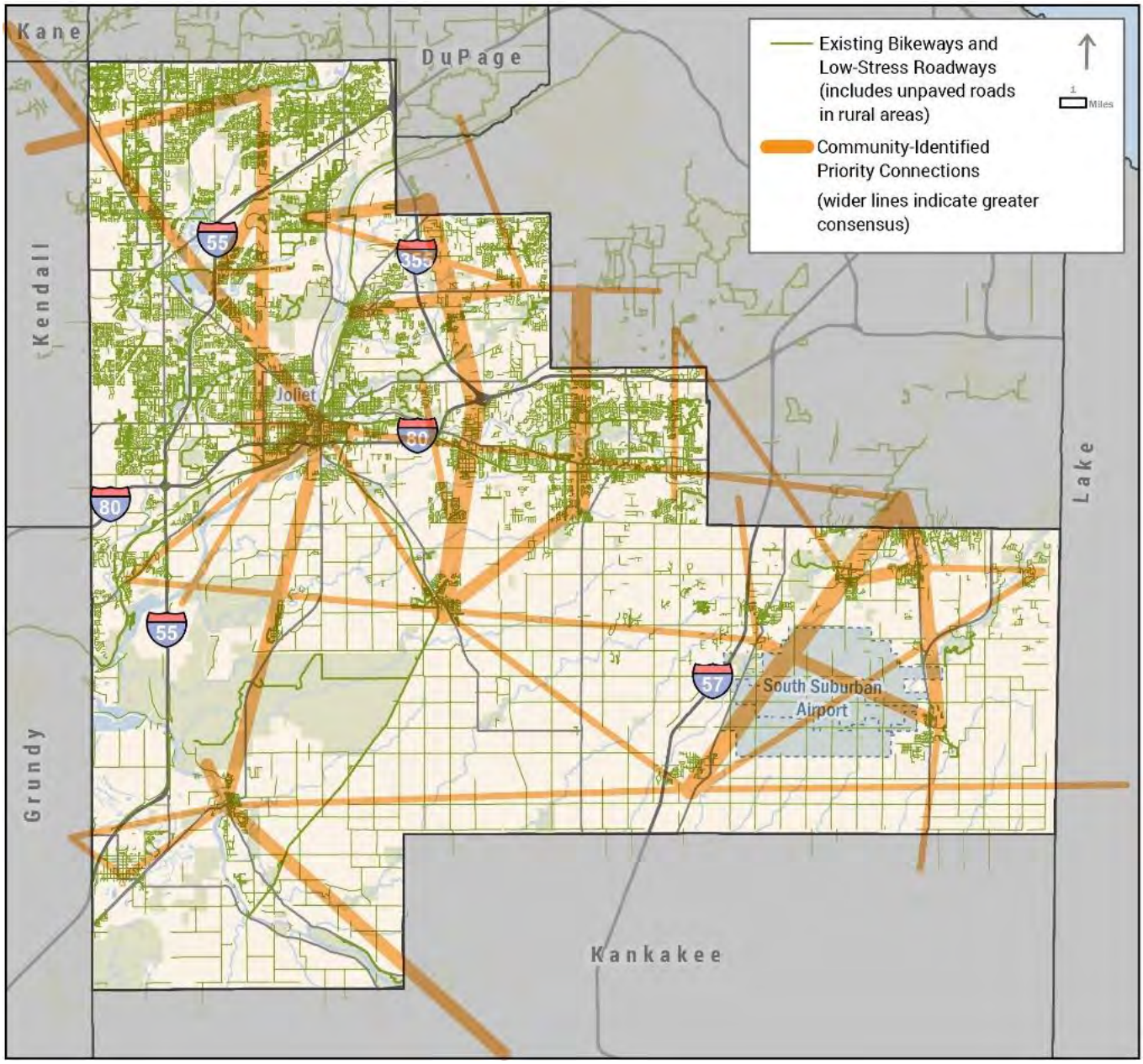


Figure 11: Community-Identified Priority Connections

6. Connectivity Analysis Summary

As shown in Figure 12, overlaying the five components of the connectivity analysis helps to pinpoint the intersection between these key factors. The process of identifying locations where multiple line types overlap—such as network gap lines overlapping priority connection lines—is a useful tool to inform the potential for bikeway corridors, which are described further in Chapter 3.

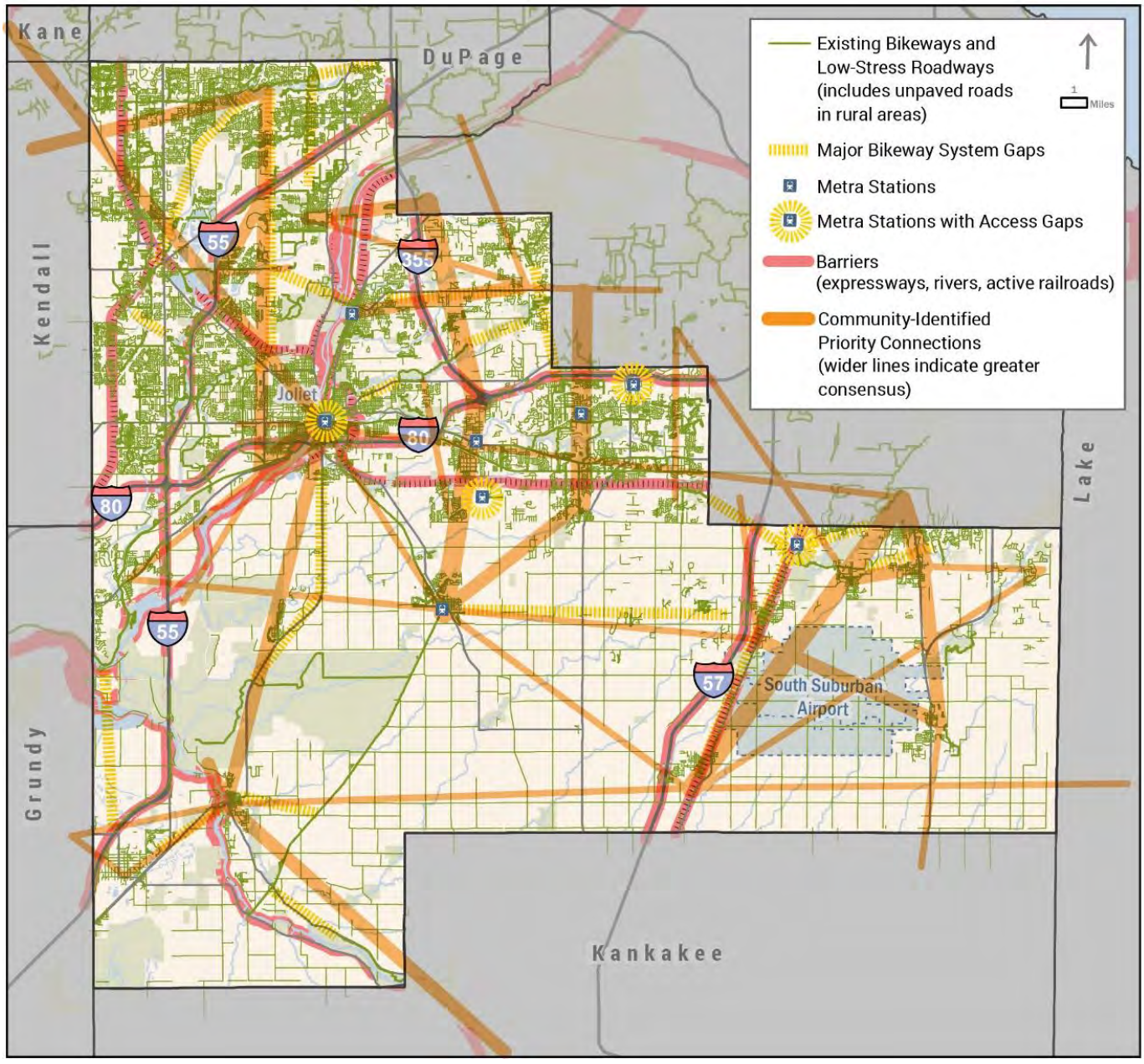


Figure 12: Connectivity Analysis Summary

NEEDS AND ISSUES

A range of needs and issues were identified as part of the analysis of existing bicycling conditions in Will County. These needs and issues help to shape the countywide network recommendations in Chapter 3 as well as the implementation strategies in Chapter 4. Needs and issues have been divided into the following three categories.

- Network Connectivity
  - There are several gaps in bikeway networks across the county. Some will be resolved through the development of future county bikeways, but many will ultimately be the responsibility of municipalities.
  - Several bridges and overpasses in Will County do not have provisions or space for bikeways. Some bridges may be retrofitted, but others may not. As bridges are replaced in the future, each one should include space for a bikeway accommodation on one or both sides, even if a bikeway is not present along the corridor at the time.
  - Disconnected development patterns are present across the county—especially in the southern and western areas. As development continues, communities should actively seek solutions to increase connectivity between neighborhoods through street connections, trail easements, or other means. This may entail adopting subdivision regulations that mandate bikeway and pedestrian connections to surrounding developments.
- Policy and Process
  - Bikeways are often an afterthought in the roadway project development process. As such, there is often not adequate budget or right-of-way (ROW) remaining to provide bikeways. An updated project development process that includes communication with local agencies prior to engineering or a presence of a Complete Streets policy would support proactive bikeway planning.
  - Will County, IDOT, and local municipalities are all faced with budget limitations, to some degree. As such, investments in bikeway infrastructure should be targeted to prioritize projects that provide high levels of connectivity between communities and destinations.
  - Consistency between bikeways from one community to the next is important. Just as people driving expect consistency along major streets in pavement quality and roadway width when they cross a boundary from one city to the next, people biking expect consistency in the design of bikeways. Facility selection guidelines and design guidelines (see Chapter 4) will help to address this issue.
- Ease of Use
  - In order to serve as a viable transportation system, bikeways must connect people to where they want to go. This includes providing safe and convenient access to transit, connectivity to neighborhoods, and proximity to destinations such as employment centers, schools, and

commercial areas. This is commonly referred to as first and last mile connectivity, a term that highlights the fact that a bikeway that runs near destinations is not as useful as one that connects to destinations.

- People have different preferences, abilities, and levels of traffic tolerance when it comes to bikeway route selection. Many people prefer only to bike on separated trails and feel unsafe interacting with motor vehicle traffic to any degree. This group is likely to ride more often (perhaps consequently drive less often) if comfortable bikeways were available and convenient. Other people have high higher levels of traffic tolerance and prefer the most direct route between where they are and where they are going. They may prefer on-street bikeways because they prefer to avoid slower bicyclists, pedestrians, and animals on trails. Creating a bikeway network that meets the needs of various users is important to making the network useful to the entire population.
- Finally, the usefulness of bikeways is greatly influenced by legibility and the presence of wayfinding tools. In other words, providing bike route signs, trail maps, pavement markings, and other visual cues increases the ability to navigate the bikeway network.

Chapter 3: Future Conditions: Tomorrow's County Bikeway Network

DEFINING THE FUTURE NETWORK

As described in the previous chapter, Will County has a number of major bikeway corridors that provide long-distance cross-county connections and linkages to surrounding counties, to Chicago, and to the State of Indiana. For example, the I&M Canal Trail and Centennial Trail corridor connects Joliet and multiple smaller communities to surrounding counties and beyond. Existing bikeway corridors provide a logical starting point from which to envision a more layered and interconnected countywide bikeway network. Building on this foundation, strategic corridors within Will County have been identified to address gaps in the bikeway network that emerged through the connectivity analysis performed in Chapter 2. The ultimate goal is to create a more comprehensive county bikeway network that can:

- Provide connections between major destinations not currently accessible by existing bikeways;
- Expand the grid of bikeways that link parts of the county and are accessible to the majority of the population;
- Expand transportation choices by enabling bicycling to become a more viable transportation option in Will County; and
- Provide easily-accessible recreation opportunities for the public.

1. Future Network Overview

The future county bikeway network is shown in Figure 13; however, it should be noted that future residential developments, commercial developments, and public facility improvements may also offer new opportunities for additional and/or alternative bikeway linkages than those specifically identified in this Plan. The various segments of the future network provide new connections to regional destinations such as numerous parks, Metra stations, Governor's State University, commercial centers along Weber Road, and many more. It also includes 15 connections to surrounding counties, in addition to the connections already made by existing county bikeway corridors.

Some segments within the future bikeway network follow rivers, railroads, or utility corridors. In these locations, the bikeways will eventually be developed as multi-use trails. The surfaces in the more populous portions of the county and along heavily-used trails will generally be concrete or asphalt. Limestone screening surfaces will likely be used in the more rural parts of the county, along lesser-used trails, or in environmentally-sensitive areas.

As discussed in Chapter 2, many segments of the future network follow roadway ROW out of necessity. In general, the roadways that are followed have higher traffic volumes and/or speeds. This necessitates the provision of bikeways with a higher degree of separation between people bicycling and motor vehicle traffic. The most common type of bikeway for this situation is the sidepath—a trail alongside a roadway. Although sidepaths provide separation, they are subject to conflicts at driveway crossings and intersections between people bicycling and motor vehicles. These conflicts should be avoided by minimizing driveway crossings, increasing visibility at crossings, and designing intersections with grade-separated crossings or advanced signal design (see Chapter 4 for further guidance on sidepath design considerations). Other bikeway types that may

provide adequate separation in similar situations (depending on context) include separated bike lanes, buffered bike lanes, and standards bike lanes. Guidance on the selection of appropriate bikeway facility types is provided later in this chapter.

Following is a brief description of each of the 14 identified bikeway corridors as shown in Figure 13.

North-South Corridors

1	DuPage River Trail	This corridor creates new connections between population and employment centers in the north and enhances access to the bikeway network for users in the south. Much of this corridor serves both recreational and transportation trip purposes; however, the context changes south of Channahon, becoming more rural and recreational in nature. Many segments and neighborhood connections in the corridor are already in place.
3	Weber Road / IL-53	In the north, Weber Road has experienced tremendous growth and is a major destination, serving primarily short distance transportation-oriented trips. An alternative to Weber Road follows Independence Boulevard (IL-53). It offers a less active context than Weber Road for the majority of the alignment except in downtown Joliet and includes both an urban and rural setting.
5	Veterans Memorial Trail to Jackson Creek	This corridor follows the I-355 footprint along a utility corridor and continues south to Manhattan. The corridor context changes as it traverses through both developed and undeveloped areas. It intersects with other corridors that offer a mix of transportation and recreational value.
7	Spring Creek to Jackson Creek / US-45	The corridor has two distinct contexts; in the north it connects suburban communities and destinations while the rural setting of the portion south of Delaney Road primarily offers recreational value. Many segments in the northern section are already in place.
9	Tinley Park to Plum Creek Greenway	This corridor provides connectivity between suburban communities and a major destination (Governor's State University). It serves both transportation and recreational trips, connecting to other corridors that have recreational value. Many neighborhood connections are already in place in its northern section.
11	Thorn Creek / Governor's Highway	This inter-county corridor provides a bikeway connection to established bikeways in southern Cook County. The northern portion of the corridor serves a mix of transportation and recreational trip purposes, but south of Monee it primarily offers recreational value. Much of the corridor does not have developed bikeways in place already.
13	Vincennes Trail	This corridor is mainly situated within a rural setting and serves recreational trips. The corridor creates new connections between Crete and Beecher populations. It connects to other corridors that offer a recreational function and some segments of this corridor are already in place.

15	Plum Creek to Pennsy Greenway Trail	Segments of this corridor on its southern end are already. This corridors serves a recreational function, but also offers access to communities in Crete and Beecher. This inter-state corridor provides a bikeway connection to destinations in Indiana.

East-West Corridors

2	Plainfield to Veterans Memorial Trail	This corridor connects existing population and employment centers between Plainfield and Bolingbrook and primarily serves short-distance transportation trips. The corridor intersects with other corridors that also serve a similar function. Many local bikeway segments within this corridor are already in place to connect these communities.
4	Aurora to Orland Park	The corridor traverses through a mix of densities, destinations, and community types in the northern half of the county. The corridor offers both transportation and recreational value and intersects with other corridors that similarly offer a mix of trip purposes. Some segments in the western portion of the corridor are in place, but much of the corridor does not have developed bikeways.
6	Black Road	With many bikeway segments already in place, this corridor provides connections between suburban communities as well as connections to other corridors and existing bikeway facilities. While the bikeway bypasses downtown Joliet , it does connect with existing bikeways that offer access to the downtown areas, helping this bikeway serve both transportation and recreational trip purposes.
8	Rock Run to Harlem Avenue	This corridor mainly serves recreational trip purposes as it does not create new connections between existing population and employment centers. However, the corridor passes through several future residential growth areas. An alternative to Delaney Road would follow Jackson Creek. This corridor provides a long-distance recreational route to enhance east-west connectivity with existing major bikeways in the county and also connects to other corridors that offer a mix of transportation and recreational value.
10	Wauponsee Glacial Trail to Plum Creek Greenway	The rural context of this corridor means that it will primarily be used for recreational trip purposes. However, the corridor also creates new connections between Monee and Crete. This corridor does not have developed bikeways in place at this time.
12	Wilmington Peotone Road / Route 66	This corridor follows the proposed Illiana Expressway. The rural setting means that it will primarily be used for recreational trip purposes. The corridor provides a long-distance route, but it does not connect population or employment centers. This corridor does not have developed bikeways in place at this time.

Note: There is not a Corridor 14.

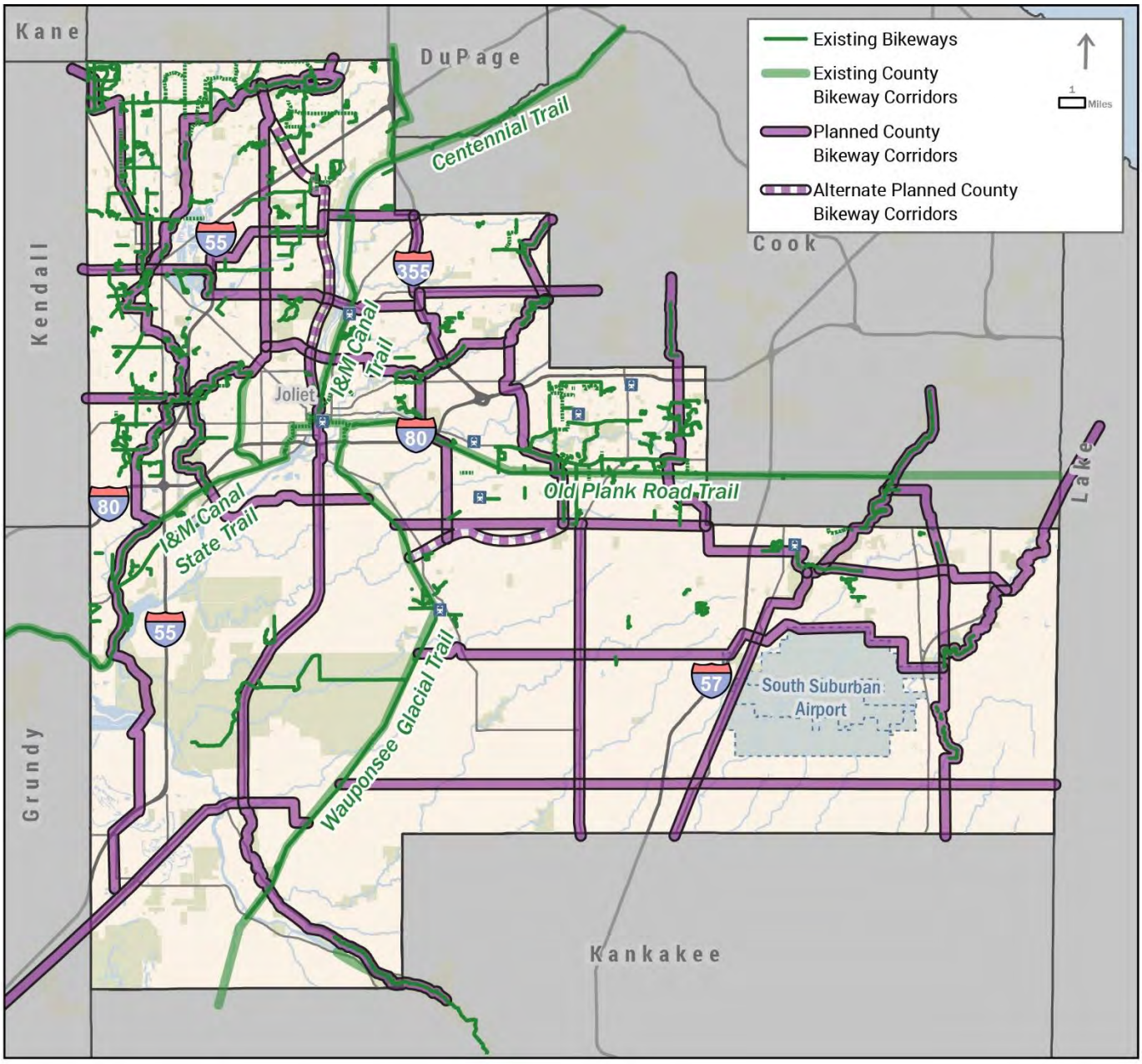


Figure 13: Future County Bikeway Network

CORRIDOR SELECTION

Using a corridor approach provides a framework for organizing cross-county bikeway opportunities geographically for both transportation and recreation functions. Corridors offer a structured and strategic approach to help facilitate more detailed planning, prioritization, and ultimately programming of bikeways, whether they are long distance connections or critical first or last mile links. First, the county bikeway network was divided into cross-county corridors, and then evaluated using a set of selection criteria developed specifically for this Plan, and finally selected for further study.

