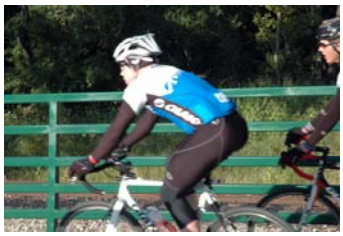
KANE COUNTY
BICYCLE AND PEDESTRIAN PLAN



PREPARED FOR:

FOREST PRESERVE DISTRICT OF KANE COUNTY	KANE COUNTY	KANE/KENDALL COUNCIL OF MAYORS (INCLUDING KENDALL COUNTY)

APRIL 2012

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CHAPTER 1 - INTRODUCTION

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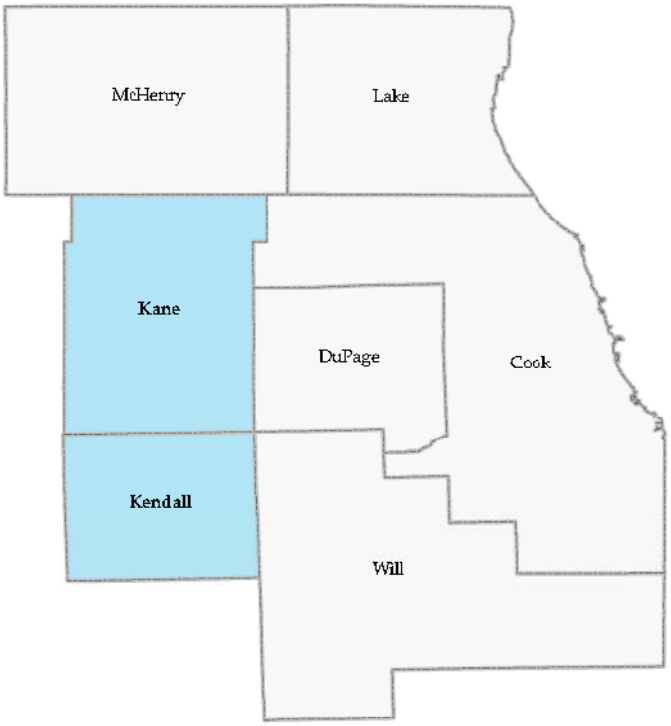
INTRODUCTION

Kane and Kendall Counties are part of the seven-county Chicago metropolitan region that also includes Cook, Lake, McHenry, DuPage and Will Counties. These two counties contain a diverse mix of urban, rural, agricultural and recreational land uses. The Kane/Kendall Council of Mayors, one of eleven sub-regional councils established through the Chicago Metropolitan Agency for Planning, provides a forum for municipal and public involvement and partnership in the various transportation plans and projects developed throughout northeastern Illinois.

In December 2002, the Kane County Council of Mayors, Kane County Division of Transportation, and the Kane County Forest Preserve completed a bicycle/pedestrian planning study, with the recognition that it is easier and more cost effective to plan for and construct bicycle and pedestrian facilities than to retrofit existing developments. While the automobile is the primary mode of transportation in the two counties, a growing number of residents are choosing to commute to work or perform errands with alternative modes of transportation – including walking and biking. Recreation and transportation opportunities can be increased by providing bicycle and pedestrian facilities that link residents to common destinations such as transit stations, retail centers, business districts, parks and housing.

Map 1. Chicago Metropolitan Planning Region



Since the plan was completed in 2002, a number of changes have occurred within the planning area. Kane County's population has increased from 404,119 residents to 515,269. The eastern third of the County has seen development pressures and despite past growth about 60 percent of the county remains agricultural.

Further changes have also occurred to the south in Kendall County. In 2002, the Kane County Council of Mayors boundaries included only the northern Kendall County Townships of Oswego, Bristol and the northern portion of Kendall. The entirety of Kendall County was included in the planning area to form the Kane/Kendall Council of Mayors in 2005. Kendall County has also experienced tremendous growth as the 2010 Census recognized Kendall County as the fastest growing county in the nation percentage-wise over the past ten years. The total population of Kendall County has increased from 54,563 residents to 114,736.

Along with the growth of the counties there have been other advances that have changed the landscape of bicycle and pedestrian planning in the region. First, the Illinois Complete Streets law requires the Illinois Department of Transportation to consider safe bicycling and walking facilities in projects in all urban areas. In addition, an update to the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) was published in 2009 creating new standards for traffic control devices throughout the nation. The American Association of State Highway and Transportation Official (AASHTO) "Green Book" which has long been the standard for infrastructure engineering, is also updating its bicycle design standards.

The municipalities, park districts, counties, forest preserves and other implementing agencies have made significant strides in advancing the policies and strategies of the 2002 Plan. For example, in 2002 there were approximately 210 miles of regional and local bikeways while there are now over 300 miles in Kane and Kendall Counties combined.

Communities have also recognized the importance of bicycle and pedestrian planning. Fifteen municipalities and park districts now have stand alone bicycle and pedestrian plans as compared to only eight in 2002. Many other communities include bicycle and pedestrian planning in their local comprehensive or transportation plans.

This plan seeks to build off of the 2002 Plan and continue to link local trails with regional trails, update standards for bikeway construction, classify existing and proposed trails, and plan for regional corridors where bicycle use is most likely.

NEED FOR BICYCLE AND PEDESTRIAN PLANNING

The primary reason that communities plan for bicycle and pedestrian facilities is to provide a high quality of life for their residents. The benefits of bicycling include: enjoyable exercise, economical transportation, the ability to choose an alternative transportation mode, independence or mobility for children, and contact with neighbors and the physical environment. Current levels of interest indicate a huge potential for increasing bicycling and walking nationwide. With improved conditions and infrastructure the safety of these activities should also increase.

As areas continue to develop, roadway planning and improvements must keep pace with residential and commercial growth. Without proper facilities, traffic generated by developments on the roadways may make it difficult to bicycle or walk. Proper planning is critical to ensure that developments and the roadways that serve them are as bicycle and pedestrian friendly as possible. Planning is also needed to ensure that future visions of a multi-modal system are clearly recognized by all parties involved in the development of the region.

WHY PLAN FOR BICYCLES AND PEDESTRIANS

The Kane County 2040 Transportation Plan describes a comprehensive transportation strategy that includes a multi-modal approach to a transportation system with sections on public transportation and bicycle and pedestrian facilities, along with recommendations for the County's highway system. This Bicycle and Pedestrian Plan will serve as a component of the Kane County 2040 Transportation Plan, providing specific recommendations for improving bicycle facilities.

In January of 2003, the Kendall County Forest Preserve District and the Kendall County Planning, Building and Zoning Department initiated the creation of the Kendall County Trails and Greenways Plan. The central purpose of the Kendall County Trails and Greenways Plan is to merge existing municipal, park district and county trail plans, and to plan for the establishment of greenway corridors in suitable locations. This Bicycle & Pedestrian Plan will incorporate the Trails and Greenways Plan and provide additional recommendations for improving bicycle and pedestrian travel within Kendall County.

Kane and Kendall Counties continue to face significant choices about their futures. Like most suburban areas, the automobile dominates the two counties. However, county officials and residents are recognizing the importance of bicycle and pedestrian facilities not only as a means for recreation and transportation, but also for an improved quality of life.

For the existing urbanized areas, it can be difficult and expensive to retrofit streets and parks with bicycle facilities to link to existing facilities. However, consideration needs to be paid to the existing facilities and how they can be improved to serve residents' needs. At the same time, there is an opportunity to set aside corridors of land for facilities when planning new development. Lack of bicycle and pedestrian facilities or gaps in the system are significant obstacles. Providing continuity of the infrastructure encourages bicycle and pedestrian travel by making this alternative form of transportation safer and more accessible.

PLANNING AREA

The planning area for the Bicycle and Pedestrian Plan coincides with the political boundaries of the Kane/Kendall Council of Mayors. This area includes all of Kane and Kendall Counties, along with portions of Elgin in Cook County, and portions of Aurora in DuPage County. Kane County contains 522 square miles and Kendall County has approximately 324 miles for a total planning area of over 840 square miles. The planning area includes 38 municipalities and 16 park districts.

PLANNING PARTNERS

The following municipalities, governmental agencies and other organizations have participated in planning meetings and/or furnished information which was incorporated into the plan:

Kane/Kendall Council of Mayors
Kane County
Kane County Forest Preserve District
Kendall County
Kendall County Forest Preserve District

Village of Algonquin
City of Aurora
Village of Barrington Hills
Village of Bartlett
City of Batavia
Village of Burlington
Village of Carpentersville
Village of East Dundee
Village of Elburn
City of Elgin
City of Geneva
Village of Gilberts
Village of Hampshire
Village of Hoffman Estates
Village of Huntley
Village of Lily Lake
Village of Maple Park
Village of Montgomery
Village of North Aurora
Village of Oswego
Village of Pingree Grove
Village of Sleepy Hollow
Village of South Elgin
City of St. Charles
Village of Sugar Grove
Village of Virgil
Village of Wayne
Village of West Dundee
City of Yorkville

Batavia Park District
Big Rock Park District
Burlington Park District
Dundee Township Park District
Elgin Parks and Recreation
Fox Valley Park District
Geneva Park District
Hampshire Park District
Huntley Park District
Oswego Park District
South Elgin Parks and Recreation
St. Charles Park District
Sugar Grove Park District
Yorkville Parks and Recreation

Chicago Metropolitan Agency for Planning
Pace
Metra

League of Illinois Bicyclists
Active Transportation Alliance
Fox Valley Bicycle and Ski Club

PLANNING OBJECTIVES

The broad objectives of the plan are to comprehensively identify bikeways and strategically plan bicycle and pedestrian projects to create a council-wide network that will improve public safety and encourage alternative modes of transportation. This can be achieved through the following objectives:

1. **Publish an Updated Bicycle and Pedestrian Plan.** The plan inventories existing and planned bike facilities to help coordinate the systematic development of the bicycle/pedestrian system. It identifies gaps in services and high demand corridors to recommend and prioritize improvement projects. The plan includes strategies, specific policies, and design guidelines that will promote the creation of bikeways and pedestrian facilities in the council area.

2. **Identify Funding Programs.** In order to facilitate the implementation of regional considerations, the plan identifies and describes appropriate funding sources.

3. **Publish a Kane County and Kendall County Bikeways Map**. The Bicycle and Pedestrian Plan includes two maps: one for public distribution that illustrates the existing bikeway system and a planning map details existing and proposed facilities.

4. **Facilitate Local Planning and Education.** The plan supports local planning efforts by providing a framework and a wider understanding of bikeway and pedestrian facilities. It includes a section on funding sources to assist in local implementation. There are also sections on bikeway and pedestrian standards to ensure that new facilities are safe for all users. Finally, education materials, including model ordinances, are provided to promote safe walking and bicycling.

5. **Initiate a Coordinated Sign Program.** The plan outlines a prototype sign and way finding system for bicycles and pedestrians. A uniform way-finding sign scheme creates consistency for facility users and directs them to regional paths and destinations. The way-finding program coordinates with neighboring counties and national sign standards.

6. **Facilitate Arterial Roadway Corridor Improvements**. Arterial roadway crossings that are barriers or pose safety concerns to bicyclists and pedestrians have been identified. The plan presents recommendations for designs that improve movement and safety through intersections.

7. **Establish a Corridor System with Implementation Plan.** The plan includes recommendations for a system of regional and sub-regional bicycle corridors. The plan highlights specific implementation recommendations for the KKCOM and member communities. This will include funding opportunities for corridor and project implementation and more municipal- and corridor-based planning work.

8. **Develop a Tool-Kit for Reviewing Development, Redevelopment and Transportation Projects.** In order to promote the principles of the plan, various strategies or "tools" are recommended. The plan includes a checklist that allows users to quickly reference specific tools or guidelines depending on the plan or project being reviewed. The toolkit can be found in **Appendix A.**

9. **Update the KKCOM Bikeway GIS Database to CMAP Bikeway Inventory System (BIS) Standards.** Currently, each community in the KKCOM identifies their bicycle facilities in their own way. Creating a comprehensive KKCOM database, using CMAP's Bikeway Inventory System (BIS) standards, enables local implementers of individual transportation and development projects to identify existing and planned bicycle facilities in the area of their projects and to integrate these plans into their designs. This planning tool helps officials, planners, and transportation agencies understand, communicate, and coordinate efforts to accommodate bicyclists and other non-motorized modes of travel.

MISSION & GOALS OF THE PLANNING PROCESS

The underlying mission of the planning process is to increase bicycle and pedestrian travel in the region through the development, coordination and implementation of local and regional bicycle and pedestrian plans. The broad goal of the Bicycle and Pedestrian Plan is to enhance bicycling and walking and to reduce the number of short distance auto trips. Bicycling and walking will contribute to improving our air quality, reduce energy consumption, reduce the growth of congestion, and generally contribute to a positive quality of life. More specific goals of this plan are described below. A set of performance measures has been recommended for each goal in order to track the progress of implementing the plan. A baseline 'scorecard' for tracking progress has been developed and is included in **Appendix B.** The Bicycle and Pedestrian Coordinator will compile performance measure achievements and reports will be provided annually to the Kane/Kendall Council of Mayors Committees and posted on the Council's website.

GOAL 1: Develop a regionally coordinated network of non-motorized facilities and coordinate bicycle and pedestrian facilities through sub-regional and local actions by:

- Completing missing gaps in bicycle and pedestrian facilities between major destinations.
- Providing access across barriers.
- Improving local bicycle and pedestrian networks.
- Accommodating bicycles and pedestrians on bridges and underpasses.
- Encouraging bicycle and pedestrian enhancements as part of all developments, roadway improvements, and transportation projects.
- Encouraging local jurisdictions to follow national design standards

Performance Measures:

- Develop a rating system similar to the League of American Bicyclists Bicycle Friendly Community Award – rate each of the municipalities in Kane and Kendall Counties. (Appendix C).
- Length of regional trails and number of local connections.

GOAL 2: Improve the inter-modal efficiency of the transportation system by enhancing the connections between non-motorized and motorized modes. This can be achieved by:

- Providing adequate and secure bicycle parking at all intermodal passenger transfer facilities and major trip destinations.
- Promoting safe and convenient bicycle and pedestrian routes to transit stations.
- Accommodating bicycles on buses and trains where physically, operationally, and/or economically feasible.
- Promoting the use of the Pace Development Guidelines.

Performance Measures:

- Number of transit stops without shelters/pads and number of transit stops lacking sidewalk connections.
- Number of bicycle parking spaces at commuter stations and their utilization rates through the Metra On-Board and Parking Surveys.

GOAL 3: Improve bicycle and pedestrian safety through a variety of methods, such as:

- Ensuring adequate maintenance of pedestrian and bicycle facilities.
- Encouraging development and use of comprehensive education programs aimed towards children, which may include the distribution of videos on bicycle safety to local schools.
- Enforcing the rights and responsibilities of bicyclists and pedestrians.
- Applying facility design techniques that limit conflicts between bicyclists, pedestrians and motorists.
- Reviewing and implementing security measures at parking locations, remote areas, new facilities, etc.
- Encouraging innovative techniques to promote safety such as bicycle safety patrols.

Performance Measures:

- IDOT crash data for bicyclists and pedestrians.
- Highway Safety Improvement Program (HSIP) funds secured by communities.

GOAL 4: Incorporate bicycle and pedestrian elements into transportation, land use, and development planning and implementation actions on local levels.

- Incorporating bicycle and pedestrian accommodations into development regulations and development review procedures.

- Encouraging development that facilitates non-motorized travel.
- Developing policies to retrofit existing facilities.
- Considering non-motorized facilities into all planning, design, construction, and maintenance activities in local units of government where appropriate.
- Improving measurement of auto trips diverted by bicycle and pedestrian projects through data collection and appropriate analysis techniques.

Performance Measures:

- Communities with adopted Bicycle Parking Ordinances.
- Communities with Bicycle and Pedestrian Plans.
- Communities addressing Bicycle and Pedestrian issues in Comprehensive Plans.
- Communities and schools with School Travel Plans.
- Communities with adopted Complete Streets policies.

GOAL 5: Promote bicycling and walking to increase their use as a transportation mode. Promotional strategies may include:

- Establishing innovative techniques or programs such as the provision of amenities (e.g., parking, toilets, showers, lockers) and travel reimbursement incentives.
- Improving public awareness of existing and proposed bicycle and pedestrian facilities through various methods and media including a website.
- Increasing public awareness of the benefits of bicycling and walking.
- Developing an efficient way to allow users to communicate concerns or comments regarding the trail facilities to the appropriate entities.
- Promote the use of bike sharing programs in communities and businesses.

Performance Measures:

- Results of mode share from the U.S. Census American Community Survey.
- Bike Share Programs in communities.
- Number of Bicycle-Friendly Businesses.

GOAL 6: Promote funding opportunities for bicycle and pedestrian projects.

- Develop and distribute a comprehensive list of funding and other resources to increase success in obtaining grants for bicycle and pedestrian projects.

Performance Measures:

- Amount of grant funding secured/available for bicycle and pedestrian projects (Safe Routes to School, ITEP, CMAQ, OSLAD, STP, HSIP, including foundation grants that may be available, etc.).

GOAL 7: Include local citizens and advocacy groups in planning and implementation processes. Public participation strategies may include:

- Developing and consulting bicycle/pedestrian advisory groups and community or neighborhood groups.
- Cooperating and coordinating with local advocacy groups, such as Active Transportation Alliance and the League of Illinois Bicyclists.

Performance Measures:

- Number of communities that have Bike/Ped Advisory Committees or other groups.

RESULTS OF BICYCLE AND PEDESTRIAN PLANNING

Planning and implementing bicycle and pedestrian facilities benefits communities and their residents. Providing safe transportation alternatives and recreational facilities improves user safety. Other potential benefits for KKCOM residents include: reducing the growth of congestion, environmental improvements, improvements to the local economy, improved health of residents, and a higher quality of life.

1. **Reduce the growth of Congestion.** Many streets and highways carry more traffic than they were designed to handle, resulting in gridlock, wasted time and energy, pollution, and driver frustration. Because bicycling and walking require less space per traveler than automobiles they can help to reduce the growth of roadway congestion.

2. **Improve the Environment**. While a bikeway plan benefits recreational riders, a major goal is to provide a feasible alternative transportation option. Although cars are much cleaner today than they were in earlier years, if traffic congestion continues to grow, overall air quality could deteriorate. Bicycling and walking are virtually pollution free, benefiting the environment.

3. **Improve Economics.** Bicycling and walking are affordable forms of transportation. In 2010, the average cost of operating a car for one year was $9,520 (AAA) while the cost of operating a bicycle was approximately $220 a year (League of American Bicyclists). Many low-income workers cannot afford a car, making bicycling, public transportation, or walking the only alternatives. Bicycling reduces transportation costs and provides a means to retain more money in the local economy. By choosing to walk or bike for certain trips, families can save money on car expenses to spend elsewhere.

4. **Improve Health.** Kane County has a number of health initiatives currently underway to help reach the goal of being the healthiest county in Illinois by the year 2030. The Fit Kids 2020 Plan was developed to guide Kane County's efforts at the local level to

reverse the trend of childhood obesity. Proper bicycle and pedestrian planning can play a significant role in these health initiatives. The health benefits of regular physical activity via bicycling, walking, or other physical activities are far-reaching. A regular, preferably daily regimen of at least 30–45 minutes of brisk walking, bicycling, or even working around the house or yard will reduce a person's risk of developing coronary heart disease, hypertension, colon cancer, and diabetes. Secondary benefits of regular exercise include lower health care costs and improved quality of life for people of all ages.

5. **Improve Quality of Life.** Better conditions for bicycling and walking have intangible benefits to the quality of life in cities and towns. In a growing number of communities, bicycling and walking are considered indicators of a community's livability – a factor that has a profound impact on attracting businesses and workers, as well as tourism. In cities and towns where people can regularly be seen bicycling and walking, there is a palpable sense that these are safe and friendly places to live and visit.

6. **Improve Bicycle and Pedestrian Safety.** The safety of pedestrians and bicyclists is a concern for all communities. Unsafe conditions deter people from walking or bicycle riding for errands and recreation. The chief factors for fatal pedestrian accidents are: improper crossing of a road or intersection, playing or working in a roadway, failure to yield the right of way, children darting into the road, and poor visibility of pedestrians. For bicyclists, the greatest factors for fatal accidents are riding in the roadway, failure to yield right of way, improper crossings, and failure to obey road markings. As the KKCOM planning area becomes more populated and urbanized, more roads are being built or expanded. There are additional stresses on roadways and points of conflict between bicyclists and motorized traffic are increasing. Kane and Kendall Counties are planning for pedestrian and bicycle facilities that will help lower pedestrian and bicyclists conflicts and accidents, and have a positive impact on pedestrian and bicyclist safety.

CHAPTER 2 – BICYCLE FACILITY INVENTORY

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INTRODUCTION

The Kane/Kendall Council of Mayors planning area has a developed and popular bikeway system. At the heart of this system are multi-use trails constructed on abandoned railroad right-of-ways. These multi-use trails allow for long rides largely unobstructed by street crossings. A large number of sidepaths (multi-use paths along roadways) have also been constructed throughout the area and shorter, local trails can be found within parks and forest preserves. To a much lesser extent, there are on-street facilities, such as dedicated bicycle lanes, paved shoulders and wide curb lanes.

This chapter provides a description and analysis of the bikeway facilities in the KKCOM planning area. The bikeway facilities are divided into categories for ease of classification and descriptions are based on the CMAP Bicycle Information System (BIS). The BIS is an inventory of all local and subregional bikeway plans that serves as a planning tool to help officials, planners, and transportation agencies understand, communicate, and coordinate efforts to accommodate bicyclists and other non-motorized modes of travel. The BIS enables implementers of transportation and development projects to identify existing and planned bicycle facilities in the area of their projects and to integrate these plans into their designs in a consistent manner. The BIS differentiates trails based on their planned status and whether they are regional or local in nature.

Regional Bikeways – Over 130 miles of existing regional bikeways have been identified within the planning area. A regional bikeway is typically more than three miles in length and crosses into more than one municipal jurisdiction. These facilities typically link bicyclists to destinations via long, street-separated trails that can be used for both commuting and recreational rides.

The development of a regional system can be challenging. Coordination between county government, forest preserve districts, municipalities and park districts to ensure maintenance agreements for segments crossing jurisdictional boundaries is important. Signage must be coordinated to be consistent and clear in its message. Finally, coordination in the planning of regional bicycle facilities and timing of their implementation may be difficult, especially when retrofitting a trail to an existing roadway network or where construction costs are high. It is important to note that grant funding is more likely to be approved for regional facilities.

Local Bikeways – Approximately 180 miles of existing local bikeways have been identified within the planning area. A local bikeway is typically a shorter trail used for local recreation or destinations. It is less than three miles, serving one community or a single neighborhood. These local facilities are oftentimes not linked to a larger bikeway system, although opportunities may exist for linkages in the future.

Bikeway Planning Status – A further distinction is made in this report concerning the planning status of a bikeway facility. Bikeway facilities are categorized as either: existing, proposed, or conceptual.

- Existing bikeway facilities are present or under construction as of August 1, 2011. Existing bikeways are illustrated in Map 2.
- Proposed bikeway facilities are those that have already received funding, are to be constructed as a part of a development or roadway project, or will be constructed in the next five years.
- Conceptual trails are wish list items. They are transportation or greenway corridors where planners and municipal officials envision high levels of recreational activities or intermodal travel. They may link future or proposed origins and destinations. Many are trails that local governments, presently, have insufficient funds or demands to construct.

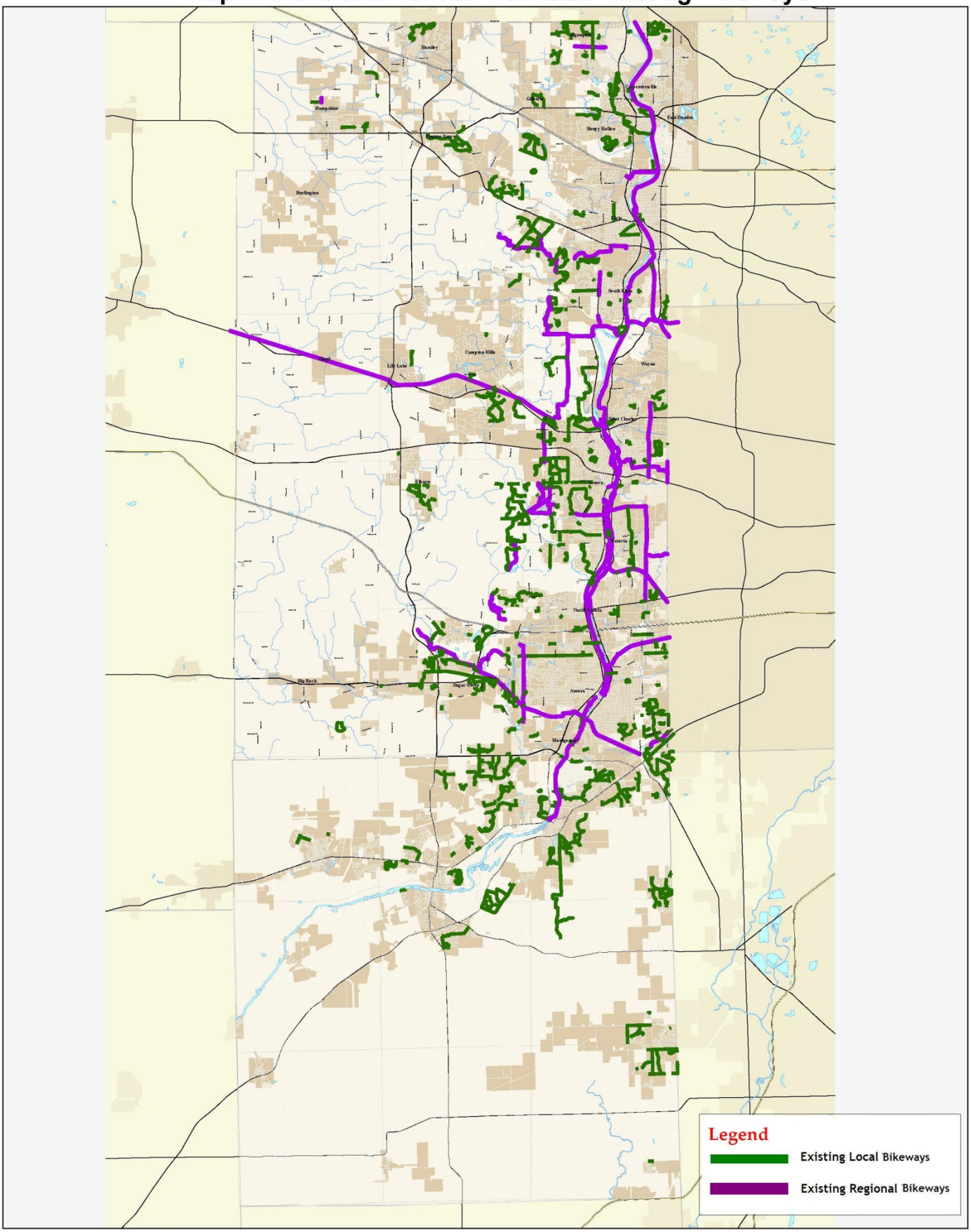
Below is Kane and Kendall Counties Bicycle and Pedestrian Planning Map 3 that illustrates existing, proposed and conceptual facilities.

Local Planning Efforts – There are various levels of commitments to bikeway planning and bikeway facility development within the Council area. 15 of the 38 communities in the Kane\Kendall Council of Mayors planning area currently have bicycle plans. The Kendall County Forest Preserve has also adopted the Kendall County Trails & Greenways Plan. While this is a good starting point, many of these plans do not consider a key component of bikeway planning, which is bicycling and walking as alternative transportation modes.

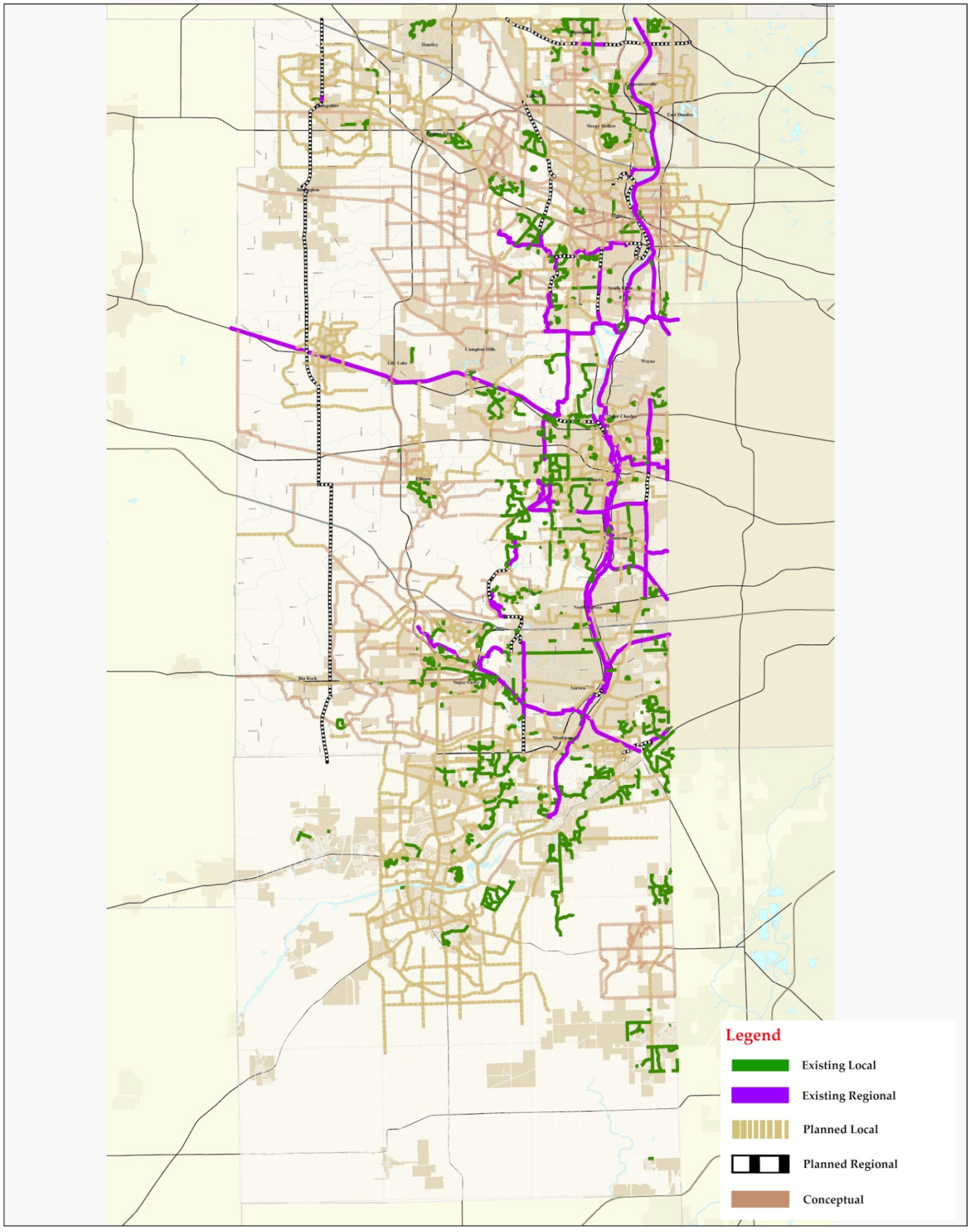
In some areas, the local park district has the responsibility to plan bikeway facilities in the communities that they serve. In a few Kane and Kendall County communities, bikeway planning is only incorporated into the community's comprehensive or transportation plan. Furthermore, many of the smaller communities have neither staff nor funds for bikeway planning. Their "conceptual bikeways" consist of lines drawn on the community map as a "wish list" for future bikeway infrastructure.

Appendix D lists the bikeway planning status for municipalities within the planning area.

Map 2. Kane and Kendall Counties Existing Bikeways



Map 3. Kane and Kendall Counties Existing & Proposed Bikeways



EXISTING REGIONAL TRAILS

Kane County's four main regional bikeways are: the Fox River Trail, Great Western Trail, the Virgil Gilman Trail, and branches of the Illinois Prairie Path. These facilities are under the primary jurisdiction of the Kane County Forest Preserve and these four trails account for approximately 85 miles of off-road paths. They are described in detail below.

Fox River Trail - The Fox River Trail (FRT) is a 35-mile long trail that runs along the Fox River. While the majority of the trail is in Kane County, it begins in the City of Crystal Lake in McHenry County. North of this point, it veers away from the river and transforms into the Prairie Trail and travels north into Wisconsin. Its southern terminus is in the Village of Oswego in Kendall County, although there are conceptual plans to extend the trail to Yorkville. The trail offers direct connections to various branches of the Illinois Prairie Path and the Virgil Gilman Trail.

The FRT ties together the charming downtowns of historic river towns while also offering some exquisite natural scenery. The trail is used for hiking, biking, cross-country skiing, and jogging. Since the trail traverses several communities, it is also an excellent commuter route.

Great Western Trail – The Great Western Trail (GWT) is a 17-mile trail constructed on an abandoned railway. It extends from Sycamore in DeKalb County east to the City of St. Charles. The GWT connects to the Fox River Trail via a trail through the LeRoy Oaks Forest Preserve, the Randall Road sidepath, and the Riverbend Trail sidepath along Silver Glen Road. A second branch of the GWT in DuPage County is accessed from the Elgin Branch of the Illinois Prairie Path.

The GWT offers an opportunity to enjoy a rural landscape and prairie flora and fauna. It is used for bicycling and hiking and offers shelters and rest areas.

Virgil Gilman Trail – The Virgil Gilman Trail (VGT) is an 11.2-mile trail constructed by the Fox Valley Park District and the Kane County Forest Preserve District on two abandoned railways. Beginning at its western terminus in the Village of Sugar Grove the VGT travels to US Route 30 in Aurora. The trail offers a variety of urban and rural landscapes to enjoy.

Illinois Prairie Path – The Illinois Prairie Path (IPP) was one of the first shared-use trails in the nation, constructed on the former Chicago, Aurora, and Elgin Railway. Although most of the 55-mile trail system is a former railbed, two stretches in Hillside and Villa Park-Lombard, are on streets. The IPP passes through several communities in Chicago's western suburbs, showing a broad cross section of suburban life. The IPP links many municipal parks and county forest preserves and offers a glimpse into prairie flora and fauna. Because of its long, uninterrupted route, it is also used as a commuter route for non-motorized travel.

The majority of the IPP system is in DuPage and Cook County, but three of its branches extend to and end at the Fox River Trail in Kane County. There may be opportunities to extend the trails further west into Kane County.

The IPP system is composed of a main path and several branches. All branches in Kane and DuPage Counties are briefly described below:

Main Stem. The Main Stem of the IPP begins at 1st Avenue in Maywood in Cook County, heads west through the communities of Bellwood, Hillside, Berkeley, Elmhurst, Villa Park, Lombard, Glen Ellyn, and "ends" in Wheaton where it divides into the Elgin and Aurora branches. It is 15 miles long.

Elgin Branch. The Elgin Branch begins in Wheaton and veers northwest until it terminates at the Fox River path in Elgin. This branch is predominately in DuPage County. The portion in Kane County is under the jurisdiction of the Kane County Forest Preserve District. It is approximately 16 miles in length.

Aurora Branch. The Aurora Branch also begins in Wheaton, is 13 miles long and terminates at the Fox River. This branch connects with the Fox River Trail and has a planned connection with the Virgil Gilman Trail, which is approximately one mile to the south. The Fox Valley Park District maintains the Aurora Branch.

Geneva Branch. The Geneva Branch of the IPP is approximately 9 miles long. The Kane County Forest Preserve District has leased most of the Geneva Spur in Kane County from Commonwealth Edison. It separates from the Elgin Branch near the Timber Bridge Forest Preserve and heads west until it terminates and connects with the Fox River Trail north of downtown Geneva.

Batavia Spur. The Batavia Spur is off of the Aurora Branch and begins near the intersection of the Aurora Branch and I-88 in Naperville. It terminates south of Downtown Batavia and connects with the southern trailhead of the Fox River Trail. About half of the spur is in Kane County and it is under the jurisdiction of the Kane County Forest Preserve District. The Batavia Branch is 5.8 miles long.

The IPP and the Fox River Trail are both part of the Grand Illinois Trail (GIT). The GIT is a proposed 475-mile loop trail from Lake Michigan to the Mississippi River. Over 250 miles are existing regional trails and 40 more miles are planned. The GIT is a partnership with the Illinois Department of Natural Resources and three regional coalitions that seek to link existing trails, develop new trails and establish on-road connections.

Other existing regional bicycle facilities include:

Fermi Laboratory Trail – The Fermi National Accelerator Laboratory has a large property around its atom accelerator laboratory. There is a four-mile shared-use path linking two branches of the Illinois Prairie Path and over 1,000 acres of high quality tall grass prairie.