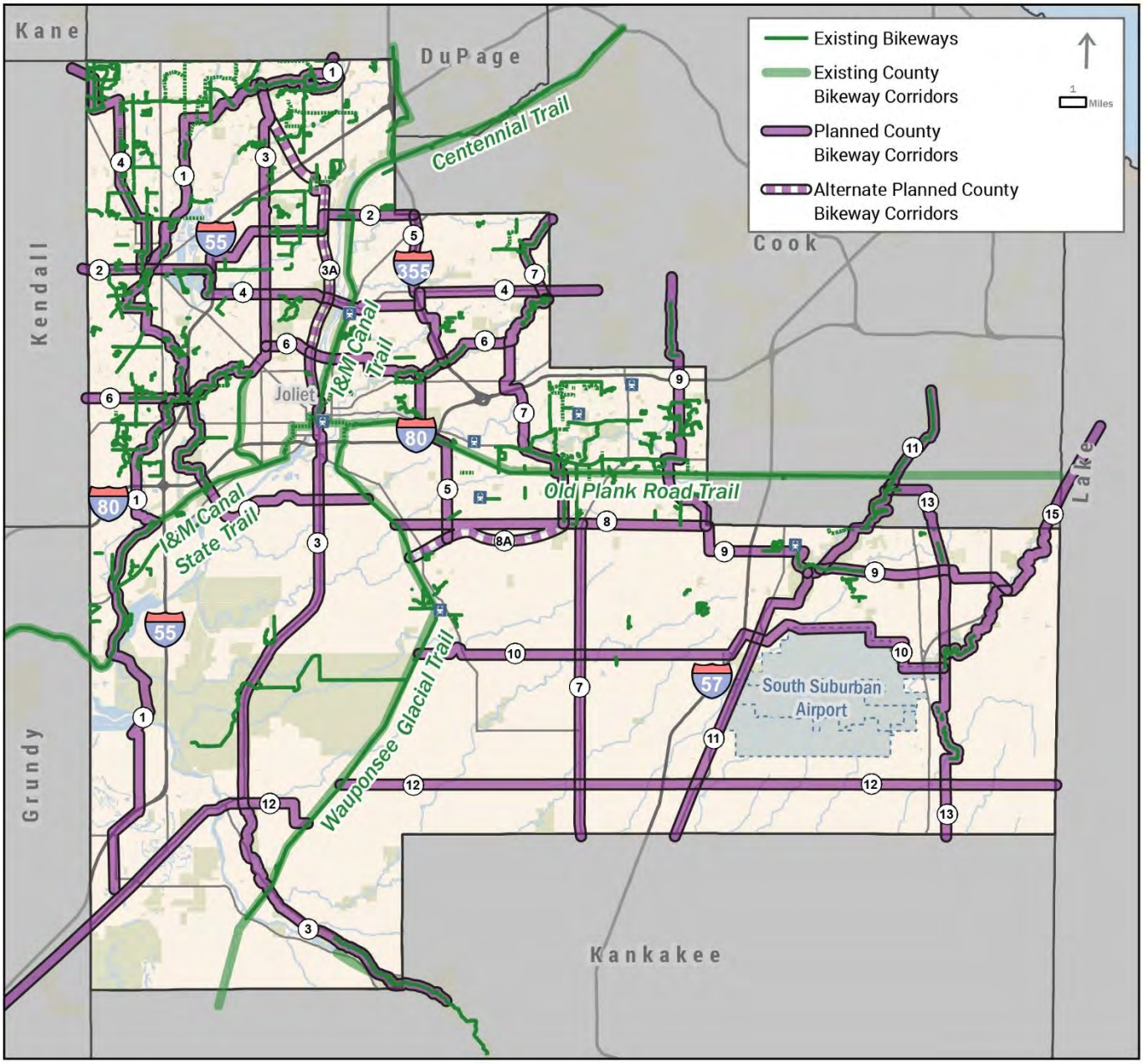
1. Defining Corridors within the Future Bikeway Network

The future county bikeway network was divided into 14 corridors (see Table 5 and Figure 14) that offer a combination of long-distance links with local connections. The corridors are numbered based on a grid, which does not reflect priority order. Odd numbered corridors run north-south, beginning with Corridor 1 at the western edge of the county and ending with Corridor 15 at the eastern edge. Even numbered corridors run east-west and begin with Corridor 2 at the northern edge of the county and end with Corridor 12 at the southern end. (There is not a Corridor 14.)

Table 5: Future Bikeway Network Corridors

ID	Name or Description	Length *	ID	Name or Description	Length *
1	DuPage River Trail	49 miles	8**	Rock Run to Harlem Avenue	25 miles
2	Plainfield to Veterans Memorial Trail	15 miles	9	Tinley Park to Plum Creek Greenway	26 miles
3**	Weber Road / IL-53	41 miles	10	Wauponsee Glacial Trail to Plum Creek Greenway	23 miles
4	Aurora to Orland Park	30 miles	11	Thorn Creek / Governor's Highway	23 miles
5	Veterans Memorial Trail to Jackson Creek	14 miles	12	Wilmington Peotone Road / Route 66	39 miles
6	Black Road	23 miles	13	Vincennes Trail	16 miles
7	Spring Creek to Jackson Creek / US-45	25 miles	15	Plum Creek to Pennsy Greenway Trail	18 miles
		Total	367 miles		

*Approximate. **Corridors 3 and 8 have alternative corridors identified, which are labeled 3A and 8A.



Note: There is not a Corridor 14.

Figure 14: Future County Bikeway Network – Distinct Corridors

2. Corridor Selection Criteria

A set of corridor selection criteria was assembled to both guide and expand the depth of understanding about the unique opportunities and challenges of each county bikeway corridor. These criteria were also used to evaluate corridors, providing a consistent platform from which all corridors could be assessed. This process was one of the considerations that led to the selection of corridors for further study. The criteria, developed with the input of the Steering Committee, help to describe and classify potential corridors and provide guidance for determining alignments within each corridor. The criteria are qualitative in nature and are applied in a descriptive way to facilitate discussion and allow for geographic equity. Quantitative criteria factor into the planning process as part of the determination of the preferred facility type for the corridors selected for further analysis.

Corridor selection criteria are phrased as questions, as shown below. Each of these questions was answered for each corridor and a qualitative rating based along a continuum (see Figure 15) was assigned. Each corridor was rated relative to the other corridors through an iterative process that incorporated refinements based on input from stakeholders.

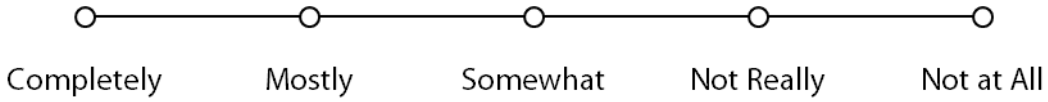


Figure 15: Corridor Selection Criteria Rating Scale

A. Does the corridor improve access to regional destinations?

To what degree will the corridor provide links between downtowns, employment centers, regional retail areas, Metra stations, individual outlying communities, parks and recreation areas, universities, major health centers, and other regional destinations? (Consider the potential for environmental, community vitality, and economic development benefits of a corridor.)

B. Does the corridor connect to existing trails and bikeways?

To what degree can new bikeways and trails within the corridor improve connections to and close gaps within the national, statewide, regional, and local trail and bikeway networks? (Consider how the corridor will expand the reach of the existing trail network in Will County.)

C. Does the corridor provide a direct route?

To what degree does the corridor provide a direct link between destinations, minimizing distances and the likelihood of confusion without relying too heavily on wayfinding? (Consider whether excessive turns and meanders are required in order to cross barriers such as rivers and freeways.)

D. Does the corridor allow the provision of low-stress bikeways?

To what degree can low-stress bikeways be provided, including those that reduce conflicts between bicyclists and motor vehicles? (These may include separated trails with limited at-grade crossings, bikeways that provide separation from motor vehicles, and bikeways along low-traffic streets and roads.)

E. Does the corridor provide recreational as well as transportation value?

To what degree does the corridor pass through scenic areas, follow waterways or greenways, utilize picturesque rural roads, and connect to Forest Preserve District lands or other open spaces? (Consider that for some people, biking in urban areas (such as to dinner or the library) has recreational value.)

F. Is near-term implementation feasible within the corridor?

To what degree can bikeway implementation be completed in the near-term within the corridor? (Consider state of development build-out, ROW constraints and opportunities for future acquisition, street and road lifecycle and upcoming projects, availability of funding, future growth areas, and physical constraints.)

3. Corridor Ratings and Descriptions

The corridor selection criteria were applied to each of the 14 corridors, with some corridors (3, 7, and 12) being divided into two parts and analyzed separately due to significant changes in context from one end to the other. The resulting ratings are summarized in Table 4. Ratings and descriptions for all corridors evaluated as part of the planning process are compiled in Appendix B. In general, the corridors in the more established and populous portions of the county rate higher because these areas have a higher density of destinations and existing bikeways. However, several corridors in the southern portions of Will County rate relatively well because of their proximity to major parks and preserves, ability to connect distinct communities, and recreational value.

Table 6: Summary of Corridor Selection Criteria Ratings

ID	Name or Description	Destinations	Bikeway Connections	Directness	Low-Stress Capability	Recreation/ Transportation Value	Feasibility
1	DuPage River Trail*	C	C	M	C	C	C
2	Plainfield to Veterans Memorial Trail	C	C	M	C	S	C
3 (north)	Weber Road	C	C	C	M	S	S
3 (south)	IL-53	M	C	C	S	M	S
4	Aurora to Orland Park	C	C	S	C	M	C
5	Veterans Memorial Trail to Jackson Creek*	C	M	M	M	S	M
6	Black Road*	C	C	M	C	C	M
7 (north)	Spring Creek to Jackson Creek	C	S	NR	M	M	M
7 (south)	US-45	NA	NA	C	S	S	NR
8	Rock Run to Harlem Avenue	S	S	M	S	M	NR
9	Tinley Park to Plum Creek Greenway	C	C	M	M	S	C
10	Wauponsee Glacial Trail to Plum Creek Greenway	S	S	C	S	S	NR
11	Thorn Creek / Governor's Highway	C	M	C	C	C	S
12 (west)	Route 66	C	M	S	M	C	M
12 (east)	Wilmington Peotone Road	NR	S	C	S	S	S
13	Vincennes Trail	M	NR	C	C	C	S
15	Plum Creek to Pennsy Greenway Trail*	M	M	C	C	C	S

*Corridor has been studied in detail as part of a previous planning effort.

Key:	C = Completely	M = Mostly	S = Somewhat	NR = Not Really	NA = Not at All

4. Bikeway Corridors for Further Study

The 14 bikeway corridors identified earlier in this chapter constitute a framework for a long-term vision of a countywide bikeway network in Will County. It is envisioned that all of the corridors will eventually be studied to identify specific challenges and opportunities, estimate probable costs, and explore alternative solutions. To provide a catalyst for implementation of the Bikeway Plan and coordination between partner agencies, five

bikeway corridors were identified as ripe for further study at this time. The selection was performed by identifying high-rated corridors, excluding corridors for which a substantial amount of planning has already been performed (DuPage River Trail, Veterans Memorial Trail to Jackson Creek, Black Road, and Plum Creek to Pennsy Greenway Trail), factoring in stakeholder priorities, and adjusting for regional equity. The five selected corridors are listed in Table 7 and shown in Figure 16.

Table 7: County Bikeway Corridors for Further Study

ID	Name or Description	Destinations	Bikeway Connections	Directness	Low-Stress Capability	Recreation/ Transportation Value	Feasibility
3 (north)	Weber Road	C	C	C	M	S	S
4	Aurora to Orland Park	C	C	S	C	M	C
7 (north)	Spring Creek to Jackson Creek	C	S	NR	M	M	M
9	Tinley Park to Plum Creek Greenway	C	C	M	M	S	C
12 (west)	Route 66	C	M	S	M	C	M
Key:	C = Completely	M = Mostly	S = Somewhat	NR = Not Really	NA = Not at All		

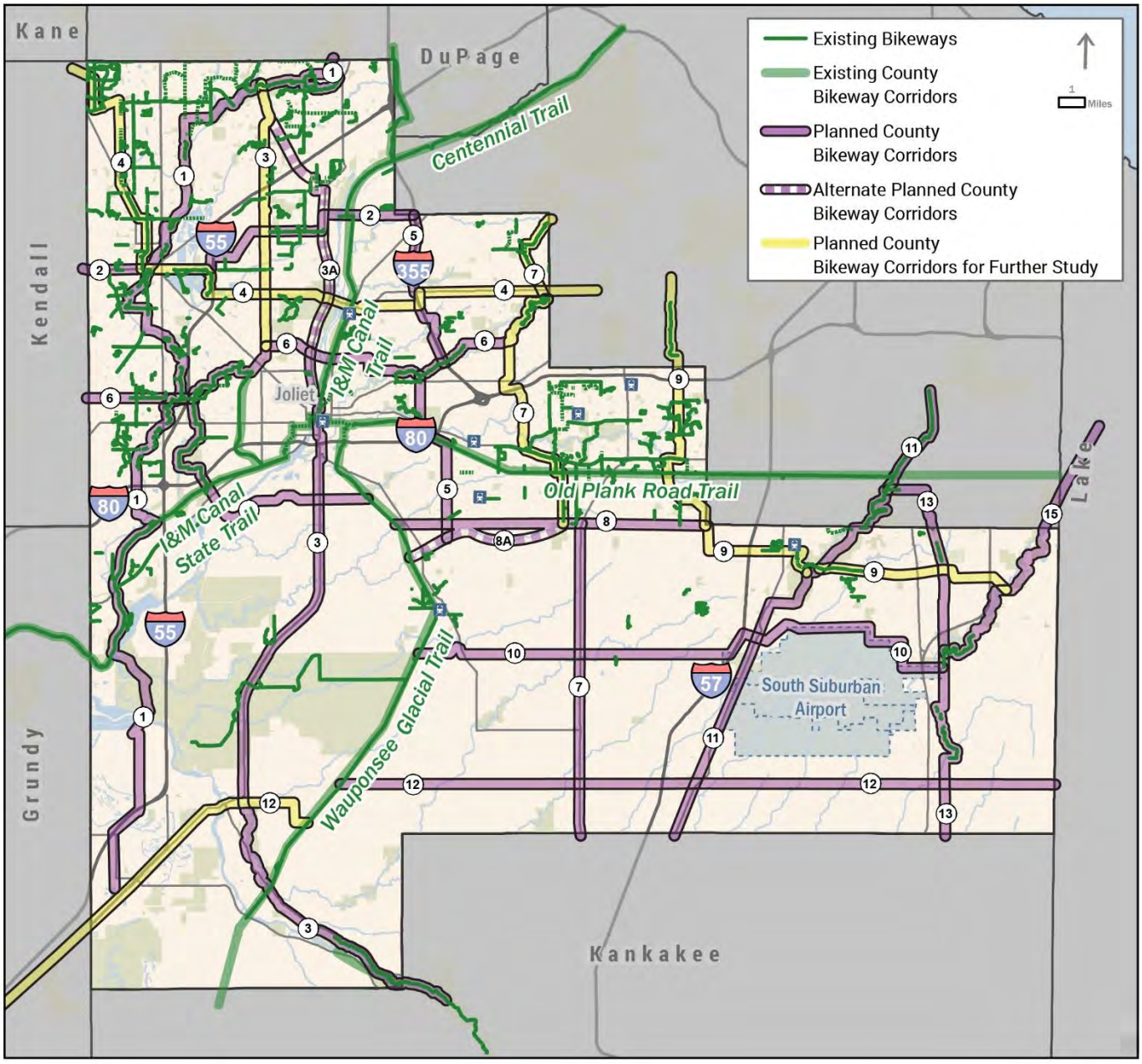


Figure 16: County Bikeway Corridors for Further Study

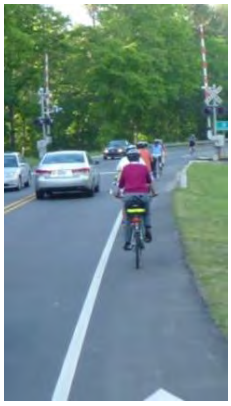
BIKEWAY TYPES AND SELECTION PROCESS

1. Bikeway Types

A variety of bikeway types are used across the country, ranging from simple bike route signs to complex separated bike lanes with colorized pavement and specialized traffic signal systems. The determination of appropriate bikeway types is described in the following section, but is largely based on traffic context and the complexity of the roadway environment. As such, some of the more complicated bikeway facilities seen in urban centers such as downtown Chicago are not necessary in Will County. Over the following pages, the basic bikeway types recommended by this Bikeway Plan are described, in order from least to most separation from motor vehicle traffic. Variations of these types are common (such as adding a buffer to a bike lane) but are not specifically described in this Bikeway Plan.



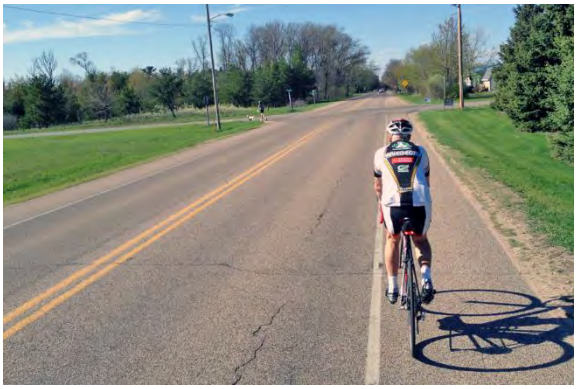


Shared Streets

Shared streets are the simplest type of bikeway, often little more than a designated route on a low-traffic or low-speed local street or rural road. Low-cost, strategically-placed pavement markings and signage enhance shared streets. Shared lane markings, or sharrows (see image), increase awareness of bicyclist presence, indicate lane positioning, and aid in wayfinding. Signs aid in wayfinding and raise awareness of the rules of the road.