Kirk Road – There is a separated path along the right-of-way on Kirk Road that passes through four communities: St. Charles, Batavia, Geneva, and North Aurora. Of the 7.5-mile length between North Avenue in St. Charles and Butterfield Road in North Aurora, there is a 1.2-mile gap in services. This facility offers connections to the Illinois Prairie Path's main trail and the Batavia Spur.

EXISTING LOCAL BIKEWAYS

Local bikeways are bicycle and pedestrian facilities that are usually entirely within one municipal boundary. They typically serve a specific facility, such as a park or recreational facility. Many municipalities do not plan local bicycle paths with connections to neighbors in mind, but instead plan access to one destination or within one facility. This type of incremental planning causes difficulties in establishing a regional system.

Often, it is a difficult task to connect local trails into the regional system. Driveways serving residential and commercial developments are a source of conflict when retrofitting a bicycle facility into an existing urban area. Establishing a continuous area of preserved property prior to land development is an especially difficult task. Unless there is a continuous right-of-way, such as an abandoned railbed, utility easement, or greenway corridor, assembling uninterrupted stretches of land is difficult and costly.

PROPOSED REGIONAL BIKEWAYS

The regional bicycle system in the KKCOM planning area is one of the most developed systems in the state, with connections to McHenry County in the north and to DuPage County in the east via various branches of the Illinois Prairie Path. This regional network can be expanded through connections to the local network.

The following are proposed expansions of regional trails or creation of new regional bikeways:

Kirk Road – St. Charles plans to extend the Kirk Road sidepath north of IL 64. There are conceptual plans to connect the missing gap of the Kirk Road sidepath between IL38 and Fabyan Parkway. The path can be extended further south through local planned facilities in Aurora to connect to the Aurora Branch of the IPP.

Mid-County Trail – The Mid-County Trail is a proposed north-south trail that will serve as a recreational and transportation corridor. This trail utilizes some existing local facilities, requires the construction of new sidepaths and trails, and utilizes forest preserves, parks and greenways. The proposed northern trailhead is near US Route 20 and Nesler Road in Elgin. The proposed southern trailhead is near IL56 and the Virgil Gilman Trail in Aurora.

Waubonsee Creek – The existing Waubonsee Creek Trail stretches 5.5 miles along the creek in Oswego. The path begins at the Fox River, north of downtown Oswego. The Oswegoland Park District plans to extend this trail to connect with the Virgil Gilman Trail in Aurora.

Fox River Trail – Although more conceptual than planned, the Fox River Trail is planned to be extended to Yorkville and Silver Springs State Park.

Aux Sable Trails – Regional multi-use trails are proposed for the Aux Sable Creek Greenway corridors in southern Kendall County.

WIKADUKE Trail – A regional multi-use trail is proposed for the WIKADUKE Trail corridor near the eastern edge of Kendall County. This trail will extend south into Grundy County to Route 6 and the I&M Canal.

West Kane / Prairie Parkway Trail – A regional multi-use trail is proposed for the western part of Kane County and the Prairie Parkway road corridor that extends from Interstate 88 northeast of Kaneville in Kane County through Plano in Kendall County to Interstate 80 in Minooka.

Grove Road Trail – A regional multi-use trail is proposed to connect Oswego with the Aux Sable Creek trail system.

PROPOSED LOCAL BIKEWAYS

Proposed bikeway facilities are either funded or those expected to be designed and constructed within the next 5 years. There are over 300 miles of planned bikeway facilities in the Council area. As stated earlier, most of the local bikeways are trails within parks or link major pedestrian destinations, such as schools, parks, or recreation facilities. The other major function of local bikeways is to link neighborhoods to regional paths. Other organizations have participated in planning meetings and/or furnished information which was incorporated into the plan.

CONCEPTUAL BIKEWAYS

Conceptual bikeways are corridors recognized as having a high potential to serve as transportation or recreation corridors. They are facilities that, presently, local governments have insufficient funds or demands to construct. Park districts and municipalities have designated these corridors on planning, transportation or recreational facility maps. These facilities are in four major areas:

- along creeks or greenways,
- as sidepaths along arterial roads,
- along active or abandoned rail corridors, and
- linking recreational and educational facilities.

Kane and Kendall Counties, along with park district and municipal officials, have drawn approximately 301 miles of conceptual bicycle facilities, or over three times the existing local or planned bikeways. Nearly every community in the planning area has been able to conceptually plan for the addition of bikeways and many communities are working with developers to include bikeway facilities in development plans.

TRANSIT LINKS

There are seven Metra train stations in the planning area: National Street Station in Elgin on the Milwaukee District West (MD-W) Line, Elgin Station on the MD-W Line, Big Timber Station in Elgin on the MD-W Line, Geneva Station on the Union Pacific (UP-W) Line, La Fox Station on the UP-W Line, Elburn Station on the UP-W Line and the Aurora Station on the Burlington Northern Santa Fe (BNSF) Line. These stations and rail lines offer opportunities for multi-modal travel to Chicago and adjacent communities.

Two of the Elgin stations, the Elgin Station and the National Street Station, are located near the Fox River Trail and are easily accessible due to their proximity to bridges. The Aurora Station is well connected to both the Aurora Branch of the IPP and the Fox River Trail. The Geneva Station is within two blocks of a local multi-use path that connects to the Fox River Trail.

All Metra stations in Kane County, except the La Fox Station on the UP-W line, have bicycle parking facilities and extensive automobile parking lots that allow multi-modal transportation opportunities. Most bicycle parking facilities are bicycle racks, which are sufficient for short-term bicycle parking and for parking bicycles in good weather conditions. However, many experienced cyclists or cyclists with expensive bicycles may prefer storage lockers or higher security locking systems. Currently, only the Big Timber Station on the MD-W line offers an alternative to bicycle lockers called a BikeLid®. A BikeLid® is a dome, open at the bottom, that

covers a bicycle like a rigid tent. Bicycles are permitted on all weekday trains arriving in Chicago after 9:30 A.M. and leaving Chicago before 3:00 P.M. and after 7:00 P.M., and on all weekend trains, with a few holiday and special event exceptions.

Pace bus service is limited in Kane County. In the rural western two-thirds of the county, there is virtually no public transportation. In the eastern third of the county, bus routes are concentrated in Aurora, Geneva, St. Charles, and Elgin. All bus routes connect to a Metra Station and in Kane County all buses are equipped with bicycle racks. In Kendall County, the Village of Oswego is serviced by Pace with a connection to the Aurora Transportation Center. This allows for a high degree of multi-modal transportation. Public transportation users are able to bicycle to bus stops, board buses, and continue to final destinations.

BICYCLE LEVEL OF SERVICE

The League of Illinois Bicyclists, in conjunction with the Kane County Division of Transportation and Kane/Kendall Council of Mayors, selected roadways for a Bicycle Level of Service (BLOS) analysis. BLOS is a nationally recognized measure of the perceived "comfort level" of a range of experienced adult bicyclists sharing a roadway with traffic. Key factors include traffic speed, daily traffic volume, surface condition, lane width, and the presence of on-road bike lanes or paved shoulders. Scores range from "A" (most comfortable for cyclists) to "F" (least comfortable). The BLOS ratings included in this plan are in no way an endorsement or recommendation of a particular road or an indication that a road is intended for use by bicyclists. Rather, the ratings are a quantified trip-planning tool for the individual adult bicyclist in the selection of roads meeting his or her experience, skill, and comfort levels.

Most paved rural roads and significant urban roads (collectors and arterials) were rated. Urban side streets and residential roads have been excluded – these are assumed to have a good BLOS score. In many places (like modern, non-grid style development), urban arterials and collectors are often the only way to get to specific destinations. In other places, side streets (or nearby trails) provide better alternatives. However, to be consistent, all "significant" urban roads have been rated – even those with alternatives.

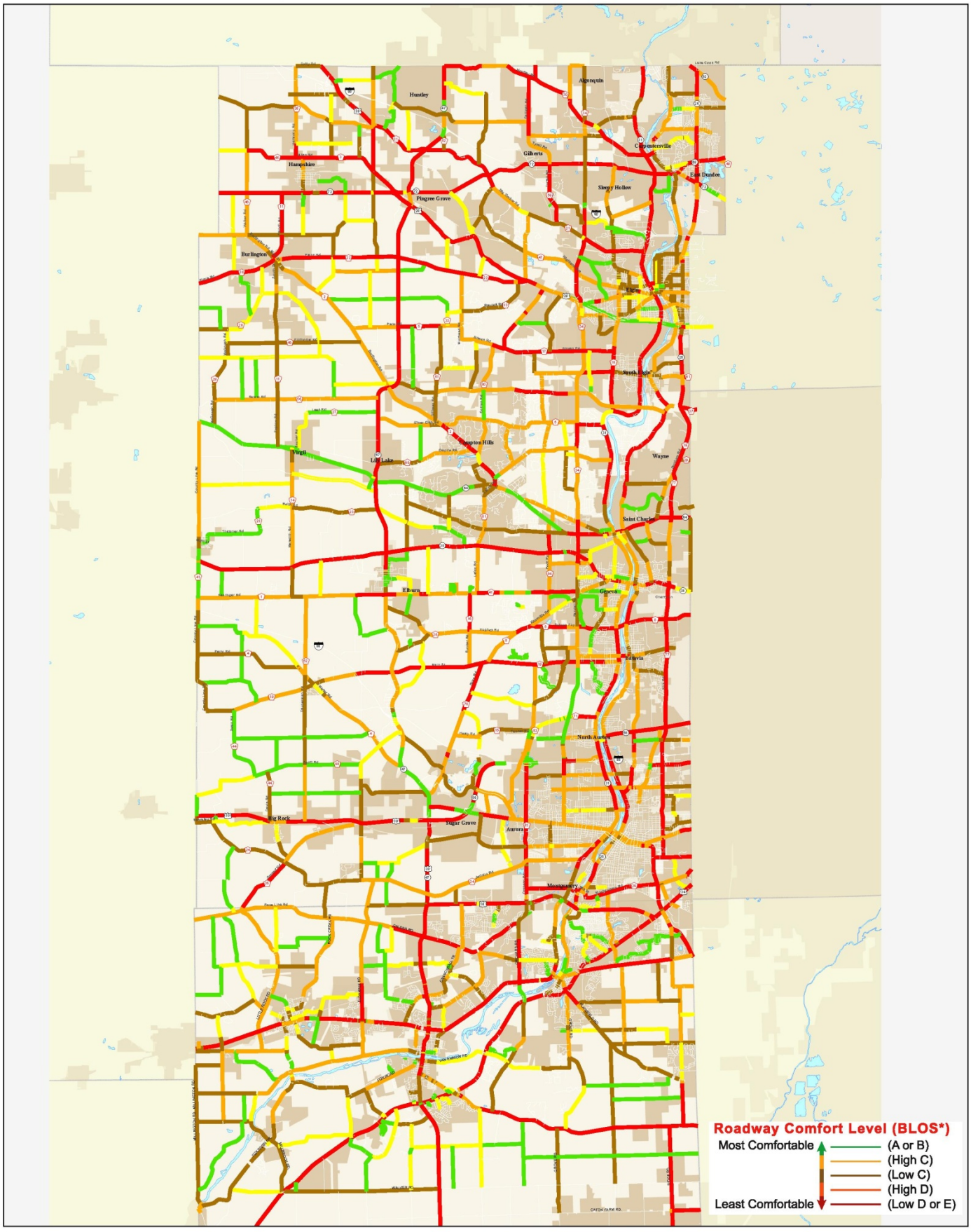
BLOS ratings are useful to many bicyclists. For example, western Kane County offers very limited off-street bicycling opportunities; the western two-thirds of the county is mostly rural. BLOS ratings are useful in this portion of the county to select a safe route.

Many local governments are concerned about publishing a Bicycle Level of Service rating for bikeway facilities. The public may interpret the BLOS ratings as an endorsement to bicycle on the identified roads, raising concerns that there would be a legal liability to local governments

should an accident occur. Because of this, the Kane and Northern Kendall County Public Bicycle Map contains a disclaimer.

This plan includes a BLOS analysis for Kane and Kendall Counties. The BLOS analysis methodology is described in Appendix E and the BLOS ratings are illustrated on the following page included on the public bikeway map. Providing BLOS ratings enhances the transportation element of this plan and the public bikeway map.

Map 4. 2011 Kane / Kendall Bicycle Level of Service Map



CHAPTER 3 – BEST PRACTICES

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INTRODUCTION

Bicycle trails, bicycle lanes, sidewalks, pedestrian signals, curb cuts and way-finding signage are physical manifestations of governmental policies for bicycle and pedestrian facilities. Both policy and initiative are required to realize this infrastructure. This chapter describes numerous means to establish policies in governmental offices that encourage the development of bicycle facilities, promote the use of alternative transportation to the public, and improve public safety.

Below are some of the described "best practices" policies and programs to promote bicycle and pedestrian travel and safety from across the nation. A successful set of bicycle policies should address these practices:

1. Commit to Designing Bicycle and Pedestrian Friendly Cities
2. Identify a Governmental Bicycle and Pedestrian Coordinator
3. Plan for Bicycle and Pedestrian Facilities
4. Promote Citizen Participation in the Planning Process
5. Provide Sufficient Public Information on Bicycle and Pedestrian Issues
6. Construct Facilities According to Recognized Standards
7. Incorporate Bicycle and Pedestrian Facilities into New Developments
8. Construct Streets for All Users
9. Plan for Multi-Modal Transportation Access
10. Design Walkable Communities
11. Create Safe Routes to Schools
12. Educate the Public on Safe Bicycling and Walking Practices
13. Establish Enforcement Policies Promoting Public Safety
14. Ensure Accessible Design of all Facilities

COMMIT TO DESIGNING BICYCLE AND PEDESTRIAN FRIENDLY CITIES

In addition to a governmental commitment to the planning and development of bicycle and pedestrian facilities, bicycle and pedestrian friendly communities must have adequate infrastructure, the involvement of bicycle and pedestrian advocacy groups, and a bicycle culture. Implementation of policies recommended in this "best practices" guide, with the support of governmental officials, promote a bicycle and pedestrian friendly community.

Infrastructure

Infrastructure, such as bicycle lanes, off-street trails and sidepaths, bicycle racks, bicycle signage, and access to public transportation make bicycle and pedestrian travel feasible and safe. Without these facilities, automobile drivers may not recognize the presence of bicyclists or pedestrians, and conflicts may arise. These facilities enable people to use alternative modes of transportation

for short trips, recreation, or daily commuting. The design manual (Chapter Five) describes construction standards and suitability. Over time, building bicycle and pedestrian facilities into the community's infrastructure should be the standard practice, not an exception.

Advocacy

Statewide, the League of Illinois Bicyclists has been working to raise the awareness of providing both on and off-street bicycling facilities. They have been advocating for improvements on all levels of government: local, county, and state transportation agencies. Additionally, the Active Transportation Alliance is a non-profit organization whose mission is to improve conditions for bicycling, walking and transit and engage people in healthy and active ways to get around in the Chicago region. Both of these organizations have been instrumental in building coalitions and working with public transit agencies to promote multi-modal transportation options.

Locally, Kane County is home to the Fox Valley Bicycle and Ski Club. While the purpose of these clubs are to organize group rides and trips, not advocacy, members are often a good source for planning new routes or connections due to their extensive knowledge of bicycling conditions in the area.

Some cities have also established "Bicycle Advisory Committees" (BAC). The Cities of Elgin, Geneva and Batavia have created such committees comprised of voluntary citizen representation appointed by the City Council to advise the government on all matters relating to bicycling. The Bicycle Advisory Committee's efforts have increased government and public awareness of bicycle issues, such as installation of bicycle lanes and designating a portion of the transportation budget to bicycle-related projects.

In 1995, the Kane County Council of Mayors established a Bicycle and Pedestrian Committee to help guide bicycle and pedestrian planning efforts and ensure coordinated facility development in the region. The efforts of this Committee guided the development of this plan.

Bicycle culture

Bicycle culture is the extent of bicycle use and its acceptance in the area. Bicycle culture would include the promotion of bicycle activities, the political climate and acceptance of bicycle facilities, and the community's attitude towards bicycle facilities.

Chicago has been praised for its annual bicycle awareness month with bicycle rides around the city and "Bike to Work" days. Other cities have sponsored "Bike to Work" days and bicycle safety fairs. In June 2011, the City of Elgin Bicycle Advisory Committee sponsored a weeklong series of events during Bike to Work Week.

Government Commitment to Alternative Modes of Transportation

Government is typically responsible for the construction and maintenance of infrastructure. The government is also responsible for setting policies for the development of infrastructure. Without a government commitment to walking and bicycling, they may be treated as marginal transportation modes, and there is little guarantee that facilities will be planned or constructed.

Incorporating consideration for bicycle and pedestrian facilities in road improvements through paved shoulders in rural areas or designating bicycle lanes on urban streets is a significant example of government commitment to the community. Other government efforts to make bicycling or walking more friendly include using bicycle police, enforcing bicycle use laws and traffic laws targeting the protection of bicyclists, developing educational programs, publishing maps, and distributing other bicycle-related materials.

IDENTIFY A GOVERNMENT BICYCLE AND PEDESTRIAN COORDINATOR

Under federal law, each state is required to fund a Bicycle and Pedestrian Coordinator position in its State Department of Transportation. Their purpose is to promote and facilitate the increased use of non-motorized transportation. The position is critical for the development of bicycle and pedestrian policies and programs at the state level. Experience shows that the coordinator typically acts as an advocate within the agency for bicycle and pedestrian issues, a vital technical resource, and an important point of contact for local agencies and user groups seeking to improve conditions for the two modes.

A Bicycle and Pedestrian Coordinator is applicable on a municipal and county level, although the job functions may not be exclusively limited to bicycle functions. On a local level, their responsibilities are to ensure that policies are in place requiring all road and transit projects to provide safe accommodations for cycling, for bicycle and pedestrian facilities, and to ensure the Bicycle and Pedestrian Master Plan contains visionary language requiring that a certain percentage of transportation funds go to bicycle-related projects. A major function would also be to initiate the Bicycle and Pedestrian Master Plan process and seek its implementation. In May of 2001, Kane County hired their first full-time Bicycle and Pedestrian Coordinator, who works in the Division of Transportation.

The final important role for the Bicycle and Pedestrian Coordinator is to act as a liaison for other cyclists and community members to advocate at the city level to improve bicycling conditions. The Coordinator needs public input and suggestions to identify and understand user needs and develop a strategy to make a more bicycle and pedestrian friendly community.

PLAN FOR BICYCLE AND PEDESTRIAN FACILITIES

A comprehensive planning process takes a snapshot of today's conditions, determines community needs, sets goals for future facilities, describes projects and policies to achieve those goals, and prioritizes improvements for implementation in a capital improvement program. The purpose of planning is to encourage more alternative modes of transportation and to reduce the number of serious bicycle and pedestrian crashes and injuries. Increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more livable communities, and more efficient use of road space and resources.

Planning for bicycle and pedestrian facilities helps guide limited available government resources. It sets the goals and policies for the development of bicycle and pedestrian infrastructure. Planning on a council-wide or regional level guides the development of a regional network of bicycle and pedestrian facilities instead of a series of isolated pieces. The best bicycle and pedestrian planning approach is a comprehensive and cooperative one that combines work in at least these five areas:

- **Engineering –** Through planning and design communities can modify the transportation system to encourage safe and convenient bicycling and walking.
- **Encouragement** – Working to raise society's awareness of the benefits of bicycling and the rights of riders and walking and the rights of pedestrians.
- **Education and Awareness –** Training and encouraging bicyclists and motorists to share the road network in a safe and cooperative manner.
- **Enforcement –** Making rules that treat bicyclists and motorists fairly and working to make sure the laws are enforced.
- **Evaluation –** Reviewing the systems that are currently in place and evaluating current programs to better plan for the future.

An important and overlooked component of bicycle and pedestrian planning is an implementation strategy. This assigns responsibility to a person or agency for implementing the plan and describes methods to obtain funding to pay for improvements.

Smaller communities also need to plan for bicycle and pedestrian facilities. Limited resources may hinder their ability to produce individual bicycle or pedestrian plans and have staff administer it. However, recognizing the importance of planning and developing these facilities, communities should incorporate bicycle and pedestrian components into their transportation plan or land use plan. Many communities have taken the pro-active stance to require the development of paths and bikeway facilities with new developments. Examples of municipal ordinances requiring bikeway facilities in new developments or subdivisions can be found in Appendix F.

PROMOTE CITIZEN PARTICIPATION IN THE PLANNING PROCESS

Public involvement is an important component of non-motorized planning. It broadens the scope of concerns, solutions, and perspectives to be considered in the plan, and helps to identify potential problems early in the process. It also provides a means of support for the plan's implementation.

A public participation process provides a means for citizens to express their views, help shape planning policies, and influence the decisions that affect their lives. It gives the public a degree of ownership of the plan and provides a means of checks and balances to ensure its implementation. There are five frequently mentioned benefits from effective citizen involvement programs.

1. **An Open Line of Communication** – Citizens become more knowledgeable about the environment, economic and social costs and benefits of the planning and its implementation. In return, it provides first-hand insight into sensitive issues and concerns of the communities, which may not have been known by the planners.

2. **Participatory Democracy –** This makes the planning process more democratic, demystifying the process and providing rationale to the citizens for the policy decisions that are made. Citizens are not spectators, but actual participants in the decision making process.

3. **Effective Decision Making** – The public decision-making process can ensure that extreme positions on an issue are balanced. Outcomes tend to explore many options or relevant alternatives, rather than exploring only one or two alternatives.

4. **Political Legitimacy** – Citizen involvement in decisions affecting their environment fortifies the acceptance and legitimacy of those decisions by the governmental body that implements it. It creates credibility for the planning process.

5. **Local Knowledge** – Often local bicyclists or community members have greater knowledge and insight into the community needs. Their intimate understanding of the area can identify problems and solutions that elude planners or engineers.

However, there is some risk involved with a poorly executed public participation process. Broken promises and planning processes that are not truly open only serve to alienate the public and make them disgruntled in the implementation and future planning process.

PROVIDE SUFFICIENT INFORMATION ON BICYCLE AND PEDESTRIAN ISSUES

Providing public information increases awareness of bicycle and pedestrian facilities, makes the resources known to outside users, promotes safety, and demonstrates the government's investment and commitment to bicycle and pedestrian facilities.

Here are three primary types of information that should be readily available to the public:

- **Bicycle Facilities Map** – Maps describe the location and types of bikeways and how they link to popular destinations. They provide information on the traffic and roadway conditions bicyclist can expect to encounter, allowing the safest route to be pre-selected. Maps also may contain a variety of other bicycle information, such as bicycle use laws, location of bicycle repair facilities, business locations, and government offices. The Kane and Northern Kendall County Public Bicycle Map can be downloaded here: http://kdot.countyofkane.org/Publications/Kane_Bike_Map.pdf

- **Bicycle and Pedestrian Plan** – Show the public the existing and proposed facilities. The plan may also be a resource for design guidance in implementation of bicycle facilities. Bicycle and pedestrian planning occurs on the state, county, regional, and local levels.

- **Bicycle Safety** – A number of different government and non-profit organizations publish bicycle and pedestrian safety information. A good safety guide describes safe bicycling practices for people of all ages and skill levels in easily understood language. Safety information is also produced for children.

CONSTRUCT FACILITIES ACCORDING TO RECOGNIZED STANDARDS

As more individual communities develop bicycle plans and multi-use trails, there is a problem with inconsistent application of trail standards, design guidelines, and philosophies. This occurs where there is no regional governing to guide individual government entities. A solution is to make municipalities aware of a consistent set of design standards so that they can apply these proven standards to create a predictable environment for bicyclists and pedestrians and construct safe facilities.

The design guides that are recognized as the authoritative guides for good bicycle and pedestrian design are:

- *The AASHTO Guide for the Development of Bicycle Facilities, American Association of State Highway and Transportation Officials (AASHTO).* This is recognized as the primary

guide for bikeway facility design. The guide is divided into two sections. It first provides an overview of planning considerations for bicycles, a discussion of types of bikeway facilities and a description of factors to consider when locating a facility. It also contains a design-oriented section that details design standards for bicycle facilities on highways or separated facilities.

- *A Policy on Geometric Design of Highways and Streets, 5th Edition, Institute of Transportation Engineers (ITE).* Last updated in 2004, it is also known as the "Green Book." This manual contains the latest design practices and standards of highway geometric design. Concerning bicycle and pedestrian facilities, the Green Book includes design guidance on how to comply with the Americans with Disabilities Act, and discussions of the latest AASHTO Guide for the Development of Bicycle Facilities.

- *Manual on Uniform Traffic Control Devices (MUTCD), U.S. Department of Transportation, Federal Highway Administration, 2009*. This guide describes standardized signs, signals and pavement markings for bicycle facilities. It should be used in conjunction with the AASHTO guide.

INCORPORATE BICYCLE AND PEDESTRIAN PLANS INTO DEVELOPMENT PROJECTS

Bicycle and pedestrian facilities should be incorporated into the construction of new residential neighborhoods, commercial properties, and roadway projects. If sidewalks are developed initially with new developments, it will typically cost much less than if a retrofit is necessary. Several municipalities have passed ordinances to insure that bicycle and pedestrian system facilities are part of new developments and constructed according to accepted standards. Many incorporate review for bicycle and pedestrian infrastructure into the subdivision and site plan development process. Below are some sample methods to ensure the incorporation of bicycle and pedestrian facilities.

Create a Bicycle and/or Pedestrian Facility Map – The first step to require bicycle and pedestrian facilities in new developments is to create a bikeway plan or a bikeway map. This map should illustrate a system that enables bicycling and walking to be effective forms of transportation, linking destinations with origins. This way, the potential requirement for bikeway or pedestrian easements will not seem capricious but instead will be a part of a planned, interconnected network.

Subdivision requirements – Counties and municipalities can strengthen provisions in their Subdivision and Zoning Ordinances to require the construction of bicycle facilities or routes in residential and non-residential projects, including intersection crossings. These requirements encourage the inclusion of these trails and pathways through the creation of an easement

specifically designated for bicycle and pedestrian facilities and legally established in perpetuity. Standards must be developed to ensure that the design and construction takes place in an integrated and timely manner. It is most important to establish these requirements in a developing area, where the bicycle or pedestrian infrastructure can be established and interwoven into the existing transportation network.

Other clauses that may be included in the subdivision requirements or development standards include:

- Require provisions for bicycle parking in commercial and industrial locations.
- Require easements or path construction to connect to adjacent trails.
- Require paved shoulders for rural road development.
- Create safe routes to schools with pedestrian paths.

Sidewalk Construction Ordinance – Preservation of the right-of-way for pedestrian facilities and the construction of sidewalks can be required by developers of properties through the passage of a development ordinance. This is applicable in both residential and commercial settings and especially important in areas experiencing new development. The pedestrian facilities can be established from a site's initial development, reducing costs to retrofit these facilities later. Sidewalks should be constructed according to accepted standards along any street right-of-way. Special attention to sidewalk design and crossing intersections should be given near schools or destinations with high pedestrian traffic.

All street improvement projects should include a system of reviews that insures there are adequate provisions for pedestrians; it should become an expected part of the improvement process. Appendix G has a sample ordinance which incorporates sidewalks in all developments.

CONSTRUCT STREETS FOR ALL USERS

The streets of our cities and towns are an important part of our communities. They should be constructed with all users in mind, whether young or old, motorist or bicyclist, walker or wheelchair user, bus rider or shopkeeper. In communities across the country, a movement is growing to complete the streets. States, cities and towns are asking their planners and engineers to build road networks that are safer, more livable, and welcoming to everyone.

The State of Illinois has adopted a 'Complete Streets' policy for the inclusion of bicycle and pedestrian components during the planning, design, and construction phases on state routes but such a policy does not exist at the local level in many Kane and Kendall County municipalities. Instituting a complete streets type of policy ensures that transportation planners and engineers consistently design and operate the entire roadway with all users in mind - including bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities.

According to the National Complete Streets Coalition, an ideal complete streets policy:

- Includes a vision for how and why the community wants to complete its streets.
- Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles.
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
- Is adoptable by all agencies to cover all roads.
- Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs.
- Directs that complete streets solutions will complement the context of the community.
- Establishes performance standards with measurable outcomes.
- Includes specific next steps for implementation of the policy.

Appendix H contains two highly rated *Complete Streets* policies for pedestrian and bicycle access as part of the maintenance and construction of roads.

PLAN FOR MULTI-MODAL TRANSPORTATION ACCESS

Bicycle and pedestrian facilities should be considered a component of a larger transportation system and incorporated into the larger network. It is important to link pedestrian and bicycle systems into public transit, and especially to connect with commuter train service. This can be accomplished through:

- Sidewalk connections with ADA accessibility to bus stops.
- Street furniture at transit stops.
- Bicycle parking at commuter rail and bus stations.
- Where possible, reserve parallel right-of-way for the installation of bikeways or sidewalks when planning to extend commuter rail lines.
- Connect existing local and regional bicycle trails to train stations.

Bicycle commuting can be incorporated into public transportation by allowing bicycles on buses and trains where physically, operationally, and/or economically feasible. This encourages people to ride their bicycles to buses or trains, take lengthier trips, disembark, and continue their commute. This is important in areas where there is little public transportation or densities are low and it is difficult for people to walk to transit stops.

DESIGN WALKABLE COMMUNITIES

Creating walkable communities must take into account many interrelated factors of the urban environment, such as planning and zoning, traffic calming, street and intersection design, specific bicycle and pedestrian facility design, and ADA requirements. These communities put urban environments back on a scale for sustainability of resources (both natural and economic) and lead to more social interaction, better physical fitness and diminished crime and other social problems. A sample "Walkability Checklist" is in Appendix I. Designing or re-designing a community to foster pedestrian activity takes into consideration the following principles:

Principle 1. Build for Everyone – Communities built before automobiles were designed to be multi-modal. Today, many streets were designed for only cars.

Principle 2. Scale For People – Communities identified as neighborhoods must be planned and assembled to walking scale, so people are able to reach most primary destinations in five-minute walks.

Principle 3. Create Many Linkages – Communities and their varied destinations need many transportation routes and links. To optimize linkages and route options, most new street blocks must be short so walkers, bicyclists and other roadway users will have many choices to move from one place to another.

Principle 4. Streets Have Multiple Functions – Streets perform many functions in addition to moving and storing vehicles. This includes moving pedestrians, providing space for recreational bicycling, and creating a sense of community through connecting neighborhoods.

Principle 5. Sidewalks Must Be Comfortable – Sidewalks need adequate width, buffers, continuity, connectivity and regular maintenance. These factors make the user feel safe and create an inviting atmosphere.

Principle 6. Streets Must Be Crossed with Ease – Intersections cannot be intimidating to pedestrians or the connecting network will not be perceived as a viable transportation route. Intersections require pedestrian infrastructure, such as crosswalks and pedestrian signals.

Principle 7. Keep Urban Traffic Dispersed and Low Speed – Communities taking actions to curtail speeding are achieving injury reductions to pedestrians and enhancing other modes of travel. Popular traffic calming methods include narrowing pavement

widths, creating center median islands, narrowing intersections, and decreasing turning radii at intersections.

Principle 8. Keep Traffic Moving – By timing and interconnecting traffic signals properly motorists will have to stop and wait at intersections less than otherwise.

Principle 9. Build Bicycle Lanes – Pedestrians and bicyclists consider many suburban streets built in the past fifty years to be too wide. The extra width can be used to redesign roads to include bicycle lanes or shoulders for bicycling. This segregation of lanes promotes the safety and efficient movement of all modes of travel.

Principle 10. Build Compact Intersections – More and more intersections are being designed to remain compact and efficient to maximize pedestrian crossings.

Principle 11. Provide ADA Access – A simple street crossing should be made in such a way to help people navigate to a crossing point, make easy entry, detect the exit, find no barriers along the way, and make convenient and efficient exits.

CREATE SAFE ROUTES TO SCHOOL

As our community streets become busier, the task of walking or biking to school becomes increasingly difficult. Children must often cross arterial and collector streets to get to school. They have to deal with incomplete or nonexistent sidewalk systems. Parental concern for the dangers of traffic and the general safety of young children has reduced their freedom to move about the neighborhood on their own. While all pedestrians are at risk as highway users, children are particularly vulnerable. Elementary school-aged children:

- have a field of vision 1/3 narrower than adults;
- are unable to determine the directions of sounds;
- can not accurately judge speed or distance of moving vehicles;
- lack the ability to understand what time and distance is needed for a vehicle to stop;
- overestimate their own abilities;
- are easily distracted;
- tend to be less careful than adults in entering traffic lanes to cross a street;
- lack an understanding of a driver's intent at an intersection or crossing point;
- have unpredictable movements;
- are easily hidden by bushes, parked cars.

There is a universal concern for the safety of children walking or biking to school. Safe Routes to School programs promote walking or biking with children to school instead of driving, thereby reducing automobile congestion. The idea is to examine routes that children must take to get to

school, paying particular attention to places where kids cross major roads. These programs investigate conditions like high traffic speeds, amount of truck and bus traffic, lack of sidewalks, poor sidewalk condition, intersections lacking pedestrian infrastructure (particularly at major streets), and other similar problems that hinder children from safely traveling to or from school.

The Making Kane County Fit for Kids campaign was launched in 2008 with participation from municipalities, school districts, park districts, businesses, the faith community, health care providers, health and social service agencies, as well as local and state elected officials. The campaign attempts to tackle the childhood obesity epidemic and has called for a sustained, countywide mobilization through implementation of 4 strategic action principles that go to the heart of the systems, policy and environmental changes needed to reverse the epidemic. Walk to School Initiatives was a common theme identified by participants in the Fit for Kids program. Experts agree that physical activity that was a normal part of our daily lives in the past has been reduced dramatically due to our dependence on vehicles. Safe Routes to School can be an integral part of the efforts to get children actively moving to and from school and to help develop healthier children and better learners.

Safe Routes to Schools promote secondary health benefits. Active kids are healthy kids, and the walk to school is one way to build exercise into a child's lifestyle. The CDC states: Regular physical activity is linked to enhanced health and a reduced risk for all-cause mortality and the development of many chronic diseases in adults. Children and adolescents are more physically active than adults, but participation in physical activity is declining in adolescence. School and community programs have the potential to help children and adolescents establish lifelong, healthy physical activity patterns.

Other benefits of Safe Routes to School programs include:

- A healthier lifestyle for the whole family.
- Less traffic congestion around schools.
- Safer, calmer streets and neighborhoods.
- Improved air quality and a cleaner environment.

Safe Route to School Process – There is a strategic planning process that can be initiated to help parents, schools, and government officials build safe routes to schools. Through this analysis process, a set of relatively safer routes is selected and a number of improvements are proposed to make these even safer. In Portland, Oregon, the routes are publicized through the schools, parent organizations, and the community at large. Their ten-step planning process is briefly described below.

1. *Identify Prospective Schools.* Solicit nominations for prospective school participants from school districts, police precincts, and community board district managers. The concept is to draw on knowledgeable sources who work with more than one school.

2. *Select Schools.* Review nominations and compare to pedestrian crash data using a five-year history of crashes involving children 5-14 during the morning and afternoon hours. A GIS map with these data is one tool to identify problem locations and build community support.

3. *Initial Contact with Schools.* Meet with the principal or citizens who have taken the lead on walking safety. Explain the project and enlist their help in organizing a larger meeting with parents. If necessary, send meeting notices home with children or mail to parents.

4. *School Outreach.* At the larger meeting, explain the program and ask for help in identifying problematic locations. Complete a conditions survey. Meetings may be conducted in English and Spanish to effectively reach most parents.

5. *Distribute Surveys / Parents Identify Walking Routes.* A coordinator distributes a survey to parents with a map of the area within four blocks of the school. The parents are asked to draw a line showing their usual walking route and indicating hazards.

6. *Surveys Collated / Routes Matched With Crashes.* The surveys are collected and walking routes are drawn on a master map to determine the most popular routes. Routes and sites with frequent collisions are compared.

7. *Site Tour.* Traffic engineers, planners, and safety groups are invited to visit to the sites to develop solutions and proposals.

8. *Proposal.* At the conclusion of the site tour, the proposals are collected and sent to the appropriate Department of Transportation Chief Planner or Chief Engineer for comments.

9. *Installation.* The appropriate department of transportation installs recommended traffic calming devices. Typical traffic calming devices include curb extensions, speed bumps, elevated crosswalks, and center median refuge islands.

10. *Follow up.* The Safe School Zone Coordinator returns three to six months after the installation of the traffic calming devices and follows up with principals and parents.

After a year, before and after crash histories will be compared and further modifications made, if needed.

Walking School Bus – The Walking School Bus is a group of families forming a roster to take turns at walking their children to school, either from the driver's house or by picking up children en route to school. Typically, each Walking School Bus is made up of several families, with one parent driving up to eight children. Implementing Walking School Bus programs was a major theme identified during the Kane County Fit Kids 2020 planning process.

Walk to School Day – Walk to School Day is an internationally organized event to encourage walking to school to reduce car trips and promote health. The main idea is for a responsible adult to accompany kids on the walk to school and, thus, encourage more walk-to-school trips. While this program is not directly aimed at improvements on sidewalks or crossings, they help identify problems that should be corrected. In this way, "safe routes to school" programs and "walk your children to school" programs enhance each other's success.