Paved Shoulders



Paved shoulders that serve as a bicycle accommodation are typically 4 or 5-feet wide. Higher traffic roads can be improved for bicycling through the provision of wider (6 to 8-feet) paved shoulders. Considering the fact that most rural roads in Will County have speed limits of 45 miles per hour or higher, paved shoulders are typically only comfortable for more confident bicyclists. While a stripe delineates the shoulder from the travel lane, paved shoulders are not typically marked or signed as bike lanes. Furthermore, shoulders are not only used by bicyclists, but also by emergency and maintenance vehicles, agricultural equipment, and others.

Bike Lanes

A bike lane designates space for the preferential or exclusive use of bicyclists. Standard bike lanes are typically 5-feet wide but wider variations can be advantageous, especially where traffic volumes are higher than 8,000 ADT or speeds are greater than 35 miles per hour. A common variation is the buffered bike lane, which places an 18-inch to 3-foot wide painted buffer between the bike lane and adjacent travel lane. When high-turnover on-street parking is present, it is common to place a painted buffer between the bike lane and the parking lane to minimize the threat of "dooring."

Separated Bike Lanes

A separated bike lane, sometimes called a cycle track or protected bike lane, is a bicycle facility that is separated from both the street and the sidewalk by a physical barrier. Separated bike lanes can be designed as one-way for bicycles on each side of a two-way street, or serve two-way bicycle traffic, installed on one or both sides of the street. A variety of vertical elements are typically used to provide separation from motor vehicle traffic including curbs, concrete barriers (as pictured), planter boxes, bollards, and flex posts.

Sidepaths

A sidepath is a shared-use paved path or trail located within a roadway ROW. Sidepaths may be desirable along high volume or high speed roadways, where accommodating the targeted type of bicyclist within the roadway in a safe and comfortable way is impractical due to physical constraints, traffic volumes and speeds, and context. However, sidepaths may present increased conflicts between path users and motor vehicles at intersections and driveway crossings. Conflicts can be reduced by minimizing the number of driveway and street crossings present along a path and otherwise providing high-visibility crossing treatments. Common engineering standards state that sidepaths should not be used to preclude on-street bicycle facilities, but rather to supplement a network of on-street bikeways. In other words, in some situations it may be appropriate to provide an on-street bikeway in addition to a sidepath along the same roadway.

Paths

A shared-use path or trail is typically located in an independent ROW such as a river corridor, wooded greenway, along a utility corridor, or an abandoned railroad corridor. Paths as part of county bikeway corridors should be at least 10-feet wide and can be paved with asphalt, concrete, or limestone screenings. Where higher use is expected, 12-foot wide paths or even wider should be considered to separate users.

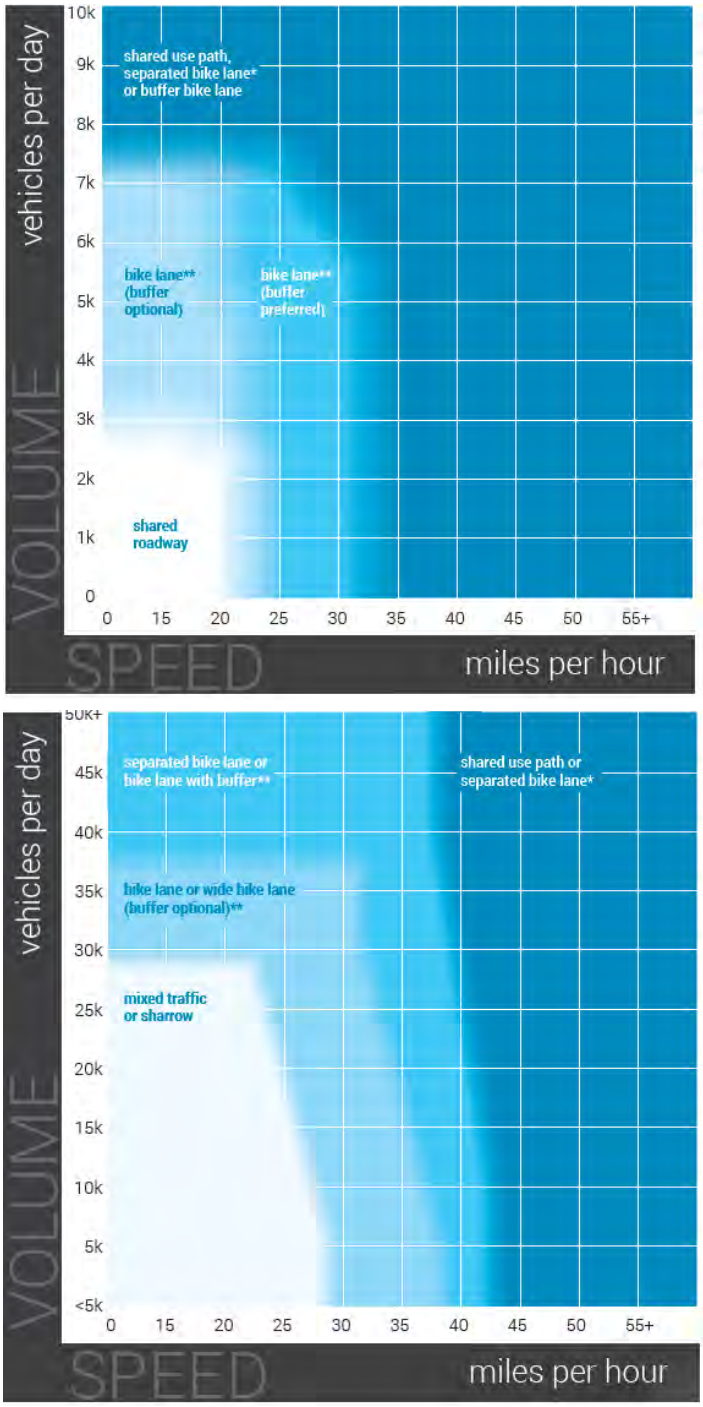
2. Bikeway Facility Selection Process

The first step in selecting an appropriate bikeway facility type for a county bikeway corridor is to determine the corridor type. For bikeways along independent ROW (rivers, railroads, utility corridors, etc.), the appropriate facility type will almost always be a shared use trail (asphalt or concrete in most situations and limestone screenings in lower-traffic or environmentally-sensitive areas).

For county bikeways along street and road ROW, a more complex selection process is used. In summary, an appropriate facility type is selected by first determining the type of users expected. Less confident bicyclists typically need a more substantial bikeway facility whereas more confident bicyclists can be accommodated with a moderate level of separation from motor vehicle traffic. As shown in Figure 17, traffic volumes and speeds are the primary determinant of bikeway facility type. Higher traffic volumes at faster speeds require higher-grade bikeway facilities to provide more separation from motor vehicle traffic. Selected bikeway facility types should consider engineering and economic feasibility as well as overall bikeway network continuity.

The bikeway facility selection process is explained in greater detail in Chapter 4.

Figure 17: Facility Selection Process



Top: Selection process for Less Confident, Casual, or "Interested but Concerned" Users.
Bottom: Selection process for More Confident, Avid, or "Enthused and Confident" Users.

SELECTED CORRIDOR PROFILES

Earlier in this chapter, a strategic set of 14 county bikeway corridors was identified, analyzed, and rated. These corridors provide a framework for a countywide bicycle network, as one does not currently exist. From the larger set of countywide corridors, five high-rated corridors were selected for further study to initiate planning activity and serve as a guide for bikeway partner agencies. This section provides a detailed profile for each of the five corridors, providing information about the following elements:

- Summary of the corridor's context.
- Discussion of corridor selection criteria ratings.
- Overview of challenges and constraints.
- Recommendations for bikeway facilities within the corridor.[4]
- Planning-level cost estimate ranges for bikeway facilities within the primary corridor alignment.[5] (Planning-level cost estimates are discussed further in Chapter 4.)

[4] For some of the corridors, different alignment options have been explored. While they are referred to as alternatives, there may be value in further developing more than one of the recommended alignments in order to increase access to the bikeway network within the corridor. All alignments are dependent on more detailed scoping and engineering study of the more fine-grained constraints and opportunities within the corridor.

[5] Planning-level cost estimates may not fully capture all cost categories (e.g., ROW acquisition, utility relocation, etc.) that would be included in a detailed cost estimate developed during preliminary and final design of a bikeway project. There are many unknown variables that could impact cost, which makes estimating costs for any project a challenge until the project advances to a state where it is more fully scoped and designed. Planning-level cost estimates provide an order-of-magnitude range and are considered preliminary and will be refined as a project advances through planning, design, and construction.

1. #3 (north): Weber Road

Context

Weber Road is one of the most highly- traveled arterial streets in Will County, carrying traffic between Bolingbrook, Romeoville, and Joliet. The corridor is 10.7 miles long and shows strong development, with more commercial uses on the horizon. Providing local access to neighborhoods, commercial centers, employment areas, and parks, the corridor will include a reconstructed interchange with I-55 in the near future. When constructed, the new diverging diamond interchange will include a 10-foot wide trail crossing through the interchange.

Corridor Selection Criteria Ratings

	Criteria	Rating	Description
A	Destinations	Completely	Connects Joliet, Romeoville, Bolingbrook, Naperville; Regional retail; Industry near I-55; O'Hara Woods, Prairie Bluff Preserves.
B	Bikeway Connections	Completely	DuPage River Trail; Rock Run Greenway Trail; Joliet Junction Trail; Trails in Romeoville; I&M Canal Trail.
C	Directness	Completely	Very direct if the bikeway follows Weber Road directly.
D	Low-Stress Capability	Mostly	Generally, ROW is adequate for side path but some areas are constrained and have multiple driveway crossings.
E	Recreation/ Transportation Value	Somewhat	Provides access to trails and parks, but more transportation oriented.
F	Feasibility	Somewhat	High Population/ High Demand area; ROW currently largely available but future roadway projects may restrict ROW substantially; local interest may spur local funding.

Challenges and Constraints

The primary challenge along this corridor is interaction with motor vehicle traffic. Although a sidepath is feasible (and recommended), and will provide much separation of traffic, intersections and commercial driveway crossings present the potential for significant conflicts between people biking and people driving. Solutions to reduce the number of driveway crossings and mitigate conflicts through increased visibility and traffic control should be sought. Other challenges include the constrained ROW through Crest Hill between Renwick Road and Division Street and the narrow bridge over the railroad crossing just south of Caton Farm Road.

Bikeway Facility Recommendations

Bikeway facility recommendations are shown on the map in Figure 18.

Considering the nature of this corridor, which follows a high-traffic road with higher motor vehicle speeds, a high degree of separation between people biking and people driving is needed. The most suitable facility type within the Weber Road corridor is a sidepath. However, the sidepath must be designed to minimize conflicts at driveways and intersections.

An alternative to a bikeway along Weber Road is to provide a sidepath along Veterans Parkway and Independence Boulevard (IL-53). This alternative would present fewer intersection and driveway crossings (and therefore fewer conflicts with motor vehicle traffic), but this alignment does not provide access to the numerous neighborhoods and commercial centers along Weber Road.

Two alternatives to Weber Road north of I-55 have been identified. One is to provide a path or trail between Bolingbrook's Clow International Airport and the commercial center south of Boughton Road (anchored by Meijer, Home Depot, and Lowes). Another is to provide an on-street bikeway along collector streets through western Bolingbrook (along Remington Boulevard, Dalton Lane, Sapphire Drive, and Kings Road). Remington Boulevard and Dalton Lane have adequate pavement width to incorporate bike lanes through simple restriping, perhaps including removing the two-way left turn lane in the middle of the roadway. If this approach is determined to be infeasible, another option is to widen sidewalks along these streets to serve as a sidepath. There is existing bike lane striping on Kings Road from Hassert Boulevard to Century Park. To continue the bike lanes north of Century Park, Kings Road may require a road diet.

Planning-Level Cost Estimate

The estimated cost of constructing the recommended bikeway facilities within the primary corridor is $800,000 to $1 million per mile. A sidepath is one of the costlier types of bikeway facilities because its construction typically requires clearing and grading plus pouring pavement. Outside variables not included in this estimate are the cost of ROW acquisition, traffic signal modification, the Weber Road/I-55 interchange, or the cost of a new bridge over the railroad south of Caton Farm Road.

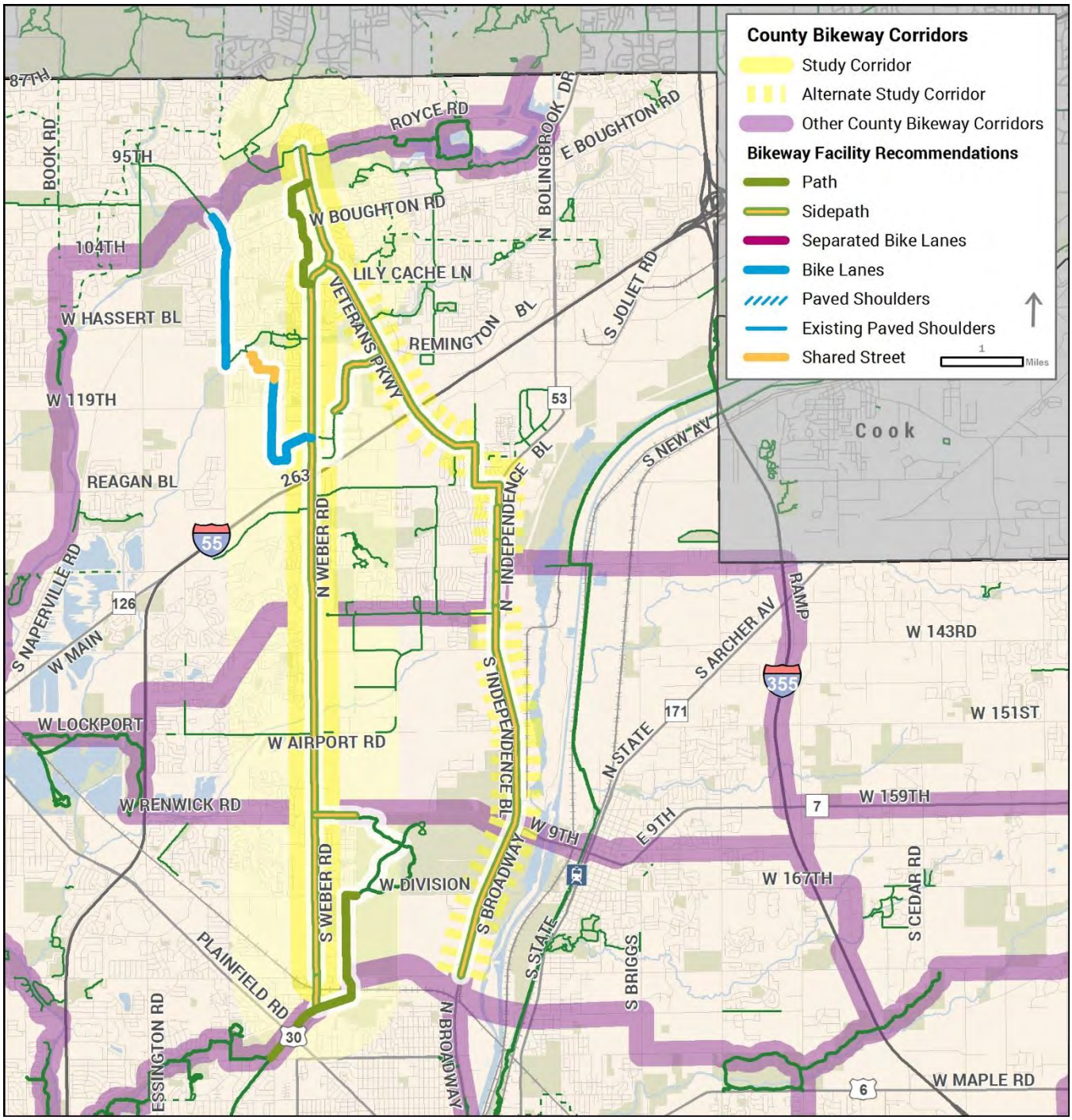


Figure 18: Recommendations for Corridor #3 (north) – Weber Road

2. #4: Aurora to Orland Park

Context

This study corridor is 29.8 miles long and connects four counties—Kane, Kendall, Will, and Cook. Passing through numerous cities and villages in Will County including Naperville, Plainfield, Romeoville, Lockport, and Homer Glen, the western portion of the corridor (from Aurora to Plainfield) passes through suburban neighborhoods and is largely established. Few gaps remain in the corridor in this area. The central portion (Plainfield to I-355) is unestablished at this time. The eastern portion (I-355 to Orland Park) passes through low-density rural areas and will soon be completed as a sidepath along IDOT's 159th Street reconstruction project.

Corridor Selection Criteria Ratings

	Criteria	Rating	Description
A	Destinations	Completely	Connects Homer Glen, Orland Park, Lockport, Plainfield, and Aurora; Lewis University; new subdivisions; Prairie Bluff, Renwick, and Avery Preserves.
B	Bikeway Connections	Completely	Trails in Plainfield; Renwick Preserve Trail; Prairie Bluff Trail; I&M Canal Trail.
C	Directness	Somewhat	Depends on alignment, but will require some meandering around barriers.
D	Low-Stress Capability	Completely	Portions follow busier roads, but a sidepath with protected crossings can provide a low-stress experience.
E	Recreation/ Transportation Value	Mostly	Uses road and railroad corridors, but connects large preserves.
F	Feasibility	Completely	Many segments already in place; potential constraints crossing canal.

Challenges and Constraints

The majority of the challenges enhancing this corridor exist in the central portion between Plainfield and Lockport. They include crossing two expressways (I-55 and I-355); crossing over the DuPage River, Chicago Sanitary and Ship Canal, and I&M Canal; and two or three railroad crossings (depending on alignment). Furthermore, the corridor passes through Plainfield and Lockport, which is desirable from a mobility and access perspective. However, these communities have constrained rights-of-way, limiting the ability to provide separated bikeways.

Bikeway Facility Recommendations

Bikeway facility recommendations are shown on the map in Figure 19.

The western portion of the study corridor (Aurora to Plainfield) is largely established in the form of shared use trails. Several bikeway facility types are recommended to complete this section including shared use trails, a segment of sidepath along Wolfs Crossing Road, and shared streets along portions of the old Normantown Road. As previously mentioned, the eastern section of this study area (I-355 to Orland Park) will be completed as a sidepath in the near future.

The central portion of the study area (Plainfield to I-355) is the focus of this Plan's analysis. The corridor predominately follows Renwick Road because it is the most direct and available east-west ROW connecting Plainfield to Lockport. Based on traffic volumes on Renwick Road and the importance of bikeway facility type continuity, a sidepath along Renwick Road is recommended. Conflicts with motor vehicles will be minimized by the limited number of intersections and driveway crossings.

Alternative recommendations are provided for the portion of the corridor near Plainfield, as well as the portion near Lockport. On the Plainfield end, two options are shown for passing through the community. One alignment follows Lockport Street across the DuPage River to the Lake Renwick Preserve as an on-street bikeway. While Lockport Street has fairly high traffic volumes, the street has been given significant traffic calming treatments (including all-way stops, raised medians, raised crosswalks, and curb extensions) that make it more suitable as a shared-street for biking and driving. The other crosses the DuPage River near Renwick Community Park via a planned trail bridge, then follows Renwick Road east to Lockport.

In Lockport, one option for crossing the Des Plaines River, Sanitary and Ship Canal, and I&M Canal is to utilize 9th Street/IL Route 7. This crossing could be achieved via a two-way separated bike lane on one side of the bridge. This would connect to the I&M Canal Trail, which would take people north to 8th Street (a shared street) and eventually to 7th Street (with bike lanes). While the eastern section of 7th Street would have to be widened to accommodate continuous bike lanes, bike lanes could be more easily introduced west of Farrell Road.