On October 6, 2010, the Making Kane County Fit for Kids Funders Consortium and Kane County schools were teamed up to promote International Walk to School Day. The Making Kane County Fit for Kids Funders Consortium made grants available to Kane County School Districts and Parent Teacher Organizations for participating in Walk to School Day. All the districts that participated received support promoting the event in their neighborhoods with such ideas as walking school buses. More than 45 schools in eight of Kane County's nine school districts participated in the initiative.

School Safety Zone – The City of Chicago has been working with residents and schools to create "School Safety Zones" under the Illinois Safe School Zone Act. This act is designed to help ensure that criminal activities don't occur in or around our schools, in part by increasing the penalties for such activities. But "Safe School Zone" signs alone aren't enough; parents and other community residents need to be actively involved in creating safety zones. Parent Patrols are an effective way of ensuring that the areas around our schools are free from crime. Parents, community residents and school staff monitor and observe all activities in and around schools and can serve as a powerful deterrent to criminal activity.

While "School Safety Zones" are primarily focused on crime, they also seek to eliminate other safety hazards children may encounter outside of conflicts with motorists. It utilizes the Walking School Bus and Parent Patrols to identify abandoned buildings, abandoned cars and uncleared vacant lots that can pose a danger to children. Citizens work with the police and other city agencies to ensure that these kinds of hazards are removed from neighborhoods.

Elements of Good School Site Design – Safe Routes to School can be accomplished through the good design of a school layout and neighborhood street network. If well designed to begin with, later expensive retrofitting of streets or right-of-way can be avoided. Good school design may include these features:

- Surrounding streets with sidewalks and bicycle lanes.
- Bicycle paths and lanes that connect directly to centrally placed bicycle parking facilities with adequate capacity for the school.
- Sidewalks or trails with direct links between schools and neighborhoods.
- Bus drop-off zones separated from automobile drop-off zones to minimize confusion and conflict.
- Pedestrian travel zones that are clearly delineated from other modes of traffic through striping, colored pavement, signing, or other methods.
- Strategically located, well-delineated crossing opportunities at controlled intersections and mid-block crosswalks.
- Traffic calming devices.
- Removal of obstructions that limit pedestrian visibility.

According to the Institute of Transportation Engineers (ITE) School Trip Safety Program Guidelines, a number of elements should be studied to determine the appropriate type of crossing treatments and traffic control in school zones or along walk routes. These solutions may include: traffic volumes and speeds, traffic control devices, adequacy of gaps in streams of traffic, number and ages of children crossing, accident statistics, and the location of the school and its relationship to surrounding land uses. ITE recommends traffic control and crossing treatments near schools, where deemed necessary. Typical crossing treatments may have the following safety devices:

- School speed zones (reduce speed)
- Traffic calming techniques, such as bulb-out or roadway narrowing
- Marked crosswalks at intersection and mid-block crossings
- Signalized crossings with pedestrian actuators
- Flashing beacons
- Grade separated crossings
- Crossing guards or school patrolled crossings

EDUCATE THE PUBLIC ON SAFE BICYCLING AND WALKING PRACTICES

Education of pedestrians, cyclists and motorists is essential for non-motorists' safety and mobility. This can be one of the most effective and least costly ways of reducing accidents and encouraging cycling and walking. A number of different types of programs can be implemented. Program ideas used in cities across the United States include:

- Offering bicycle education classes to the public with the assistance of bicycle clubs or advocacy organization.

- In schools, pedestrian and cycling classes can be integrated with school trip management programs (reducing auto travel to, and traffic around schools), personal safety and fitness programs, and physical education programs. Classes can include "how-to" information on walking and biking as transportation, provide cycling skills training and promote safety equipment such as helmets, reflectors and lights.

- Adult cycling skills classes may be taught at recreational facilities by local park districts or provided through local traffic safety associations. These programs aim to get adults back onto bicycles after a long hiatus. Bike rodeos are skill classes that can be used to develop bicycle skills for younger cyclists.

- Public education campaigns can be conducted, targeting motorists, cyclists, and pedestrians and covering bicyclist and pedestrian rights and safety. "Share the Road" public education campaigns can be adopted at the state and local levels as part of a highway traffic safety program. These programs should address issues related to safe vehicle operation (both motorists and cyclists) including alcohol use and obeying applicable traffic laws.

- Components on "safe bicycling" and "sharing the road" in driver education programs.

- Media campaigns (television, bus and billboard ads) aimed at raising awareness of bicycles on the roads.

- Educating local and regional law enforcement on the role of walking and bicycling as transportation, including a review of existing traffic laws relevant to these modes.

- Amending the motor vehicle code to give precedence to bicyclists in the absence of overriding traffic rules.

- Creating a national "Ride Safely" marketing campaign targeting bicycle riders.

- Educating community professionals on effective ways to promote safe bicycling.

- Motivating decision makers at all levels to adopt policies that promote safe bicycling.

- Participating in national and Chicagoland "Bicycle to Work" week.

Although many communities have some programs, few communities have enough pedestrian and cycling programs to educate a significant portion of the population. Excellent safety education resources are available from numerous sources, including state and federal agencies, private organizations, and bicycle safety interest groups. There are now excellent safety resources available for free on the Internet. One such source is from a private group called the Pedestrian and Bicycle Information Center found on the Internet at: http://www.bicyclinginfo.org/ee/education.htm.

Appendix J contains a list of educational resources that can be found on the Internet.

ESTABLISH ENFORCEMENT POLICIES PROMOTING PUBLIC SAFETY

When a bicyclist or a pedestrian has a collision with a motorized vehicle, the pedestrian or cyclist typically receives the brunt of the damage. Accidents are a serious concern at certain locations and can usually be prevented through better design of the transportation infrastructure and/or an awareness of safety issues for all parties -- the bicyclist, pedestrian, and the motorist.

There are three methods highlighted in this guide to promote public safety for bicyclists and pedestrians. They are: promotion of helmet use, establishing ordinances for safe bicycle use, and enforcement of bicycle use laws. In addition, production and distribution of educational materials and educational programs are also very important and are discussed as the next item of best practices.

Helmets – When a bicyclist is killed or injured in motor vehicle-related accidents, it is most often an injury to the head. It is important for bicyclists or any person using a self-propelled wheel vehicle (such as rollerblades or scooters) to wear a helmet.

It has been proven that helmets, if worn properly, are effective in preventing serious injury. Bicycle helmets have been shown to reduce the risk of head injury by as much as 85 percent and the risk of brain injury by as much as 88 percent. It is estimated that 75 percent of bicycle-related fatalities among children could be prevented with a bicycle helmet. While helmet use overall is on the rise, 43 percent of riders never wear helmets. Of bikers who now report wearing a helmet, 98 percent said they wore a helmet for safety reasons, 70 percent because a parent or spouse insisted on it and 44 percent because a law required it.

Municipalities can make a pro-active attempt to enforce mandatory helmet laws to protect residents from accidents and promote such requirements in promotional campaigns. Twenty one states have also passed helmet laws; however, most ordinances are intended to protect riders less than 16 years of age. Please see Appendix K for three sample ordinances that may be adopted for your community.

While passing helmet laws is a positive step to promote the safety of both children and adults who cycle, it may not be the most effective means to get people to wear one. Helmet laws may consume valuable law-enforcement man-hours in enforcement efforts. Often, citizens who are unaccustomed to wearing helmets ignore these laws; therefore no increase in helmet use will be achieved. Instead, municipalities should consider taking an approach to educate the public on the benefits of wearing a helmet rather than passing a new ordinance. Helmet use should be a key component of any educational campaign concerning bicycle use and safety.

Ordinances for Safe Bicycle – Bicycles are generally considered vehicles with the same responsibilities and rights of motorized vehicles. This is consistent with the approach that they are used as a mode of transportation in addition to recreation. Because of this perception, many municipalities have passed ordinances detailing safe and proper operation of bicycles.

Municipalities can make a pro-active attempt to pass and enforce safe bicycle usage laws to protect bicyclists from conflicts and motorists from accidents. Appendix K contains sample ordinances that can be modified and adopted to promote safe bicycle usage.

Enforcement – When the police initiate enforcement campaigns to make bicycle riding safer, they typically focus on the actions of bicycle riders. However, crashes are caused by the poor operation by both motorists and bicyclists. Good law enforcement strategies will target both cyclist and motorist and will focus on behaviors that cause the greatest danger.

Bicycle riders often contribute to circumstances of crash incidents. Poor riding practices that most commonly lead to accidents include:

- Riding at night without lights or reflective clothing. Bicyclists can be difficult to see for motorists at night. Reaction time is minimal for motorists.
- Riding the wrong direction in the traffic lanes or on the wrong side of the road. Motorists do not expect traffic to be approaching from the wrong way.
- Sudden swerves or unpredictable movements. The bicyclist swerves to the left without checking traffic, without signaling, and moves into the path of an overtaking motor vehicle. The motorist does not have enough time to avoid the collision.
- Running a stop sign or red light. A bicyclist enters an intersection controlled by a sign or signal and collides with a motor vehicle approaching from a crossing roadway. The bicyclist fails to stop/slow and look for traffic before entering the intersection, leaving the motorist too little time to avoid a collision.

Other bicycle movements which frequently contribute to accidents include failing to yield the right-of-way, riding out from mid-block locations, abruptly entering a crosswalk and failing to signal an abrupt turn.

Motorists typically focus on looking for safety threats from other motor vehicles; they may not be paying attention to the cyclist or pedestrian ahead of them in the road. Their non-recognition of bicyclists and pedestrians and inability to react because of high speeds are major factors contributing to accidents.

When overtaking a bicyclist, motorists are worried about how close vehicles in the adjacent or oncoming lanes are rather than how close they are coming to the bicyclist. They are often in too much of a hurry to stop and wait for a gap in traffic before pulling out and safely passing a rider. Motorist-initiated conflicts with bicyclists (or pedestrians) most often occur for the following reasons:

- Driving while impaired by drugs or alcohol
- Failing to yield the right-of-way
- Failure to predict cyclist movements at intersections
- Speeding, particularly in neighborhoods and near schools
- Overtaking bicycles in areas where they cannot be safely passed

Enforcing traffic rules against motorists who violate a bicyclist's rights to use the road can be problematic and even controversial. Motorists often hold bicyclists in low esteem. Many motorists will be completely unaware of what they have done wrong even after being pulled over. The first task for a police officer, therefore, is to make sure the motorist understands and appreciates the impact of his or her dangerous behavior. If the driver understands the message, a warning may be all that is necessary.

Some drivers, however, will not understand. They will refuse to accept that a cyclist should be on the road. They may claim to be acting in the cyclists' best interest in telling them to "get off the road" for their own safety. Even if the police officer would not ride on that road themselves, the officer should help the driver understand that the cyclist has a legitimate right to be on the road and that riding in the gutter or on the sidewalk (assuming one exists) can be more dangerous. If the driver still fails to comprehend, a ticket may be the only option.

A key component of any enforcement program is educating law enforcement officers about treating bicycles as vehicles under the existing vehicle code. In many cases officers may be unaware of the special circumstances under which a normally minor vehicle incident can be life threatening when one of the involved vehicles is a bicycle. For example, one of the most common car-bicycle conflicts is the lane change at an intersection prior to a motorist making a right turn. In a traffic situation without bicycles present, this movement will not normally create a traffic conflict. However, if a bicycle is present and the motorist fails to check their mirror for the presence of a bicycle, serious injury could result to the cyclist. In this example, the motorist is failing to yield to the cyclist, a violation of Illinois' motor vehicle code is occurring. Most officers will probably not recognize this situation without some specialized training in bicycle traffic law

enforcement issues. It is important to note that the focus of such education should be informational: the goal is to let officers know what tools are already available to help them protect cyclists. A program that emphasizes this type of education will probably be more successful in achieving equal enforcement of existing laws than a program that mandates such equal enforcement to officers.

ENSURE ACCESSIBLE DESIGN OF ALL FACILITIES

Accessible design signifies designing bicycle facilities that can be accessed by all people, including those with mobility disabilities or impairments. Accessible design is more than a best practice; it is a civil right. Designing and constructing facilities that exclude a group of people is discriminatory and unjust.

There are two applicable national accessibility laws: the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973. It should be noted that many states and municipalities also have accessibility design guidelines.

The ADA is divided into three sections, or titles, to ensure equal access to public facilities for persons with disabilities. Title I prohibits discrimination in employment practices. Title II prohibits discrimination based on disabilities in programs, activities, and services in State and local governments. Title III prohibits discrimination based on disability in public accommodations such as any commercial business, places of public gathering, service establishments, stations used for specified public transportation, education institutions, and places of recreation. Bicycle facilities may be considered systems of transportation, recreational facilities, and services of state or local governments; therefore the ADA, is applicable.

Section 504 of the Rehabilitation Act of 1973 states that "no handicapped individual shall, solely by reason of...handicap, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Many bicycle facilities receive federal funding through the CMAQ program, which triggers a requirement of accessible design.

The ADA and Section 504 use design standards detailed in the American with Disabilities Design Guidelines (ADAAG). ADAAG contains scoping and technical requirements for accessibility to be applied during the design, construction, and alteration of buildings and facilities. Bicycle and pedestrian facilities requiring accessible design include:

- Path design for sufficient width
- Curb cuts and street crossing design
- Slopes and cross slopes of trails and paths
- Bridge design and access ramps

- Horizontal and vertical clearance on paths
- Accessible parking which serves trails and recreational facilities
- Consideration in way-finding for people with cognitive and visual impairments
- Restrooms and accessibility to related recreational facilities

It is fortunate that good bicycle design and accessible design are synonymous. Conditions that make bicycle transportation enjoyable are synonymous with having sufficient access for people with mobility impairments. AASHTO and other accepted manuals of bicycle and pedestrian facilities design are cognizant of disability needs and reflect this in their design recommendations. The design recommendations in the following chapters also reflect accessible design.

CHAPTER 4 – REGIONAL BIKEWAY CONSIDERATIONS

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INTRODUCTION

The facilities presented for consideration in this plan are the result of an analysis of the existing bikeway network, planned bikeways, accident data, local destinations, regional destinations and barriers to bicycle and pedestrian movements. It is also important to recognize that Kane and Kendall County are both changing and growing. At this time, opportunities should be seized to plan bikeways and reserve bikeway transportation corridors. If these opportunities are lost, it will become more difficult to obtain them in the future, thus impacting the quality of life and future alternative transportation options.

The plan considerations are not meant to contradict or supplant local planning efforts. The considerations are a means for municipalities and bikeway users to understand how Kane and Kendall Counties' bikeways are pieced together and how, through coordinated efforts, bikeways can become regional in nature instead of serving just local destinations and users.

First, policies are recommended to create a heightened awareness to government officials who design and construct transportation infrastructure. These policies should inspire municipal or park district planners to think of their regional role in a bicycle and pedestrian network.

Second, physical considerations are offered that identify gaps in infrastructure and fulfill specific needs in the existing bikeway network. Projects are recommended to quickly expand the bicycle network and connect to local trails and high demand destinations. The objectives of the plan's physical considerations are:

- Link bicycle and pedestrian destinations
- Improve the on-street bikeway network
- Increase pedestrian and bicyclist safety
- Improve trail network connectivity
- Support multi-modal transportation
- Develop future bikeway corridors
- Strive for minimum Bicycle Level of Service standards with road improvements
- Encourage alternative modes of transportation

POLICY RECOMMENDATIONS

The following policies should be considered by county, local and regional governmental bodies to promote the improvement of the pedestrian and bikeway infrastructure. While not eliminating the need for a Complete Streets Policy, these recommendations ensure that transportation planners and engineers consistently design and operate the entire roadway with all users in mind.

Incorporate bicycle and pedestrian elements into roadway improvements
Encourage bicycle and pedestrian enhancements as part of all development and transportation projects. Local jurisdictions should be encouraged to routinely accommodate bicycles when adding or improving roadways through the implementation of wide outer lanes, bicycle friendly drainage grates, traffic signal actuation devices, paved shoulders and other amenities. This also includes the design and development of bridges, interchanges and overpasses.

Municipal, county and township transportation departments should coordinate with IDOT to ensure bicycle and pedestrian accommodations are incorporated into other types of roadway projects, such as bridges, underpasses, arterial intersection improvements, at-grade rail crossings, and highway interchanges. The cost to retrofit these types of facilities can be prohibitively expensive, yet a small part of the overall cost of a project if initially designed and constructed with consideration of bicycle and pedestrian facilities.

Any road improvements bridging barriers--such as overpasses, bridges across rivers, or interchanges--should be planned to include bicycle and pedestrian facilities. Retrofitting these structures is extremely expensive. It is important to include 5 - 8 foot wide paths during the engineering design phase, for use by pedestrians and bicyclists, who will need and want to cross these barriers.

Improve or construct rural roads with paved shoulders
The Kane County Division of Transportation (KDOT) should rigorously apply this policy to ensure that all roads that are to be improved (either widened or resurfaced) have a paved shoulder to allow for bicycle use, if necessary. Agencies should seek to provide a 4-foot wide paved shoulder or greater. Providing a paved shoulder is important for three reasons:

- Allows for bicyclists to ride along the side of the road safely.
- Lowers accident rates by providing an area of maneuverability around roadway obstructions or threats.
- Decreases maintenance requirements because road edges deteriorate slower.

A 4-foot shoulder is the desirable minimum width for providing protection to bicyclists. Due to the existing road structure, roads cannot typically be widened more than 4 feet without significantly broadening the scope and cost of the project. In those cases where a 4-foot shoulder can't be achieved, officials may choose to narrow traffic lanes to 11 feet or 11.5 feet to provide an extra 12 or 6 inches for a shoulder. This extra space will partially alleviate a common problem to bicyclists, which is riding on pavement stripes. These stripes can be slippery and hazardous to bicyclists. The narrower lanes also provide traffic calming.

If shoulders are being added as part of an agency's resurfacing program, it will generally be difficult to meet the desired minimum shoulder width of 4-feet. However, any repaving of local roadways should consider any additional shoulder width that can be achieved. The additional

width increases the safety of the bicyclist and motor vehicles. Any new roadway construction should have paved shoulders installed as a standard.

Achieve Minimum Bicycle Level of Service standards with road improvements

Bicycle Level of Service (BLOS) is a measure of bicyclist comfort level as a function of road geometry and traffic. A BLOS analysis of main roadways within Kane County was performed as a part of this plan. As a policy for the Kane County Division of Transportation, any new or reconstructed road should strive to be designed with a BLOS Grade "B" to serve a broad range of cyclists. At minimum, a new or reconstructed road should be designed with a BLOS Grade "C" to accommodate more experience and confident bicyclists. .

Improvements in BLOS can be achieved through a variety of roadway improvements. By merely requiring a BLOS improvement and not a specific roadway design, engineers are allowed more freedom in designing roadway improvements. BLOS improvements can be achieved through, for example, paved shoulders, expansion of paved shoulders, and wider curb lanes.

Incorporate bicycle and pedestrian elements into the review of development plans

Bicycle and pedestrian accommodations should be incorporated into the development review process. Local jurisdictions should include provisions for sidewalk and bicycle facilities in their development process and regulations. If all local jurisdictions follow this procedure, developers will understand that the construction of bicycle and pedestrian facilities is a standard part of development in Kane County and Kendall County.

One method to incorporate bicycle and pedestrian accommodations into development reviews is to promote the connection of regional bikeways to adjacent new developments. Local and regional governing bodies should institute plan review policies that mandate new development near existing or proposed regional bikeways create connections to the trails. This enhances the regional network and creates connectivity for residential and commercial development, fostering alternative transportation options.

Ensure path connectivity to adjacent activity generators

Local agencies should strategize to connect pedestrian and multi-use paths to popular destinations including, residential and commercial developments, public and open spaces and established bikeways. This can be accomplished in the following ways:

- Obtain a public access easement and construct trail connections with local funds.
- Have the local or state transportation agencies reserve a transportation corridor through designation of easements.
- Write development or subdivision ordinances mandating the connectivity of new development to adjacent private development, parks or trails.
- During the plan review process, seek a voluntary set aside and/or construction of paths or trails to adjacent development, parks or trails. The advantage of this option

is that there is no initial cost to the governing body, however, there is also no guarantee of obtaining the path or sidewalk connection.

- Incorporate bikeway rights-of-way on transportation and master plans. This will demonstrate to developers that mandating construction of a multi-use path or reservation of an easement is not a capricious act. Then request compliance during the site plan review process.

Improve access to school zones

Any road improvements near school zones should employ designs that minimize student-pedestrian / vehicular conflicts by directing students to safer routes along sidewalks or multi-use trails, controlling vehicular traffic, traffic calming, and improving motorist awareness of school-aged children. New school site plans should be scrutinized for layout, orientation, and connectivity to pedestrian sidewalks, multi-use trails, and neighboring subdivisions. Schools should be designed with *Safe Routes* in mind and separate pedestrian, bus, and automobile access.

Follow recognized standards

Many local agencies have constructed local multi-use paths and design standards have varied by agency. Any new bikeway or pedestrian facility should adhere to recognized standards, which promotes the safest possible environment for users. Note that all design guidelines within this plan follow recognized standards.

Coordinate with transit expansion

Metra and Amtrak are both currently planning to expand existing transit rail routes in Kane County further west and Kendall County further south. In many instances, additional right-of-way will need to be acquired. This is an opportunity for local government agencies to purchase the desired right-of-way or obtain a negotiated easement to reserve a bikeway transportation corridor for a parallel multi-use path. These paths can link residential developments to train stations and increase the multi-modal commuting opportunities.

Bicycle parking, pedestrian sidewalks, and pedestrian crossings near stations should be included with any new station or station renovation.

Ensure inter-governmental cooperation

The Kane/Kendall Council of Mayors should coordinate and cooperate with local and regional agencies to promote the Bicycle and Pedestrian Plan. The KKCOM should describe the plan's objectives and recommendations to local governmental agencies to guide the direction and priorities in their planning and development of bikeway infrastructure.

REGIONAL BIKEWAY CONSIDERATIONS

The Kane/Kendall Council of Mayors Bicycle and Pedestrian Plan has policy and program recommendations to encourage the development of bicycle and pedestrian facilities during roadway design and construction and to encourage bikeway connectivity to the existing system. Another key component of the plan is "Regional Bikeway Considerations", which address the establishment of bicycle corridors through the physical expansion of the bikeway network. These considerations are consistent with the first goal of this plan, which is "to develop a regionally coordinated network of non-motorized facilities by completing missing gaps in bicycle facilities, recommending new bicycling corridors, providing access across barriers, and improving local bicycle and pedestrian networks.

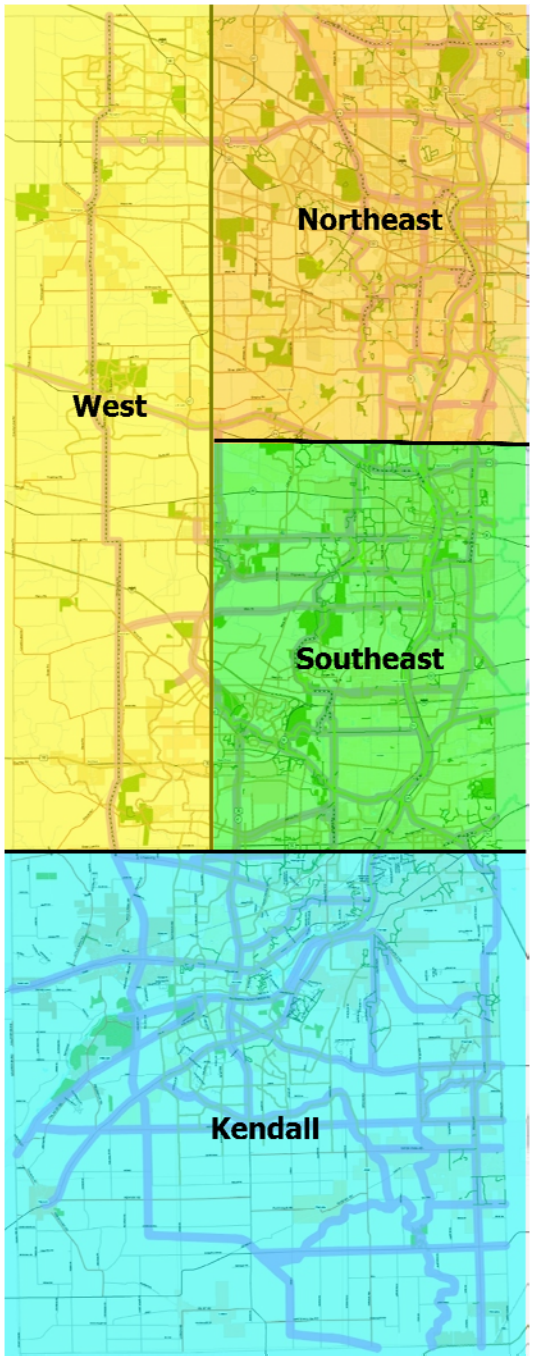
The Regional Bikeway Considerations take into account the Kane County 2040 Transportation Plan and Kendall County Forest Preserve Greenways and Trail Plan and identify missing gaps in services as identified through the exhaustive inventory. In addition, the Bicycle Level of Service Analysis (BLOS) has identified streets that provide acceptable levels of bicycle facilities and those that should consider additional improvements.

Many recreational bicyclists only recognize off-street bicycle trails, such as the Fox River Trail, as the only bicycle infrastructure. However, the bicycle infrastructure encompasses a wider range of facilities reflected in the Regional Bikeway Considerations. There are regional trails, local trails, and on-street bikeways, including bike lanes and paved shoulders.

The objectives of Regional Bikeway Considerations are:

- Link bicycle and pedestrian destinations
- Increase pedestrian and bicyclist safety
- Improve trail network connectivity
- Improve the on-street bikeway network
- Encourage bikeway use
- Support multi-modal transportation
- Break barriers which prevent bicycle trips
- Develop future bikeway corridors

Map 5: Division of KKCOM into Planning Areas



The Regional Bikeway Considerations are described by region and by facility type. These considerations were recommendations from various agencies and the public. Each were reviewed by the KKCOM Bicycle & Pedestrian Committee. Map 5 (previous page) illustrates the division of the Kane\Kendall Council of Mayors planning area into four areas. These areas are: West Kane, Northeast Kane, Southeast Kane, and Kendall County. The Bikeway Considerations include three different types of improvements:

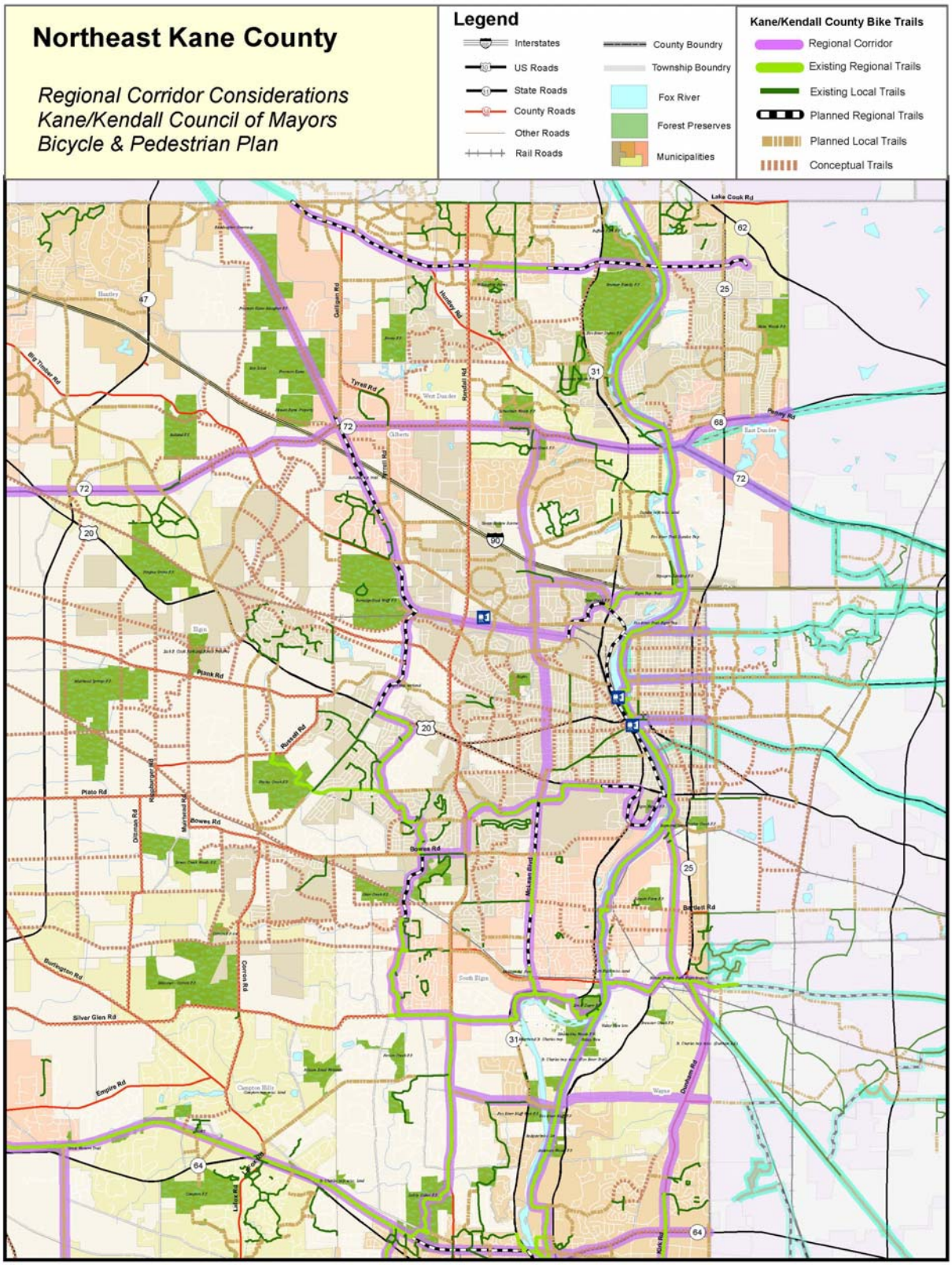
Bicycle Level of Service (BLOS) Improvements - Improve the existing BLOS to provide a safer environment for bicyclists that elect to ride on the street. Roadway improvements that improve a BLOS grade include wide outside lanes, bike lanes, and paved shoulders.

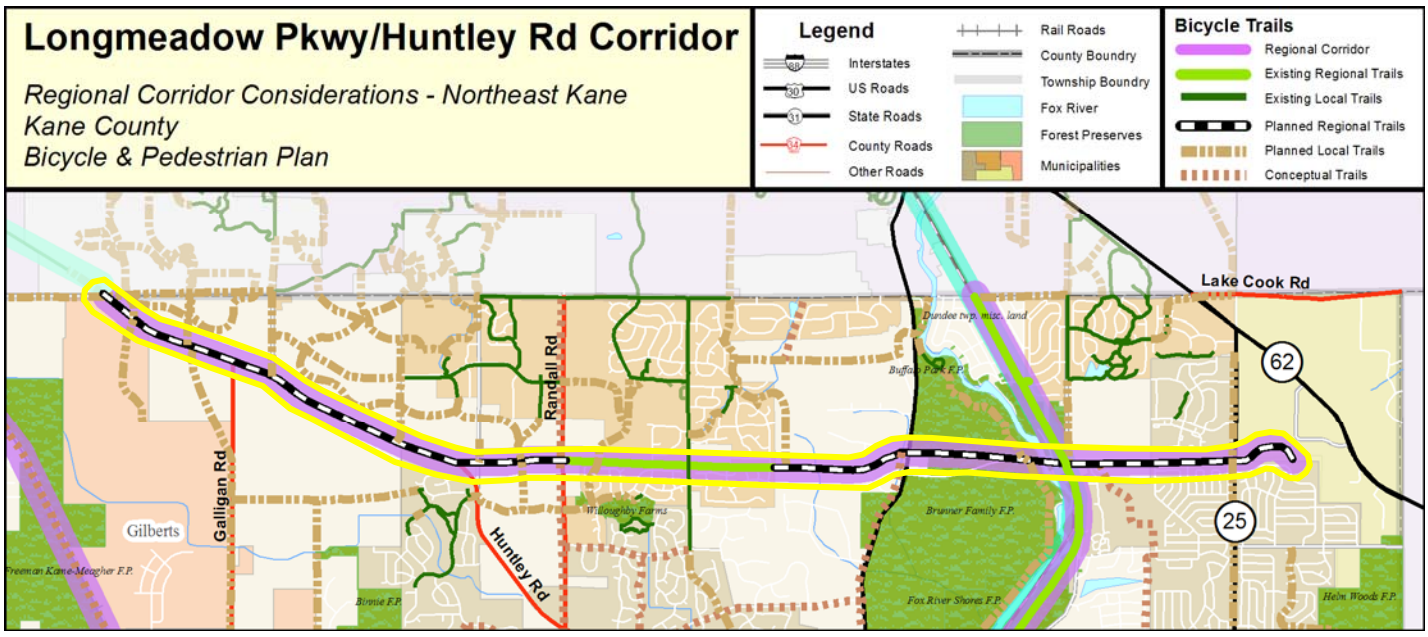
Completion of Bikeway Gaps - Providing facilities between two existing facilities to promote the creation of a regional or sub-regional network.

Conceptual Bikeway Corridors - Utilizing greenways, open spaces, roadways, utility rights-of-way, and forest preserves to identify desirable corridors to develop the regional bikeway network.

NORTHEAST KANE COUNTY

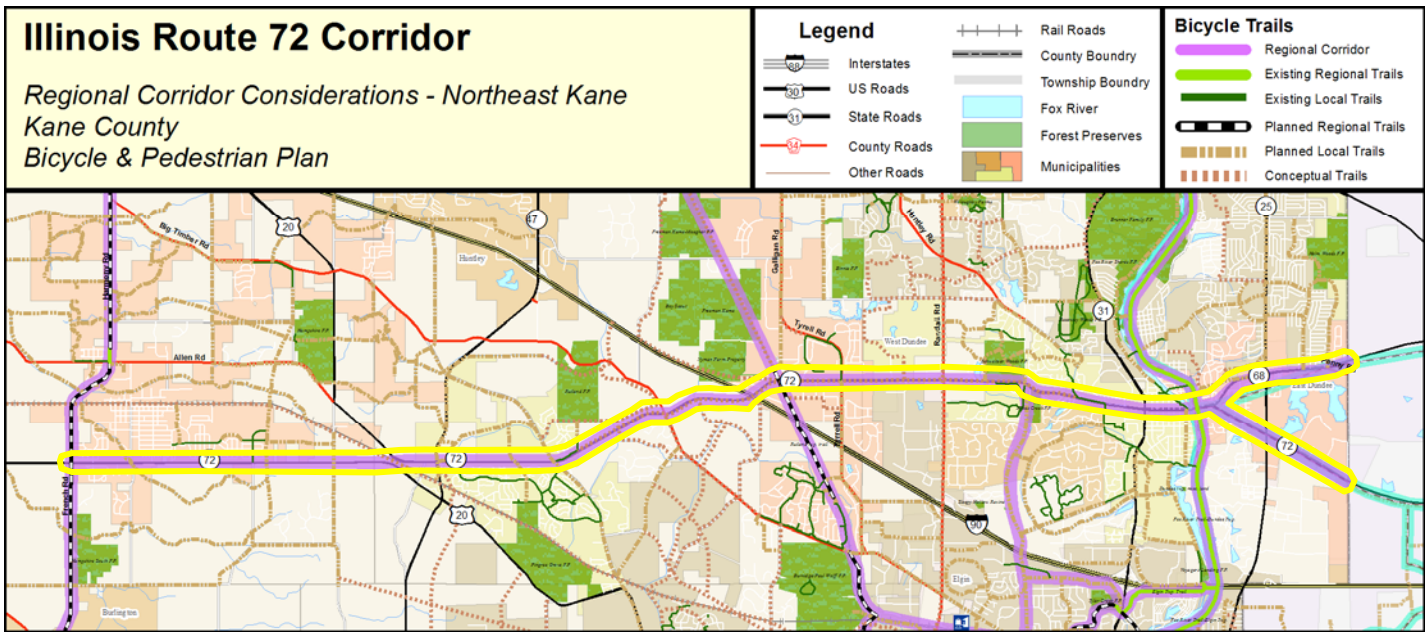
The "Northeast Kane County" area is an urbanized portion of Kane County including primarily Dundee and Elgin Townships, and portions of Rutland, Plato, St. Charles and Campton Townships. For this study, the boundaries are: DuPage and Cook Counties to the east, McHenry County to the north, Dittman Road (extended) to the west and the Great Western Trail to the South.