Planning-Level Cost Estimate

The estimated cost of constructing the recommended bikeway facilities within the primary corridor is $800,000 to $1 million per mile for path and sidepath sections and $100,000 to $400,000 per mile for bike lane sections. Outside variables not included in this estimate are the cost of ROW acquisition.

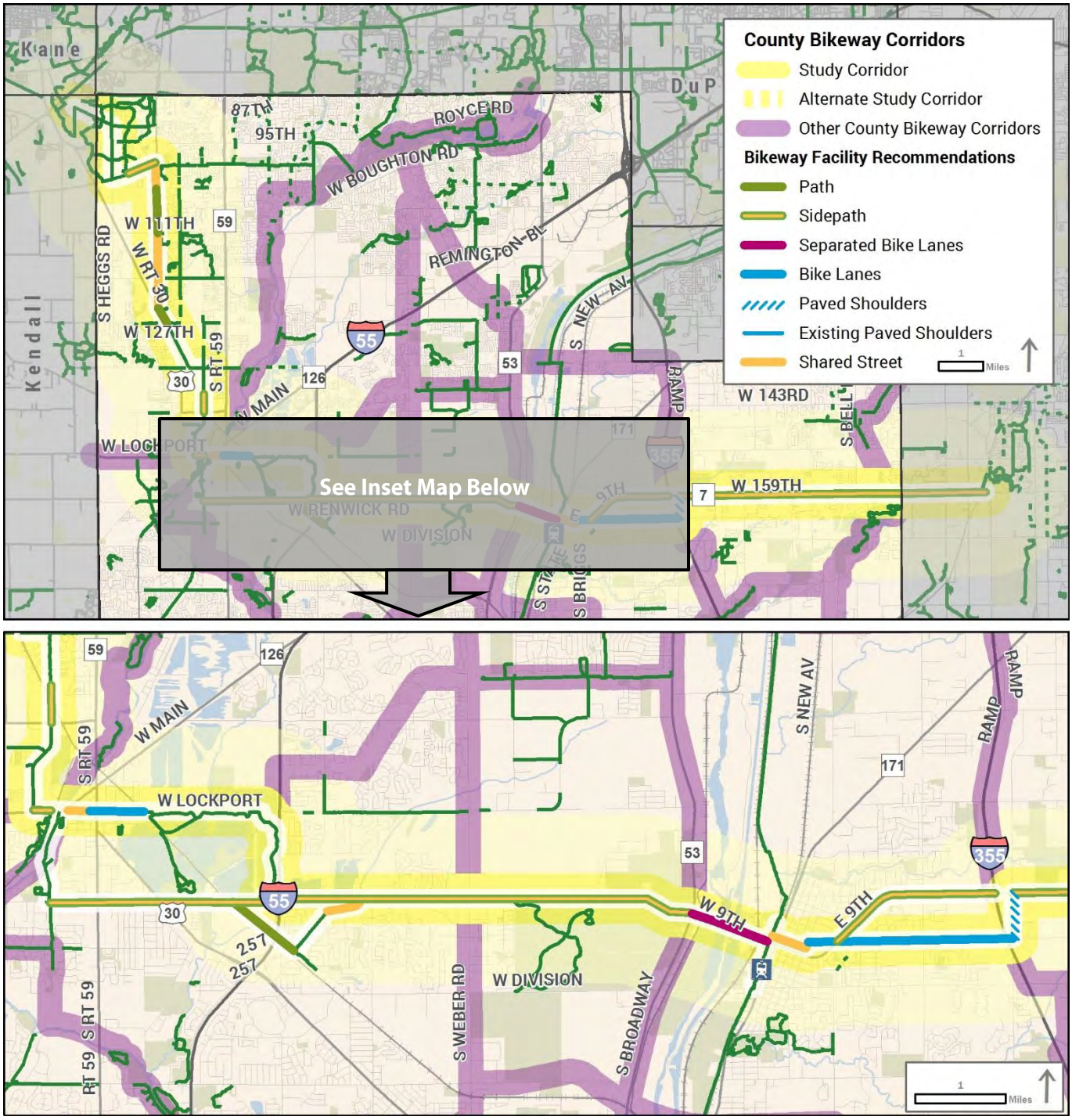


Figure 19: Recommendations for Corridor #4 – Aurora to Orland Park

3. #7 (north): Spring Creek to Jackson Creek

Context

This 12.9-mile long corridor includes several existing shared use trails in Homer Glen, Mokena, and Frankfort. The corridor passes mostly through low-density residential areas along utility corridors. Connections are made to existing and planned segments of the Spring Creek Greenway Trail, the Old Plank Road Trail, and several smaller trails and bikeways. A substantial portion of this corridor is in place; upon completion, it will connect numerous existing bikeway investments, greatly expanding the value and use of each.

Corridor Selection Criteria Ratings

	Criteria	Rating	Description
A	Destinations	Completely	Connects Homer Glen and Mokena; one or two Metra stations; Hickory Creek Preserve; two Cook County Preserves; Messenger Marsh.
B	Bikeway Connections	Somewhat	Plank Road; Hickory Creek Preserve Trails.
C	Directness	Not Really	Will likely necessitate many turns.
D	Low-Stress Capability	Mostly	Would include a fair number of at-grade crossings.
E	Recreation/ Transportation Value	Mostly	Along utility corridors and road corridors mostly, but through a rural-like area.
F	Feasibility	Mostly	Somewhat developing area with available right-of-way.

Challenges and Constraints

The main challenge along this corridor is the convergence of I-80, the Metra Rock Island District railroad, and Marley Creek. In addition to overcoming these physical barriers, significant ROW constraints may exist.

Bikeway Facility Recommendations

Bikeway facility recommendations are shown on the map in Figure 20.

Shared use trails and sidepaths are recommended for bikeways within the primary study corridor, depending on whether the alignment is following a utility corridor or a roadway. Establishing bikeways along the primary corridor is largely dependent on the future extension of Schoolhouse Road from Francis Road to Regan Road.

Two alternative alignments are shown in the aforementioned I-80/Metra/Marley Creek challenge area. One follows Parker Road south to Florence Road, runs along Florence as a shared street, and then follows the I-80 ROW to the Metra railroad. The other cuts across on 184th Street as a shared street to Haas Road, then runs as a sidepath south until it reaches the Metra railroad. Both cross under I-80 at the Metra crossing and both would have to cross the Metra line, either as a new dedicated crossing or by following the railroad south to Regan Road. Any new railroad grade crossings would require additional study to address the financial feasibility and safety considerations.

In the short-term, an alternate alignment of on-street bikeways can be provided. This includes paved shoulders on Maple Street/187th Street and Francis Road as well as bike lanes on Townline Road. This alignment could possibly be enhanced by adding a sidepath as a way to bypass the I-80/Metra/Marley Creek challenge area altogether.

Planning-Level Cost Estimate

The estimated cost of constructing the recommended bikeway facilities within the primary corridor is $1 to $1.5 million per mile. Outside variables not included in this estimate are the cost of ROW acquisition or the cost of new railroad crossings.

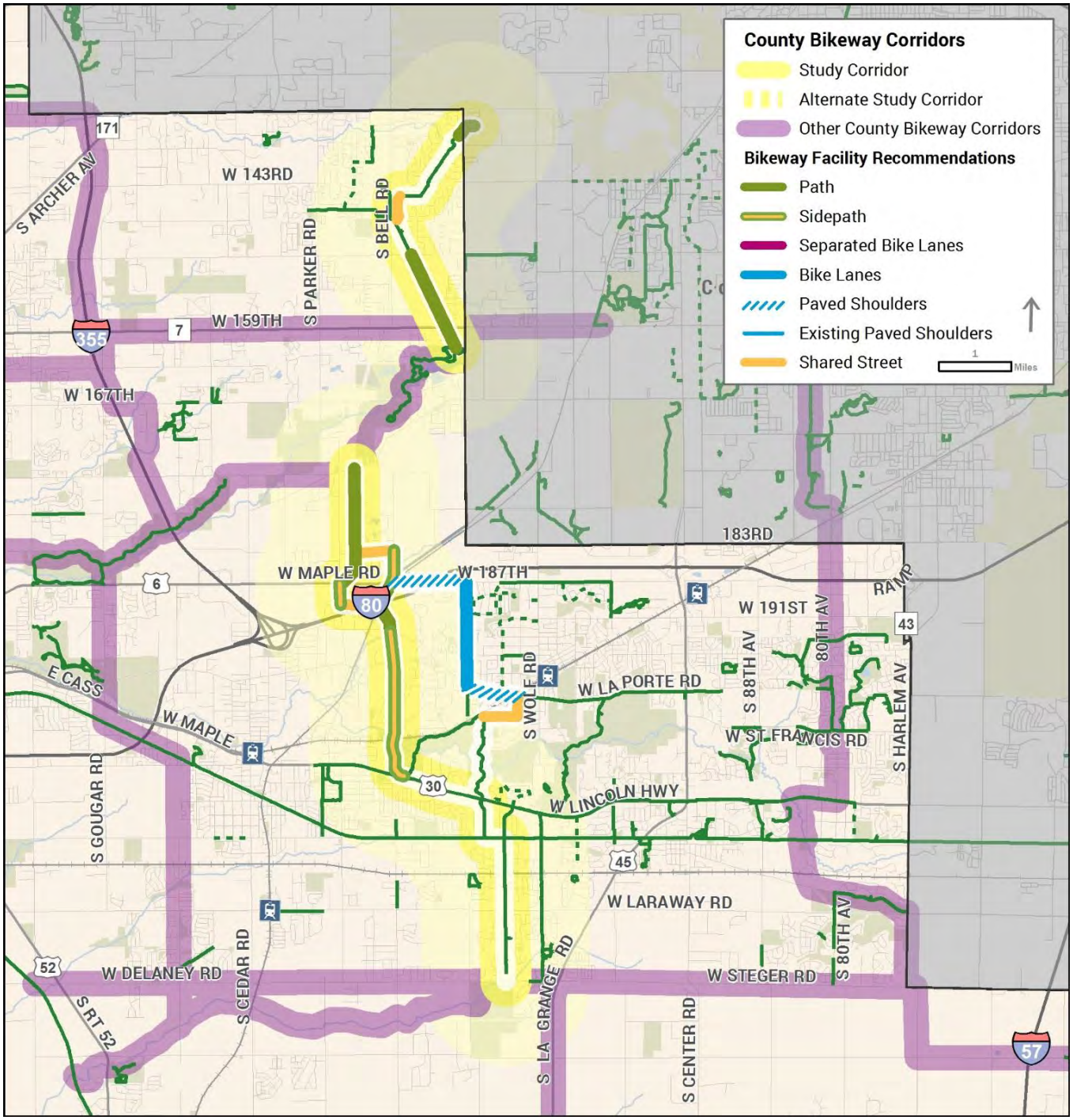


Figure 20: Recommendations for Corridor #7 – Spring Creek to Jackson Creek

4. #9: Tinley Park to Plum Creek

Context

This 25.4 mile corridor (21.4 miles in Will County) connects multiple communities in Will and Cook Counties. The northwestern and southeastern ends of the corridor are in developed areas (primarily low-density residential, with some areas of commercial and industrial), while the central portion runs through a generally undeveloped rural environment. This corridor connects to Governor's State University, which currently is not connected to the rest of Will County or to Cook County by bikeway. The corridor mostly follows roadways with some potential to utilize utility corridors. The corridor in Cook County is generally complete with a few gaps remaining. The upcoming 80th Avenue reconstruction project presents the opportunity to provide a bikeway as part of the project.

Corridor Selection Criteria Ratings

	Criteria	Rating	Description
A	Destinations	Completely	Connects Orland Park, Tinley Park, Frankfort Square, Frankfort, University Park, and Crete; Metra station; Hospital; Governor's State University.
B	Bikeway Connections	Completely	Old Plank Road Trail; trails in Tinley Park and Frankfort; Cook County Forest Preserve District Trails.
C	Directness	Mostly	Mostly straight with a few circuitous portions.
D	Low-Stress Capability	Mostly	Can be mostly developed as trails along utility corridors and low traffic streets; few at-grade crossings will be necessary.
E	Recreation/ Transportation Value	Somewhat	Connects to parks, but mostly follows utility/road corridors
F	Feasibility	Completely	Upcoming 80th St. reconstruction project provide the opportunity to construct a trail crossing; many segments of trail exist already.

Challenges and Constraints

This corridor crosses several major roadways, such as Governors Highway (IL-50), IL-1, IL-394, and US-30. Each of these crossings will need to be treated carefully in order to ensure the safety of people biking. One particular challenge is crossing I-57 at Stuenkel Road. This recently-reconstructed interchange includes space for a 12-foot wide trail on the bridge deck, but because it is a full interchange near an industrial center with significant truck traffic, crossing the ramps on either side will be challenging and may require special signal phasing, signage and pavement markings. Another challenge is crossing the Canadian National (CN), which runs parallel to and

south of the Old Plank Road Trail. Crossing over or under the railroad near Camp Manitoqua may be infeasible, requiring the bikeway corridor to deviate to a nearby existing street crossing.

Bikeway Facility Recommendations

Bikeway facility recommendations are shown on the map in Figure 21.

This corridor includes several existing trails and sidepaths. It also has higher traffic volumes and speeds along some of the roads that it follows. Therefore, the primary recommended bikeway facility types are trails and sidepaths. In the northwestern portion of the corridor, a sidepath is recommended along 80th Avenue and is included in the upcoming 80th Avenue project lead by the Will County DOT between 191st Street and the Tinley Park Metra Station (an alternative alignment between 191st Street and Laraway Road follows a creek and utility corridor). A sidepath is also recommended along Harlem Avenue between Laraway Road and Stuenkel Road. The Village of Frankfort is actively seeking funding for this section.

Between Harlem Avenue and Governor's State University, a sidepath is recommended along Stuenkel Road. This addition would help to close the short gap between the Metra station and the trail leading to Governor's State University. If implementation of a sidepath along Stuenkel Road is not feasible in the near-term, a low-cost interim solution is to use the existing paved shoulders on Steger Road, stripe bike lanes on Central Avenue and on a portion of Dralle Road (each of which have adequate width to accommodate bike lanes), and pave shoulders on 0.7 miles of Steger Monee Road from Dralle Road to University Parkway. Additional considerations include:

- Rumble strips are significant hazards to bicyclists. To accommodate the bikeway on Steger Road, rumble strips should be removed when then next pavement overlay occurs. Alternatively, if rumble strips are deemed necessary the paved shoulder should be widened to provide at least 4 feet of clear shoulder width for bicycling.
- Central Avenue may require a road diet to accommodate bike lanes.
- The Dralle Road segment may be suitable as a shared street given current traffic levels.
- The south-side sidepath along University Parkway/Exchange Street is narrow and may need to be widened.
- On Exchange Street between Western Avenue and Crete-Monee High School, the current paved shoulders should serve more confident adults adequately.
- Exchange Street in Crete may require a road diet to accommodate bike lanes.

A sidepath is also recommended along Exchange Street as a continuation of the existing sidepath from Governor's State University to Western Avenue. Limited ROW in Crete may require a short section of bike lanes (or a two-way separated bike lane) instead of a sidepath. A low-cost interim solution is to provide a sidepath along Sangamon Street to Naoma Drive and a signed shared street route on Naoma Drive, Division Street, Selleck Street, Cass Street, and East Street.

Planning-Level Cost Estimate

The estimated cost of constructing the recommended bikeway facilities within the primary corridor is $800,000 to $1 million per mile for sidepath and path sections and $50,000 to $200,000 per mile for on-street sections.

Outside variables not included in this estimate are the cost of ROW acquisition, the cost of any new railroad crossings, and the cost of specialized traffic control design (if necessary).

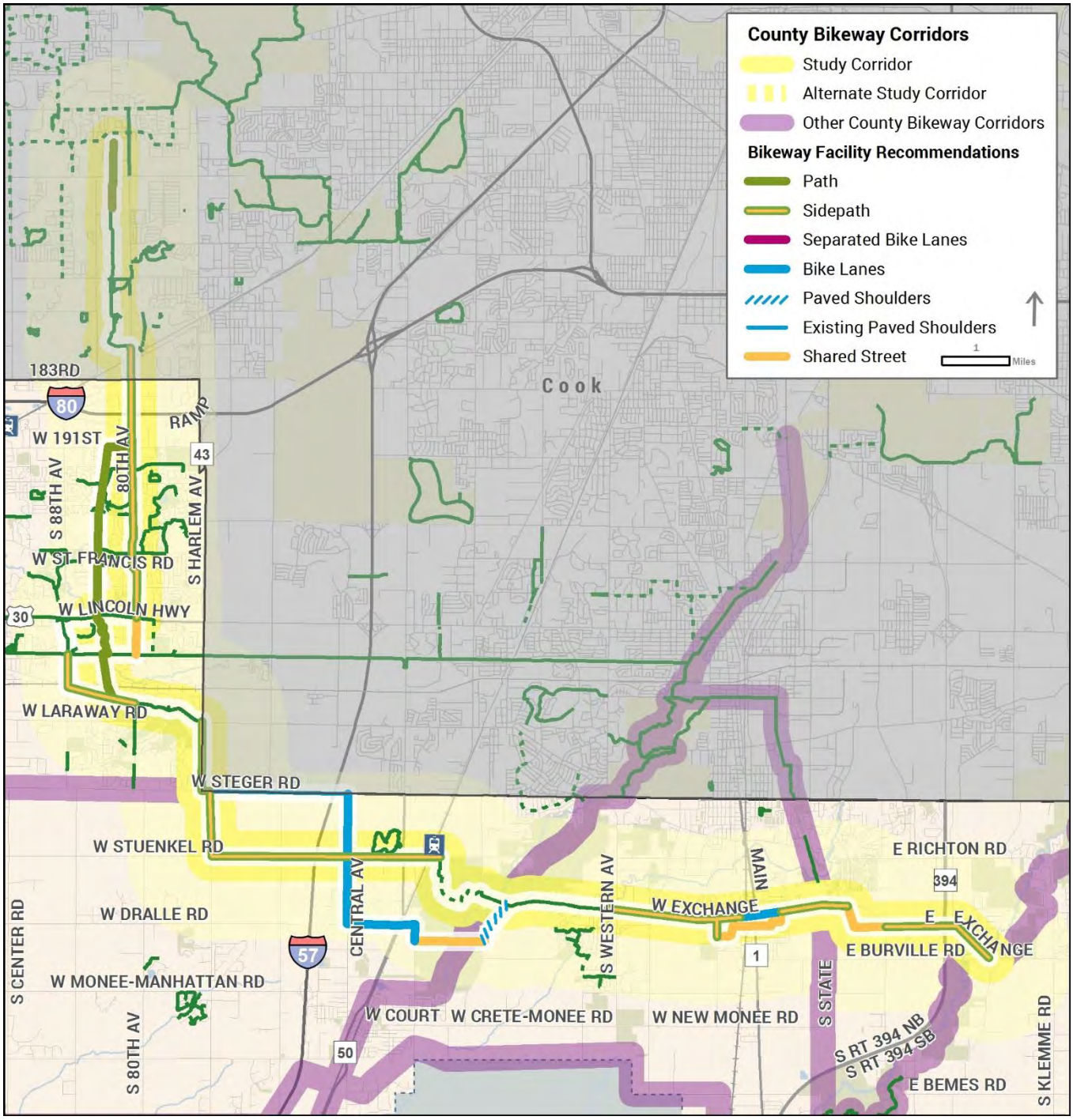


Figure 21: Recommendations for Corridor #9 – Tinley Park to Plum Creek

5. #12 (west): Route 66

Context

The historic Route 66 holds a special place in America's history as a tourist route for driving and biking alike. This 18.3 mile corridor (11.3 miles in Will County) follows one of the historic alignments of Route 66 through rural landscapes and distinct small communities. It connects to the Wauponsee Glacial Trail on its east end and to Grundy County and beyond on its west end. The western half of the corridor follows IL-53, which has relatively high traffic volumes and speeds.