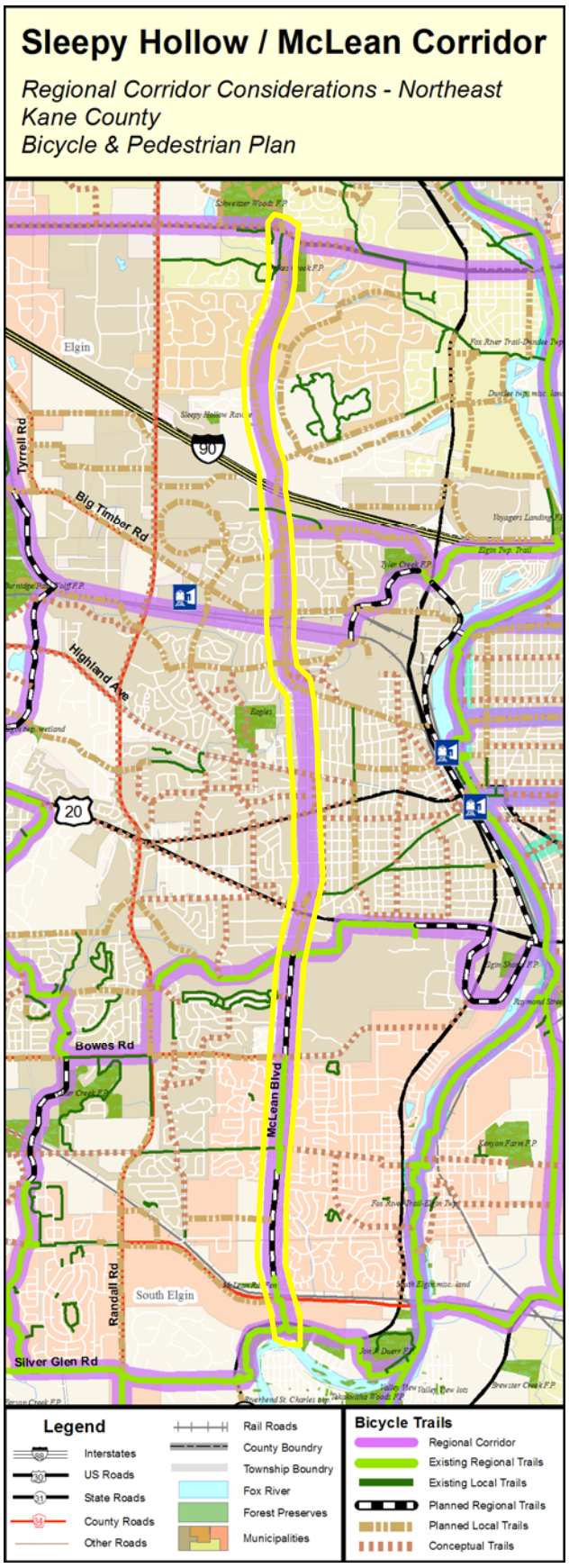
This is a significant east-west corridor in the northern portion of Kane County. It connects to an existing path on Longmeadow Parkway and the Fox River Trail and would travel north into McHenry County. An off-street path is proposed to be constructed as part of the Longmeadow Parkway Bridge Corridor between Huntley Road and Algonquin Road. Coordination with McHenry County to continue the path to the northwest is recommended.

Longmeadow Parkway/ Huntley Road Corridor	7.71 miles
Jurisdictions	Algonquin, Carpentersville, Barrington Hills, Gilberts, Dundee Township Park District, Kane County, Kane County Forest Preserve District, IDOT
Connectivity to Regional Destinations	Brunner Family Forest Preserve
Connectivity to Existing Bicycle Network	Fox River Trail, Sleepy Hollow Road Path
Direct access to/from Transit	Pace 803
Barriers	Lacking a bridge across the Fox River, Need for crossings at Randall Road, IL Rte 31 & IL Rte 25
Percentage of Corridor Existing	16%
Percentage of Corridor Planned	84%



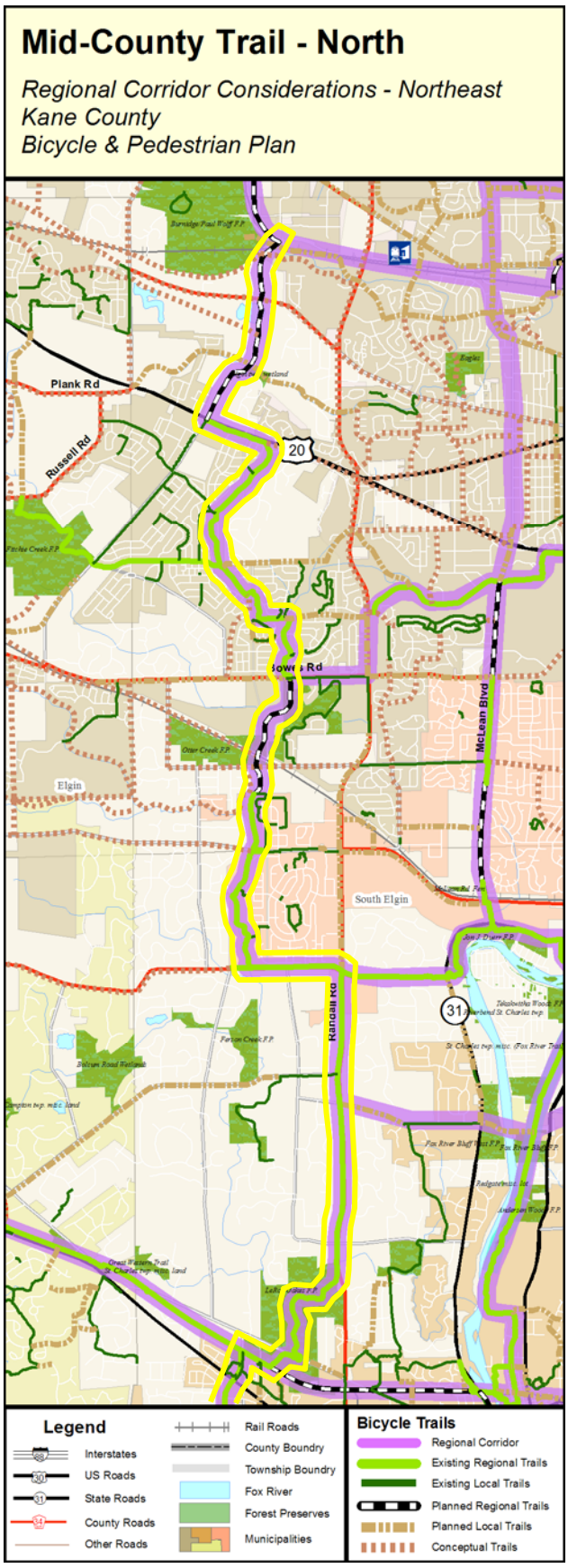
From Hampshire and into Cook County, IL Route 72 (Higgins Road) is a significant east-west route. In the more dense areas to the east of Interstate 90, a separated multi-use path is most appropriate. The remaining corridor should be improved to at least a BLOS grade of "C" to insure bicycle compatible conditions for more experienced cyclists. In addition, local bicyclists have identified IL Route 68 as a significant barrier to east-west travel between Cook County and the Fox River Trail.

Illinois Route 72 Corridor	18.63 miles
Jurisdictions	Carpentersville, East Dundee, Gilberts, Hampshire, Pingree Grove, Sleepy Hollow, West Dundee, Hampshire Park District, Dundee Township Park District, Kane County, Kane County Forest Preserve District, IDOT
Connectivity to Regional Destinations	Spring Hill Mall, Schweitzer Woods Forest Preserve, Dundee Township Park District, downtown West Dundee, downtown East Dundee
Connectivity to Existing Bicycle Network	Pingree Grove Paths, Tyrell Road Path, Sleepy Hollow Road Trail, Tartans Drive Trail, Fox River Trail
Direct access to/from Transit	Pace 543, Pace 552, Pace 803,
Barriers	Need for crossings at IL Rte 72/47, Randall Road, IL Rte 31 & IL Rte 25
Percentage of Corridor Existing	5%
Percentage of Corridor Planned	2%
Percentage of Corridor Conceptual	34%
Percentage of BLOS Improvements	59%



This is a significant north-south corridor in the northern portion of Kane County. It connects to an existing path on Longmeadow Parkway, to the Elgin Community College and south to the River Bend Trail. A regional off-street path is planned along McLean Boulevard and a local facility is planned along Sleepy Hollow Road to the north.

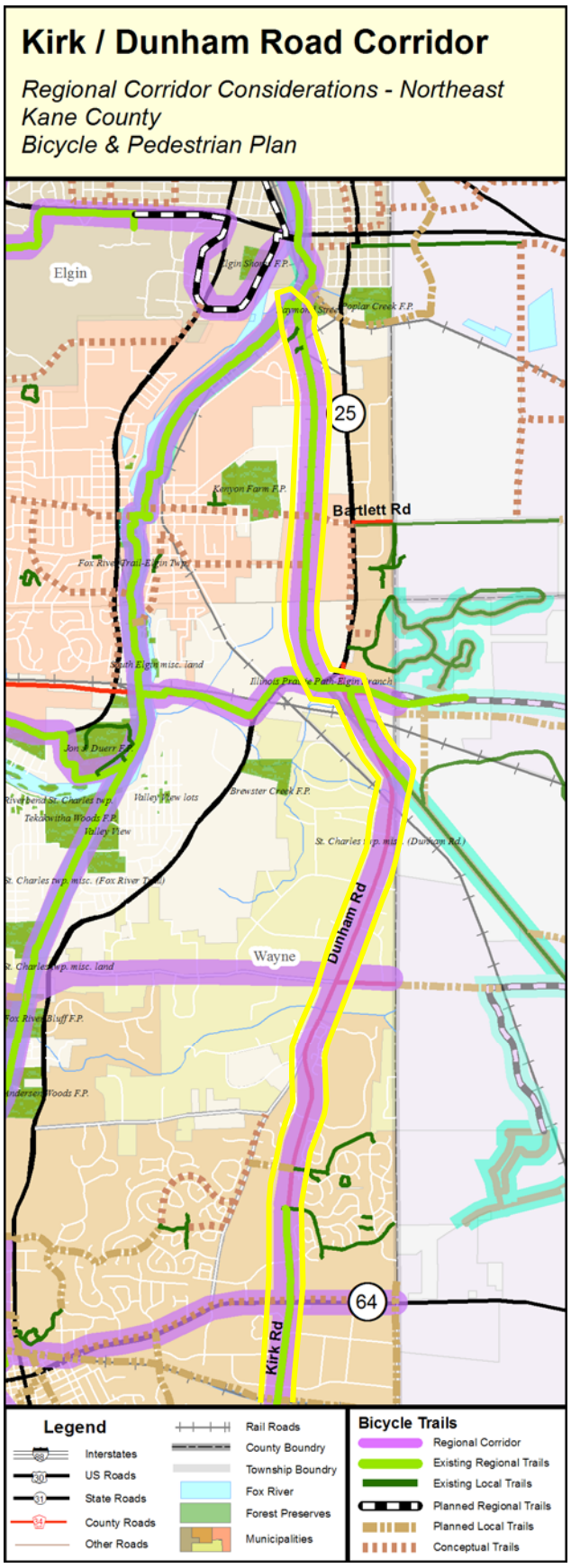
Sleepy Hollow Road / McLean Boulevard Corridor	**10.37 miles**
Jurisdictions	Elgin, Sleepy Hollow, South Elgin, Dundee Township Park District, Kane County, Kane County Forest Preserve, IDOT
Connectivity to Regional Destinations	Jon J. Duerr Forest Preserve, Elgin Community College, Schweitzer Woods Forest Preserve, Jelkes Creek Bird Sanctuary
Connectivity to Existing Bicycle Network	River Bend Trail, Elgin Connector, UP Railroad Trail, Longmeadow Parkway
Direct access to/from Transit	Pace 546, Pace 547, Pace 548, Pace 549, Pace 550
Barriers	None
% of Corridor Existing	16%
% of Corridor Planned	68%
% of Corridor Unknown	16%



The Mid-County Trail is a proposed north-south trail that will serve as a recreational and transportation corridor. This trail utilizes some existing local trails, forest preserve, parks and greenwasy and requires the construction of new trails. The proposed northern trailhead is near Burnidge / Paul Wolff Forest Preserve in Elgin. A portion of the Randall Road bikeway north of LeRoy Oaks Forest Preserve is utilized as the Mid-County Trail. The proposed southern trailhead is near IL Route 56 and the Virgil Gilman Trail in Aurora. The Mid-County Trail can be extended at the north trailhead along the UP Railroad trail when there is available right-of-way.

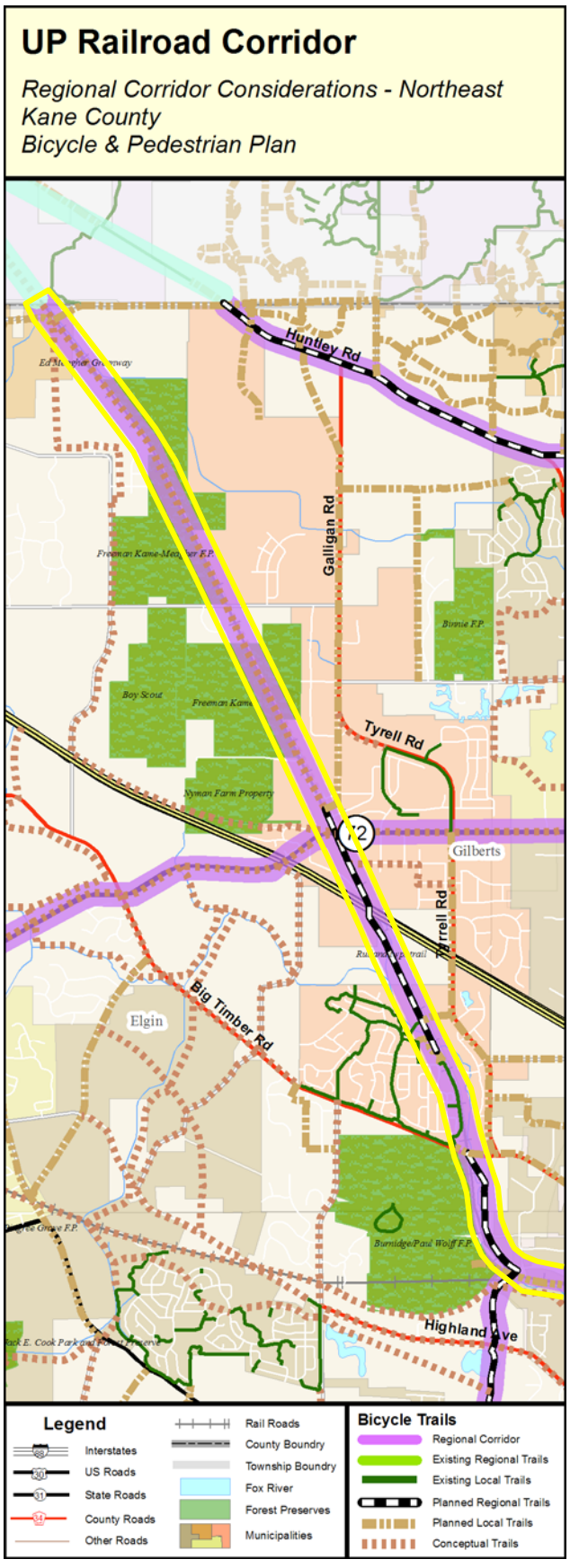
Mid-County Trail - North	12.53 miles
Jurisdictions	Elgin, South Elgin, St. Charles, St. Charles Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Paul Brundige F.P., Otter Creek F.P., LeRoy Oaks F.P.
Connectivity to Existing Bicycle Network	River Bend Trail, Great Western Trail, Bowes Road Trail, Providence Trail System
Direct access to/from Transit	None
Barriers	Need for crossings at US Rte 20 & Illinois Central Railroad. Lacking a bridge over Otter Creek.
% of Corridor Existing	71%
% of Corridor Planned	29%

The Kane County Forest Preserve District in coordination with other local agencies is acquiring land connecting existing forest preserves and trail systems, to form the Mid-County Trail corridor. Continued residential and commercial development in the area will make it more difficult to acquire property and right-of-way for a bikeway corridor.



The northern portion of the Kirk Road Sidepath currently ends at St. Charles East High School. It is desirable to extend the path to the north along Dunham Road to create a connection to the Elgin Branch of the Illinois Prairie Path and the Stearns Road bicycle trail.

Kirk / Dunham Road Corridor	6.79 miles
Jurisdictions	Bartlett, South Elgin, St. Charles, Wayne, Bartlett Park District, St. Charles Park District, Kane County, Kane County Forest Preserve District
Connectivity to Regional Destinations	St. Charles East High School
Connectivity to Existing Bicycle Network	Illinois Prairie Path – Elgin Branch, Fox Chase Path System
Direct access to/from Transit	Pace 801
Barriers	Lack of safe crossings at all railroads.
% of Corridor Existing	55%
% of Corridor Unknown	45%

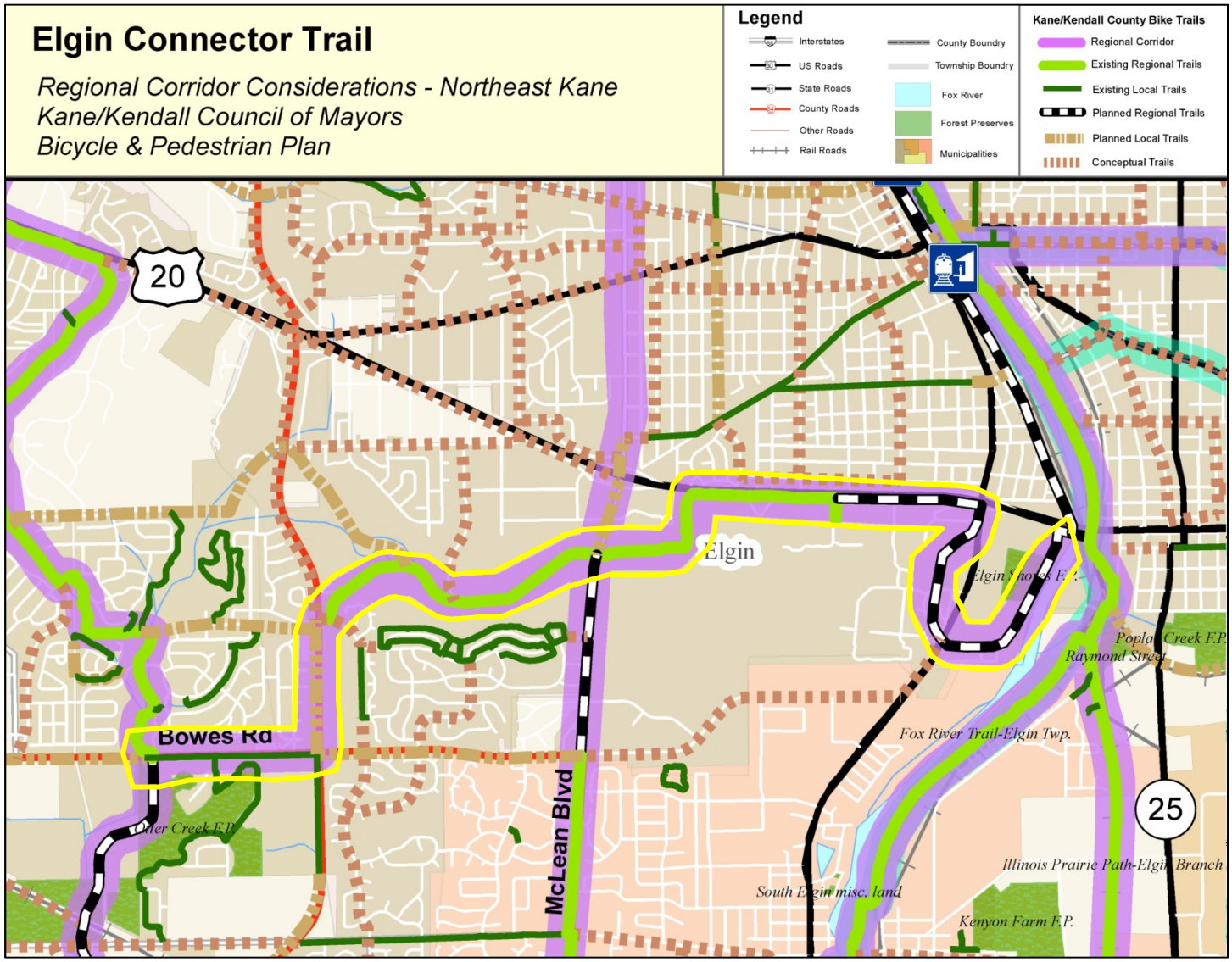


This proposed rail-trail corridor connects the City of Elgin to the Village of Gilberts, and could be extended further west and north into McHenry County. The rail-trail passes the Big Timber Road Station on the Milwaukee West District of Metra, and provides a multi-modal transit link. If the these raillines are abandoned, conversion of rails to trails is recommended.

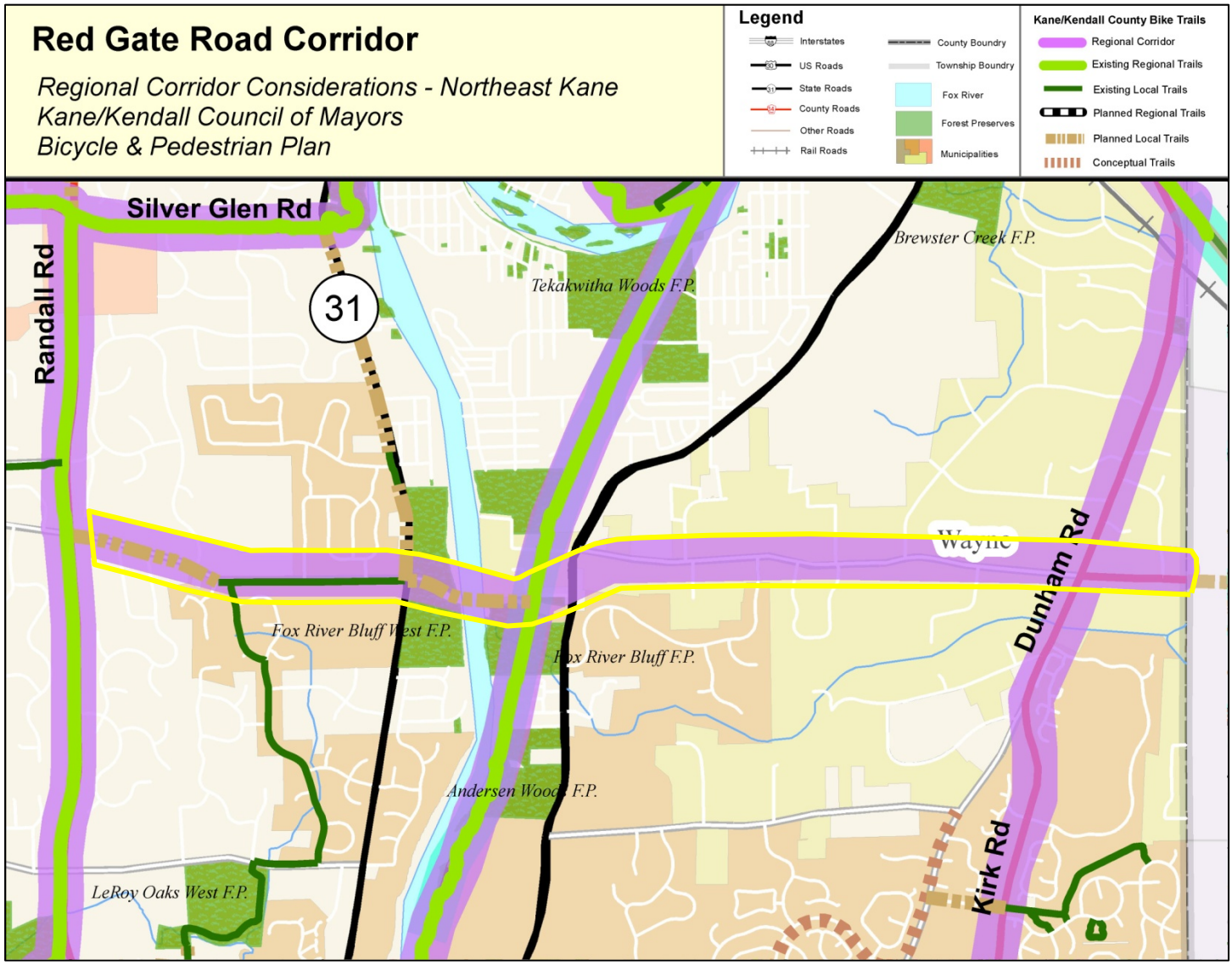
In many parts of the country, bikeway corridors are developed parallel to active rails. If Metra expansion is extended along this rail, a parallel strip of right-of-way can be obtained and a designated a bikeway corridor. Any component of a rail-trail should consider potential safety concerns by providing barriers between therails and the trail.

UP Railroad Corridor	13.59 miles
Jurisdictions	Elgin, Gilberts, Huntley, Huntley Park District, Kane County, Kane County Forest Preserve, IDOT, Union Pacific Railroad
Connectivity to Regional Destinations	Freeman Kame Forest Preserve, Camp Tomo Chi-Chi Knolls, Brundige Forest Preserve, Big Timber Metra Station, Sherman Hospital
Connectivity to Existing Bicycle Network	Fox River Trail, Village of Gilberts Trail System
Direct access to/from Transit	Pace 547, Pace 550, Pace 552, Metra UP-West Line
Barriers	Lack of crossings at Randall Road, IL Rte 31 & Interstate 90
% of Corridor Existing	14%
% of Corridor Planned	41%
% of Corridor Conceptual	28%
% of Corridor Unknown	14%

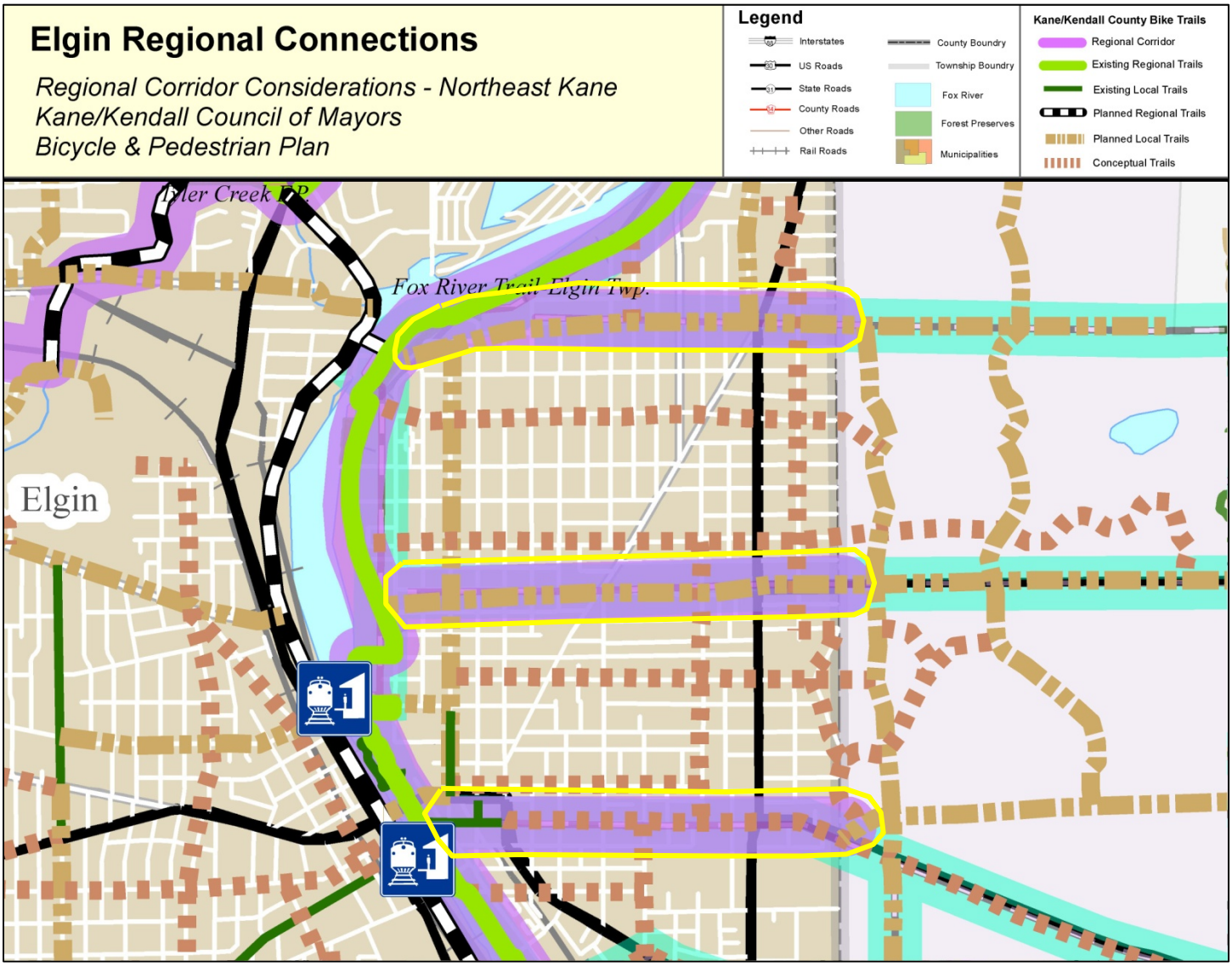
ADDITIONAL NORTHEAST CORRIDOR PRIORITIES



This programmed bikeway corridor consists of two paths to connect the Fox River Trail with existing paths to Elgin Community College and then west to the Mid-County Trail. The route will utilize greenways and public spaces to connect transit, trails, major trip attractors, and residential areas.



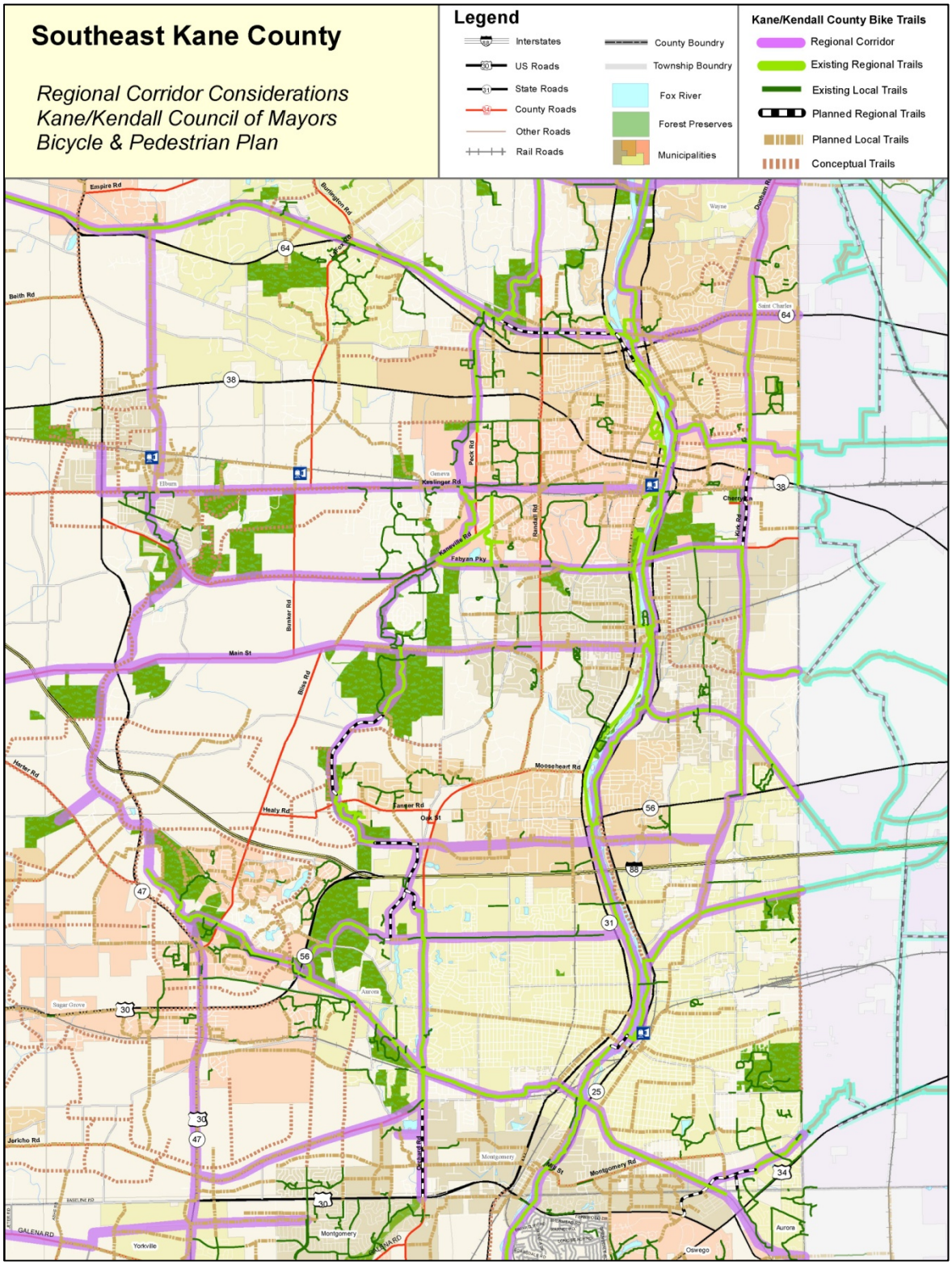
This programmed bikeway corridor consists of a bridge over the Fox River to be built with the Red Gate Bridge project. Later, the bikeway corridor should be extended west to the Mid-County Trail and to the east to the proposed Kirk Road Sidepath.

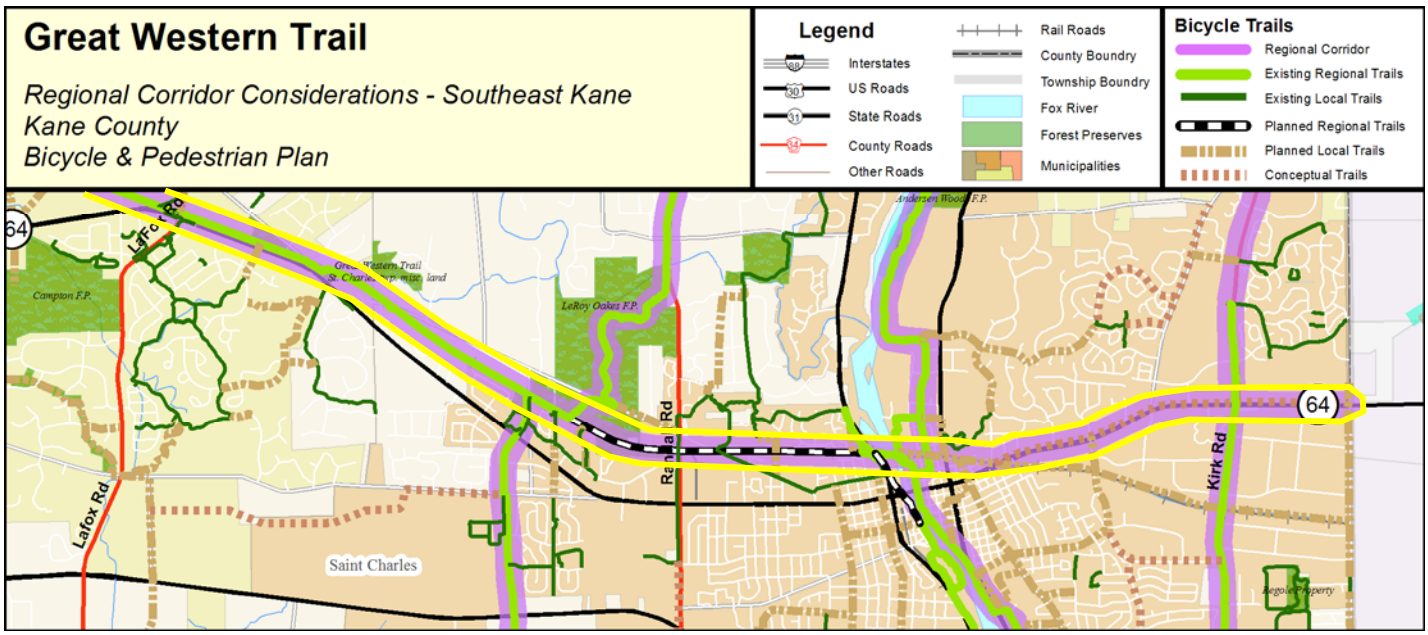


The Elgin Connectors provide access to the Fox River Trail from three different locations in Elgin. Shoe Factory Road is a very important regional corridor for cycling from the Poplar Creek system (and neighboring towns to the east and south) to Elgin and the Fox River Trail network. While most of the corridor is outside the planning region, the City of Elgin should continue to work with Hoffman Estates and other agencies to coordinate its improvement. These facilities are extensions of regional corridors from the Northwest Municipal Conference.

SOUTHEAST KANE COUNTY

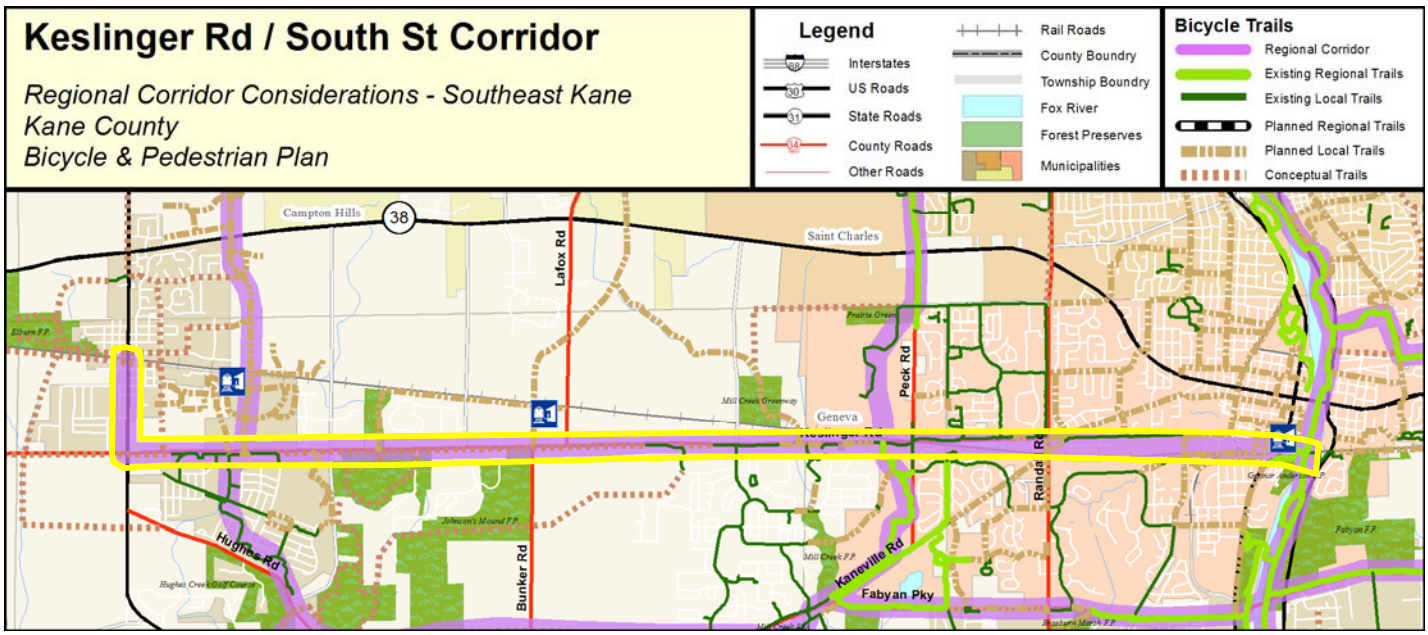
The "Southeast Kane County" area is an urbanized portion of Kane County including primarily Aurora, Batavia and Geneva Townships, and portions of Sugar Grove, Blackberry, St. Charles and Campton Townships. For this study, the boundaries are: DuPage County to the east, the Great Western Trail to the north, Anderson Road (extended) to the west and Kendall County to the South.





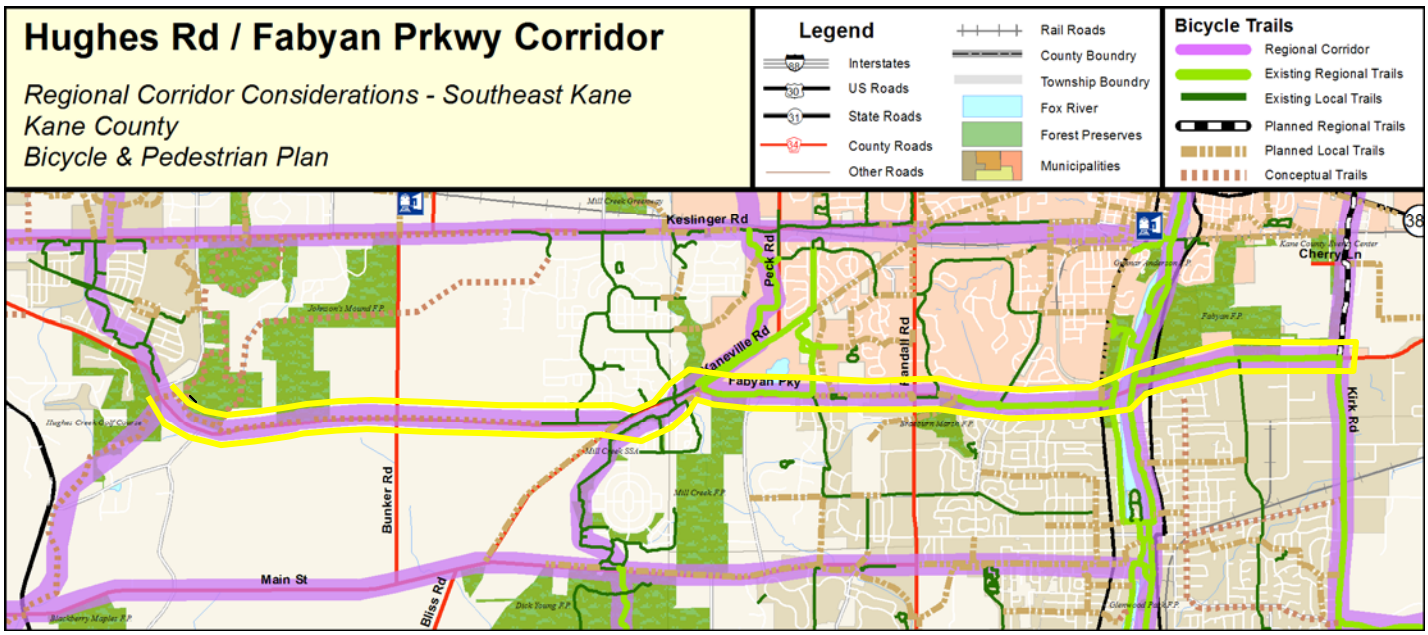
This rail-trail corridor connects the Great Western Trail to the Fox River Trail, and could be extended further east to Tyler Road and eventually the Kirk Road Sidepath. The Union Pacific Railroad is vacating the rail-line and multiple agencies are working to secure it as a future trail corridor. An important local and regional corridor extends from downtown St. Charles where the road grid pattern ends eastward along IL Route 64 to the Charlestown Mall area.

Great Western Trail	20.58 miles
Jurisdictions	Campton Hills, Lily Lake, St. Charles, Virgil, St. Charles Park District, Kane County, Kane County Forest Preserve, IDOT, Union Pacific Railroad
Connectivity to Regional Destinations	Virgil Forest Preserve, LeRoy Oaks Forest Preserve, downtown St. Charles, Charlestown Mall
Connectivity to Existing Bicycle Network	Mid-County Trail, Fox River Trail, Campton Hills Trail System
Direct access to/from Transit	Pace 801
Barriers	Need a crossing at Kirk Road
Percentage of Corridor Existing	78%
Percentage of Corridor Planned	12%
Percentage of Corridor Conceptual	10%



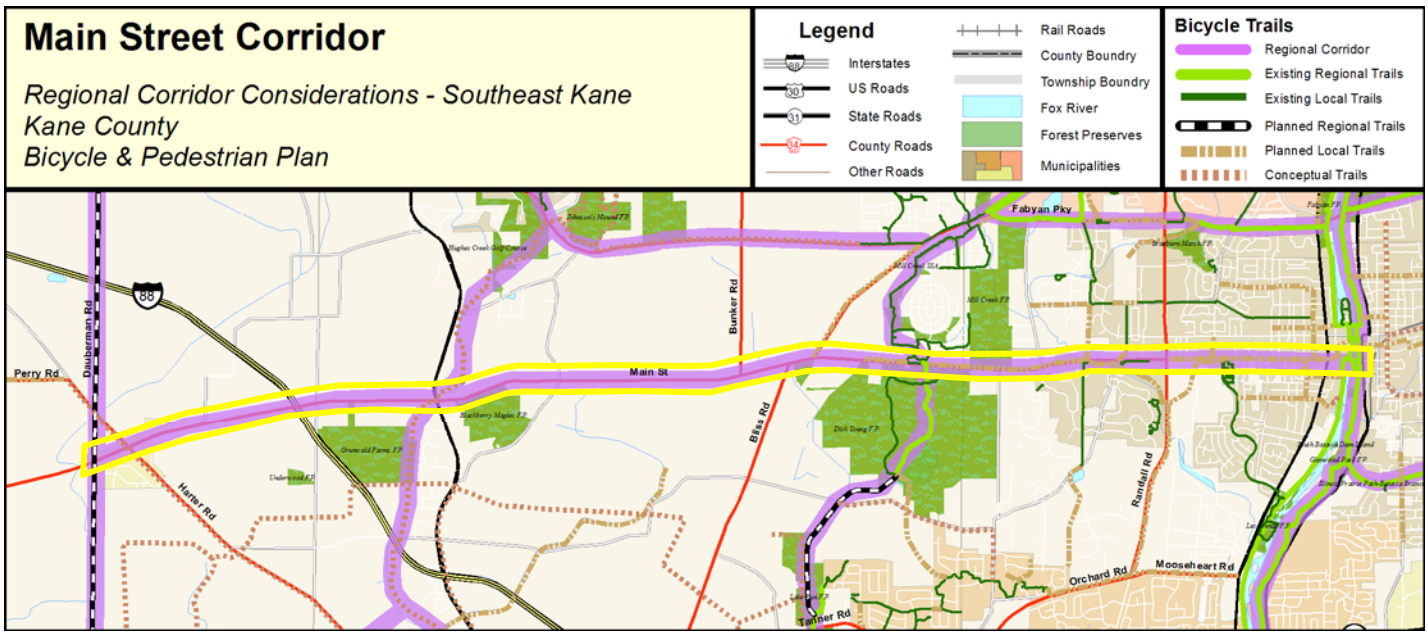
The Keslinger Road / South Street Corridor from Elburn to Geneva is a logical place to add an east-west trail to the Kane County's network. Kane County and Elburn should continue to pursue sidepaths as part of development along Keslinger Road. Such a path would provide a connection to the La Fox Metra Station on the Union Pacific (UP-W) Line. Kane County's South Street Underpass project will provide a grade separated crossing for Randall Road and allow for a future connection to downtown Geneva and the Geneva Metra Station on the UP-W Line.

Keslinger Rd / South Street Corridor	9.28 miles
Jurisdictions	Elburn, Geneva, Geneva Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Johnson's Mound Forest Preserve, Delnor Hospital, Geneva Park District, downtown Geneva
Connectivity to Existing Bicycle Network	Mid-County Trail, Anderson Road Trail, Mill Creek Trail System, Elburn Trail System, Geneva Trail System, Fox River Trail
Direct access to/from Transit	Metra UP-West Line at Elburn, La Fox & Geneva, Pace 529, Pace 801, Pace 802
Barriers	Need a crossing at Randall Road
Percentage of Corridor Existing	39%
Percentage of Corridor Planned	21%
Percentage of Corridor Conceptual	33%
Percentage of Corridor Unknown	7%



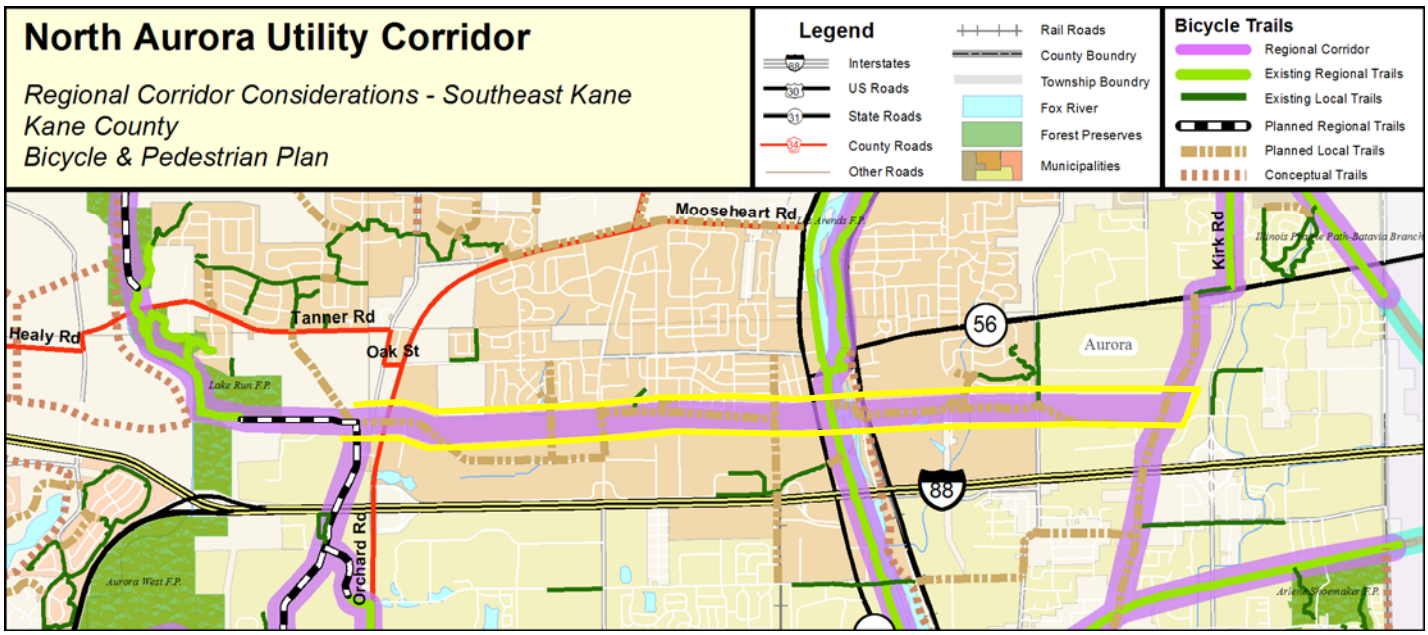
There are a series of trails from Geneva along Kaneville, Fabyan, and Hughes Roads that could connect and provide pathways to regional destinations. There is a short gap at the Kaneville/Fabyan intersection that should be filled, and the trail or a wider paved shoulder could be extended westward along Hughes Road to the Johnson Mound Forest Preserve. To the east, there are sidepaths along Fabyan Parkway on both sides of the Fox River. However, there are gaps in this facility especially over the Fox River. Completion of these gaps will connect the Mid-County Trail, Fox River Trail, and the Kirk Road Sidepath.

Hughes Rd / Fabyan Pkwy Corridor	**8.94 miles**
Jurisdictions	Batavia, Elburn, Geneva, Batavia Park District, Geneva Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Johnson's Mound Forest Preserve, Fabyan Forest Preserve, Peck Farm Park
Connectivity to Existing Bicycle Network	Mill Creek Trail System, Mid-County Trail, Kirk Road Sidepath, Peck Farm Park Trail System, Deerpath Road Trail, Fox River Trail, Bent Tree Drive Route
Direct access to/from Transit	Pace 529, Pace 802
Barriers	Lacking a bridge across the Fox River, need crossings at Randall Rd & IL Rte 31
Percentage of Corridor Existing	57%
Percentage of Corridor Planned	8%
Percentage of Corridor Conceptual	32%
Percentage of Corridor Unknown	3%



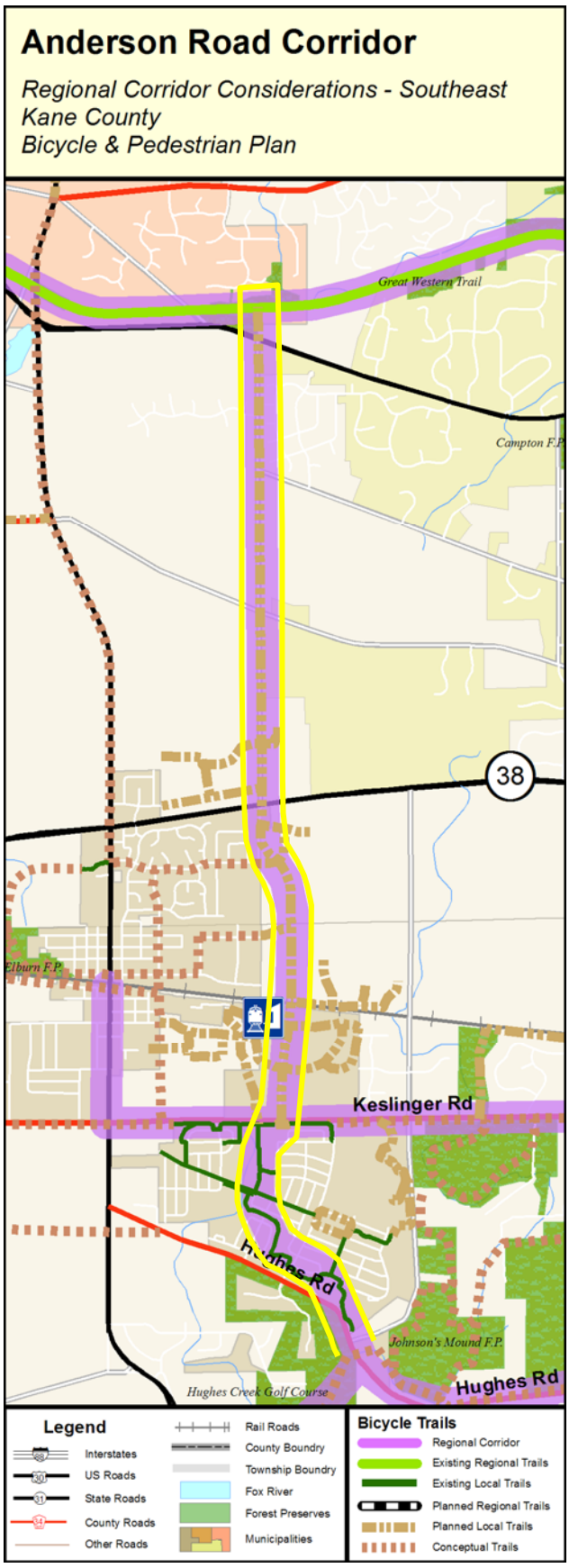
This is a significant east-west corridor for residents of central and western Kane County. It connects rural regions to the Fox River Trail and the Mid-County Trail. As Kane County becomes more residential, improvements will occur to Main Street. Future improvement designs should include adequate paved shoulders or other appropriate accommodations for bicyclists.

Main Street Corridor	11.61 miles
Jurisdictions	Batavia, Kaneville, Batavia Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Blackberry Maples Forest Preserve, Dick Young Forest Preserve
Connectivity to Existing Bicycle Network	Mid-County Trail, Fox River Trail, Mill Creek Trail System, Deerpath Trail, Millview Drive Bike Route
Direct access to/from Transit	Pace 529, Pace 802
Barriers	Need crossings at Randall Road, IL Rte 31 & Interstate 88
Percentage of Corridor Existing	6%
Percentage of Corridor Planned	28%
Percentage of Corridor Unknown	66%



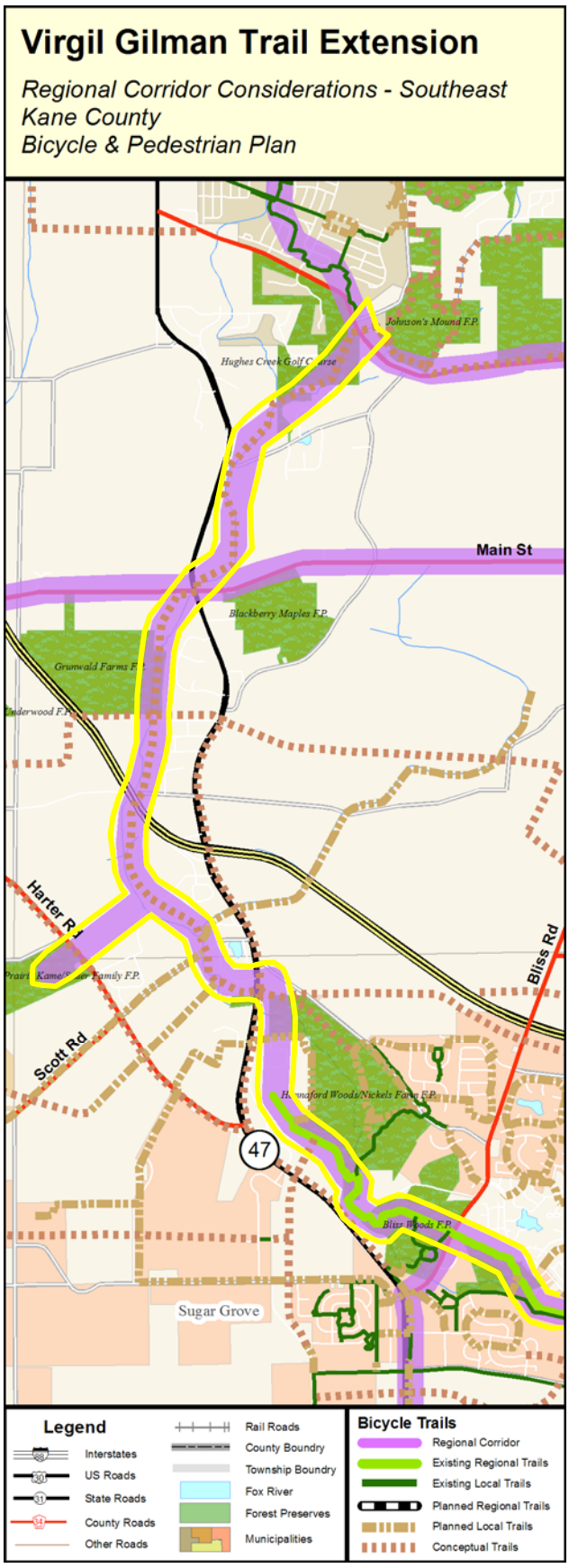
The North Aurora Non-Motorized Plan details a proposed east-west trail corridor along utility easements, connecting the Fox River Trail westward to the planned Mid-County Trail. Partnering with the Village of North Aurora and other agencies to extend the corridor to the southern portion of the Kirk Road Sidepath would create a significant regional east-west trail. Such a trail would be the easiest way to connect the Illinois Prairie Path and DuPage County bikeway systems with the Mid-County Trail.

North Aurora / Aurora Utility Trail	4.66 miles
Jurisdictions	Aurora, North Aurora, Fox Valley Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Lake Run Forest Preserve
Connectivity to Existing Bicycle Network	Fox River Trail, Mitchell Road Trail
Direct access to/from Transit	Pace 529, Pace 533, Pace 802
Barriers	Lacking a bridge across the Fox River
Percentage of Corridor Planned	88%
Percentage of Corridor Unknown	12%



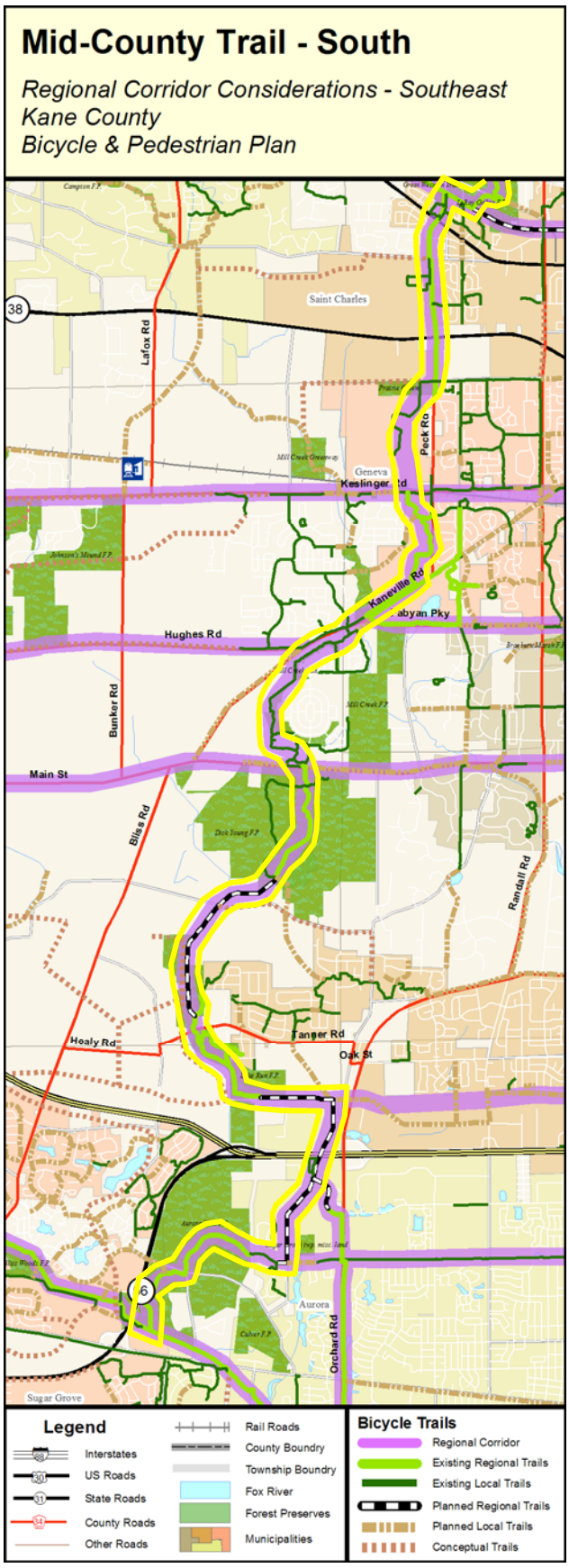
The Anderson Road Corridor is a proposed north-south trail corridor connecting the Great Western Trail south to the planned extension of the Virgil Gilman Trail and Hughes Road Trail. A planned local facility is proposed on the northern portion of Anderson Road. The Anderson Road Extension project by Kane County will provide a multi-use path from IL Route 38 over the Union Pacific Railroad and connecting to the Elburn Metra Station on the UP-W Line.

Anderson Road Corridor	5.76 miles
Jurisdictions	Campton Hills, Elburn, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Elburn Metra Station
Connectivity to Existing Bicycle Network	Great Western Trail, Elburn Trail System
Direct access to/from Transit	Metra UP-West Line Station at Elburn
Barriers	Need crossings at IL Rte 38 & UP Railroad
% of Corridor Existing	28%
% of Corridor Planned	72%



At its western terminus at Waubonsee Community College, the Virgil Gilman Trail can be extended west of IL Route 47 along existing planned open spaces and the Blackberry Creek. The proposed greenway would provide future connections to a number of forest preserves and the Main Street and Hughes Road regional corridors.

Virgil Gilman Trail Extension	18.03 miles
Jurisdictions	Elburn, Sugar Grove, Sugar Grove Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Waubonsee Community College, Bliss Woods Forest Preserve, Grunwald Farms Forest Preserve, Prairie Kame / Sauer Family Forest Preserve, Hannaford Woods Forest Preserve, Aurora West Forest Preserve
Connectivity to Existing Bicycle Network	Mid-County Trail
Direct access to/from Transit	None
Barriers	Need a crossing at Interstate 88
% of Corridor Existing	64%
% of Corridor Conceptual	28%
% of Corridor Unknown	8%



This is the southern extension of the Mid-County Trail as described in the "North Kane County" section. The southern extension begins at the Great Western Trail in St. Charles and ends at the Virgil Gilman Trail in Sugar Grove. The Kane County Forest Preserve District has been working on acquiring land west of Aurora to connect existing forest preserves and trail systems, to form the Mid-County Trail corridor. This major north-south route will become an integral part of a regional trail grid. There are two major connections that remain in the southern portion of the Mid-County Trail: (1) from Dick Young Forest Preserve to the Lake Run Forest Preserve and (2) from the Lake Run Forest Preserve to the Aurora West Forest Preserve.

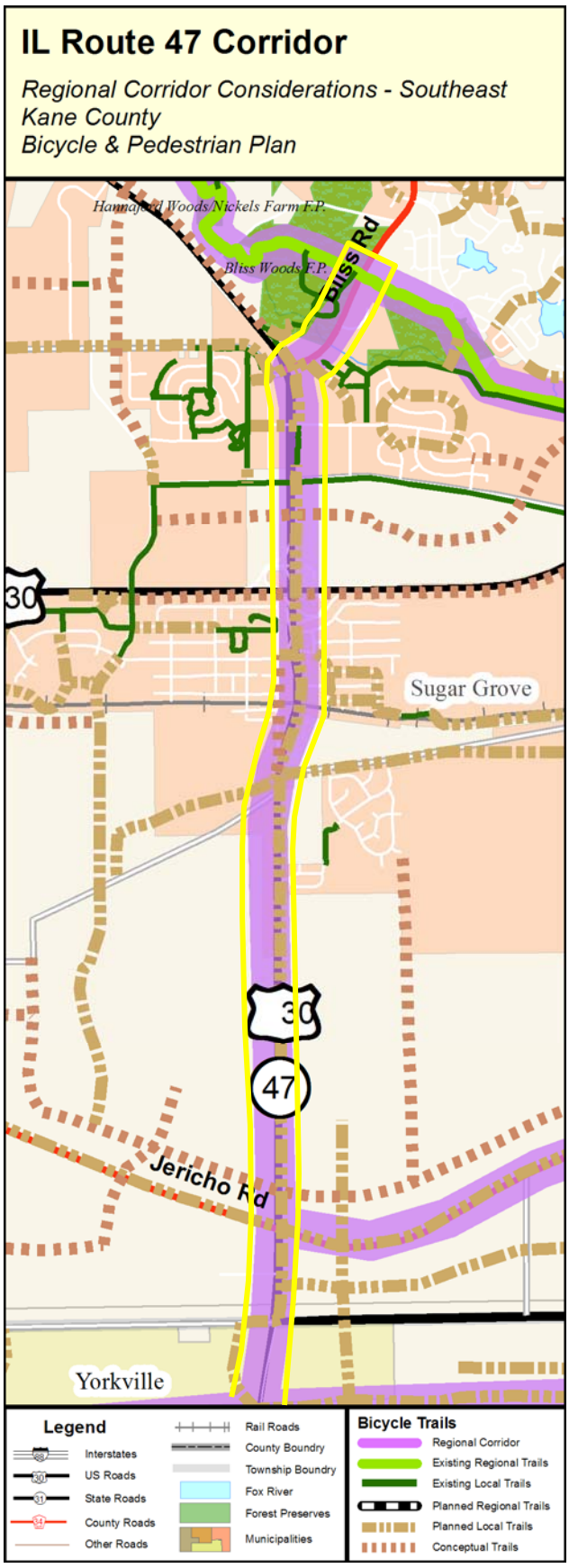
Mid-County Trail - South	15.69 miles
Jurisdictions	Aurora, Geneva, North Aurora, St. Charles, Geneva Park District, Fox Valley Park District, St. Charles Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Dick Young Forest Preserve, Aurora West Forest Preserve, Peck Farm Park, Lake Run Forest Preserve
Connectivity to Existing Bicycle Network	Great Western Trail, Keslinger Road Trail, Bricher Road Trail, Peck Farm Pack Trail System, Fabyan Parkway Corridor, Mill Creek Trail System, Indian Trail Corridor
Direct access to/from Transit	Pace 529, Pace 801
Barriers	Need a crossing at Interstate 88
% of Corridor Existing	72%
% of Corridor Planned	28%

The Orchard Road corridor will soon link these major trails: the Mid-County Trail, the Virgil Gilman Trail, the Fox River Trail, the Indian Trail sidepath, and the Jericho Road Corridor. This corridor could serve as an extension of the Mid-County Trail south of the Virgil Gilman Trail and into Kendall County. The Stuart Sports Complex, just north of the Kendall County line, is a popular bicycle and pedestrian destination. A connection from the Orchard Road Corridor through Jericho Lake Park to the Stuart Sports Complex should be pursued.

Orchard Road Corridor	5.01 miles
Jurisdictions	Aurora, Montgomery, Fox Valley Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Stuart Sports Complex
Connectivity to Existing Bicycle Network	Virgil Gilman Trail, Indian Trail Sidepath
Direct access to/from Transit	Pace 520, Pace 532
Barriers	Need a crossing at US Rte 30
% of Corridor Existing	66%
% of Corridor Planned	34%

The Kirk Road Sidepath currently terminates at IL Route 56 in Aurora and it is proposed to extend south along Church Road to connect to the Aurora Branch of the Illinois Prairie Path. The northern terminus extends to IL Route 64 in St. Charles. There is a break in the path in Geneva, forcing significant detours to the west and preventing access to the Kane County Events Center, Elfstrom Stadium, and other key destinations. The Kirk Road Bridge over the Union Pacific railroad has no additional width. Future improvement designs should include adequate paved shoulders or other appropriate accommodations for bicyclists.

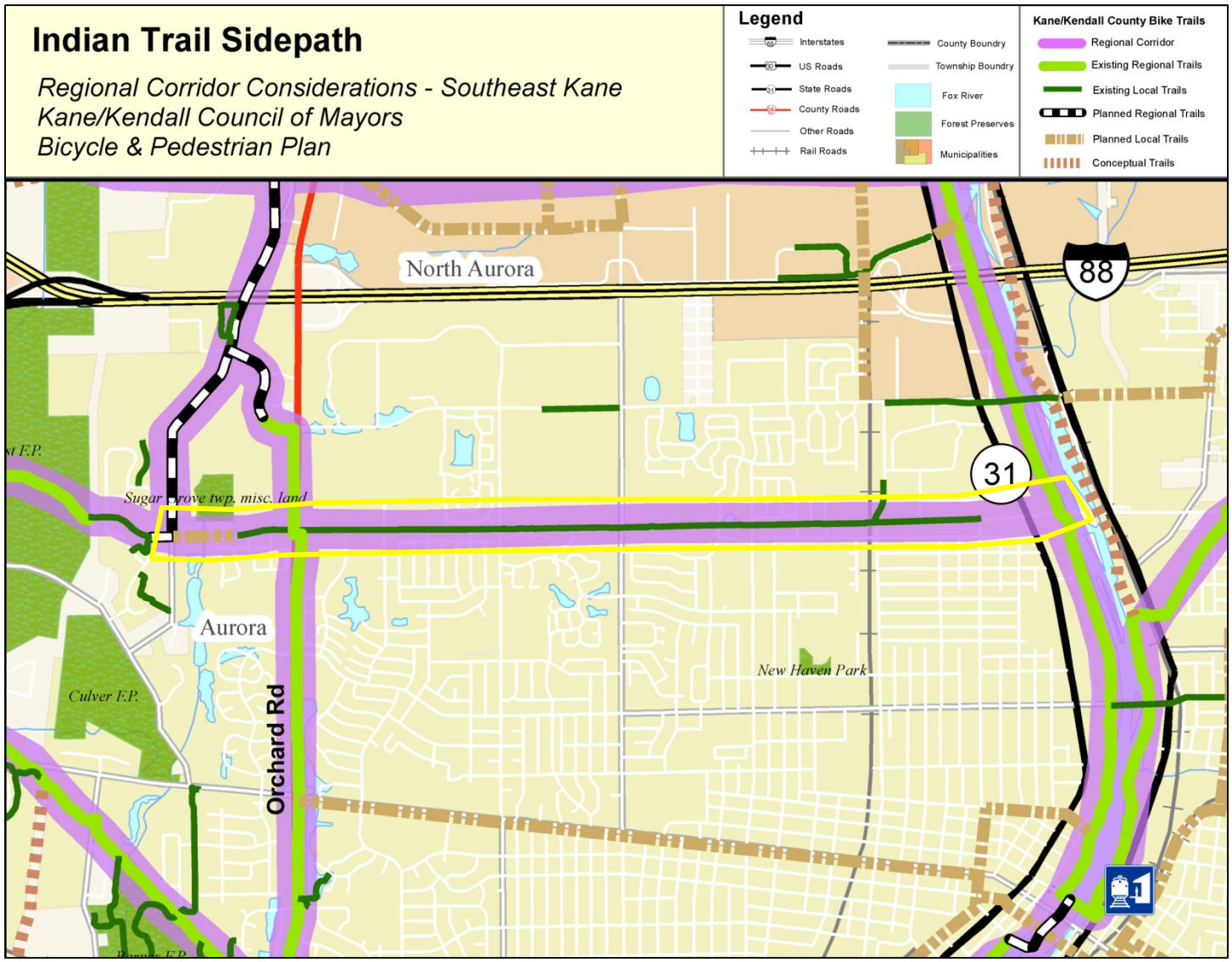
Kirk Road Corridor	9.66 miles
Jurisdictions	Aurora, Batavia, Geneva, North Aurora, St. Charles, Batavia Park District, Geneva Park District, Fox Valley Park District, St. Charles Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Kane County Event's Center, Kane County Cougars, Fermi Lab, East Side Sports Complex, Charlestown Mall
Connectivity to Existing Bicycle Network	Fabyan Parkway, Aurora Branch – IPP, Batavia Branch – IPP, Fermi Lab Trail, Great Western Trail Corridor, East Side Sports Complex Trails
Direct access to/from Transit	Pace 533, Pace 801
Barriers	Need crossings at Interstate 88, IL Rte 64, IL Rte 28, IL Rte 56, & UP Railroad
% of Corridor Existing	67%
% of Corridor Planned	33%



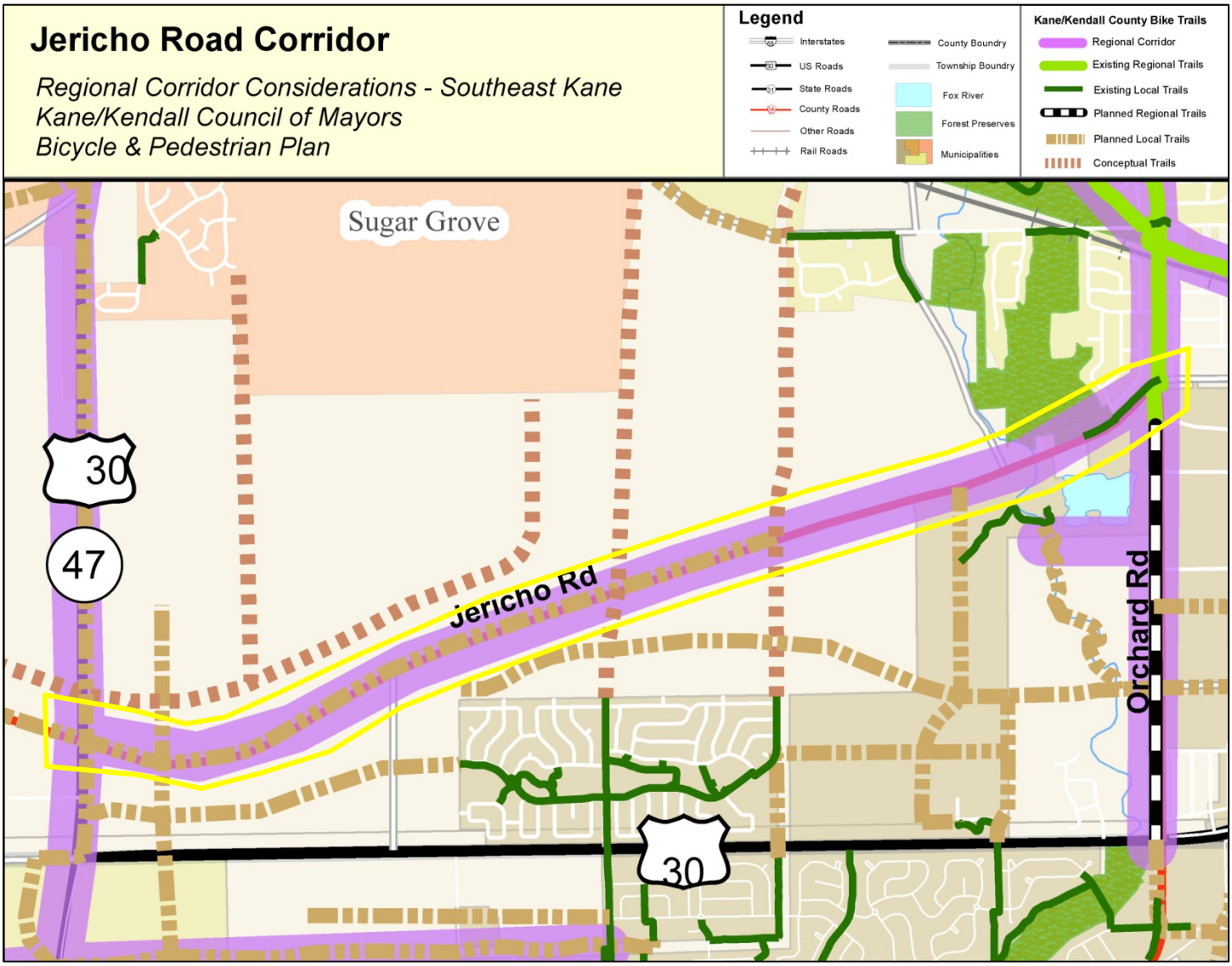
A sidepath on IL Route 47 would provide a significant north-south corridor in the central part of Kane County and south into Kendall County. The trail could connect to the Virgil Gilman Trail in Sugar Grove and would travel south into Kendall County and Yorkville.