Corridor Selection Criteria Ratings

	Criteria	Rating	Description
A	Destinations	Completely	Connects Codley, Braidwood, and Wilmington; Route 66-associated destinations; Midewin National Tallgrass Prairie, Hitts Siding Prairie, and Wilmington Shrub Prairie Preserves.
B	Bikeway Connections	Mostly	Wauponsee Trail; Route 66 designated route.
C	Directness	Somewhat	Depending on alignment, this bikeway may have numerous turns.
D	Low-Stress Capability	Mostly	Low stress roads or trails feasible. If placed along IL-53, wide paved shoulders (and perhaps eventually a sidepath) would be necessary to minimize stress.
E	Recreation/ Transportation Value	Completely	Follows the historic Route 66 corridor and provides access to Forest Preserve preserves. Passes through area with a high number of strip mine lakes.
F	Feasibility	Mostly	Requires some right-of-way, but the nearby population likely would support the investment.

Challenges and Constraints

The Kankakee River divides this corridor into roughly two halves. Crossing the river in Wilmington is a challenge because while the IL-53 Bridge has sidewalks on both sides, it does not have adequate deck width to accommodate a trail crossing. Furthermore, constrained ROW on both sides of the bridge limits the selection of bikeway facility types.

Traffic volumes, speeds, and amount of heavy trucks on IL-53 present a challenge for people bicycling. With paved shoulders, more confident users can be accommodated adequately. A minimal number of intersections and driveway crossings reduce conflicts between people biking and people driving.

Bikeway Facility Recommendations

Bikeway facility recommendations are shown on the map in Figure 22.

Priorities and needs for bikeways differ within the corridor from one end to the other. On its eastern end, the corridor connects to the Wauponsee Glacial Trail. Providing a low-stress bikeway connection between that trail and Wilmington should be a high priority. Two options exist for a low-traffic shared street bikeway—one along County Road (which would require a short segment of trail and a small bridge over Forked Creek) and the other along Kahler Road. Longer term, stakeholders should seek opportunities to provide a path or sidepath connection between Wilmington and the Wauponsee Glacial Trail, such as along Peotone Road.

Baltimore Street (IL-53) is the only way to cross the Kankakee River in the Wilmington area other than the Wauponsee Glacial Trail bridge, which is more than 4 miles to the south. To enhance this crossing, bike lanes are recommended on Baltimore Street from West River Road to Park Street, which includes the westernmost of the two bridges over the river. From Park Street, bicyclists can travel north to the Millrace Foot Bridge, which crosses a small river channel and connects to Jackson Street. Jackson Street can serve as a shared street and connect to future potential bikeways along County Road or Peotone Road.

It is anticipated that the western end of the corridor will primarily be used by more confident, avid bicyclists (at least initially). Recommendations include a paved shoulder along IL-53/Route 66. Long-term, a sidepath may be feasible and desirable to supplement paved shoulders along IL-53. An alternative or additional alignment is to use existing paved shoulders on West River Road south to shared street bikeways on Zilm Road and W 4250N Road in Kankakee County. This would improve access to the southernmost end of the Wauponsee Glacial Trail.

Planning-Level Cost Estimate

The estimated cost of constructing the recommended bikeway facilities within the primary corridor is $10,000 per mile to $20,000 per mile for shared street sections and $200,000 to $300,000 per mile for bike lane and paved shoulder sections. Outside variables not included in this estimate are the cost of ROW acquisition or the cost of modifications to the IL-53 Bridge over the Kankakee River (if necessary).

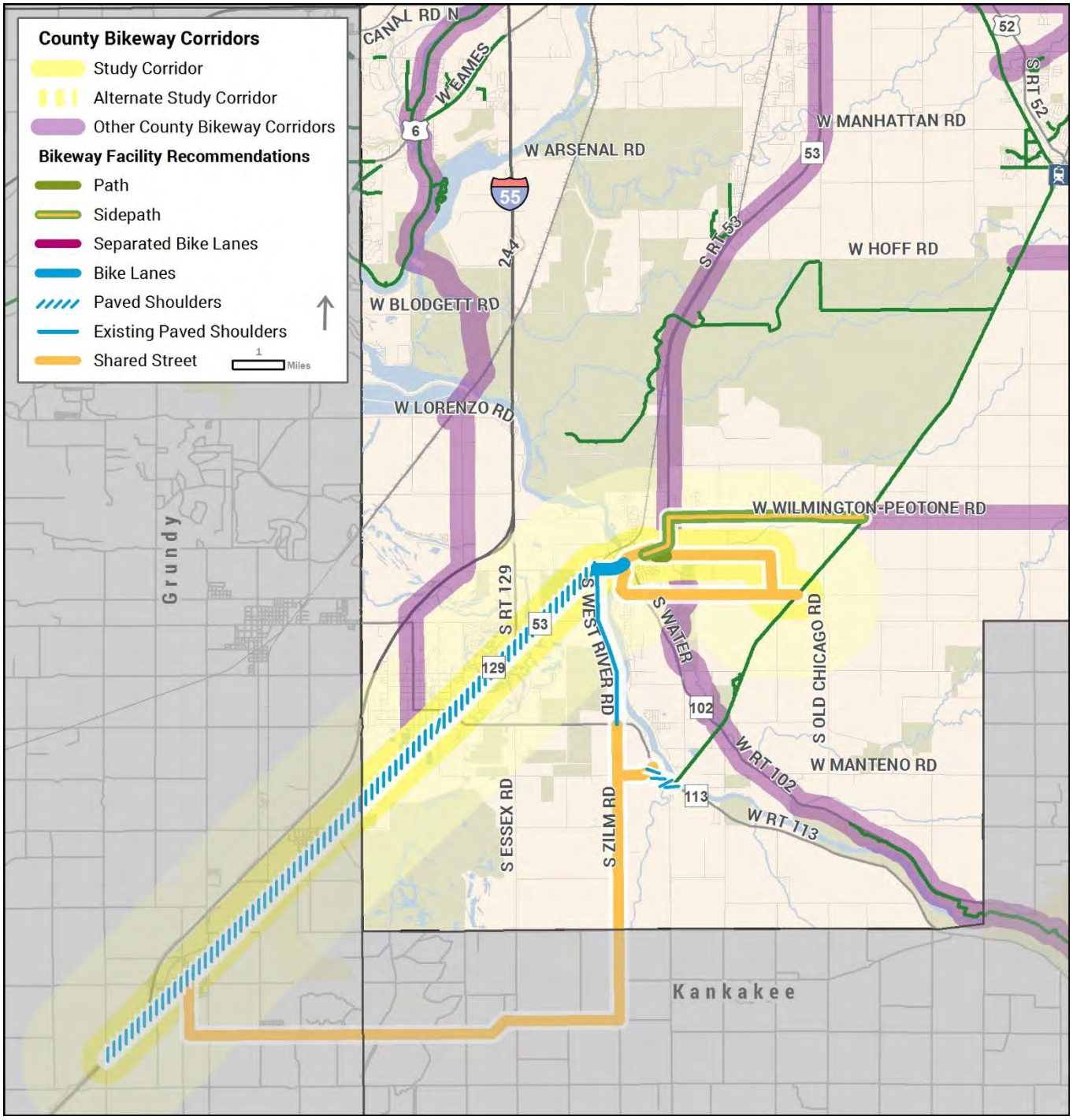


Figure 22: Recommendations for Corridor #12 – Route 66

Chapter 4: Ongoing Bikeway Planning

MODEL TRANSPORTATION PLANNING PROCESS

1. Model Process

When planning or designing a bikeway along a roadway, the specific facility type should be selected based on the following key factors:

- Type of users expected (see Chapter 2 descriptions of avid/confident bicyclists or casual/less-confident bicyclists);
- Traffic volumes and speeds;
- Available ROW and complexity of the environment; and
- Overall continuity with the existing bikeway network.

As described in Chapter 2, there is a spectrum of facility types and treatments that respond to the particular constraints and needs of various traffic contexts. In less complex environments, the usefulness and applicability of more innovative and tailored facility treatments, (e.g., raised cycle track, contraflow bike lanes, bike boxes) diminishes.

Outlined below is a model bikeway facility selection process that provides simplicity and clarity to planners, designers, officials, and the public, while also increasing consistency across the county. Bikeways along independent rights-of-way (rivers, railroads, utility corridors, etc.) are constructed as shared use trails; therefore, the process of selecting an appropriate bikeway facility type may not be necessary in those instances.

1. Select Preferred Facility Type

Using the graph in Figure 23 (or the spreadsheet-based Bikeway Facility Selection Tool developed alongside this Plan), select an appropriate bikeway facility type for casual and less confident bicyclists based on traffic volumes and speeds. If the selected corridor is in a rural area consider providing paved shoulders (see Table 8).

2. Refine Facility Type

Use the Street Configuration feature of the Bikeway Facility Selection Tool to explore how the incorporation of the selected facility type and minor adjustments to the street's configuration can reduce traffic stress. Consider narrowing lanes, removing lanes, lowering speed limits, and upgrading the bikeway facility type in order to reduce traffic stress.

3. Assess Feasibility

Assess the feasibility of the refined bikeway facility type by considering ROW availability, impacts to utilities, spot constraints such as bridges and intersections, and fiscal constraints.

4. Begin Design or Explore Alternatives

If the refined facility type is deemed feasible, proceed to design. Otherwise, explore alternative facility types that adequately serve less confident bicyclists or identify an alternate parallel route that provides less than a 30 percent detour. At the same time, identify an appropriate facility type for the original corridor that serves more confident users (see the graph in Figure 24 to select a different facility type). Once a feasible alternative has been identified, proceed to design.

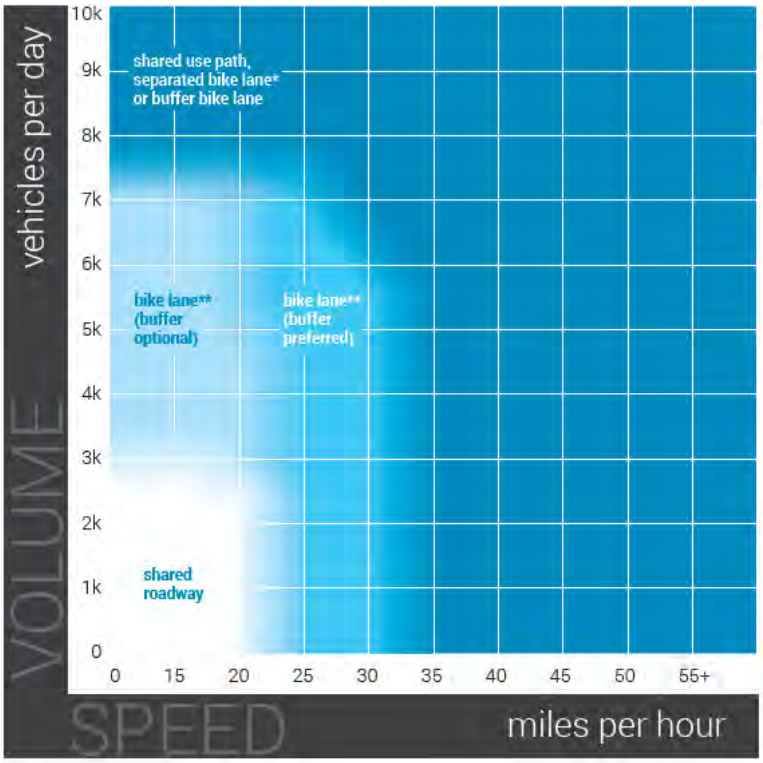


Figure 23: Facility Selection Graph for Casual or Less Confident Bicyclists (e.g., the "Interested but Concerned")

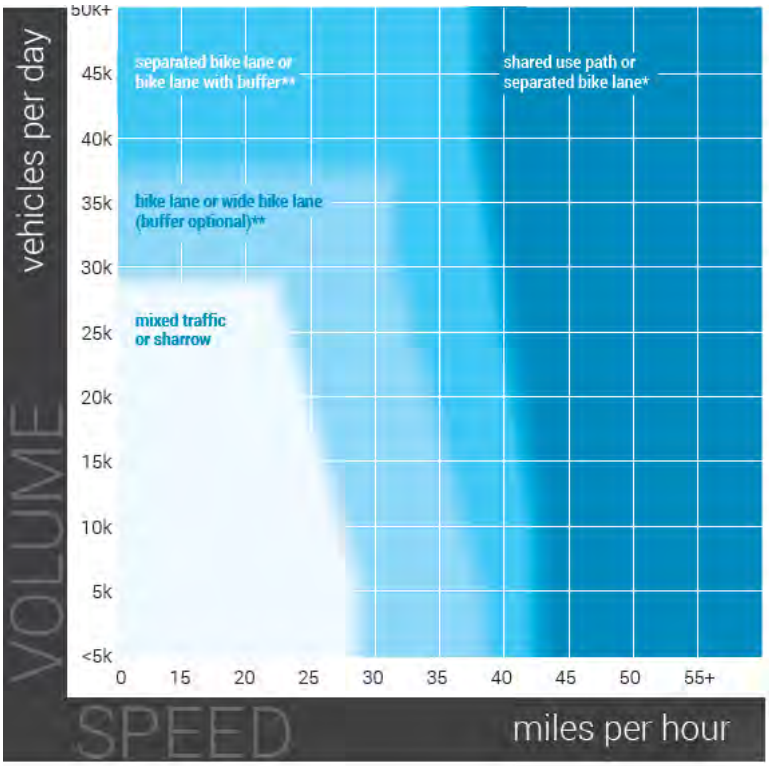


Figure 24: Facility Selection Graph for Avid or More Confident Bicyclists (e.g., the "Strong and Fearless")

Table 8: Rural Considerations for Bikeway Facility Selection

Casual/Less Confident Bicyclists	Avid/More Confident Bicyclists
Less confident bicyclists can be accommodated in rural contexts by means of paved shoulders or sidepaths, depending on ADT: - Up to 500 ADT: Shared road with signs that increase awareness of the presence of bicyclists - 500 to 3,500 ADT: 4 to 6-foot wide paved shoulders and optional sidepath - 3,500+ ADT: Sidepath in addition to 6-foot wide paved shoulders	More confident bicyclists can be accommodated in rural contexts by means of paved shoulders or sidepaths, depending on ADT: - Up to 1,500 ADT: Shared road with signs that increase awareness of the presence of bicyclists - 1,500 to 3,500 ADT: Minimum 4-foot wide paved shoulders - 3,500+ ADT: Minimum 6-foot wide paved shoulders - 7,000+ ADT: Sidepath in addition to 6-foot wide paved shoulders

Bikeway Facility Selection Tool

A facility selection tool (see Appendix C) was developed as part of the countywide bikeway planning process to streamline the selection and refinement of suitable bikeway facilities along streets and roads. The tool can be used by county and local planners and engineers to determine appropriate bikeway facility types for various roadway contexts. The tool can be used during the conceptual engineering phase, the mid-term planning and budgeting phase, or even in the long-term planning phase as a way to identify future bikeway needs and preserve future opportunities. While bikeways may not be appropriate in all instances, the bikeway facility selection tool can be used as roads are expanded or reconstructed to help determine what type of facility would be compatible with the context. For example, the tool can help determine appropriate bikeway facilities in tandem with the roadway improvement or it can be used to inform the addition of a bikeway at a later date.

2. Implementation Strategies

The countywide Bikeway Plan is a high-level strategy document that defines long-term bikeway corridors for implementation. The Forest Preserve District of Will County, the Will County DOT, local municipalities, and other partner agencies will need to conduct further analysis to plan and implement local connections to complete the comprehensive countywide bicycle network. The Bikeway Plan initiates that process on five bikeway corridors, exploring each in-depth and recommending suitable short- and long-term bikeway facility treatments. It should be noted that no single agency is responsible for implementation. Implementation of the bikeway network across the county is a shared responsibility by multiple agencies and jurisdictions. Furthermore, implementation depends on local agency support, multiple agency partnerships, supportive land use planning requirements, and consideration alongside road and/or utility projects.

The following section outlines recommended implementation strategies. These reflect the most common and practical strategies used by agencies across the country that are most appropriate in Will County. However, the implementation strategies described herein are not exhaustive. Conditions may change, new opportunities arise, and unique approaches may be developed that fall outside of these strategies. New strategies should be considered over time to implement the countywide bikeway network.

Coordinate Bikeway, Path, and Sidewalk Implementation with Upcoming Roadway Projects

The most cost-effective and coordinated way to develop bikeways is to construct bike lanes, sidepaths, and other bikeway infrastructure as part of larger roadway reconstruction, rehabilitation, or repaving projects. When constructed in this manner, the bikeway project is considered "incidental" because it is incorporated into the overall phasing of a larger road project. Incidental projects are often driven by opportunity, such as when a roadway is resurfaced or reconstructed. When such opportunities arise, bikeways are typically funded using the same source of funding as the roadway project and can often be incorporated at a relatively modest cost. For example, providing bicycle accommodations as part of a larger roadway project often means simply adding a few additional feet of pavement. Depending on ROW constraints and the selected bikeway type, the impact on the project cost can be cost-effective.

The Will County DOT and individual communities can further enhance this strategy by adopting Complete Streets policies and coordinating with new construction, reconstruction, and 3R (resurfacing, restoration, or rehabilitation)[6] projects on all streets and roads in the area.

Consider Future Bikeway Needs during Road Construction and ROW Acquisition

In some cases, a bikeway might not be included as part of a roadway project due to lack of near-term feasibility, funding, or demand. In these situations, the road project should not preclude future bikeway additions. This applies to new construction, reconstruction, ROW acquisition, bridge replacement, and other significant undertakings along future bikeway corridors. Examples are listed below:

- If a new roadway is being constructed, the implementing agency should acquire adequate ROW to provide a path alongside the roadway in the future.
- When a bridge is replaced, it should be adequately designed to accommodate a bikeway now or in the future.
- When above- and below-ground utilities are installed or replaced along a roadway, place them so that they do not obstruct the future bikeway.

Currently the Will County DOT provides 10-feet at back of curb on both sides of the roadway for projects subject to the Phase I federal process. For municipalities that express a desire for a sidepath during this process, the Will County DOT provides 15-feet of flat area at back of curb on the desired path side and 5-feet of flat area on the opposite side of the street.

[6] The Will County DOT does not currently conduct 3R projects.

Adopt Complete Streets Policies

The term "Complete Streets" refers to the practice of considering the needs of a variety of transportation users and accommodating all modes (including bicycling, walking, driving, and using transit) on every road and street. However, Complete Streets is a process—not a specific outcome—and is therefore sensitive to the context in which the project occurs. For example, a low to moderate traffic rural road might not need sidewalks and bike lanes, but adding paved shoulders to accommodate bicyclists may be warranted.

Complete Streets policies facilitate the development of multimodal streets and roads by requiring or encouraging that roads accommodate all anticipated users based on context. IDOT adopted a Complete Streets policy as part of the Illinois Highway Code in 2010. This policy requires that bicycle and pedestrian ways be given full consideration in the planning and development of streets and roads, and that road construction and reconstruction projects within one mile of an urban area include bicycle and pedestrian ways as part of the project. This mirrors the direction taken at the national level, where the United States Department of Transportation (USDOT) now encourages states and regional agencies to follow the Complete Streets approach when planning and building roadways.

Individual Complete Streets policies can be adopted by all agencies tasked with building and maintaining roadways, such as the Will County DOT and local municipalities. Policies should be written such that bikeways and pedestrian ways are included by default, provide guidance as to how to select appropriate facilities for these modes, and outline the exceptions to the policy (in other words, specify when bikeways and pedestrian ways are not required as part of the roadway project). The IDOT Complete Streets policy can be used as a model policy for the Will County DOT and municipalities.[7]

Employ Interim Solutions as a Bridge to Full-Build Implementation

Along many segments of the future countywide bikeway network, it may be advantageous to identify and develop interim solutions until the full bikeway can be developed as envisioned. Interim solutions offer a near-term mobility option that did not previously exist and are not seen an alternative to a more comprehensive solution. One example of how an interim solution can be implemented is to provide an on-street bikeway accommodation (e.g., a bike lane) that may adequately serve more confident bicyclists until a lower-stress bikeway can be funded and constructed (e.g., a sidepath). Another example is to provide a low-stress on-street bikeway along a parallel route that might not be very direct or might not be highly-accessible until a bikeway can be established along the preferred alignment.

Continued Interjurisdictional Coordination

The development of this Plan has been one of several interjurisdictional bikeway planning efforts initiated in Will County over the past several years. However, it is the first that has provided a comprehensive look at a countywide multijurisdictional bikeway network for the county. One of the many benefits of interjurisdictional and interagency coordination is that it broadens funding opportunities and increases communication for individual projects where shared objectives may be achieved. Agencies and groups within Will County—including the Forest Preserve District, Will County DOT, municipalities, park districts, and nonprofits—should

[7] The National Complete Streets Coalition also offers model policy language.

continue to coordinate with each other and with the IDOT, Department of Natural Resources (DNR), Chicago Metropolitan Agency for Planning (CMAP) and other groups as appropriate to update this Plan in the future and continue active discussions regarding other bikeway issues. Coordination may occur through informal processes or more formal ones, such as though regular committee meetings.

3. Planning-Level Cost Estimates

Planning-level cost estimates were developed for the Plan based on typical costs of similar facilities built in and around the region. While every bikeway project is unique, it is possible to estimate an approximate cost per mile based on historical data. In recent years, many miles of path have been constructed in Will County and numerous roadway projects have been performed, all of which inform the cost estimates for this Plan. These cost estimates include the elements that are typically part of every bikeway project (e.g., pavement markings, moderate grading, and signs), but are not all-encompassing for every project. For example, these estimates do not include costs for elements such as trailheads, fence removal and replacement, wetland mitigation, etc.

The cost estimates are presented as a range and a prevailing (most common) typical cost in also provided (see Table 9). Considering a range of costs is important because context dictates the complexity of a bikeway and therefore the cost of bikeway improvements in many cases. For example, paths built on abandoned railroad grades are less expensive per mile than those built on virgin land, in densely developed areas, or in locations requiring significant grading.

Table 9: Planning-Level Cost Estimates

Facility/Treatment Type	Typical Cost Range		Prevailing Typical Cost
	Low	High	
Shared Street Low-cost, strategically-placed pavement markings (e.g., sharrows) and signage along bike routes.	**$10,000 per mile** *Example: Add bike route signs or simple wayfinding signs to an existing low-stress bikeway.*	**$50,000 per mile** *Example: Restripe a roadway to provide a wide outside shared lane with sharrows as a stand-alone project.*	**$20,000 per mile**
Paved Shoulder* Typically 4 to 5 feet wide, but often wider on higher-traffic roadways. Generally only used in rural contexts.	**$100,000 per mile** *Example: Widen existing paved shoulders by 2 feet by paving existing gravel shoulders as part of a roadway reconstruction project.*	**$300,000 per mile** *Example: Add 6-foot wide paved shoulders as a stand-alone project.*	**$200,000 per mile**
Bike Lane Includes variations of bike lanes, wide bike lanes, and buffered bike lanes. Significant savings can be realized by constructing as	**$40,000 per mile** *Example: Add bike lanes as part of a resurfacing project requiring no additional pavement, but including additional pavement markings.*	**$650,000 per mile** *Example: Widen a roadway by 14 feet independent of a larger roadway project expressly to add buffered bike lanes.*	**$250,000 per mile**

Facility/Treatment Type	Typical Cost Range		Prevailing Typical Cost
	Low	High	
part of a larger roadway project.			
Separated Bike Lane Also known as a cycle track, these can be one-way or two-way. Separated from the street by vertical elements (e.g., flex posts, bollards, medians, planters.).	**$250,000 per mile** *Example: Reconfigure a roadway to include a two-way flex post-separated bike lane on existing pavement as part of a resurfacing project.*	**$1 million per mile** *Example: Widen a roadway by 14 feet independent of a larger roadway project expressly to add a pair of one-way median-separated bike lanes.*	**$750,000 per mile**
Path and Sidepath Also known as a trail when in an independent alignment like a river greenbelt or former railroad. Referred to as a sidepath when along a roadway.	**$400,000 per mile** *Example: Along a roadway as part of a larger reconstruction project with existing cleared and graded right-of-way.*	**$1.5 million per mile** *Example: Along a wooded river greenbelt with undulating topography and numerous drainage crossings. May include lighting and path connectors to neighborhoods.*	**$1 million per mile**
Bicycle / Pedestrian Overpass Bridge designed for people and bicyclists that extend over expressways, railroads, or water.	**$1 million (each)** *Example: A crossing built over an expressway as part of a street project placed in a location with favorable topography.*	**$5.5 million (each)** *Example: A long span with significant site constraints and long ramps built as a stand-alone project.*	**$2.5 million (each)**

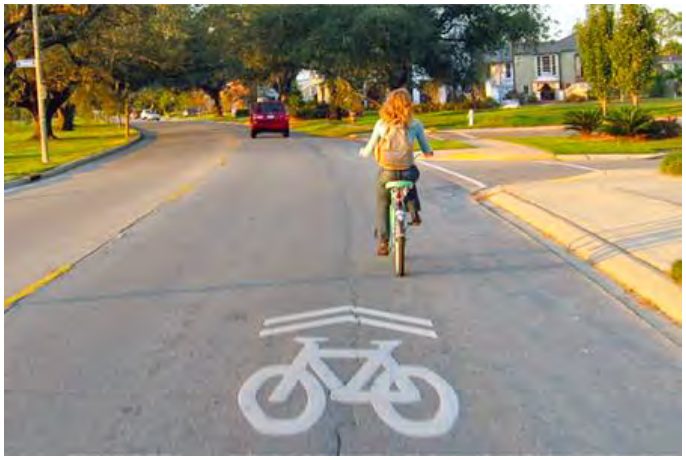
*In many cases, on-street bikeways can be implemented by simply adding a solid white line to delineate a portion of the existing pavement for a striped shoulder. One mile of shoulder striping (one solid line on each side of the road) costs approximately $15,000.

BIKEWAY DESIGN GUIDELINES

In order to serve a wide range of bicyclists in various contexts, a spectrum of bikeway types are proposed for Will County. This section provides design guidelines for the recommended five primary bikeway facility types. The guidelines include best practices, minimum and preferred standards, design considerations, and guidance regarding variations for each bikeway type. Also included are specific references that should be consulted when bikeways are being formally designed and designated.

1. Shared Streets

Shared streets can be defined in several ways, whether simply as a designated bike route, or a signed bike route, or a street with shared lane markings. Shared lane markings (or sharrows) are pavement markings that denote shared bicycle and motor vehicle travel lanes. The markings are two chevrons positioned above a bicycle symbol, placed where the bicyclist should be anticipated to operate. In general, this is a design solution that should only be used in locations with low traffic speeds and volumes as part of a signed route, bicycle boulevard[8], or as a temporary solution on constrained, higher-traffic streets until additional ROW can be acquired.



Shared lane markings on shared streets show preferred lane positioning to people bicycling while also reminding drivers to expect people on bikes.

Key Points

- May increase motorist awareness of the potential presence of bicyclists.
- Can act as wayfinding aids.
- Have low implementation costs and do not require specialized maintenance, sweeping, or plowing.
- May not be suitable for all users as shared lane markings do not provide separate space for bicyclists.
- Shared lane pavement markings may have higher maintenance needs than other facility types due to the wear and tear presented by motor vehicles driving over the pavement markings.
- Potential updates to FHWA's Manual on Uniform Traffic Control Devices striping guidelines may be forthcoming.

[8] *A shared street that prioritizes bicycle traffic by way of motor vehicle traffic diversion and traffic calming.*

Design Criteria

Preferred on streets with posted speed limits of up to 25 mph and traffic volumes of less than 4,000 vehicles per day.

Maximum posted speed of street: 35 mph

Notes:

- The shared lane marking's centerline must be minimum 4-feet from curb where parking is prohibited.
- The shared lane marking's centerline must be minimum 11-feet from curb where parking is permitted, so that it is outside the door zone of parked vehicles.
- For narrow lanes, it may be desirable to center shared lane markings along the centerline of the outside travel lane.

Additional Considerations

- Typically used on local and collector streets with low traffic volumes. Commonly used as part of bicycle boulevards to reinforce the priority for bicyclists.
- Typically feasible within existing ROW and pavement width even in constrained situations that preclude dedicated facilities.
- May be used as interim treatments to fill gaps between bike lanes or other dedicated facilities for short segments where there are space constraints.
- May be used for downhill bicycle travel in conjunction with climbing lanes intended for uphill travel.
- Typically supplemented by signs, especially Bikes May Use Full Lane (R4-11).

References & Resources

- American Association of State and Highway Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (2012)
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide (2012)
- FHWA Manual on Uniform Traffic Control Devices (2009)

2. Paved Shoulders

Paved shoulders provide a range of benefits: they reduce motor vehicle crashes, reduce long term roadway maintenance, ease short term maintenance such as snow plowing, and provide space for bicyclists and pedestrians (although paved shoulders typically do not meet accessibility requirements for pedestrians). Paved shoulders are typically reserved for rural road cross-sections.

Paved shoulders reduce run-off-road crashes, improve roadway maintenance, and can provide space for bicyclists.

Where 4-feet or wider paved shoulders exist already, it is acceptable or even desirable to mark them as bike lanes in various circumstances, such as to provide continuity between other bikeways. If paved shoulders are marked as bike lanes, they need to also be designed as bike lanes at intersections. Where a roadway does not have paved shoulders already, paved shoulders can be retrofitted to the existing shoulder when the road is resurfaced or reconstructed.

Key Points

- Provide separated space for bicyclists.
- Reduce run-off-road motor vehicle crashes.
- Reduce pavement edge deterioration and accommodate maintenance vehicles.
- Provide emergency refuge for public safety vehicles and disabled vehicles.
- May not provide a comfortable experience for all bicyclists when used on high-speed roads.
- May not facilitate through-intersection bicycle movement unless specifically designed to do so.

Design Criteria

Minimum width: 4-feet (5-feet if adjacent to curb or guardrail)

Preferred width: Determined based on traffic volume (see Table 10).

Table 10: Shoulder Width Selection Grid

Intended User Type	Under 500 ADT	500-1,500 ADT	1,500-3,500 ADT	Over 3,500 ADT	Over 7,000 ADT
More Confident	--	--	4′	6′	Sidepath recommended*
Less Confident	Advisory Bike Lanes recommended	4′	4′	Sidepath recommended*	Sidepath recommended*

*In addition to paved shoulders, which should be provided by default on roads with these traffic volumes to reduce run-off-road crashes, improve roadway maintenance, and provide space for more confident bicyclists.

Additional Considerations

- There are several situations in which additional shoulder width should be provided, including motor vehicle speeds exceeding 50 miles per hour, moderate to heavy volumes of traffic, and above-average bicycle or pedestrian use.
- The placement of rumble strips may significantly degrade the functionality of paved shoulders for bicyclists. Rumble strips should be placed as close to the edge line as practicable and four feet of usable space should be provided for bicyclists. Alternatively, rumble stripes may be used. Where rumble strips are present, gaps of at least 12-feet should be provided every 40 to 60 feet.
- Intersections with unpaved roads and driveways often result in gravel and debris deposited on paved shoulders. Paving the aprons of these intersections can mitigate the negative effect.
- Inlet grates, particularly on bridge decks, should be perpendicular to the direction of travel to prevent bicycle wheels from getting stuck.
- Measures should be taken to avoid the temporary dropping of paved shoulders. This challenge is especially common in rural areas at intersections, which may include curb and gutter, right turn lanes, and left turn lanes. All rural intersections should be designed to include continuous paved shoulders through the intersection and other measures to reduce conflicts between right-turning motor vehicle traffic and straight-through bicycle traffic.

References & Resources

- IDOT Highway Standards (2016)
- AASHTO Guide for the Development of Bicycle Facilities (2012)
- AASHTO Policy on Geometric Design of Highways and Streets (2013)
- Manual on Uniform Traffic Control Devices (2009)

3. Bike Lanes

Bike lanes provide an exclusive space for bicyclists in the roadway. Pavement markings on the roadway and optional signs are used to establish bike lanes. Bike lanes are typically used on collector and arterial streets with higher traffic volumes and/or speeds. Research on bicyclists' perceptions of safety has shown that as traffic speed and volume increase, bicyclist's perception of safety degrades significantly and results in increased stress and discomfort. Adding bike lanes on moderately busy streets can lower the stress level and encourage bicyclists to use the street.

Bike lanes provide dedicated space for bicyclists on a roadway.

Bicyclists are not required to remain in a bicycle lane when traveling on a street and may leave the lane as necessary to make turns, pass other bicyclists, avoid debris, or position themselves for other necessary movements. Motorists may only use bike lanes temporarily when making right turns, accessing parking spaces and entering and exiting driveways and alleys. Stopping, standing, and parking in bike lanes is prohibited.

Key Points

- Provides dedicated space for bicyclists (except near intersections where motorists may enter bike lanes to make right turns).
- Established facility type that is understood by most road users.
- May encourage more bicycle travel.
- Inexpensive; typically installed by re-allocating existing street space by narrowing or removing lanes.
- Can lower motor vehicle speeds in some settings.
- May not be appropriate for all types of bicyclists, depending on the traffic volumes and speeds of the roadway.
- Potential risk of "dooring" when placed adjacent to parking.
- Potential for vehicles driving/parking in the bicycle lane due to lack of curb or other vertical separation.

Design Criteria

Minimum width: 4-feet next to gutter seam

5-feet next to parked cars

Preferred Width: 5-feet next to gutter seam

≥6-feet next to parked cars

Notes:

- May be wider adjacent to narrow parking lanes and in areas with high on-street parking turnover. When placed next to a parking lane, the reach from the curb face to the edge of the bike lane should be 14.5-feet; the minimum is 13-feet, according to the Wisconsin Bicycle Facility Design Handbook.
- If bike lanes are adjacent to guardrails, walls, or other vertical barriers, additional bicycle lane width is desired to account for bicyclist "shy" distance from the edge.
- Include pavement markings to indicate one-way travel and designate that portion of the street as a bike lane.
- Bicycle lanes should be demarcated with 6- 8-inches white lines using traffic paint or 6-inch skid-resistant material.

While typically provided on both sides of the street, bike lanes can be provided individually to address unique challenges. Contra-flow bike lanes can be provided on one-way streets to allow two-way movement by bicyclists (above). On steep roadways without room for bike lanes on both sides, climbing lanes (below) provide space for bicyclists in the uphill direction.

Additional Considerations

- Two-way bicycle travel may be achieved on some one-way streets by providing a contra-flow bike lane.
- A bike lane may optionally be placed on only one side of a roadway in the uphill direction as a climbing lane if space is limited.
- Depending on the design of the roadway, bicyclists may have to operate in mixed traffic (such as to make turns). Green paint can be used to highlight bike lanes at conflict points, such as right turn lanes.
- For high-speed or high-volume roads, alternative routes suitable for users of all abilities should be considered, in addition to bike lanes on the main road.
- Standard bike lanes may be 6-feet wide, which provides greater separation between bicycles and cars, accommodates people who are pulling bike trailers, and may allow passing without leaving the bike lane.
- If street width is available to provide bike lanes wider than 6-feet, consider painting a buffer (minimum 18-inches) between the bike lane and travel lane and/or between the bike lane and the parking lane to

provide additional separation and reduce the threat of dooring. A separated bike lane (discussed in detail on the next page) may also be considered.

- Inlet grates, particularly on bridge decks, should be perpendicular to the direction of travel to prevent bicycle wheels from getting stuck.
- A common challenge is the continuation of bike lanes through intersections, especially where dedicated left and right-turn lanes are provided and pavement width or right-of-way is limited. Measures should be taken to avoid the dropping of bike lanes at intersections, such as narrowing turn lane widths, shifting lanes, or widening roadways. NACTO's Urban Bikeway Design Guide provides design guidance to mitigate this issue.

References & Resources

- AASHTO Guide for the Development of Bicycle Facilities (2012)
- NACTO Urban Bikeway Design Guide (2012)
- Manual on Uniform Traffic Control Devices (2009)

4. Separated Bike Lanes

Separated bike lanes, also known as protected bike lanes or cycle tracks, are exclusive bicycle facilities that are physically separated from both pedestrians and motor vehicles. Separated bike lanes isolate bicyclists from motor vehicle traffic using a variety of methods, including curbs, a parking lane, flexible delineators, bollards, large planting pots or boxes, landscaped medians, removable curbs, or other measures. Buffered bike lanes that do not include a vertical element are not considered separated bike lanes.

Separated bike lanes are typically used on large multi-lane arterials or bridges with high vehicle speeds, but can be appropriate for lower-speed streets that have high traffic volumes.

Separated bike lanes can be one way for bicycles on each side of a two-way road, or two-way and installed on one or both sides of the road. They are typically used on large multi-lane arterials where higher vehicle speeds exist. They may also be appropriate on high-volume but lower-speed streets, particularly in urban centers.

Key Points

- Comfortable for a broad spectrum of people, including young riders and more cautious bicyclists.
- Minimize mid-block conflicts with motor vehicles.
- Reduces conflicts with pedestrians by reducing sidewalk riding; can also shorten pedestrian crossings.
- Careful design at intersections is necessary to ensure bicyclists are visible to motorists in adjacent lanes.

- May require special equipment for street sweeping and snow plowing.
- Where the vertical separation is achieved with curbs, stormwater drainage can present a challenge.
- Require a greater reallocation of existing street space than a standard bicycle lane.
- Emergency, transit, and maintenance vehicle access may require special treatments.

Design Criteria

Minimum width: 5-feet (one-way)

8-feet (bidirectional)

Preferred width: 6.5-feet (one way; allows for passing)

≥10-feet (bidirectional)

Notes:

- Separated bike lanes require varying widths of buffer space between the bike lane and the adjacent lane. Small barriers such as flexible delineator posts or removable curbs can be separated with a minimum 2-foot buffer. In general, a 6-foot buffer is preferred for all separation methods.
- Separated bike lanes are appropriate on streets with operating speeds of 25 mph and higher, and volumes that exceed 4,000 vehicles per day.

Additional Considerations

- Separated bike lanes can be level with the sidewalk, at an intermediate height between the sidewalk and the street, or level with the street. If designed to be level with the sidewalk, they should provide a vertical separation between bicyclists and pedestrians, as well as a different surface treatment to delineate the bicycle from the pedestrian space (such as asphalt vs. concrete).
- Separated bike lanes can be a useful treatment on streets that connect to off-street paths, because people riding on paths are likely to be less accustomed to riding with motor vehicle traffic.
- The provision of separated bike lanes should consider the design and function of intersections, which may require adjustments to signal timing and phasing and/or modifications to pavement and curb sections. Traffic studies should be performed before implementing separated bike lanes.
- Bi-directional bike lanes can create challenges with turning vehicles, because motorists looking for gaps in traffic may not be looking for bicyclists approaching from the counter-flow direction.
- Inlet grates, particularly on bridge decks, should be perpendicular to the direction of travel to prevent bicycle wheels from getting stuck.

References & Resources

- NACTO Urban Bikeway Design Guide (2012)
- Massachusetts Department of Transportation (MASSDOT) Separated Bike Lane Planning and Design Guide (2015)

5. Paths (Trails and Sidepaths)

A shared use path is a two-way facility physically separated from motor vehicle traffic and used by bicyclists, pedestrians, and other non-motorized users. Shared use paths located in an independent alignment, such as a greenbelt or abandoned railroad, are commonly referred to as trails. Shared use paths constructed along roadways are commonly referred to as sidepaths. Sidepaths typically result in increased interactions between people bicycling and motor vehicle traffic at driveways and intersections.