Illinois Route 47 Corridor	4.59 miles
Jurisdictions	Sugar Grove, Sugar Grove Park District, Kane County, Kane County Forest Preserve, IDOT
Connectivity to Regional Destinations	Waubonsee Community College, Bliss Woods Forest Preserve
Connectivity to Existing Bicycle Network	Virgil Gilman Trail, Galena Road Path
Direct access to/from Transit	None
Barriers	Need a crossing at Bliss Rd / IL 47
% of Corridor Existing	16%
% of Corridor Planned	84%

ADDITIONAL SOUTHEAST CORRIDOR PRIORITIES



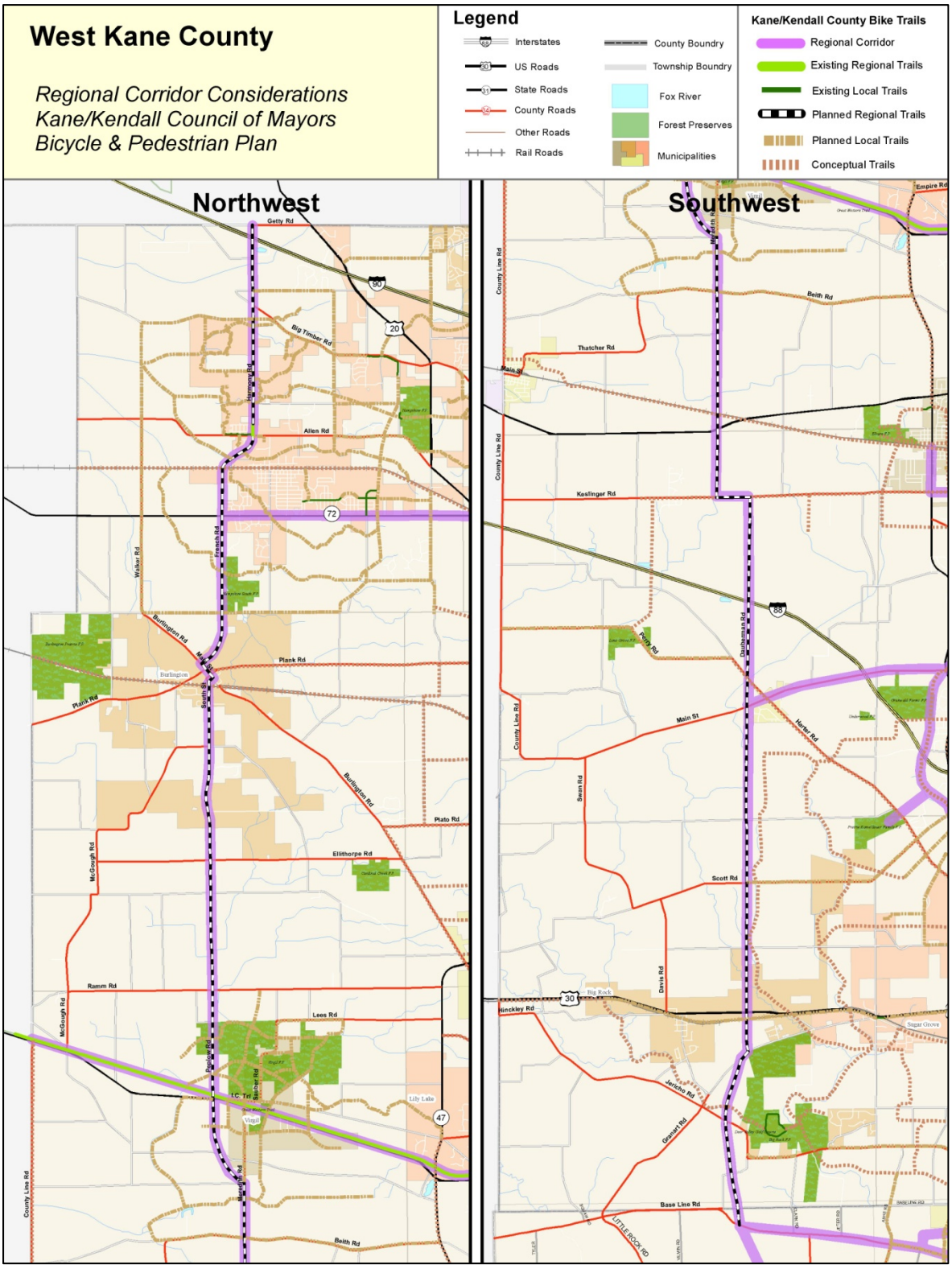
This is an extension west of the existing Indian Trail Sidepath to connect with the Mid-County Trail and Orchard Road Corridor. The Indian Trail Sidepath will provide direct access to the Fox River Trail from the Mid-County Trail. This proposed trail extension has a significant potential for high use as both a recreational trail and transportation link, when the Mid-County Trail is completed. On the eastern end of the sidepath, there is a small gap that remains to be completed to connect to the Fox River Trail. While filling this short gap might be difficult, it would dramatically increase the access of Aurora's west and northwest side to the Fox River Trail.



Jericho Road is a logical destination to provide on-street facilities to connect the proposed IL Route 47 sidepath and the Orchard Road Corridor. Future improvement designs should include adequate paved shoulders or other appropriate accommodations for bicyclists.

WEST KANE COUNTY

This is the mostly rural region of Kane County, covering the entire western third of the county west of Dittman and Anderson Roads (extended). The easiest and most cost-effective method to provide basic bicycle facilities for experienced riders is to have a network of on-street facilities. Improvements of roads in western Kane County should always take into account bicycle users. Roadways, when improved, should strive to achieve a Bicycle Level of Service Grade of "C."



An immediate goal is to have a street network with acceptable BLOS grades from the north border to the south border in west Kane County. The network would begin at the north of Kane County and travel south along Harmony Road to French Road to Peplow Road to Meredith Road to Dauberman Road until it reaches the proposed connection to the Prairie Parkway. The long-term goal is to have a separated regional trail in this corridor.

West Kane Corridor	45.2 miles
Jurisdictions	Hampshire, Burlington, Virgil, Big Rock, Hampshire Park District, Burlington Park District, Big Rock Park District, Kane County, Kane County Forest Preserve
Connectivity to Regional Destinations	Hampshire South Forest Preserve, Virgil Forest Preserve, Big Rock Forest Preserve
Connectivity to Existing Bicycle Network	None
Direct access to/from Transit	None
Barriers	Need a crossing at Interstate 88
Percentage of Corridor Existing	1%
Percentage of Corridor Planned	99%

CHAPTER 5 – PEDESTRIAN DESIGN GUIDE

TABLE OF CONTENTS

INTRODUCTION

Most of the public considers pedestrian facilities to be limited to sidewalks; however, they encompass a much broader scope of services and facilities. Pedestrian facilities include, but are not limited to, traffic control devices, curb ramps, grade separations (overpasses and underpasses), crosswalks, and design features intended to encourage pedestrian travel (such as traffic calming devices including speed bumps or center refuge islands). In general, these facilities parallel the roadway system and are provided as part of the public right-of-way.

Pedestrian facilities provide people with space to travel within the public right-of-way that is separated from roadway vehicles. They improve mobility for pedestrians and provide access and an alternative means of travel to and from home, work, parks, schools, shopping areas, and transit stops. They also provide places for children to walk, run, skate, bike, and play. Where no walkways are provided, or where walkways are in poor repair or have missing sections, the following conditions often result:

1. People may be forced to walk in the roadway, resulting in increased pedestrian/motor vehicle collisions.
2. Without a safe and well-maintained place to walk, people are discouraged and, in extreme cases, prevented from walking. For example, children have a difficult time walking to school and seniors cannot access nearby shops.
3. The absence of sidewalks can eliminate access to all destinations for some people with disabilities. Even short gaps in sidewalk facilities make nearby destinations completely inaccessible to these individuals.
4. The needs of people who rely on walking as a mode of travel are not accommodated.

The solution is to provide good facilities for people to walk. Establishing policies and design standards to ensure that safe places to walk will be developed is a good starting point in making a community more walkable. With these policies and design standards in effect, the development of pedestrian linkages becomes routine and a natural part of highway, road, and street planning, design, and construction processes. The policies may be part of a local comprehensive plan, or they can be included in metropolitan or statewide long-range transportation plans. Design standards can also be included as a part of local or county development codes.

Ensuring continuity throughout the pedestrian infrastructure can improve pedestrian safety and increase the likelihood that more people choose to walk more often.

IMPLEMENTATION STRATEGIES

In almost every instance, it is desirable to provide sidewalks on both sides of the street. Providing sidewalks on both sides enables pedestrians to travel facing traffic in either direction, and minimizes the need for pedestrian crossing points.

Several factors influence the decision of whether to place sidewalks, walkways, and widened shoulders on both sides or one side of a road. These factors include the available space within the right-of-way, the existing physical limitations on the roadside, and which side of the street origins and destinations (such as bus stops) are located. A sidewalk on one side may be adequate for some local streets, especially when this improves a condition where there were no sidewalks previously. The Federal Highway Administration (FHWA) has published a set of guidelines for installing sidewalks along roadways based on the type of road and surrounding land use. Communities should consider adopting the following guidelines for sidewalk installation.

TABLE 1: FHWA Guidelines for New Sidewalk Installation

Roadway Classification and Land Use	Sidewalk Requirements	Future Phasing
Highway (rural)	Min. of 1.525 m (60 in) shoulders required.	Secure/preserve ROW for future sidewalks.
Highway (rural/suburban - less than 1 d.u./acre)	One side preferred. Min. of 1.525 m (60 in) shoulders required.	Secure/preserve ROW for future sidewalks.
Suburban Highway (1 to 4 d.u./acre)	Both sides preferred. One side required.	Second side required if density becomes greater than 4 d.u./acre.
Major Arterial (residential)	Both sides required.	
Collector and Minor Arterial (residential)	Both sides required.	1.525 m (60 in)
Local Street (Residential - less than 1 d.u./acre)	One side preferred. Min. of 1.525 m (60 in) shoulders required.	Secure/preserve ROW for future sidewalks.
Local Street (Residential - 1 to 4 d.u./acre)	Both sides preferred. One side required.	Second side required if density becomes greater than (4 d.u./acre).
Local Street (Residential - more than 4 d.u./acre)	Both sides required.	
All Commercial Streets	Both sides required.	
All Industrial Streets	Both sides preferred. One side required.	

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Establishing walkable linkages requires a well thought out approach that may take several years to implement. There are several approches communities can take to implement pedestrian improvements.

1. **Regulate new development and re-development** – Official policies and related ordinances make walkway installation "automatic." When policies and ordinances are changed, include this type of provision.

2. **Capital projects** – Look for opportunities to install sidewalks as part of capital projects. In urban and/or suburban situations, add sidewalks when widening a road or installing a sewer line in the right-of-way. Typically, sidewalks will add only a small amount to the overall project budget and extra savings can result when expenses, such as excavation, can be consolidated.

3. **Adjacent property owners** – Many communities give property owners the option of installing curbs, gutters, and sidewalks through a Limited Improvement District (LID). With a LID, property owners pay the cost (or a percentage) over time. This can be expensive and may generate opposition to sidewalks in general. However, if they are locally acceptable, LIDs can be an important part of establishing pedestrian facilities.

WALKWAY TYPES

It is much safer for pedestrians to have a walkway separated from automobile or other types of motorized vehicle traffic. However, in many instances, this is not reflective of existing conditions. Hence, there are several different recognized types of walkways.

Sidewalks – In urban and suburban environments, the preferred facility for pedestrians is a sidewalk. Sidewalks are typically constructed of concrete and located adjacent to curbs and separated from the roadway by a buffer zone. They provide positive separation from motor vehicle traffic, a hard smooth surface on which to walk, and the opportunity to clearly indicate crossing points and movements at intersections.

This chapter focuses policy and design recommendations on the placement of pedestrian sidewalks, since they are the most recognized, most widely constructed, and most visible form of walkway.

Multi-Use Paths – In fringe areas outside or near the limits of an urban boundary, a path may be appropriate along rural roads connecting to just one or two specific destinations. A common example is a path leading to a school in a rural setting, where sidewalks, curbs and drainage are not warranted. A high level of attention must be paid to safety at their intersections with roadways.

Paths may attract multiple user types, including bicyclists and skaters as well as pedestrians. Paths are usually separated from the traveled portion of the roadway and the highway right-of-way. Paths may be paved or unpaved; however, when unpaved, they should be smooth and firm enough to meet ADA requirements.

Shoulders – Shoulders on roadways, when designed according to AASHTO recommendations, are usually wide and smooth enough to accommodate pedestrians in rural areas where the provision of sidewalks or paths may not be practical or feasible. In rural areas that are more residential in character but do not have high enough densities to warrant sidewalks, there should be at least 4-foot wide shoulders to accommodate pedestrian and bicycle traffic. Shared use of such shoulders by other users, including motor vehicles, should be expected.

However, using shoulders as the primary type of pedestrian facility is problematic. It opens up points of conflict between pedestrians and motorists. Paved shoulders should only be a last-resort, low-cost pedestrian facility.

Sidewalks vs. Multi-Use Paths – Sidewalks are not to be used as bicycle facilities unless no other option is available. Sidewalks should not be identified as part of a bikeway network. Conflicts arise when pedestrians share sidewalks with bicyclists. Due to the horizontal operation space of both parties, a standard sidewalk does not allow for adequate passing space.

Typically it is only recommended that children operate bicycles on sidewalks. Some local governments have passed ordinances prohibiting any person over the age of 12 to operate a bicycle on a sidewalk. Other municipalities, such as the City of Aurora, ban the use of bicycles on sidewalks in downtown districts or areas where there are high levels of pedestrian activity and potential conflicts.

RECOMMENDED SIDEWALK DESIGN

It is a concern that local governments in the KKCOM area have used varying design standards for sidewalks in urban and rural areas, resulting in lack of continuity of facilities. A commonly applied set of pedestrian facility standards will create a predictable environment for pedestrians that promote network development. Since design standards are continuously being updated, implementing agencies should always consult the most recent update to ensure they are using the most up-to-date best practices.

Sidewalk Width – For two people walking side-by-side or passing each other while traveling in opposite directions on a sidewalk, the average space occupied is 4 feet 8 inches. In considering accessibility standards, the ADA Design Board calculates that an average wheelchair occupies approximately three feet of horizontal space. It can be reasoned that a wheelchair user and

ambulatory pedestrian would occupy at least five feet of horizontal space. Sidewalks in low and high traffic areas should be designed to consider these dimensions.

The Institute of Transportation Engineers (ITE) has a design guide for the development of roads that includes design standards for curbs, gutters, and sidewalks. It recommends a minimum sidewalk width of 5 feet to allow two people to pass comfortably or to walk side-by-side if there is a buffer between the sidewalk and the street. A six-foot wide sidewalk is recommended if it abuts the back of a curb.

The width of a sidewalk or walkway needs to comfortably accommodate the volume of pedestrians normally using it. For example, on a neighborhood collector that provides a high volume of pedestrian access to a school, park, or other popular destinations, it may be desirable to provide wider sidewalks. In high use areas, such as central business districts, sidewalks can be 10 to 15 feet wide, if necessary. Conversely, when excessively wide sidewalks are located in areas with low pedestrian volumes, the expansive pavement and empty-looking sidewalks are uninviting to pedestrians. Please refer to Table 2, which describes recommended sidewalk and buffering widths.

TABLE 2: Recommended Sidewalk Width Based on Street Conditions

	Principal Arterial	Minor Arterial	Neighborhood Collector	Local Residential
# of Lanes	4-6	2-4	2	2
Sidewalk Width with Buffer Strip	6 feet	6 feet	5 feet	5 feet
Sidewalk Width on Curb (No Buffer)	6-8 feet	6-8 feet	6 feet	5 feet
Central Business District Sidewalk Width	10 - 15 feet	10 - 15 feet	Not Applicable	Not Applicable

Sidewalks on bridges may require special consideration. For pedestrian bridges, the curb-to-curb width should generally match the approach pathway's width. Sidewalks should be carried across a bridge in all circumstances, even if approaching sidewalks are missing (in anticipation of the connecting pedestrian facilities). AASHTO recommends pedestrian-only bridges to be 12 feet wide when serving multi-use trails, to allow for maneuvering of pedestrians and cyclists and for access by emergency vehicles, if necessary.

Slope – Sidewalks are typically constructed with a maximum cross slope of 2 percent (1:50), which is also the maximum cross slope allowed for accessible routes of travel. The cross slope facilitates positive drainage toward the street or adjacent planting buffer. Drainage grates are best located outside the route of pedestrian travel. If this is not possible, the grate, as well as

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manhole covers, hatches, vaults and other utility coverings, should not have openings greater than 0.5 inches in width and should be mounted flush with the level of the pavement.

Sidewalk Buffer Area – Sidewalks alongside roadways are often separated by planting strips consisting of natural vegetation or landscaping that create a buffer from the noise and splash of moving vehicles. Planting buffers (also referred to as planting strips, landscape strips, landscape buffers, and nature strips) are generally considered to be an effective separation treatment between walkways and streets in all types of settings. The added separation of a planting buffer helps a pedestrian feel more comfortable when walking along the street. The buffer area also provides space for streetlights, fire hydrants, utility boxes, and bike racks. Other advantages of buffer areas include:

- A sidewalk can be installed at a constant level grade across driveways, avoiding dipping at every driveway cut.
- An area is provided for drainage runoff.
- Provides an aesthetic enhancement, increasing the appeal of the walkway and pedestrian environment.
- If planted with trees, they can provide shade and wind protection.

Well-designed arterial and collector streets should include a planting strip as a standard. A planting strip should be at least 5 feet wide. If right-of-way is limited, a 3-foot buffer may be sufficient. Buffer landscaping should be relatively low maintenance and should not obstruct vision of pedestrians or motorists at intersections. Disadvantages of planting buffer strips may include:

- Maintenance that varies depending on the type of landscaping selected.
- If not designed and maintained properly, landscaping may hinder visibility and cause security problems.
- Root growth can sometimes lift and buckle sidewalks, creating a tripping hazard.

Wider sidewalks covering the full lot frontage facing the public right-of-way are generally justified and often required in commercial areas, through adjoining multiple-residential complexes, near schools and other pedestrian generators, and in areas where border width is restricted. Parked cars also provide a degree of separation and a buffer zone in urban areas.

A swale ditch is sometimes used as a buffer area. It provides an economical alternative to curb and gutter sections. However, attention should be paid to the slopes of the swale to allow for maintenance.

Street Furnishings, Utilities, and Related Clearances – Sidewalks should be continuous and should be part of a system that provides access to goods, services, transit, and homes. Well-designed walking environments are enhanced by urban design elements and street furniture, such as benches, bus shelters, trash receptacles, and water fountains. A pedestrian facility with

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these features creates an environment that encourages walking and social interactions. However, these design elements should not obstruct the walkway. These obstructions should be placed between the sidewalk and the roadway, to create a buffer for increased pedestrian ease.

A clear travel way of 3 feet minimum is recommended on all sidewalks around obstructions and street furniture. This provides for sufficient clearance of wheelchairs or people with other mobility impairments. Sidewalk areas must also be properly maintained and kept clear of debris, overgrown landscaping, tripping hazards, or areas where water accumulates.

Clearance to vertical obstructions, such as signs and tree branches, must be at least 5 feet.

Transit Stop Treatments – Well-designed routes to public transportation connections and the transportation stop are important components of pedestrian facility design. Transit stops should be designed to provide safe and convenient access and should be comfortable places for people to wait. Adequate bus stop signing, lighting, a shelter with seating, trash receptacles, and bicycle parking are desirable features.

Proper placement of bus stops is key to user safety. The bus stop location should be fully accessible to pedestrians in wheelchairs, should have paved connections to sidewalks where landscape buffers exist, and should not block pedestrian travel on the sidewalk.

Pace Development Guidelines should be consulted when designing transit stop locations.

SIDEWALKS IN RURAL & DEVELOPING AREAS

Sidewalks are integral parts of city streets, but few are typically provided in rural areas due to the low perceived usage and high costs to install. Yet, a need exists in many rural areas because higher traffic speed and general absence of lighting increase the potential for accidents for those walking on or adjacent to a roadway.

In moderate use rural and suburban areas, sidewalks are most justified at points of community development such as at schools, local businesses, and industrial plants that result in pedestrian concentrations near or along the highways. In high-use pedestrian areas such as state parks, recreation areas, and small towns, pedestrian facilities such as sidewalks, crosswalks or grade separations are appropriate.

When suburban residential neighborhoods are first developed, construction of a street hierarchy within the development is necessary. These streets are designed for the safety of motorists through the careful design of street widths, drainage, turning radii, and separation of local and through traffic. While there may be existing roads to access a new development, the construction of streets within a new subdivision is typically the responsibility of the developer. Construction

of a pedestrian network with sidewalks and paths should also be the responsibility of the developer.

Unfortunately, this responsibility is often deferred to the point of never being realized or the responsibility not clearly defined in the development code. To clarify this responsibility, county and local governing bodies can adopt and implement development regulations (zoning, subdivisions, and building codes), which require property owners in urban areas to provide and maintain sidewalks consistent with local comprehensive plans.

Sample ordinances for the provision of sidewalks in the development of residential neighborhoods are in Appendix G and later in this chapter.

ACCESSIBILITY

Sidewalks should be accessible to all users -- including those with disabilities. Whenever sidewalks or walkways serve as a route of travel between public buildings or facilities, they are required to be designed in accordance with the provisions of the Americans with Disabilities Act (ADA). The key provisions to comply with the ADA include: curb cuts, limiting slopes of ramps, intersection crossings, and sidewalk width. Here are some specific ADA design and construction considerations for pedestrian facilities:

- The desirable sidewalk width is 5 feet and the minimum passage width is 3 feet.
- If a 3-foot wide walkway must be used, a 5-foot by 5-foot passing area is required at intervals not to exceed 200 feet.
- For walkways adjacent to a roadway, the walkway may follow the natural grade of the land.
- The maximum allowable cross-slope of a walkway is 2 percent (1:50).

Curb Ramps – Curb ramps or wheelchair ramps provide access between the sidewalk and roadway for people using wheelchairs, strollers, walkers, crutches, handcarts, bicycles, and also for pedestrians with mobility impairments. Curb ramps must be installed at all intersections and mid-block crossing locations. Where feasible, separate curb ramps for each crosswalk at an intersection should be provided rather than having a single ramp at a corner for both crosswalks. This provides improved orientation for visually impaired pedestrians.

The Access Board, the governing body of the ADA Accessibility Guidelines (ADAAG), recommends a clear width of a curb ramp of at least 48 inches, excluding flares. The average wheelchair is approximately 28 inches wide, so a 48-inch ramp allows for an ambulatory person and wheelchair user to navigate a curb ramp side by side, and may be the preferred standard.

The least possible slope should be used for any ramp. Wheelchair ramps must have a slope of no more than 1:12 (1 in/ft) or a maximum grade of 8.33 percent, with a maximum side slope of 1:10,

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and must be designed in accordance with the ADA guidelines. In retrofitting situations where space prohibits the installation of an 8.33 percent ramp, ADAAG allows a slope between 8.33 percent and 10 percent for a maximum rise of 6 inches or a slope between 10 percent and 12.5 percent for a maximum rise of 3 inches.

Curb Ramp Landings – Landings provide a clear level space at the top of the curb ramp and flush with the street at the bottom of the sidewalk. If there are no landings, a wheelchair user may accidentally begin to roll back into the street. Minimum landing dimensions are derived from the need to provide a five-foot diameter turning circle. Landings need to be positioned at locations that provide the user with directional choices or where the user must wait for a suitable time to cross the street. Landings should have a minimum clear dimension of a 60-inch by 60-inch square or 60-inch diameter circle.

A curb ramp and landing is necessary wherever the pedestrian route crosses a sidewalk/ street transition, including intersections, mid-block crosswalks, medians and islands traversed by crosswalks, alleys, and accessible parking aisles.

Accessible Push Buttons – Pedestrian actuators or push buttons should also be accessible to people with disabilities. The location of push buttons should meet the following minimum requirements:

- Unobstructed and adjacent to a level all-weather surface to provide access from a wheelchair;
- Where there is an all-weather surface, a wheelchair accessible route from the pushbutton to the ramp;
- Between the edge of the crosswalk line (extended) farthest from the center of the intersection and the side of a curb ramp (if present), but not greater than 5 feet from said crosswalk line;
- Between 1.5 and 6 feet from the edge of the curb, shoulder, or pavement;
- With the face of the pushbutton parallel to the crosswalk to be used; and
- At a mounting height of approximately 3.5 feet, but no more than 4 feet, above the sidewalk.

Accessible Crossing Time – There should be sufficient time in the traffic signal cycle to permit people to cross the street. The general standard for rate of pedestrian travel in a crosswalk is 3.5 feet per second; however, it is believed that this rate is not representative of the general population, particularly persons with disabilities. If there is an expected high volume of people with disabilities, elderly people, or school children, signal phase timing should be calculated using a pedestrian walk speed of less than 3.5 feet per second.

Accessibility Resources – There may be other accessibility issues with crosswalks, curb cuts, and pedestrian signals that should be carefully examined. These issues include placement of curb

cuts, pedestrian signals with audio warnings and accessibility at transit stops. Design guidance for these facilities as well as the ones already described can be obtained from the resources listed below. These resources were used in the compilation of this chapter.

AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES (ADAAG), 1991
U.S. Architectural & Transportation Barriers Compliance Board
1111 18th Street, N.W., Suite 501
Washington, D.C. 20036-3894
(202) 653-7834 v/TDD
http://www.access-board.gov/adaag/ada-ag.txt

PUBLIC RIGHTS-OF-WAY ACCESS ADVISORY COMMITTEE
Currently under update
Architectural and Transportation Barriers Compliance Board (ATBCB)
1331 F Street, NW, Suite 1000
Washington, DC 20004-1111
(202) 272-0080
http://www.access-board.gov/prowac/

UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS), 1984
Architectural and Transportation Barriers Compliance Board (ATBCB)
1331 F Street, NW, Suite 1000
Washington, DC 20004-1111
(202) 272-0080
http://www.access-board.gov/ufas/ufas-html/ufas.htm

CROSSWALKS AND PEDESTRIAN CROSSING ENHANCEMENTS

A crosswalk is defined as the portion of roadway designated for pedestrians to use in crossing the street. They indicate preferred locations for pedestrians to cross and help designate right-of-way for motorists to yield to pedestrians. Crosswalks are often installed at signalized intersections and other selected locations. They are typically assumed to be most beneficial at signalized intersections, particularly in urban areas and at locations where there are pedestrian signals.

Marked vs. Unmarked Crosswalks – There is some controversy concerning the effectiveness of installing crosswalks at every street intersection. There have been numerous studies in the last 20 years on this subject. Some of these studies indicate that motorists are more likely to yield at a marked crosswalk rather than an unmarked one. Other studies indicate that standard marked

crosswalks may not command the attention and respect of motorists, offering little significant improvement in pedestrian safety.

No set of guidelines can cover every situation or guarantee improved safety. For marked crosswalks to be continually effective they must be located and designed in accordance with good judgment and accepted engineering practices. *The Manual of Uniform Traffic Control Devices* (MUTCD) states that *"crosswalk lines should not be used indiscriminately."* Overuse should be avoided to maximize the effectiveness of those crosswalks that are marked. Marked crosswalks are generally recommended at the following locations:

- Where multiple pedestrian crossings can be centralized or concentrated to a single crossing.
- To delineate the optimal crossing location, due to confusing geometrics or traffic operations.
- At approved school crossings or at crossings on recommended safe routes to school.
- Where there are high numbers of pedestrian crossings (more than 25 pedestrians per hour) or conflicts between pedestrians and vehicles.
- Where pedestrian cross to channelized islands when the volume of pedestrians times the number of vehicles exceed 800 per hour. Crosswalks are not recommended at lower levels of conflict.

Crosswalks should be placed in accordance with the MUTCD. However, it is often stated that the most essential tool for use in determining crosswalk placement is engineering judgment. Public input should also be heeded in selecting locations for crosswalks.

Design of Crosswalks – In designating a pedestrian crosswalk, a minimum 6-inch solid white line is recommended. ITE recommends crosswalk lines between 10 and 12 inches, with wider lines or advanced stop lines used when greater emphasis is considered helpful. However, other patterns are now being used to provide more distinction.

The MUTCD requires a minimum crosswalk width of 6 feet.

Crosswalks need to be kept close to the turning traffic so that pedestrians stay within a driver's line of sight. The MUTCD recommends keeping the crosswalk lines within 2 feet of the lateral lines of the highway. If this cannot be achieved, it is essential to stay as close as possible.

Mid-Block Crossings – In some urban areas where distances between intersections are long, a mid-block crossing provides pedestrians an opportunity to cross the street safely. Mid-block crossings also provide convenience and safety in less developed areas where pedestrian activity is high, such as by apartment buildings, stores, schools, parks, or transit stops.

Locations considered for a mid-block crossing need to be carefully studied. The following guidance for determining locations for mid-block crossing installation is provided by the ITE manual, *Design and Safety of Pedestrian Facilities*:

- Where the crossing can serve to concentrate or channelize multiple pedestrian crossings to a single location.
- At approved school crossings or crossings on recommended safe school walk routes.
- Where land uses create high concentrations of pedestrians needing to cross (such as residential areas across from retail or recreation, and transit stops across from residential or employment).
- Where pedestrians could not otherwise recognize the proper place to cross or there is a need to delineate the optimal location to cross.

There are design variations to consider at mid-block crossings. Determining methods of crossing design treatments and related traffic control requires careful consideration and traffic engineering analysis of existing conditions on a case-by-case basis.

Advance pedestrian warning signs should be installed to warn motorists of pedestrian crossing activity. There are crosswalk markings that stand out at night or during adverse weather conditions. The crosswalk and signage should be adequately lit and additional lighting may be helpful. The crossing should be designed to ensure there is adequate sight distance for the motorist and pedestrian. Any obstacles that would interfere with visibility at the crossing location (mailboxes, utility poles, street furniture, and landscaping) should be removed or relocated.

Whenever possible, and especially on busy arterial or multi-lane streets, a median refuge island should be installed at mid-block crossing locations. This allows pedestrians who cross mid-block to focus on one direction of traffic at a time, thus simplifying the crossing task, and breaking a longer crossing into two shorter crossings.

It should be noted that marked crosswalks at mid-block crossings are meant to guide pedestrians to cross at the safest location. Mid-block crosswalks, unless signalized, should generally be avoided under the following circumstances:

- Located less than 300 feet from a traffic signal or bus stop where motorists are not expecting pedestrians to cross.
- Within 600 feet of another crossing point, except in central business districts or other locations where there is a well defined need. The recommended minimum separation in most cases is 300 feet.
- On high-speed streets with speed limits above 45 mph.

Crosswalk Materials – It is important to ensure that crosswalk markings are visible to motorists, particularly at night. Some municipalities have chosen to use special reflective striping or pavement materials to make pedestrian crossings more visible. These special treatments are frequently used in special districts, such as historic districts or areas with high levels of pedestrian travel.

Any special crosswalk marking or paving should keep in mind the needs and safety of the pedestrians they are trying to protect. For example, thermoplastic tape or striping should not be slippery or create tripping hazards.

Some downtowns have made a significant investment in the use of color rich paver stones to delineate the intersection and crosswalks or create useful patterns. However, special attention should be paid to the materials; non-slip bricks or unit pavers should be used. Scored or stamped colored concrete surfaces can also be used and are generally more durable over the long term than unit pavers, with more uniform joints and less chance of displacement. If paver stones are used, they must be designed to eliminate the movement of the stones or bricks. Special paving surfaces should be installed and maintained in a smooth, level, and clean condition that does not negatively impact accessibility.

Crosswalks marked with buttons or reflective raised markers (RRMs) are not recommended. Any rumble effect given to motorists at this point is provided too late for use as advance warning, and the pedestrians who walk along the lines (especially older adults and blind pedestrians) may trip on the RRMs. They are also detrimental to wheelchairs and bicyclists. In addition, these devices should not be used in bike lanes or where bicycling traffic can be anticipated.

Stop Lines – Stop lines may be used as a guide to indicate the optimal stopping location for motorists, and may be used in advance of marked crosswalks to help encourage motorists to stop further back from the crosswalk. Stop lines are normally 12 to 24- inch wide white stripes that extend across all approach lanes. Stop lines need to be located at least 4 feet in advance of the crosswalk, as indicated in the MUTCD.

Recessed stop lines are commonly applied. This improves the visibility of pedestrians and increases the stopping time for motorists before an intersection. Another benefit of recessed stop lines is that they allow larger vehicles turning left (or right) extra maneuverability space.

Additional Crosswalk Infrastructure – Crosswalks can be used in conjunction with other measures, such as curb extensions, to improve the safety of a pedestrian crossing. This is particularly applicable on multi-lane roads with average daily traffic (ADT) above 10,000. Special crosswalk designs may include:

- **High Visibility Crosswalk Markings** – Various crosswalk-marking patterns, such as ladder and zebra designs, are illustrated in the MUTCD. In some cases, they can be raised and may be installed in conjunction with other enhancements that physically reinforce crosswalks and reduce vehicle speeds. Zebra crosswalks can be advantageous because they are higher visibility and require reduced maintenance. Properly placed, the wheels of crossing motorists can fall between the open spacing, thus allowing the markings to remain visible much longer than with other markings.