Shared-use paths may parallel streets, highways, utility easements, railroads, and natural features such as rivers or creeks.

Key Points

- Provides separation from motor vehicle traffic.
- May be appropriate for less-confident adults, children, seniors, and persons with disabilities.
- Provides recreational opportunities in addition to transportation.
- Potentially costly and complicated ROW acquisition.
- Typically have higher construction costs than other bikeway facility types.
- Topography and drainage can greatly impact design.
- Can present safety concerns when placed adjacent to a roadway with frequent driveway or intersection crossings.

Design Criteria

Minimum width: 10-feet

Preferred Width: 10-12-feet

Notes:

- Widths as narrow as 8-feet are acceptable for short distances under physical constraint. Warning signs should be considered at these locations. (IDOT has allowed sidepaths as narrow as 8-feet due to constrained ROW or when connecting older paths constructed under the prior 8-feet standard.)
- In locations with heavy volumes or a high proportion of pedestrians, widths exceeding 10-feet are recommended. A minimum of 11-feet is required for users to pass with a user traveling in the other direction. It may be beneficial to separate bicyclists from pedestrians by constructing parallel paths for each mode.
- Paths must be designed according to state and national standards. This includes establishing a design speed (typically 18 mph) and designing path geometry accordingly. Consult the AASHTO Guide for the

Development of Bicycle Facilities for guidance on geometry, clearances, traffic control, railings, drainage, and pavement design.

Additional Considerations

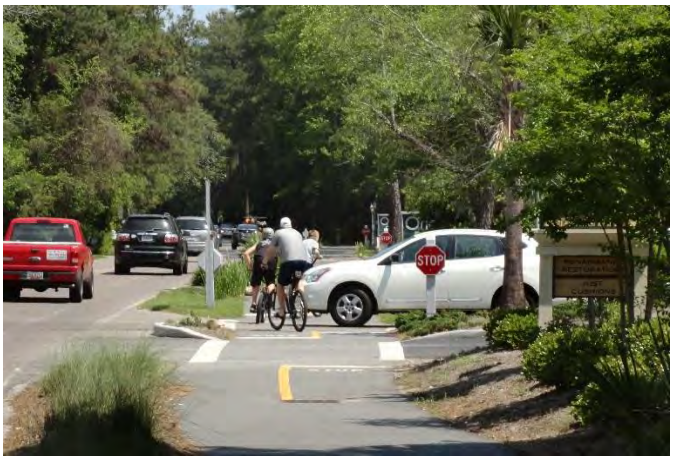
- According to the American Association of State Highway and Transportation Officials, "Shared use paths should not be used to preclude on-street bicycle facilities, but rather to supplement a network of on-street bike lanes, shared roadways, bicycle boulevards, and paved shoulders." In other words, in some situations it may be appropriate to provide an on-street bikeway in addition to a trail or sidepath in the same area.
- Paths typically have a lower design speed for bicyclists than on-street facilities and may not provide appropriate accommodation for more confident bicyclists who desire to travel at greater speeds. In addition, greater numbers of driveways or intersections along a sidepath corridor can decrease bicycle travel speeds and traffic signals can increase delay for bicyclists on off-street paths compared to cyclists using in-street bicycle facilities such as bike lanes.
- Along paths that provide attractive recreational opportunities, consider adding amenities such as benches, rest areas, and scenic overlooks.
- If there are structures along the bikeway, they should be adequate width and strength to carry emergency vehicles (e.g., ambulance to an injured user).

Special Considerations for Sidepaths

Many people express a strong preference for the separation between bicycle and motor vehicle traffic provided by paths when compared to on-street bikeways. Sidepaths may be desirable along high volume or high speed roadways, where accommodating the less confident bicyclist within the roadway in a safe and comfortable way is impractical. However, sidepaths may present increased conflicts between path users and motor vehicles at intersections and driveway crossings. The most effective way to reduce conflicts and increase safety is to minimize the number of driveway and street crossings present along a sidepath. Otherwise, crossing conflicts should be mitigated by providing high-visibility crossing treatments and sidepath intersection approaches.

High-Visibility Crossings

Pavement markings, signage, and traffic signals can all be used to increase the visibility of sidepath crossings of driveways and intersections, thereby reducing conflicts between people bicycling and people driving. In addition to standard warning signs, a variety of pavement markings including green pavement, shared lane markings, bike boxes, dashed lines, and solid lines can be used to enhance visibility, guide bicyclists, and warn of potential conflicts. The treatment will vary depending on the context of each intersection and should be chosen based on engineering judgment.



Sidepaths can present conflicts between people bicycling and people driving, especially at intersections and driveway crossings (above). Steps can be taken to mitigate these conflicts. Examples include high-visibility pavement markings, specialized warning signs, and enhanced traffic signals (below).

Adjust Intersection Approaches

Another way to mitigate conflicts is to adjust the location of the sidepath as it approaches the intersection. Best practices support taking one of two approaches:

1. Move crossings closer to the curb line of the parallel road (and reduce corner radii significantly). The theory behind this approach is to allow people driving and people bicycling to be able to recognize each other as intersecting traffic. However, this approach may result in motor vehicles blocking the crosswalk and places bicyclists in a location that is not highly visible for turning motorists. Mitigating high-visibility signage and pavement markings should be combined with this approach. The only national guidance that is relevant in this case is the NACTO Guide's section on two-way separated bike lanes (cycle tracks), which recommends very small corner radii (e.g., 5-10-foot actual radius) and high-visibility pavement markings (such as solid green paint bordered by white dashed stripes). However, the NACTO Guide is largely designed for urban contexts and such treatments may not be appropriate in all locations in Will County.
2. Moving crossings farther away from the curb line so that the crossing functions as a second intersection. Moving the path crossing farther from the curb line of the parallel road has many advantages, including:
    - Increasing the visibility of bicyclists and pedestrians in the crossing by motorists turning off of the parallel street, since the crossing is now directly in front of the motorist once he has turned, instead of in his peripheral view.
    - Allowing space for cars turning from the parallel street onto the cross street to wait outside of the flow of traffic on the parallel street.

- Slows bicyclists as they approach the intersection, meaning they enter the crossing at slower speeds, making them more visible to motorists.
- Allows one or more cars waiting to turn onto or cross the parallel street from the cross street to queue without blocking the path crossing.

The primary disadvantage is that offset crossings require more ROW and additional traffic control (warning signs for motorists). The most applicable design guidance for suburban two-way paths along roadways is the Dutch CROW Manual. Its guidelines recommend 16-23-feet of setback from the curb line of the parallel road, with the path offset bend beginning at least 115-feet from the intersection with curve radii at least 39-feet (which serves to slow bicyclists). These recommendations are for intersections between arterial roads and collector/local roads. For intersections between two arterial roads, the crossings should be closer to the intersection and bicycle-specific signal heads should be used.

References & Resources

- AASHTO Guide for the Development of Bicycle Facilities (2012)
- FHWA Shared-Use Path Level of Service Calculator (2006)
- Manual on Uniform Traffic Control Devices (2009)
- CROW Design Manual for Bicycle Traffic (2007, The Netherlands)

6. Bike Routing/Destination Wayfinding

The current state-of-the-practice has been moving away from route signage to wayfinding as it is a highly visible way to improve bicycling in an area because it helps identify the best routes to destinations, helps people overcome a barrier of not knowing where to ride, and reminds motorists to anticipate the presence of bicyclists. A wayfinding system is typically composed of signs and pavement markings that guide bicyclists along preferred routes (which may or may not be numbered, named, or color-coded) to destinations across the community, county, or region. Signs may also state distances or time to destinations.

Key Points

- Improves the usefulness of the bicycle network, especially when routes are diverted away from well-known streets.
- Helps bicyclists find lower-stress bikeways.
- Supports bicycle encouragement efforts by reducing concerns about misdirection and getting lost.
- Provides a widespread indicator for motorists that bicyclists should be expected on streets, especially those that are popular bike routes.
- Can cause unnecessary confusion if signs do not uniquely identify the route, if the selection of destinations is not optimized, and if placement of signs is not logical.
- Bike route signs should be placed in addition to appropriate facility types such as paved shoulders or bike lanes. Bike route signs are only a suitable stand-alone treatment on very low-traffic roads.
- Too many signs can contribute to sign clutter.

Design Criteria

- Basic bicycle route signs consist of a MUTCD-style "Bike Route" sign placed every half mile on a major bike route and on the approach to major bike routes at decision points. Unique numbered routes can be designated and can incorporate a route name or agency logos (see example in Image 1).
- Bike route signs can be supplemented with "fingerboard" panels showing destinations, directions, and distances (see Image 2 and Image 3).
- Place directional signs (see Image 2) on the near side of intersections and confirmation signs (see Image 3) on the far side of intersections.

M 1-8 series bicycle route sign

D11-1 series bicycle route sign with D1-3 series destination signs

Additional Considerations

- A bicycle wayfinding protocol should coordinate with bicycle route maps and provide three general forms of guidance:
  - Decision assemblies, which consist of Bike Route identification and optional destination fingerboards, placed at decision points where routes intersect or on the approaches to a designated bike route.
  - Turn assemblies, which consist of Bike Route panels and arrow plaques, placed where a designated bike route turns from one street to another.
  - Confirmation assemblies, which consist of Bike Route panels and optional destination fingerboards, placed on the far side of intersections to confirm route choice and the distance (and optionally, time) to destinations.
- Sign design can be customized to add distinct community branding, but the clarity and accuracy of the information must be the top priority.
- If destination wayfinding is implemented, the location of signs and represented destinations should be planned in a comprehensive manner, considering the likely routes of bicyclists and probable destinations. Typical destination wayfinding content includes direction, name, and distance to communities, commercial centers, shared use paths, and other popular destinations.
- The sign protocol should take into consideration the height and type of sign post that is used. It is common on shared-use paths for two sign assemblies to be mounted on the same sign post. If signs are bolted directly to the post, and the assemblies need to be mounted at a 90-degree angle, a longer post may be required to accommodate the extra height.

D11-1 series bicycle route sign with D1-3 series destination signs

References & Resources

- NACTO Urban Bikeway Design Guide (2012)
- Manual on Uniform Traffic Control Devices (2009)

Appendix A: Detailed Level of Traffic Stress Methodology

APPENDIX A: DETAILED LEVEL OF TRAFFIC STRESS METHODOLOGY

In Chapter 2, an analysis of Will County's roadways for on-street bikeway compatibility was briefly discussed. This Appendix includes a comprehensive discussion of the methodology used to perform the Level of Traffic Stress analysis.

Multiple methodologies to determine the suitability of streets for bicycling have been developed over the past few decades. The most common models used over the past few years (such as the Bicycle Compatibility Index and Bicycle Level of Service models) are very quantitative and scientific, being developed based on the feedback of users riding along various study segments of streets in selected locations in the United States. One critique is that these methods estimate and are based on the perception of safety afforded by various factors, as opposed to being based on proven crash reduction strategies. As such, the traditional methods arguably overestimate the effects of some factors (such as the presence of a striped bike lane) and underestimate the effects of others (most notably traffic volumes and speeds). While these models may be adequate for determining suitability for highly-skilled and confident bicyclists, they may not be adequate for determining suitability for the entire population (including people that do not currently ride a bicycle, but have interest in doing so).

1. Types of Bicyclists and the New "Typical Bicyclist"

The Portland Office of Transportation [9] supplemented with survey-based research[10] indicates that people (whether or not they regularly ride a bicycle) fall into one of the four categories shown in Table A- 1, based on their traffic stress tolerance or comfort, confidence, and willingness to interact with motor vehicle traffic.

As shown in Table A- 1, the majority (56 percent) of people are "Interested but Concerned" about bicycling. The research and thinking surrounding this method for classifying the general population by traffic stress tolerance posits that the "Interested but Concerned" portion of the population is not bicycling very often, at least not on streets with little separation between bicycles and cars. Table A- 1 illustrates that the majority of the population that currently or might bicycle (the "Interested but Concerned" and "Enthused and Confident" categories) are concerned about interactions with motor vehicles, which indicates that separation from motor vehicle traffic may be the most important factor to consider to encourage more people to bicycle.

[9] *Geller, R. "Four Types of Cyclists." Portland Office of Transportation. (https://www.portlandoregon.gov/transportation/article/264746)*

[10] *Dill, J. and N. McNeil. (2013, January) "Four Types of Cyclists? Examining a Typology to Better Understand Bicycling Behavior and Potential." Paper presented at the Annual Meeting of the Transportation Research Board.*

2. Level of Traffic Stress Methodology

Since the categorization methodology used by Geller, Dill, and others as described in Table A- 1 posits that people can be classified based on their willingness or aversion to bicycle with or alongside motor vehicle traffic, determining the "traffic stress" of a street segment may be the most appropriate way to determine the segment's suitability for bicycling. The Mineta Transportation Institute (a California-based research institution) developed the LTS model to do this, and it loosely correlates with the categories outlined in Table A- 1. Generally speaking, LTS 4 is only suitable for "Strong and Fearless" bicyclists, LTS 3 is suitable for that group as well as "Enthused and Confident" bicyclists, LTS 2 is suitable for almost everyone other than children, and LTS 1 is suitable for the entire population (with the exception of very young children). The LTS definitions are shown in Table A- 2.

As opposed to other methods to determine the suitability of streets for bicycling (mentioned previously), the LTS method provides a greater weight to motor vehicle traffic speeds and volumes. While most people are comfortable bicycling on quiet streets, the LTS method requires physical separation between bicycles and cars when traffic volumes and speeds exceed certain thresholds. This is important because, as noted above, separation from motor vehicle traffic may be the most important factor to encourage more people to bicycle.

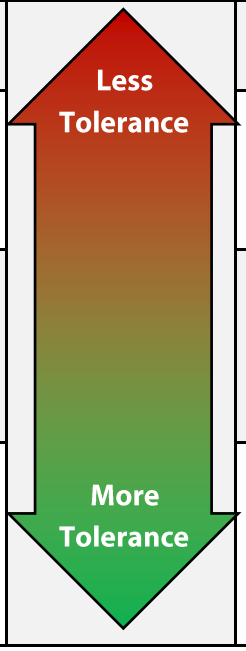
The LTS model can factor traffic stress along street segments, intersection approaches, and street crossings in determining an overall rating for a segment.[11] The method uses several base criteria for determining traffic stress (street width, motor vehicle speed, and presence of on-street parking) as well as additional criteria depending on facility type (bike lane width, traffic volume when streets do not have bike lanes, and number of driveway/street crossings for paths).

Table A- 3 illustrates how LTS is calculated for various types of streets. The factors included in this table have been tailored specifically for Will County. (Note: Due to GIS data limitations, the presence of bike lanes is unknown. Therefore the thresholds shown in the "shared streets" column were applied to all street and road segments in Will County.)

In summary, the LTS model helps Will County identify the traffic stress that may be experienced along each part of the street and road system. It also serves as a tool to help develop interconnected systems of low-stress bikeways that will appeal to the majority of the population (the "Interested but Concerned" and "Enthused and Confident" groups). A similar approach has been taken by the Dutch for decades, resulting in approximately 80 percent of the population riding a bicycle at least once per week and 25-50 percent of the population in larger cities biking to work on a daily basis.

[11] *Due to data limitations, only street segment traffic stress was calculated for this project's analysis.*

Table A- 1: General Population Broken Down by Interest in Bicycling

Category Description*	Traffic Stress Tolerance	Characteristics** The red bars indicate the percent of this group that strongly or somewhat agrees that being hit by a motor vehicle when bicycling is a concern of theirs.	Percent of Population**
No Way, No How		Not interested in riding a bicycle for transportation. 87%	31%
Interested but Concerned		Little tolerance for traffic stress with major concerns for safety. Strongly prefer separation from traffic on arterials by way of protected bike lanes and paths. 84%	56%
Enthused and Confident		Some tolerance for traffic stress. Confident riders who will share lanes with cars, especially on rural roads, but prefer separated bike lanes, paths, or paved shoulders on roads with higher traffic levels. 52%	9%
Strong and Fearless		High tolerance for traffic stress. Experienced riders who are comfortable sharing lanes on higher speed and volume arterials. These riders are less interested in protected bike lanes and paths than the general population. 39%	4%

*These category names were developed by Roger Geller of the City of Portland Office of Transportation. They have become the standard naming convention, but some advocates and industry professionals feel they cast a negative tone on certain types of bicyclists.
**Percent of people concerned about being hit by a motor vehicle and percent of total population are from Dill, J. and N. McNeil. (2013, January).

Table A- 2: LTS Definitions

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.

Source: Mekuria, Furth, and Nixon. "Low-Stress Bicycling and Network Connectivity." Report 11-19. May 2012. Mineta Transportation Institute. San Jose State University, San Jose, California.

Table A- 3: Level of Traffic Stress (Tailored for Will County)

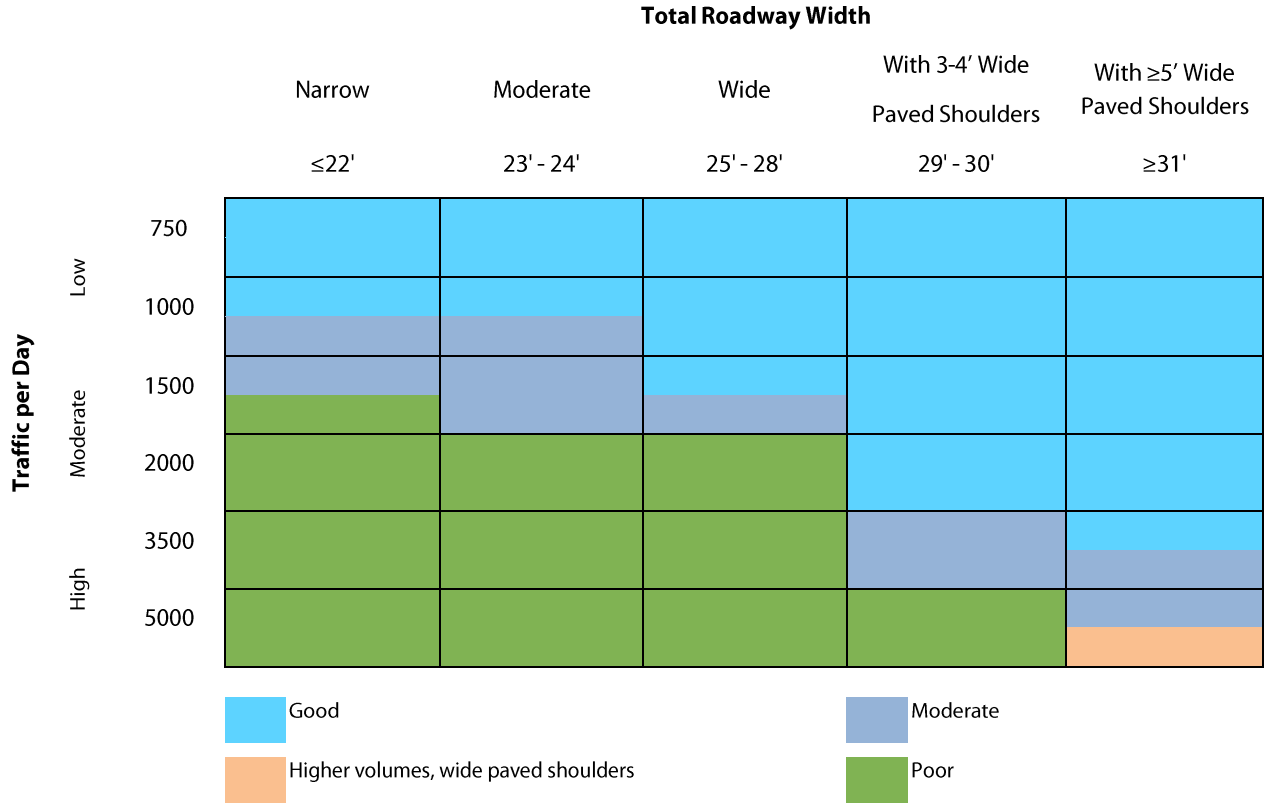
Level of Traffic Stress	Shared Streets*	Bike Lanes* not Alongside a Parking Lane (not calculated)	Bike Lanes* Alongside a Parking Lane (not calculated)	Shared-Use Paths* (trails)
LTS 1	≤ 25 MPH One travel lane in each direction	≤ 30 MPH 1 lane† Bike lane ≥ 6 feet	≤ 25 MPH 1 lane† Bike lane ≥ 7 feet	Completely separated from car traffic ≥ 10 feet wide
LTS 2	≤ 30 MPH One travel lane in each direction	≤ 30 MPH 2 lanes Bike lane 4-6 feet	≤ 30 MPH 1 lane Bike lane 6-7 feet	Along streets with few driveway/street crossings ≥ 10 feet wide
LTS 3	≤ 25 MPH Two travel lanes in each direction	≤ 35 MPH > 2 lanes Bike lane 4-6 feet	≤ 35 MPH ≥ 2 lanes Bike lane 5-6 feet	Along streets with many driveway/street crossings 8 feet wide
LTS 4	> 30 MPH More than two travel lanes in each direction	≥ 40 MPH > 2 lanes Bike lane < 4 feet	≥ 40 MPH ≥ 2 lanes Bike lane < 5 feet	n/a

* Shared streets include sharrows, neighborhood streets, and any street without a dedicated bicycle facility. Bike lanes may include paved urban shoulders. The LTS model developed by the Mineta Transportation Institute does not consider shared-use paths; however, the LTS was tailored for Will County to account for an assessment of its shared-use paths.
† Travel lanes in each direction (does not including bike or parking lanes).