- **Raised Crosswalks** – Raised crosswalks raise the level of the pavement to the height of the curb. The grade change slows traffic and heightens a motorist's perception of the intersection environment. However, they are not recommended on busy arterial streets.

- **Streetlight**s – Sufficient lighting should insure that drivers can see pedestrians.

- **Adequate Sightlines** – Traffic engineers should design crossings while being aware to remove clutter such as street furniture, newspaper boxes, or utility boxes which impede a pedestrian's vision of traffic or a motorist's vision of pedestrians.

- **Street Print** – Asphalt can be indented or colored to set it apart from the rest of the roadway at crosswalks. This increases visibility for both motorists and pedestrians.

- **Mounted Warning Lights** –MUTCD has approved a crosswalk design with inset warning lights. The lights flash, which greatly improves their visibility on wet pavement or at night.

- **Turning Restriction** – "No Turn on Red" signs and regulations reduce conflicts between motorists and pedestrians at intersections.

- **Pedestrian Signals** – Pedestrian signals provide a form of traffic control for pedestrians. Although pedestrians may ignore them, it is better to have them present. Pedestrian signal designs include a countdown signal, which tells pedestrians the remaining time to cross a street.

- **Traffic Calming** – As stated above, using methods to calm or slow down traffic gives pedestrians better opportunities to cross streets and gives motorists more reaction time to avoid potential crashes. Popular methods of traffic calming at intersections include curb bulb outs, center median refuge islands, and increased curb radii.

SAFETY EDUCATION AND ENFORCEMENT

While the public perceives the typical pedestrian accident occurring with young children, people of all ages and backgrounds are regularly victims. Accidents also occur in all parts of the country: on highways, low-volume country roads, and busy urban streets.

The federal government, local government, and numerous interest groups have initiated pedestrian programs to address pedestrian accidents. One component of success in many of these programs revolves around addressing the need for education on pedestrian issues. A pedestrian safety plan could be developed to address the following pedestrian safety education and enforcement goals:

- Achieving consistency in enforcement of traffic laws protecting pedestrians.
- Reaching uniformity and consistency in the accurate reporting of vehicle/pedestrian collisions across jurisdictions and within reporting agencies.
- Reducing substance impairment for both motorists and pedestrians.
- Raising the importance of pedestrian safety education in schools in order for it to receive comparable recognition with other social issues that schools address as part of their health curricula.
- Working with the media to raise public awareness on the benefits of walking.
- Developing an ongoing public information campaign for pedestrians and motorists that focuses on pedestrian awareness and safety laws.
- Incorporating more pedestrian safety issues as part of drivers education courses.
- Promoting "Safe Routes to School."
- Developing community support to create walkable communities.

The National Highway Transportation Safety Administration (NHTSA) developed a resource guide on laws related to pedestrian and bicycle safety. This guide contains traffic laws that are thought to affect pedestrian or bicycle safety, either positively or negatively. It can be used to select laws that enhance pedestrian or bicycle safety, to assess a state's position with respect to other states, or to examine the extent to which prevailing vehicle and traffic laws may impact the generation of pedestrian or bicycle crashes. To obtain a copy of this guide, visit the NHTSA website, listed below.

Special bicycle and pedestrian safety programs targeted at pre-school and school age children should be considered as part of a Safe Routes to School Program. Education and enforcement are key factors to be considered for bicycle and pedestrian safety. Helmet use, training children to ride bicycles safely, and an overall awareness of roadway dangers by cyclists, pedestrians, and motorists are critical components for making our roads safer for everyone.

PEDESTRIAN FACILITY RESOURCES

Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG), 1991
U.S. Architectural & Transportation Barriers Compliance Board
http://www.access-board.gov/adaag/html/adaag.htm

*Design and Safety of Pedestrian Facilities, A Recommended Practic*e, 1998.
Institute of Transportation Engineers

Designing Sidewalks and Trails for Access (Part I & II)
U.S. Department of Transportation, Federal Highway Administration

Manual on Uniform Traffic Control Devices (MUTCD)
U.S. Department of Transportation, Federal Highway Administration, 2009

National Highway Transportation Safety Administration
http://www.nhtsa.gov/people/injury/pedbimot/bike/resourceguide/
Traffic Safety Facts 2000. The National Highway Traffic Safety Administration,

Pace Development Guidelines
Pace Suburban Bus
http://www.pacebus.com/sub/guidelines/guidelines.asp

Pedestrian Facilities Users Guide: Providing Safety and Mobility
U.S. Department of Transportation, Federal Highway Administration

Planning and Implementing Pedestrian Facilities in Suburban and Developing Rural Areas, Report No. 294A, Transportation Research Board
http://nationalacademies.org/trb/

CHAPTER 6 – BICYCLE FACILITY DESIGN GUIDE

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INTRODUCTION

Communities in the Chicago region are experiencing increased traffic congestion, air pollution, and frustration with dependence on the automobile for even the shortest of local trips. With a national average bicycle trip length of two miles, these trips are within reasonable bicycling distance if a community is designed to make bicycle trips just as easy and convenient as automobile trips.

The typical suburban development, through its typical design, has catered to the automobile and discourages walking, biking and transit. A nation that has become increasingly suburban also has become increasingly sedentary, more prone to obesity, diabetes and heart disease.

One reason people are not bicycling or walking is that they are prevented from doing so. Either the infrastructure is insufficient, has significant gaps, or contains physical barriers that prevent convenient access to destinations. However, many people want to change that. They want livable communities where they can walk, bicycle, recreate, and socialize. In response, many local governments are beginning to understand the need to support balanced transportation to promote bicycling and walking as a transportation alternative.

Bicycle and pedestrian facilities have frequently been overlooked in the quest to build sophisticated transportation systems. Promoting and building bicycle facilities to nationally accepted standards is not a miracle cure to a sedentary lifestyle, but can offer safe and convenient options to a community's residents and improve the quality of life. The following sections describe accepted design standards for bikeway facilities.

PLANNING APPROACH

This plan recognizes that no single type of bicycle facility will accommodate all types of bicyclists. Nor will a single type of bikeway allow users to reach all desired destinations.

The Kane/Kendall Council of Mayors Bicycle and Pedestrian Plan is not merely a trails plan that identifies a system of off-road paths linking area parks, forest preserve districts and natural areas. While the recreational nature of bicycle facilities is inherent, the potential to use the bicycle as a form of local transportation is also important.

For this reason, the plan looks at the council area as a whole and proposes ways to connect communities and link neighborhoods with existing and planned local commercial areas, employment centers and commuter train stations, as well as existing trails, scenic corridors, recreational facilities, and links to adjacent counties. The plan examines both on-road and off-road opportunities through a variety of infrastructure improvements and bikeway facility types intended to serve multiple users.

Types of Bicyclists

It is generally recognized that there are two types of cyclists: Group A or Advanced Bicyclists, and Group B or Basic Bicyclists. There is also a Group C, representing children, whose needs are similar to the basic bicyclists and thus the two are often classified together as Group B/C.

Group A

Composed of experienced riders who can operate a bicycle under most traffic conditions. This includes bicycle commuters, bike club riders and other cyclists currently following the rules of the road and riding on area streets and roadways with no special accommodations for bicyclists.

Group B

Casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Some will develop greater skills and progress to the advanced level, but nationally there will always be millions of basic bicyclists who prefer comfortable access to destinations and well-defined separation of bicycles and motor vehicles.

Comprehensive bicycle planning generally promotes a "design cyclist" concept that recognizes and accommodates the needs of both the Group A and B bicyclists. Group A cyclists will be best served by making every street bicycle-friendly by removing hazards and maintaining smooth pavement surfaces. Group B riders will be best served in key travel corridors where designated bicycle facilities are provided in the form of signed and striped bicycle lanes on selected roadways, and off-road trails following waterways and other linear open space corridors.

Group C

Child cyclists are generally pre-teen riders whose bicycling activity is closely monitored by their parents. Before age ten, bike-riding choices are extremely limited and parental supervision is extremely important. While sidewalks are often the best choices for young riders, sidewalks have many liabilities if promoted for bicycle use.

Even bicycle trails in a park-like setting may not be a good choice for young children. Trail intersections and conflicts with faster, older cyclists will likely prove difficult for children without developed control and anticipation of the movements of other vehicles, bicycles and pedestrians.

Sidewalk facilities, which are traditionally reserved for pedestrian use, will accommodate the youngest Group C riders, but should not be included as an aspect of bicycle planning. Likewise, the routine development of wide asphalt or concrete trails immediately parallel to roadways is generally not recommended for those reasons discussed in the sidepath section of this chapter. Such facilities should not be intended to replace the need for on-street bicycle accommodation and hazard removal, but should reflect a desire to provide dual facilities in selected corridors where multiple user groups are present.

HIERARCHY OF FACILITIES

To meet the needs of the various types of bicyclists identified above, a comprehensive county-wide system of bike-friendly roadways, streets and trails is needed. Following this approach, individual users can select a given route for a specific trip based on their skill level and travel needs. When planning for bicycle movements consideration should be given, as feasible, to provide more than one option within a broadly defined transportation corridor to meet the travel and access needs of all potential non-motorized users.

Such a planning approach is similar to that of traditional transportation planning whereby motorized vehicles are provided a hierarchy of facility types ranging from expressways and regionally significant arterials to neighborhood streets and alleyways.

To create a similar bicycle system, planners and engineers need to take a holistic look at the county's transportation infrastructure in an effort to determine what bicycle facility type is most prudent for implementation within a given corridor. The table below presents a model for providing various levels of bicycle accommodation based upon functional roadway classifications found in Kane and Kendall Counties:

TABLE 3: Recommended Bikeway Accommodations by Street Type

Roadway Type	Recommended Bikeway Facility Type
Interstates and Expressways	Bicycling not permitted
Regionally Significant Arterial Street	Wide curb lanes or paved shoulders
Minor Arterial Street and Collectors	Bicycle lanes
Local Neighborhood Streets	Shared roadways
Forest Preserves, Utility Easements, Rail Corridors, Waterways	Multi-use trails

The following sections of this design guide discuss the recommended bikeway types in detail. The guidance is arranged per functional roadway classifications, based on the characteristics of the physical environments through which a bicyclist travels.

Since it is likely that only confident, experienced Group A cyclists will want to ride on the busiest streets, providing additional right-hand lane width in such corridors is an adequate infrastructure improvement to facilitate easier lane sharing by bikes and motor vehicles. In moderately traveled corridors, the presence of a designated facility such as signed and striped on-street bicycle lanes will serve to attract cyclists of all skill levels and aid in the lane channelization of both bicycles and motor vehicles. On lightly traveled local streets, no special accommodation is necessary as slow speeds permit bikes and cars to share lane space. And, for

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those who desire complete separation from motor vehicles, scenic, linear open space corridors offer opportunities to develop off-road trails.

When planning a bicycle system, the important principle to understand is that all of the bikeway types are interrelated, and must be interconnected to provide continuous routes and various travel options throughout the planning area. While they do not appear on a county-wide map, it is often the little details that make or break a system for non-motorized travel. Cyclists need to be able to safely cross busy roadways, transition from on-road to off-road facilities, have access across natural barriers, position themselves properly at intersections, and ride on well-maintained streets and trails that are free of debris, glass, snow and sand. Planning for such accommodations as communities grow and develop ensures that residents have viable choices for personal transportation now and in the future.

THE IMPORTANCE OF GOOD DESIGN

Well-designed bicycle facilities are those that are safe, attractive, convenient and easy to use. They minimize user conflicts and promote good riding habits. As such, well-designed facilities are popular community amenities and are heavily used.

Poor bicycle facilities are those that are little used, are used irresponsibly because of poor design, or have not been designed for ease of maintenance. Inadequate facilities discourage users from bicycling on a regular basis, waste money and resources, and make future bicycle improvements less favorable with the general public.

The best way to ensure good facility design is to include the needs of bicyclists at the inception of a transportation project or improvement, so that the bicycle improvement is integrated into the total design of the project. If retrofitted, the bicycle accommodations will likely be under-designed and cost more as independent improvements. For developing areas on the suburban fringe the inclusion of bicycle facilities in all new transportation and development projects is critical to cost-effectively provide for bicycle accommodation as its communities grow.

Different types of streets and their associated characteristics necessitate different types of bikeway designs. Different design treatments need to be considered for arterial streets, collector or minor arterial streets and local streets. Appropriate designs are described in the following pages. Since design standards are continuously being updated, implementing agencies should always consult the most recent update to ensure they are using the most up-to-date best practices. Design references are listed at the end of this chapter.

BIKEWAY DESIGN GUIDANCE FOR ARTERIAL STREETS

Regionally significant arterials and other major routes through a community often are not thought of as bicycling corridors. However, cyclists - like motorists - must often use these roadways to get to where they need to go. Therefore, bike-friendly accommodations should be made whenever possible.

1. Roadway Characteristics

- Major arterials are roadways where major destinations are typically located and have the heaviest traffic and highest speeds
- Often are designated truck routes
- Are the least desirable routes for less experienced bicyclists; many will not feel comfortable riding on such roadways even with bike-friendly improvements
- To allow experienced cyclists to more comfortably share the roadway with motorists, a minimal level of bicycle accommodation is desired without designation as a bicycle facility

2. Overview of Design Treatments

Typical Facility Recommendation: *Wide Curb Lanes*

Rural Cross-Sections: *Paved Shoulders without rumble strips*

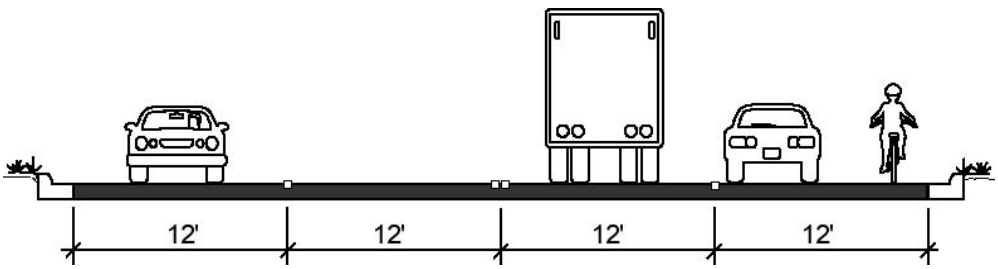
Municipal Arterials: *Possible Road Diet*

Special Situations: *Sidepath*

- A parallel off-road path may be warranted to provide connections for less experienced cyclists.
- Only where appropriate land use, adequate right-of-way, and intersection safety criteria can be met.

Existing Conditions/Traditional Design

- Typically four 12-foot lanes with no bicycle accommodation.



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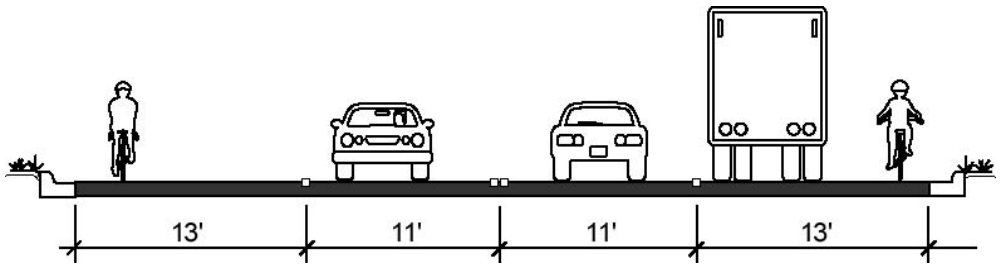
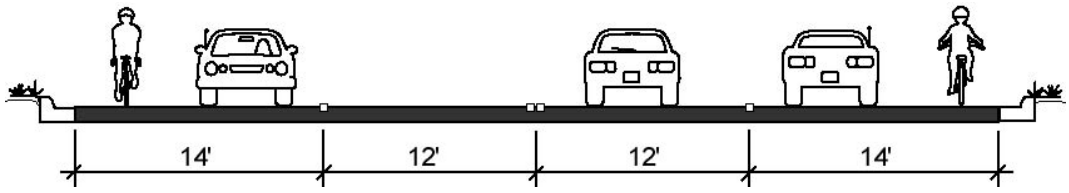
Recommended Changes when Resurfacing/Restriping

- Shift lane lines to provide additional space on the right for lane sharing.
- An added benefit of slightly shifting motor vehicle traffic to the center is to help extend pavement life, as vehicles are no longer driving in the same well-worn tire ruts.



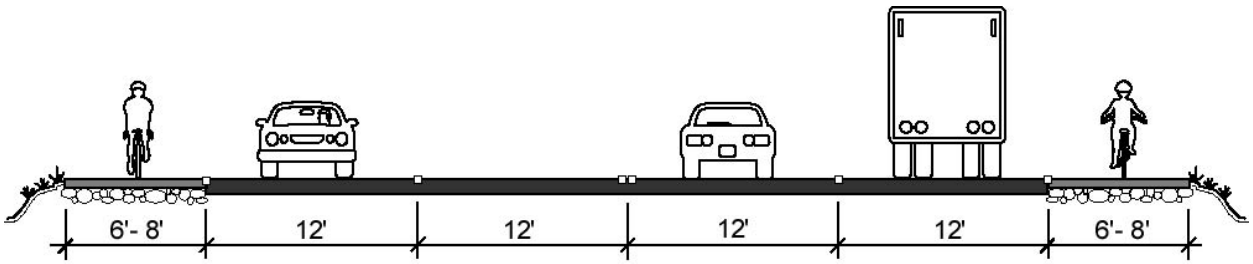
Recommendations for Bicycle-Friendly New Construction

- Provide additional pavement width in the right hand travel lane, per *IDOT BDE Procedure Memorandum 95-21: "Policies and Procedures for Accommodating Bicycle Travel in Highway Improvements"*
- The easiest way to accommodate bicycle travel within growing areas like Kane County is as an integral part of new roadway construction.



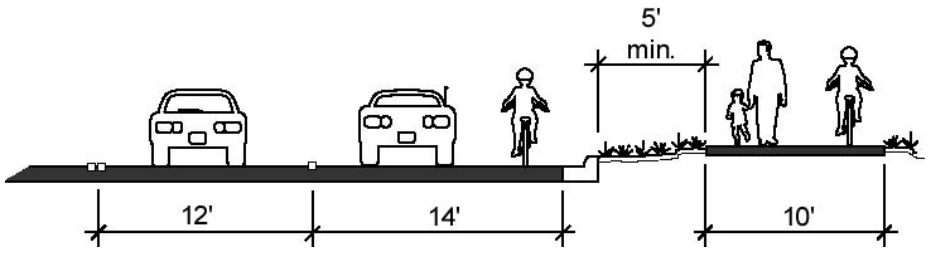
Paved Shoulder Treatment for Rural Cross-Sections

- Provide and maintain smooth paved shoulders with no rumble strips. If rumble strips are to be used, they shall be at a shallow depth, be interrupted, and of a narrow width to provide a 4-foot minimum smooth riding surface for bicycle use.
- Paved shoulders 6-8 feet or wider are recommended for busier roadways (generally upwards of 45 mph and 2,000 ADT with truck traffic). Such shoulder facilities should not be signed as bike routes or bicycle lanes; share the road signing may be appropriate.
- On lesser-traveled highways where speed limits are posted under 45 mph, the minimum 4-foot bicycle shoulder standard may be applicable. Such facilities may or may not use bicycle lane signs and pavement markings.



Sidepaths

- Not recommended in most applications due to conflicts with motor vehicles at intersections.
- Careful facility design is needed to minimize conflicts.
- Where present, should also provide bicycle accommodation on adjacent roadway via wide curb lanes.

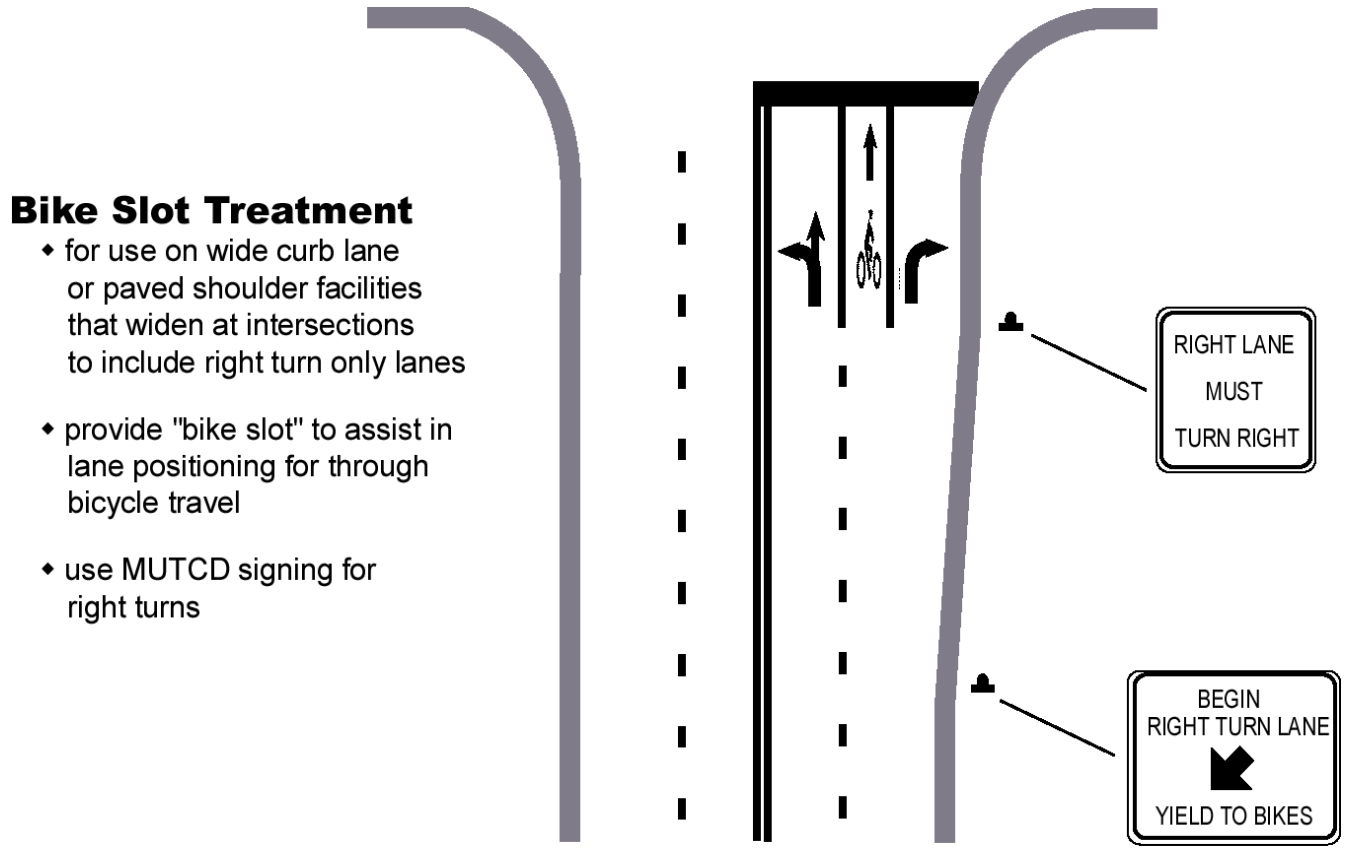


3. Design Details within Arterial Corridors

Bicycle-Friendly Drainage Grates – Older styles of drainage inlets with elongated slots are not to be used on any street where bicyclists may ride. Such parallel bar grates can trap a bicycle wheel and cause loss of control. Cyclists swerving to avoid inlets or utility covers also cause conflicts with adjacent motor vehicle traffic. Therefore all drainage grates and utility covers located in the bicyclists' expected path should be flush with the pavement. On pavement overlay projects; grates and utility covers will need to be adjusted to be flush with the new surface.

All current IDOT drainage grate designs are suitable for bicycle travel, as is the Kane County DOT design. Municipalities should follow the IDOT *Highway Standards* for bicycle-safe grates.

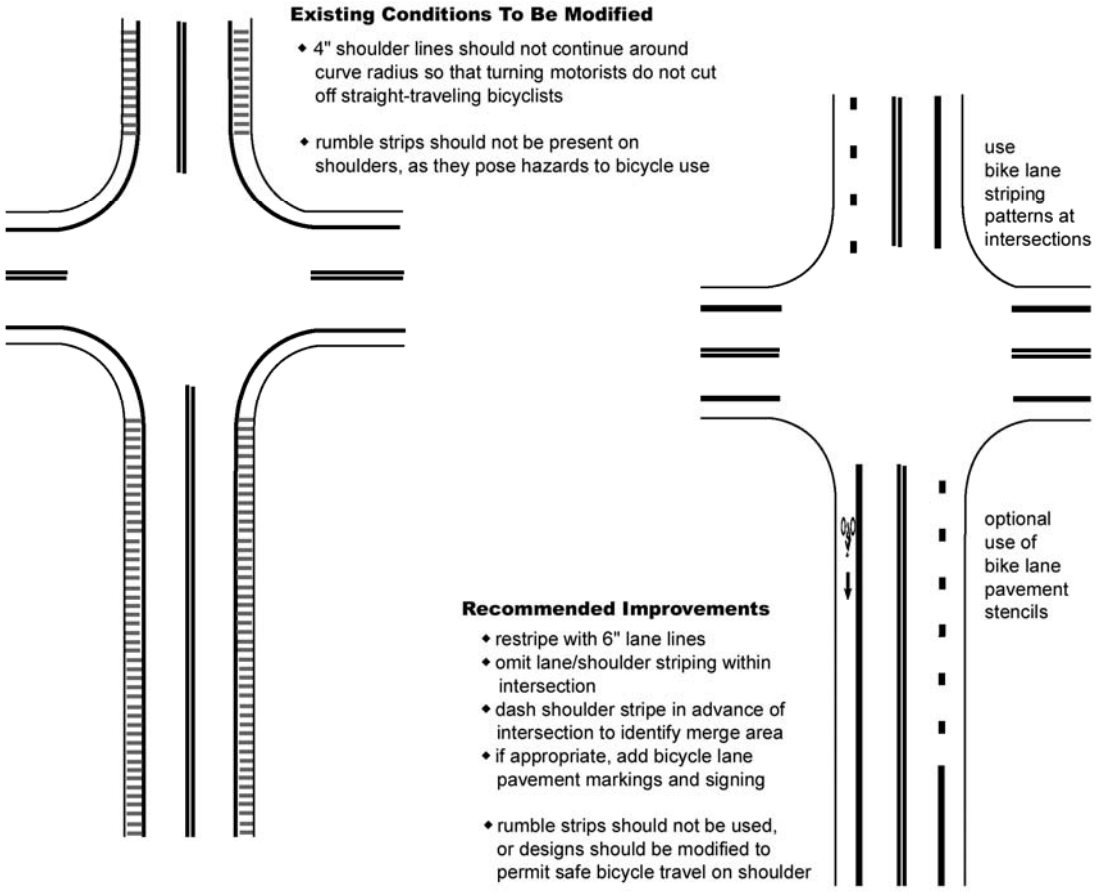
Bike Slots – When accommodating bicyclists on major arterial roadways via wide curb lanes or undesignated paved shoulders, the use of short segments of bicycle lane at intersections may be warranted where roadway geometrics permit. Such "slots" are positioned between a designated right turn only lane and through travel lane. They assist cyclists traveling straight in assuming the proper roadway position, and also tell motorists to expect and yield to bicyclists.



Following design principles set forth in the *Manual on Uniform Traffic Control Devices* (MUTCD) and the *AASHTO Guide for the Development of Bicycle Facilities*, bike slots should be painted with a combination of dashed lines that indicate areas to yield, and solid stripes that designate separation of users. Bicycle symbol pavement markings and #R4-4 signs "Begin Right Turn Lane Yield to Bikes" should also be used. The #R4-4 signs are also recommended to be installed at intersections with right turn lanes but without for bike slots.

Paved Shoulders – Shoulders provide structural support for a roadway and offer a breakdown and recovery area for motor vehicles. When maintained, without rumble strips, shoulders provide space for bicycle accommodation in developing and rural areas. They may also serve the needs of experienced cyclists on high-speed, rural arterials when wide curb lanes are not practical.

A paved and maintained shoulder width of 4 feet is the minimum standard for bicycle accommodation. In general, shoulder widths of 5 to 6 feet are recommended where traffic volumes exceed 10,000 ADT, sight distance is inadequate, heavy truck traffic exists, or speeds over 40 mph. Where prudent, shoulders may be designated as bicycle lanes by use of appropriate pavement markings and signage. On high-speed/high-volume roadways, share the road signing is more appropriate. Use of "bike slots" should also be encouraged.



Rumble Strips – While rumble strips save lives and reduce property damage for motorists, they can be a problem for bicyclists. When debris or a parked vehicle blocks the shoulder, it becomes necessary for the cyclist to cross the rumble strip to move into the lane to go around the obstacle. An aggressive strip, with wide deep grooves, can cause an intolerable level of vibration in the bicycle and possible loss of control.

Rumble strips can be such a deterrent to bicycling on shoulders that their benefits should be weighed against the probability that cyclists will ride in the motor vehicle lanes to avoid them. As a general rule, rumble strips are recommended for use only on curves, approaches to narrow bridges, and other locations where there is a high potential for benefit. Continuous rumble strips are only recommended for limited access facilities. Raised rumble strips are only recommended for the approaches to narrow bridges.

Where rumble strips are warranted, shoulders should be widened to provide at least a 4-foot wide smooth riding surface beyond the rumble strip. Where used, rumble strips should be of a design that does not create instability to the bicyclist who inadvertently drifts onto one, especially under low light conditions.

The recommended design is 12" wide with a groove depth of 3/8" ground in an interrupted pattern adjacent to the edge line. The interrupted pattern should consist of 12 feet of rumble strip, followed by a 6-foot gap.

Sidepaths – Trails running immediately parallel to a roadway are not recommended in most situations, especially as bicycle facilities.

Motorists seem to like sidepaths because they get bicycles off of the roadway. Pedestrians do not because they place faster moving bicycle traffic into the space traditionally reserved for walking. Many bicyclists who are uncomfortable operating in traffic think that sidepaths are a good idea because of the perceived safety of being removed from the traffic stream. However, safety professionals and experienced bicyclists tend to disagree because crash statistics indicate that sidepath riders are more frequently involved in bicycle/motor vehicle collisions at intersections. This, coupled with travel delays, causes many bicyclists to continue to use the roadway.

Only when it has been determined that on-road improvements are not feasible along arterial streets, should a sidepath be considered as a bicycle route. Then, additional criteria must be met to ensure user safety:

- *Available Right-of-Way*
  To accommodate the minimum standard for bicycle/shared use paths there should be 18 feet of available right-of-way. This is necessary to provide for a 3-foot clear zone from obstructions, a 10-foot wide trail, and a 5-foot buffer/open space that separates

the path from the road. (Per AASHTO standards, if there is less than a 5-foot buffer width, a 4.5-foot high physical barrier is required.)

- *Number of Street and Driveway Intersections*
  Studies show that bicyclists who ride on sidepaths incur 1.8 times greater risk of being involved in a collision with a motor vehicle than those who ride on the roadway. This risk increases for path users who are traveling against traffic — they have been found to be 4.5 times at risk as right-way sidepath travelers — because motor vehicle operators are not looking for bicycles or other traffic off of the roadway and/or coming from the opposite direction.

  For this reason, sidepaths should not be considered when there are more than 12 residential driveways, 6 commercial drives/minor streets, or 3 major street intersections per mile. Beyond this, a cyclist would face more than 1 driveway every 30 seconds, or 1 street every minute, whereby the safety and utility of the path deteriorates dramatically. Commercial strips and other areas with heavy vehicular turning movements are particularly dangerous.

- *Final Design Considerations*
  The above two criteria are most important to assess feasibility during the planning stages of a project. However, when the sidepath moves into the design and construction phase, additional problems will need to be resolved, including providing access to destinations located on the opposite side of the street from the sidepath, modifying signal timing to permit non-motorized users to move through an intersection, removing obstructions from sight triangles, locating crosswalks a proper distance from the parallel roadway, and providing curb cuts and transition areas so that bicyclists may access the path from both the parallel and intersecting streets.

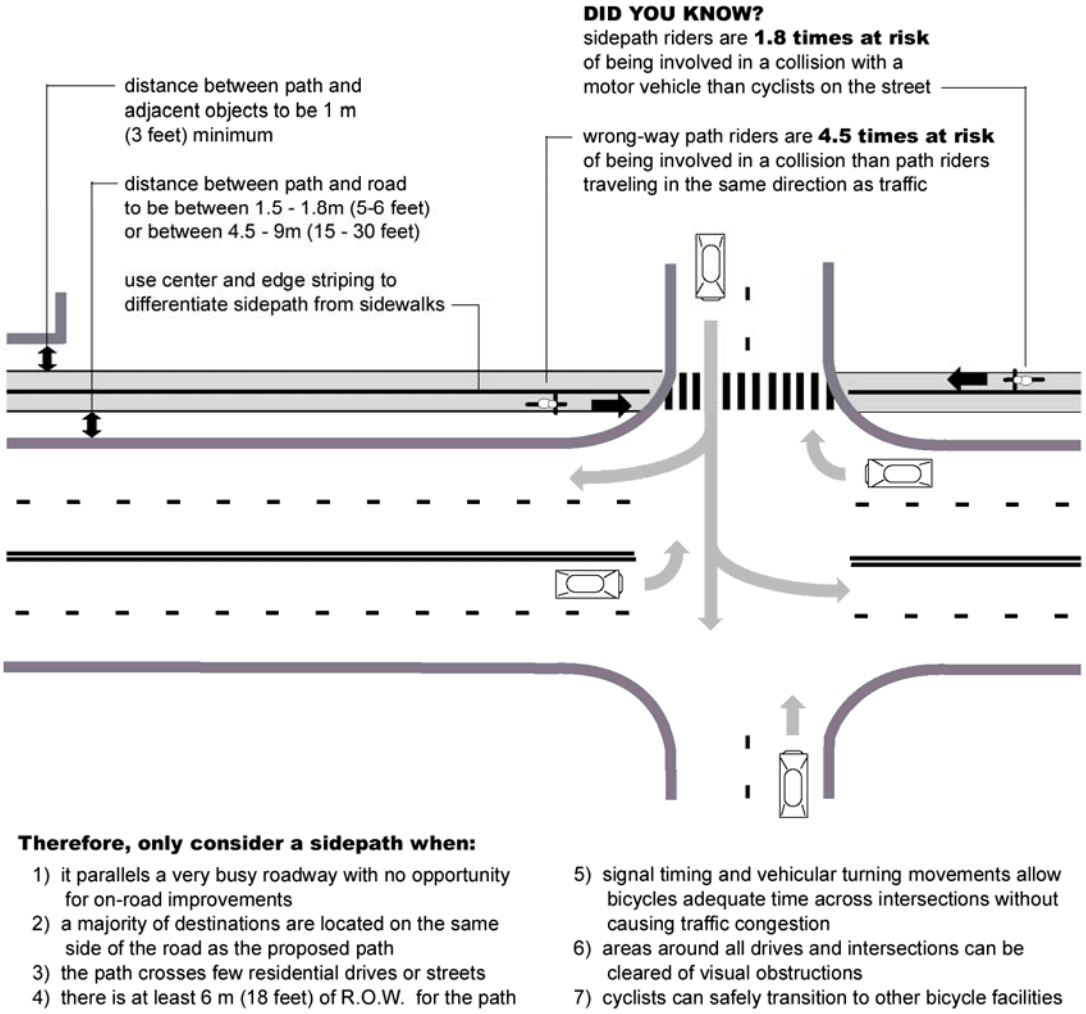
  However, in no instance should development of a sidepath preclude bicyclist use of the adjacent roadway.

Additional Cautions Against Sidepath Facilities

AASHTO warns of the following problems associated with sidepaths:

1) Unless separated, they require one direction of bicycle traffic to ride against motor vehicle traffic, contrary to normal rules of the road.

2) When the path ends, bicyclists going against traffic will tend to continue to travel on the wrong side of the street. Likewise, bicyclists approaching a shared-use path often travel on the wrong side of the street in getting to the path. Wrong-way travel by bicyclists is a major cause of bicycle/automobile crashes and should be discouraged at every opportunity.



3) At intersections, motorists entering or crossing the roadway often will not notice bicyclists approaching from their right, as they are not expecting contra-flow vehicles. Even bicyclists coming from the left often go unnoticed, especially when sight distances are limited.

4) Signs posted for roadway users are backwards for contra-flow bike traffic; therefore these cyclists are unable to read the information without stopping and tuning around.

5) When the available right-of-way is too narrow to accommodate all highway and shared-use path features, it may be prudent to consider a reduction of the existing or proposed widths of the various highway (and bikeway) cross-sectional elements (i.e., lane and shoulder widths, etc.) However, any reduction to less than AASHTO *Green Book* (or other applicable) design criteria must be supported by a documented engineering analysis.

6) Many bicyclists will use the roadway instead of the shared-use path because they have found the roadway to be more convenient, better maintained, or safer. Some

motorists who feel that in all cases bicyclists should be on the path may harass bicyclists using the roadway.