3. Rating Rural Roads

The LTS model is based on urban and suburban contexts and cannot be applied to rural roads for this reason. However, WisDOT has a methodology for calculating bicycle compatibility for rural roads, which has been used for several decades in Wisconsin, Iowa, and other states. The model was designed to be sensitive to the conditions of low and moderate volume rural roadways and was based on the probability of a conflict between bicyclists and passing vehicles based on research performed as part of a National Cooperative Highway Research Program (NCHRP) study. [12] Very few rural roads with low volumes of traffic have enough width to allow three vehicles (two passing motorists and a bicyclist) to comfortably share the same linear space. The statistical probability of motor vehicle/bicycle conflict has a major impact on the suitability of a roadway for shared use and overall safety. The model was made sensitive to volumes based on earlier research conducted for warranting passing lanes on highways. The model uses factors including average daily traffic volume, roadway width, percent solid yellow center line, and percent truck traffic. Based on a combination of these factors, roadway segments are rated "good", "moderate," or "poor." A generalized explanation of the methodology is displayed in Table A- 4.

Table A- 4: Generalized Bicycling Conditions for Rural Roadways[13]



[12] *Glennon, John C. Design and traffic control guidelines for low-volume rural roads. Washington, D.C.: Transportation Research Board, National Research Council, 1979. Print.*

[13] *Wisconsin Rural Bicycle Planning Guide. Wisconsin Department of Transportation. April 2006. 15.*

For purposes of analyzing the suitability of Will County's transportation system for bicycling, the categories shown in Table A- 4, were correlated with Level of Traffic Stress ratings, as shown in Table A- 5. Because of the higher traffic speeds experienced along rural roadways, the "Best conditions" category is associated with LTS 2. This indicates that while most adult bicyclists should be comfortable using a "Best conditions" rural road, this type of road would likely not be appropriate for younger children.

For the sake of simplicity, the LTS categorization scheme (1-4) is used for mapping urban as well as rural traffic stress. Category 1 does not appear in rural areas because there is no associated rural roads rating category, as explained in the previous paragraph.

Table A- 5: Correlation between Urban and Rural Traffic Stress Ratings

Level of Traffic Stress Rating (Urban Contexts)	**Bicycling Conditions for Rural Roads Rating (Rural Contexts)**
LTS 1	n/a
LTS 2	Best conditions
LTS 3	Moderate conditions
LTS 4	Undesirable conditions

Appendix B: Corridor Selection Ratings and Descriptions

APPENDIX B: CORRIDOR SELECTION RATINGS AND DESCRIPTIONS

In Chapter 3, 14 future bikeway corridors were analyzed based on a set of six corridor selection criteria. This analysis was used to describe each corridor and identify corridors for prioritization and further study. The resulting ratings and contributing factors are described in detail on the following pages.

#1 DuPage River Trail*

	Criteria	Rating	Description
A	Destinations	Completely	Connects Naperville, Bolingbrook, Plainfield, Shorewood, and Channahon; Greene Valley Preserve; DuPage River Park; numerous smaller preserves.
B	Bikeway Connections	Completely	Many existing smaller trails; I&M Canal Trail; Rock Run Greenway Trail; Joliet Junction Trail.
C	Directness	Mostly	Relatively direct following river meanders.
D	Low-Stress Capability	Completely	Few street crossings at grade.
E	Recreation/ Transportation Value	Completely	Very scenic corridor providing access to numerous parks.
F	Feasibility	Completely	Some challenges to resolve, but much planning has occurred for the corridor and this is a local priority for many communities.

*Corridor has been studied in detail as part of a previous planning effort.

#2: Plainfield Veterans Memorial Trail

	Criteria	Rating	Description
A	Destinations	Completely	Connects Plainfield, Romeoville, Lemont, and Romeoville; regional retail centers; Prairie and Renwick Preserves; Isle A la Cache Museum.
B	Bikeway Connections	Completely	I&M Trail; Romeoville Trails; Renwick Trail; DuPage River Trail.
C	Directness	Mostly	Mostly follows linear utility corridors.
D	Low-Stress Capability	Completely	Few street crossings at grade.
E	Recreation/ Transportation Value	Somewhat	Provides access to trails and parks, but utility corridors are not very scenic.
F	Feasibility	Completely	Romeo Rd. between Canal and Smith Road may be a challenge, but many segments are already in place.

#3 (north): Weber Road

	Criteria	Rating	Description
A	Destinations	Completely	Connects Joliet, Romeoville, Bolingbrook, Naperville; Regional retail; Industry near I-55; O'Hara Woods, Prairie Bluff Preserves.
B	Bikeway Connections	Completely	DuPage River Trail; Rock Run Greenway Trail; Joliet Junction Trail; Trails in Romeoville; I&M Canal Trail.
C	Directness	Completely	Very direct if the bikeway follows Weber Road directly.
D	Low-Stress Capability	Mostly	Generally, ROW is adequate for side path but some areas are constrained and have multiple driveway crossings.
E	Recreation/ Transportation Value	Somewhat	Provides access to trails and parks, but more transportation oriented.
F	Feasibility	Somewhat	High Population/ High Demand area; ROW currently largely available but future roadway projects may restrict ROW substantially; local interest may spur local funding.

#3 (south): IL-53

	Criteria	Rating	Description
A	Destinations	Mostly	Connects cities of Joliet and Wilmington, Intermodal; Lincoln Cemetery; Midewin Preserve; Kankakee State Park.
B	Bikeway Connections	Completely	I &M Canal Trail, Old Plank Road Trail, Wauponsee Glacial Trail, Kankakee River Trails.
C	Directness	Completely	Few deviations if following highways 53 and 102.
D	Low-Stress Capability	Somewhat	Due to traffic, shoulder cannot be low stress; side path would be low-stress, but may be cost prohibitive.
E	Recreation/ Transportation Value	Mostly	Passes thru some picturesque areas, but also thru heavy industrial; follows a portion of the historic Route 66 corridor.
F	Feasibility	Somewhat	Mostly in an undeveloped area so space is available, but local funding is probably limited.

#4 Aurora to Orland Park

	Criteria	Rating	Description
A	Destinations	Completely	Connects Homer Glen, Orland Park, Lockport, Plainfield, and Aurora; Lewis University; new subdivisions; Prairie Bluff, Renwick, and Avery Preserves.
B	Bikeway Connections	Completely	Trails in Plainfield; Renwick Preserve Trail; Prairie Bluff Trail; I&M Canal Trail.
C	Directness	Somewhat	Depends on alignment, but will require some meandering around barriers.
D	Low-Stress Capability	Completely	Portions follow busier roads, but a sidepath with protected crossings can provide a low-stress experience.
E	Recreation/ Transportation Value	Mostly	Uses road and railroad corridors, but connects large preserves.
F	Feasibility	Completely	Many segments already in place; potential constraints crossing canal.

#5 Veterans Memorial Trail to Jackson Creek*

	Criteria	Rating	Description
A	Destinations	Completely	Connects Manhattan, New Lenox, Lockport, and Lemont; Hospitals; three METRA stations; Potawatomi Woods and Spring Creek Preserves.
B	Bikeway Connections	Mostly	Veterans Memorial Trail; Old Plank Road Trail; Wauponsee Glacial Trail
C	Directness	Mostly	Potentially, depending on alignment.
D	Low-Stress Capability	Mostly	Trail would require multiple street crossings in middle portion.
E	Recreation/ Transportation Value	Somewhat	Largely through developed areas along man-made corridors, but provides access to rural areas.
F	Feasibility	Mostly	Developing area, but several challenging crossings (e.g. I-80).

*Corridor has been studied in detail as part of a previous planning effort.

#6 Black Road*

	Criteria	Rating	Description
A	Destinations	Completely	Connects Shorewood, Joliet, Fairmont, Homer Glen, and Orland Park; Hammel Woods and Spring Creek Preserves.
B	Bikeway Connections	Completely	DuPage River Trail; I&M Canal Trail; Rock Run Greenway Trail; Joliet Junction Trail; Spring Creek Trails; Veterans Memorial Trail.
C	Directness	Mostly	Some meandering likely necessary.
D	Low-Stress Capability	Completely	Trails with limited crossings feasible.
E	Recreation/ Transportation Value	Completely	Mostly along creeks with some portions along roadways.
F	Feasibility	Mostly	Joliet to Spring Creek a challenge, but many pieces are already in place.

*Corridor has been studied in detail as part of a previous planning effort.

#7 (north): Spring Creek to Jackson Creek

	Criteria	Rating	Description
A	Destinations	Completely	Connects Homer Glen and Mokena; one or two Metra stations; Hickory Creek Preserve; two Cook County Preserves; Messenger Marsh.
B	Bikeway Connections	Somewhat	Plank Road; Hickory Creek Preserve Trails.
C	Directness	Not Really	Will likely necessitate many turns.
D	Low-Stress Capability	Mostly	Would include a fair number of at-grade crossings.
E	Recreation/ Transportation Value	Mostly	Along utility corridors and road corridors mostly, but through a rural-like area.
F	Feasibility	Mostly	Somewhat developing area with available right-of-way.

#7 (south): US-45

	Criteria	Rating	Description
A	Destinations	Not at All	Jackson Creek Preserve (which has no improved access) is the only destination. No cities, transit or major employment areas are connected.
B	Bikeway Connections	Not at All	None.
C	Directness	Completely	Mostly follows US-45, so it is very direct.
D	Low-Stress Capability	Somewhat	If provided as wide paved shoulders on US-45, it will be very high-stress. A sidepath with few crossings is possible, but may not be economically feasible.
E	Recreation/ Transportation Value	Somewhat	In a rural setting, but along a busy highway with significant truck traffic.
F	Feasibility	Not Really	Substantial right-of-way acquisition may be necessary to build a sidepath.

#8 Rock Run to Harlem Avenue

	Criteria	Rating	Description
A	Destinations	Somewhat	Connects Channahon, Manhattan, University Park, and Crete; Governor's State University; Metra station; Exxon plant; Union Pacific Intermodal. However, it does not create new connections between population centers.
B	Bikeway Connections	Somewhat	I&M Canal Trail; Wauponsee Glacial Trail; relatively few connections considering length of corridor.
C	Directness	Mostly	Directness depends on selected alignment, which will likely be circuitous at the eastern end.
D	Low-Stress Capability	Somewhat	If established as an on-street bikeway, it will only be suitable for more experienced bicyclists. Urban/suburban portions may be more stressful. A continuous path is likely not feasible in the foreseeable future.
E	Recreation/ Transportation Value	Mostly	Passes through rural areas, but also industrial zones
F	Feasibility	Not Really	Probably will either follow roads as a path or be paved shoulders; is it worth the expense to acquire ROW + build a path at this point?

#9 Tinley Park to Plum Creek Greenway

	Criteria	Rating	Description
A	Destinations	Completely	Connects Orland Park, Tinley Park, and Frankfort; Metra station; Hollywood Amphitheater; Hospital; METRA; Governor's State University.
B	Bikeway Connections	Completely	Old Plank Road Trail; trails in Tinley Park and Frankfort; Cook County Forest Preserve District Trails.
C	Directness	Mostly	Mostly straight with a few circuitous portions.
D	Low-Stress Capability	Mostly	Can be mostly developed as trails along utility corridors and low traffic streets; few at-grade crossings will be necessary.
E	Recreation/ Transportation Value	Somewhat	Connects to parks, but mostly follows utility/road corridors
F	Feasibility	Completely	Upcoming 80th St. reconstruction project provide the opportunity to construct a trail crossing; many segments of trail exist already.

#10 Wauponsee Glacial Trail to Plum Creek Greenway

	Criteria	Rating	Description
A	Destinations	Somewhat	Connects Manhattan and Monee; Midewin National Tallgrass Prairie; Goodenow Grove Nature Preserve; Monee Reservoir; South Suburban Airport
B	Bikeway Connections	Somewhat	Wauponsee Glacial Trail and Plum Creek Greenway Trail
C	Directness	Completely	Straight along a road right-of-way with a few turns around the South Suburban Airport boundary
D	Low-Stress Capability	Somewhat	Low-stress roads or paths are feasible are generally feasible, although traffic along Pauling Road may continue to increase.
E	Recreation/ Transportation Value	Somewhat	In a rural setting and provides access to a couple of Forest Preserve Districts.
F	Feasibility	Not Really	Feasible only as part of potential future road improvements.

#11 Thorn Creek/Governor's Highway

	Criteria	Rating	Description
A	Destinations	Completely	Connects Glenwood, Chicago Heights, University Park, Monee, Peotone, and Richton Park; Gov. State University; Raccoon Grove Forest Preserve, Sauk Trail Woods, Brown Well Woods; Metra station.
B	Bikeway Connections	Mostly	Old Plank Road Trail; existing trails in Cook County.
C	Directness	Completely	Very linear corridor with some meanders along Thorn Creek.
D	Low-Stress Capability	Completely	The nature of the corridor dictates that most parts be developed as a trail along greenways and a railroad with few roadway crossings.
E	Recreation/ Transportation Value	Completely	Corridor Includes a rural portion and a forested greenway portion.
F	Feasibility	Somewhat	May have nature preserve conflicts; construction through wooded areas more difficult than through clear areas.

#12 (west): Route 66

	Criteria	Rating	Description
A	Destinations	Completely	Connects Codley, Braidwood, and Wilmington; Route 66-associated destinations; Midewin National Tallgrass Prairie, Hitts Siding Prairie, and Wilmington Shrub Prairie Preserves.
B	Bikeway Connections	Mostly	Wauponsee Trail; Route 66 designated route.
C	Directness	Somewhat	Depending on alignment, this bikeway may have numerous turns.
D	Low-Stress Capability	Mostly	Low stress roads or trails feasible. If placed along IL-53, wide paved shoulders (and perhaps eventually a sidepath) would be necessary to minimize stress.
E	Recreation/ Transportation Value	Completely	Follows the historic Route 66 corridor and provides access to forest preserves. Passes through area with a high number of strip mine lakes.
F	Feasibility	Mostly	Requires some right-of-way, but the nearby population likely would support the investment.

#12 (east): Wilmington Peotone Road

	Criteria	Rating	Description
A	Destinations	Not Really	Wilmington is nearby, but the actual corridor only connects to Peotone and Beecher.
B	Bikeway Connections	Somewhat	Wauponsee Glacial Trail and some low-stress rural roads.
C	Directness	Completely	Straight along the roadway.
D	Low-Stress Capability	Somewhat	A path is the only low-stress option, but may not be financially feasible.
E	Recreation/ Transportation Value	Somewhat	Passes through a rural setting, but along a busy road with heavy truck traffic.
F	Feasibility	Somewhat	Feasible only as part of a potential future Wilmington-Peotone Road expansion.

#13 Vincennes Trail

	Criteria	Rating	Description
A	Destinations	Mostly	Connects Chicago Heights, Steger, Crete, and Beecher; Plum Grove and Goodenow Grove Preserves; South Suburban Airport
B	Bikeway Connections	Not Really	Old Plank Road Trail.
C	Directness	Completely	Follows a straight railroad alignment.
D	Low-Stress Capability	Completely	If the path follows the railroad corridor, there are few crossings. Deviations to bypass properties may increase amount of interaction with motor vehicle traffic.
E	Recreation/ Transportation Value	Completely	Attractive rural setting with the possibility of a low-stress path would appeal to a wide spectrum of people.
F	Feasibility	Somewhat	Railroad bed is not rail banked and is divided amongst multiple owners. It may be difficult connecting to the Old Plank Road Trail.

#15 Plum Creek to Pennsy Greenway Trail*

	Criteria	Rating	Description
A	Destinations	Mostly	Connects Goodenow, Willowbrook, Dyer, IN, and Hartsdale, IN; Goodenow Grove Nature Preserve, Plum Creek Forest Preserve (Cook County); Dyer Amtrak Station.
B	Bikeway Connections	Mostly	Plum Creek Greenway Trail, existing and planned trails in Indiana.
C	Directness	Completely	Relatively linear along the Plum Creek corridor.
D	Low-Stress Capability	Completely	The nature of the corridor dictates that this bikeway be developed as a trail, which will result in few crossings of roadways.
E	Recreation/ Transportation Value	Completely	Includes a forested greenway portion and connects to neighborhoods.
F	Feasibility	Somewhat	Portions of this trail exist. Construction through wooded areas is more difficult than through clear areas. This corridor requires significant right-of-way acquisition and coordination with Lake County, Indiana.

*Corridor has been studied in detail as part of a previous planning effort.

Appendix C: Bicycle Facility Selection Tool Examples

APPENDIX C: BICYCLE FACILITY SELECTION TOOL EXAMPLES

In Chapter 4, the Bikeway Facility Selection Tool was introduced. The tool calculates the current LTS for a given roadway segment based on data input by the user. Data inputs include traffic volume, speed limit, roadway configuration and the presence or lack of existing bicycle accommodations. The tool then allows users to explore alternative configurations incorporating bicycle accommodations and automatically generates a projected LTS for each new configuration. The tool is intended to be used by municipalities and their park districts, the Will County DOT, and the Forest Preserve District.

The tool is an Excel workbook containing three tabs as described below.

1. **Introduction** – The first tab provides an overview of the tool's functions and limitations as well as instructions for its use.
2. **Facility Selection** - This tab recommends compatible facility types for a roadway based on traffic volume and speed limit. It allows the user to select facility types based on intended bicyclist user types: Less Confident, Casual, or "Interested but Concerned" Users; and More Confident, Avid, or "Enthused and Confident" Users.
3. **Street Configuration** - This tab asks a user to input the existing and proposed roadway characteristics. A graphical plan-view representation of conditions is displayed for the existing configuration and the proposed configuration. Based on this information, the current and future LTS scores are computed. Users can explore various configurations such as adding a bike lane, adding a buffer, removing or narrowing lanes, and can also test different alternatives such as lowering the speed limit. The resulting LTS score based on this information will be automatically generated.