7) Although the shared-use path should be given the same priority through intersections as the parallel highway, motorists falsely expect bicyclists to stop or yield at all cross-streets and driveways. Efforts to require or encourage bicyclists to yield or stop at each cross street and driveway are inappropriate and frequently ignored by bicyclists.

8) Stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may block the path crossing.

9) Because of the proximity of motor vehicle traffic to opposing bicycle traffic, barriers are often necessary to keep motor vehicles out of shared-use paths and bicyclists out of traffic lanes. These barriers can represent an obstruction to bicyclists and motorists, can complicate maintenance of the facility, and can cause other problems as well.

BIKEWAY DESIGN GUIDANCE FOR COLLECTORS & MINOR ARTERIAL ROADS

Often a community's minor arterial and major collector streets provide the greatest opportunity to implement a system of well-designed on-road bicycle facilities. Such streets typically offer a balance between access and safety for non-motorized users. With good facilities, minor arterial and collector streets can combine with an off-road trail system to form the backbone of a highly visible bicycle system that will serve the majority of cyclists in a community.

"Good design" means more than providing a facility for people who are already bicycling. Good design creates attractive, inviting facilities that encourage more people to bike more often. Motorists driving down a roadway with widened curb lanes and bicycle-friendly drainage grates probably will not notice such bicycle accommodations. But a designated lane on the street is difficult to ignore. As such, arterial and collector bicycle lanes — portions of the roadway that have been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists — are prominent components in most bicycle plans.

1. Street Characteristics

- Moderate traffic volumes/moderate speeds
- Link subdivisions
- Offer through routes and provide access to destinations
- Preferred routes for bicyclists
- Offer a combination of direct access and desirable traffic characteristics
- With bicycle accommodations, are likely to be used by both experienced bicyclists and less skilled recreational riders

2. Overview of Design Treatments

Typical Facility Recommendation: *Striped Bicycle Lanes*

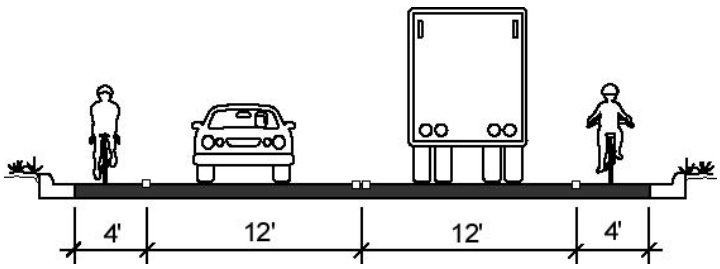
Facility Recommendation for Rural Cross-Sections: *Paved Shoulders,* designated as bicycle lanes

As an Interim Solution, or if it is not possible to provide a designated bike lane:

Wide Curb Lanes should be provided as a minimum level of accommodation

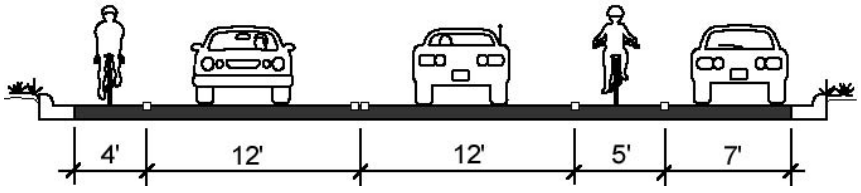
Bicycle Lanes

- Are always implemented as one-way facilities located on either side of a street
- Signs and pavement stencils indicate direction of travel — on the right, with traffic



With On-Street Parking

- Bike lanes work with or without on-street parking, or parking may be on one side only, alternating sides as land uses dictate
- Where parking is present, bike lanes should always be placed between the parking bays and right-hand travel lane



Paved Shoulders as Bike Lanes

- On lesser traveled roadways with speeds under 45 mph, sign and stripe shoulders as bicycle lanes
- Do not use rumble strips or unsafe drainage grates that pose a hazard to bicycle travel

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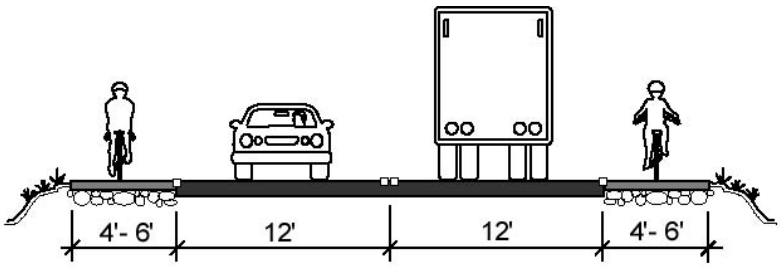
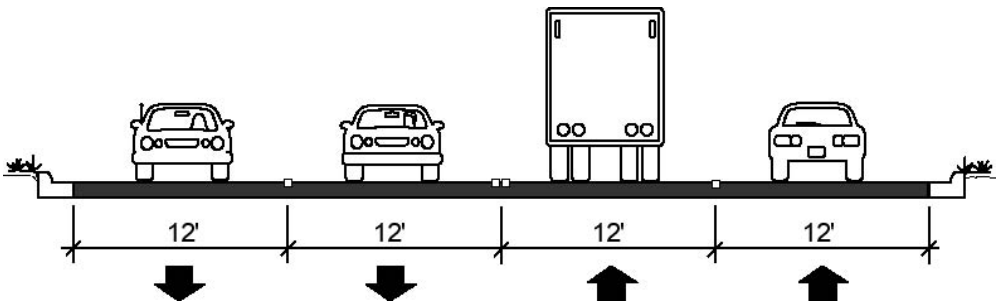
- 4 feet is the minimum useable pavement width for shoulder facilities.



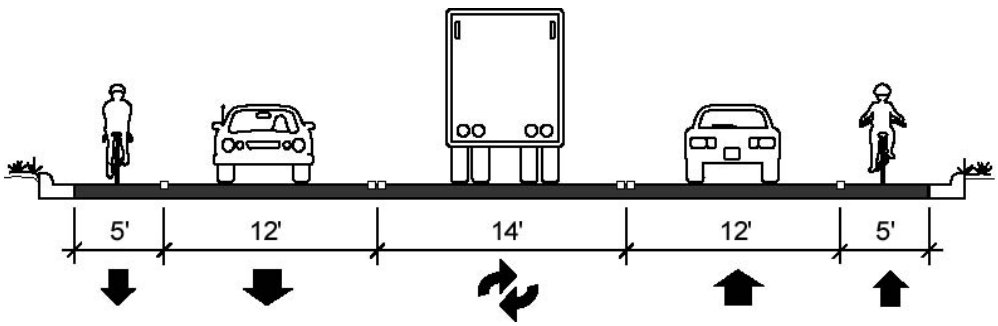
Multi-Modal "Road Diets"

- On selected minor arterial roads where traffic volumes are below approximately 18,000 ADT consideration may be given to traffic calming, whereby existing "fat" streets are restriped with a "road diet" treatment
- Reallocating space on a typical four-lane roadway can create a new multi-modal facility comprised of three auto lanes with bicycle lanes
- Such treatment should only be implemented pending an evaluation of the roadway's intersection capacity with the proposed center turn lane design



"Road Diet"

Above: A traditional 4-lane road.



Benefits of Bicycle Lanes

Properly designed bicycle lanes offer the following benefits:

- Establish the correct position of bicyclists on the roadway;
- Reduce bicycle/pedestrian conflicts as fewer people ride on sidewalks;
- Provide bicyclists a space to travel at their own speed next to motorists;
- Guide bicyclists through intersections;
- Allow bicyclists to pass vehicles backed up at intersections; and
- Send a message to motorists that bicyclists have a right to the roadway.

BIKEWAY DESIGN GUIDANCE FOR LOCAL STREETS

Bicycle facility planners must keep in mind the concept that "all streets are bicycling streets," and recognize that approximately 80 percent of the bicycle riding in a typical community is done on streets and roadways, many with no designated bicycle facilities.

With low speeds and low traffic volumes, a community's network of local, residential streets provides connections between trip origins (residences) and the collector and arterial streets which lead to common local destinations including downtown areas, employment centers, shopping areas, parks and trail heads, or intermediate stops such as Metra stations or Pace Bus Stops.

1. **Local Street Characteristics**
   - Serve neighborhoods
   - Often curvilinear or dead-end streets
   - Low traffic/low speed
   - Narrow pavement widths where on-street parking may or may not be present
   - Are pleasant to ride on
   - Often offer circuitous routes rather than direct access to destinations
   - Due to slow speeds and light traffic, special bicycle accommodations are typically not warranted

2. **Overview of Design Treatments**

Typical Facility Recommendation: *none*

In Special Situations: *Bike Route* signs with supplemental directional information may be posted to indicate connections to other bicycle facilities

Dead-Ends: *Accessways* or short sections of trail are desired to connect cul-de-sacs for through non-motorized travel

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It is important to remember that the local street system, with no special accommodations for bicyclists, works for bicycle travel. Making sure that drainage grates are of a bicycle-friendly design, and scheduling a routine sweeping of sand and debris are often the only improvements necessary.

However, local neighborhood streets frequently do not extend outside of a subdivision or community to link to commuter train stations, work centers or retail areas. Thus, there is a need for bicycle improvements on collector and arterial streets, as previously discussed, to make connections throughout the council area.

BIKE LANE DESIGN DETAILS

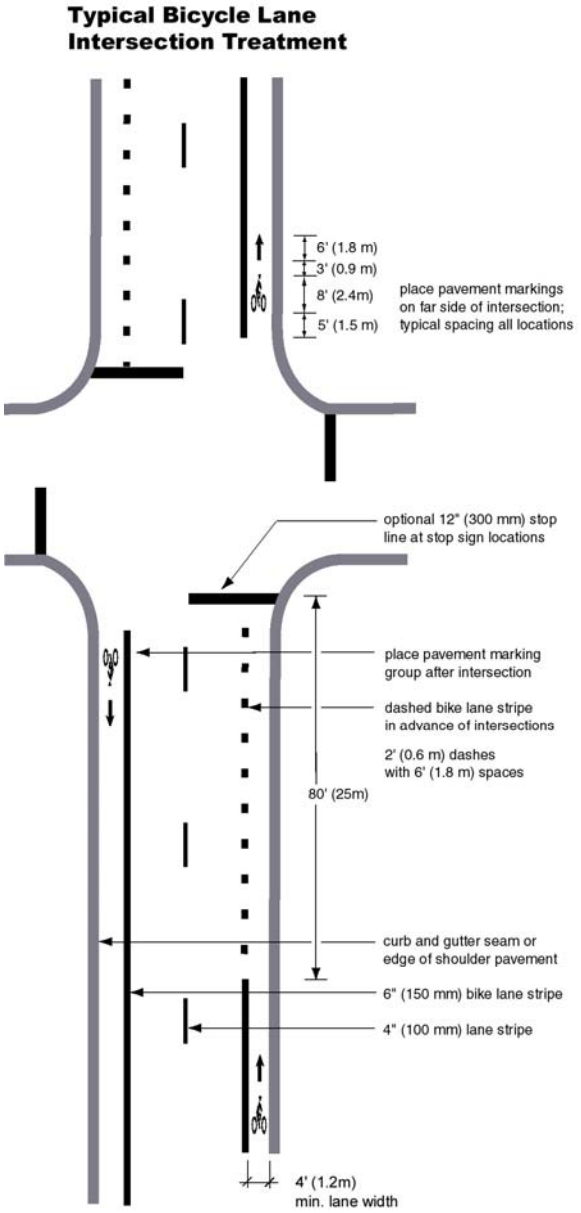
Lane Widths

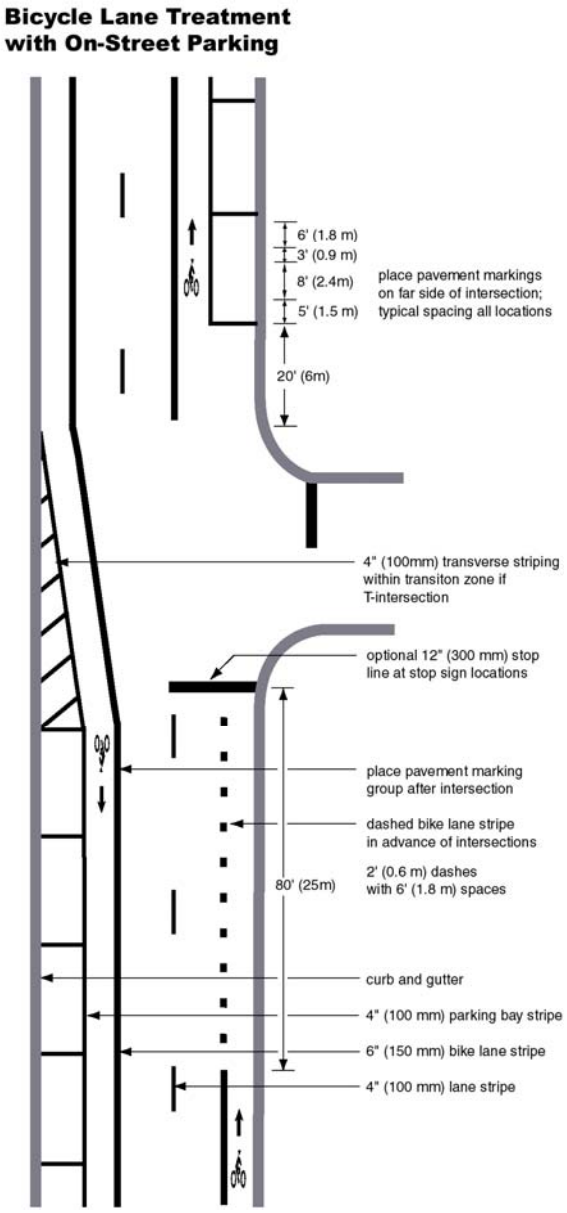
The recommended width of a bicycle lane is 5 feet, measured from the face of a curb or guardrail to the bike lane stripe. There must be a minimum of 3 feet of rideable surface to the left of the gutter pan. The longitudinal joint between the gutter pan and pavement surface shall be smooth. If the joint is not smooth, 4 feet of rideable surface shall be provided.

Lane Striping

Pavement markings for bicycle lanes should follow standards set in the *Manual on Uniform Traffic Control Devices (MUTCD)* and the *AASHTO Guide for the Development of Bicycle Facilities.* A bike lane should be delineated from the motor vehicle travel lanes with a solid 6-inch white line. An 8-inch line width may be used for added distinction. If on-street parking is present, a second 4-inch white line can be placed between the parking and bike lane to discourage motorists from using the combined bike lane/parking lane as a through travel lane.

In general, bicycle lanes encourage bicyclists to keep to the right and motorists to keep to the left. Therefore one must strive to minimize conflicts where turning vehicles and/or bicycles must cross paths at intersections. Striping and signing configurations should encourage lane crossings in advance of the intersection, in a merging fashion. Bike lane lines typically stop or become dashed at the approaches to indicate merge areas. See AASHTO and MUTCD for detailed guidance on various treatments at signalized intersections, non-signalized intersections, bus stops, crosswalks, right-turn-only lanes, left turn bays, throat widening and T-intersections. See also arterial intersection treatments in **Chapter 7** of this plan.





Road Diets for Some Four-Lane Roadways.

Some traditional four-lane roadways can be put on a "road diet" and striped with bicycle lanes to turn them into multi-modal facilities. Typically, arterial and collector streets are automobile dominated corridors with four 12-foot travel lanes and speeds posted at 35 to 45 mph, but with cars often traveling faster. With the exception of regionally significant arterial (SRA) roads, they are likely designed to handle more traffic than is actually using the roadway.

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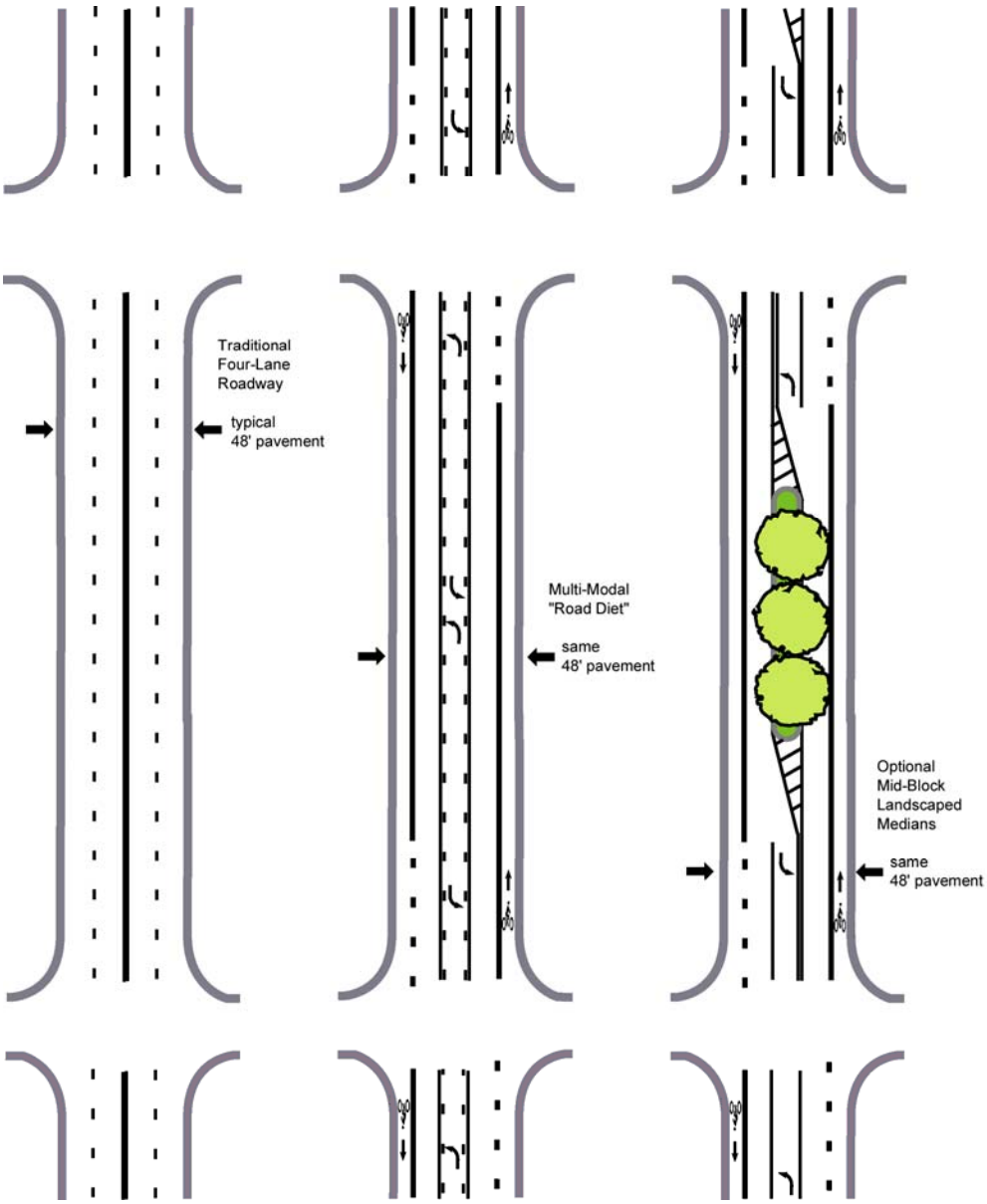
Cars can have problems on four-lane roadways. Left turning motorists who are waiting for a gap in traffic reduce the effectiveness of the center lanes for through travel. This decreases roadway capacity. Entering motorists can have difficulty finding adequate gaps in all lanes of traffic to make left turns onto the roadway. This results in heavy acceleration in order to enter the roadway. The combined effects are many lane change maneuvers and speeding as motorists try to pass turning vehicles in both left and right lanes. This adds to the perception of roadway congestion.

Road Diet Treatment



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Bicycle use on such roadways is practically non-existent for all but the most experienced cyclist. High travel speeds make it difficult for bikes and cars to effectively share a lane. Frequent lane changes pose additional hazards to cyclists. Non-signalized arterial crossings are not easy for cars, and extremely difficult for persons on foot or bike.

A "road diet" is a restriping of moderately traveled four-lane streets. The treatment is best applied to municipal collectors, typically 48 feet wide, to create a multi-modal corridor with two 12-foot through lanes, a 14-foot center turn lane, plus two 5-foot bike lanes. The road diet is inexpensive to implement -- simply shift paint lines and add bike lane designation.

Diets have been successful in several communities on roadways with 18,000 ADT or less and may handle up to 24,000 ADT depending on intersection capacity. It is important to remember that intersections determine roadway capacity, not the number of lanes mid-block. Road diets provide turning lanes to handle capacity.

A road diet changes the "feel" of the roadway. It offers traffic calming benefits by modifying perception of appropriate travel speeds. Lane maneuvering is simplified while maintaining capacity. Left-turning motorists are removed from the travelway. This results in through cars maintaining continuous movement throughout the corridor without speeding and passing. Entering motorists only need to cross one lane of traffic; if needed, they have a median refuge area in which to wait for a second gap in traffic. Non-motorized users benefit when space is provided for on-street bike lanes, turning movements are simplified, and crossings in non-signalized locations are made easier.

Communities are recommended to restripe on a trial basis, with the option to return to a four-lane design if area residents are unsatisfied or if future traffic volumes exceed three-lane capacity.

Long-term recommendations include adding landscaped medians in areas with no intersecting driveways or streets. This should be implemented at or near build-out of a corridor, when traffic volumes and land uses are known. In areas with planned access management, medians may be implemented as an incidental part of roadway development.

Landscaped medians enhance the aesthetics of a corridor, provide additional traffic calming benefits, help to create gateways and a sense of identity for neighborhoods, and create opportunities for locating mid-block pedestrian crossings.

Interstates/Expressways

Bicycle lane facilities through interchange areas require careful design to limit conflict areas between high-speed vehicles and bicycle traffic. Roadway designs that encourage free-flowing motor vehicle movements are the most difficult for cyclists to negotiate safely and comfortably.

Conversely, designs that provide enhanced bicycle crossings may require vehicles to slow or stop.

Where bicycle lanes or paved shoulder facilities are present on intersecting urban roadways and the interchange is configured with access ramps that connect to local streets at right angles, the intersection of the ramp and the street should follow recommendations for bicycle lanes within arterial intersections.

Where bicycle lanes or shoulders are present and the interchange design includes merging lanes and exit ramps, AASHTO recommends two options to minimize merging, weaving and crossing conflicts. The first is to delineate the bike lane through part of the interchange area, curving and stopping at the exit ramp, and then continuing with a bike lane on the right edge of the ramp to merge back with the traffic flow. When it is more desirable to allow the bicyclist to choose his own merge, weave or crossing maneuvers, it is recommended that the bike lane pavement marking be discontinued through the ramp crossing area. See AASHTO for details.

Where feasible, grade-separated crossings of interstates and expressways is recommended. However, such facilities must be sited with care as overpasses and underpasses are expensive, often add out-of-direction travel, and will not be used if the added travel distance is too great. A detailed discussion of design guidance for grade-separated crossings is found in Chapter 6, Arterial Roadway Intersections.

ROADWAY MAINTENANCE

Since bicyclists are likely to be found riding on all streets and roadways within Kane and Kendall Counties, special attention should be given to maintaining the right-hand travel edge of all roadways. When arterial and collector streets include designated bicycle facilities, as discussed in the next section, it is essential to design, construct and maintain corridors to the highest standards.

Maintenance of bicycle facilities is often the responsibility of the appropriate agency responsible for vehicular roadway maintenance. Maintenance resource requirements are not anticipated to increase substantially, as a more detailed focus on the right-hand edge of the roadway is often all that is necessary.

Attention to facility design is needed to prevent future maintenance problems. Design elements should include:

- continuous right-hand lanes that are of uniform width
- smooth pavement, free of surface irregularities and potholes
- correction of ponding water or other drainage problems

- use of bicycle-safe drainage grates
- feathering of new asphalt to allow pavement surfaces to meet adjacent gutter pans smoothly
- adjustment of drainage grates and utility covers so as to be flush with pavement surfaces
- filling of any longitudinal cracks that may trap a bicycle wheel
- removal of all excess gravel when applying chip seal coats (since chip sealing tends to roughen the pavement surface, slurry seal is preferred on roads where bicycle traffic is to be encouraged)
- widening approach pavements to permit crossing railroad tracks at right angles, or as close as possible to 90°; and/or filling the rail flangeway with a rubberized material
- timing light cycles to allow a safe bicycle clearance interval

Agencies with roadway maintenance responsibilities should pay careful attention to the following to ensure safe conditions exist for cyclists riding on-street:

- regularly scheduled inspections of pavement conditions and joints
- routine sweeping of broken glass, gravel, wet leaves and other debris
- routine snow plowing/sweeping of salt after major winter storms on streets with bicycle lanes or paved shoulders intended for bicyclist use; for all other streets, an early spring sweeping of any remaining salt, sand or other debris
- control of trees, shrubs and other vegetation to provide adequate clearances and sight distances
- signs and pavement markings regularly inspected and kept in good condition
- prompt attention to hazards and maintenance problems reported by users

GREENWAY / BIKEWAY SYSTEM OVERVIEW

Some of the region's best recreational trails and greenways, including the Fox River Trail, the Virgil Gilman Trail, the Great Western Trail, portions of the Illinois Prairie Path, and a section of the Grand Illinois Trail are located in Kane and Kendall Counties. In addition, county agencies are committed to protecting several key "water resource management areas" including several Fox River tributary streams which have experienced significant development pressure.

Goals of greenway planning efforts in the planning area include:

1) Protect key corridors and open space areas to preserve the distinctiveness of the "rural/urban form" as farmland is developed.
2) Coordinate municipal, park district, county and forest preserve district efforts to maximize linear parks along Fox River and its tributaries.

3) Develop municipal and other trail connections branching to and from the Fox River main trunk system.
4) Incorporate greenway trail design into new development through specific design requirements, setbacks and park donation ordinances.

Benefits of Shared Use Paths

According to the Illinois Prairie Trail Authority, multi-use trails and bikeways are good investments of public dollars, providing the following benefits:

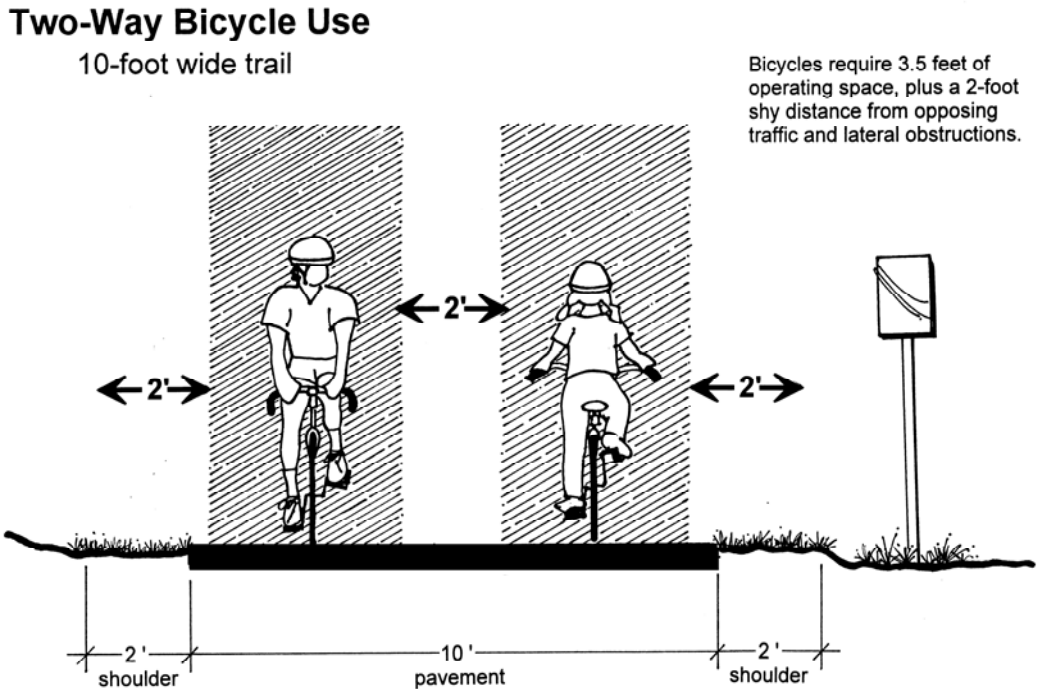
- Serve a valuable transportation service, providing access to schools, shopping, recreational sites and commuter rail stations.
- Provide a positive change in the landscape, making neighborhoods, communities and the entire region a better place to live and work.
- Accommodate the increasing demands for facilities for biking, hiking, roller blading, horseback riding, and other forms of linear recreation.
- Allow people to renew their energies and relax in a natural setting.
- Provide a learning experience in local ecology.
- Become part of the identity of an area when incorporated into business names and used as an asset in marketing real estate properties.

Trails & Greenways

- At a minimum, greenways are conservation projects to preserve unique natural areas and enhance long-term viability of public access to natural resources.
- Greenways are often desired to be developed with linear trail systems, with an emphasis on connections to other local and regional on- and off-road bikeways.
- Often called "bike paths," such off-road trail facilities are more properly referred to as shared-use paths since they serve bicyclists, in-line skaters, walkers, joggers and other non-motorized users.
- Regional, county-wide and community-wide facilities should be paved trails, a minimum of 10 feet wide.
- A 12-foot pavement width is preferred if > 300 users per peak hour are anticipated.
- Local neighborhood connector paths < 1 mile in length may be constructed at an 8-foot trail width due to low anticipated volumes of use rural segments of trail may be unpaved due to lower anticipated transportation use.
- As a planning guide, typical spatial requirements recommended for various types of trail users are presented in the following pages.

Spatial Requirements for Various Trail Users

The trail width recommendations contained within the Bikeway Facility Design Guide are those as developed and refined by national organizations such as the American Association of State Highway and Transportation Officials (AASHTO) and the Rails-to-Trails Conservancy based upon the operational requirements of various user groups. For supplemental planning purposes, user spatial requirements are presented following:



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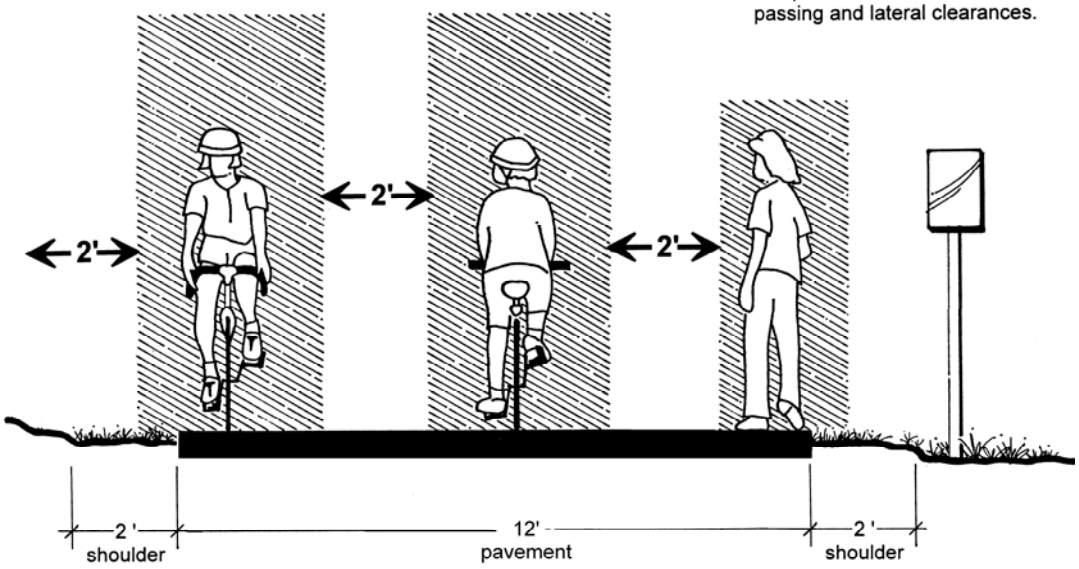
Multiple Use

12-foot wide trail

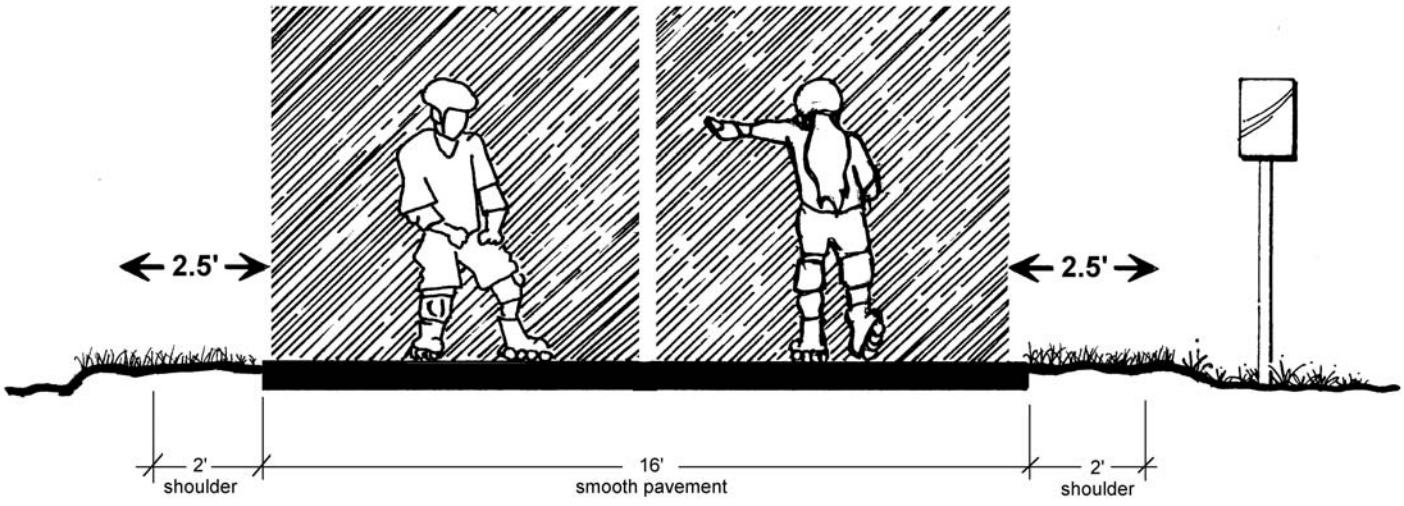
Under multi-use conditions, the shoulders of a 12-foot wide trail can provide additional room for passing and lateral clearances.



In-Line Skating

16-foot wide trail

Skaters require 6 feet minimum of operating space / 8 feet for a normal stride, plus a 2.5-foot fall zone free of obstructions.



Greenway Characteristics & Types

As with the roadway system, there is a functional hierarchy of trail types proposed to be developed within the planning area greenways. Depending on distances, destinations and users to be served, various trails may be developed to differing standards.

Regional Greenways

The *Northeastern Illinois Regional Greenways Plan* identifies greenways that are important to the development of a strong regional greenway system. "Priority Regional Greenways" run through Kane and Kendall Counties, and include:

- East-West Connections to the Fox River Trail
- Mid-County Trail
- Wikaduke Trail
- Fox River Trail
- Prairie Parkway Trail
- Waubonsee Trail
- Aux Sable Trails
- Blackberry Creek Trail
- Fox River to Saw Wee Kee Trail

Facility Recommendation for Regional Greenways:

Shared use paths within regional greenways should be developed to bike standards recommended by the American Association of State Highway and Transportation Officials (AASHTO), with a minimum 10-foot paved trail width.

Design Recommendation in High-Use Areas:

Per IDOT bicycle policy and procedures, such shared use paths are preferred to be 12 feet wide if > 300 users per peak hour are anticipated.

Design Recommendation in Rural Areas:

Where usage for transportation purposes is anticipated to be low (generally at distances > 2 miles from communities and/or major destinations), an unpaved 8-foot trail is acceptable.

County-wide Connections

Various agencies and member municipalities need to work together on multi-jurisdictional projects to provide greenway and bikeway continuity throughout the county. Inter-municipal and inter-agency coordination is crucial to ensure that proposed bikeway projects meet at

jurisdictional boundaries, are developed to like standards, and have a unified commitment to maintenance throughout the length of the project.

Opportunities for developing multi-jurisdictional trails may include the following:

- Forest Preserves
- Utility easements
- Stream corridors
- Abandoned railroad corridors
- Active rail lines
- Sidepaths along selected roadways

Since these multiple-jurisdiction trails will likely become major attractions within Kane and Kendall Counties, they are recommended to be developed to the same standards as the CMAP-identified regional greenways.

Municipal Trail Systems

Other proposed trails may be considered significant within the individual communities of the counties. Such projects can be referred to community-wide arterial trails if they span distances greater than one mile and link to on-road bicycle facilities or a regional trail facility. As above, opportunities include the following:

- Utility easements
- Stream corridors
- Abandoned railroad corridors
- Active rail lines
- Sidepaths along selected roadways

Facility Recommendation for Municipal Trail Systems:

Community-wide arterial trail systems should typically be developed to AASHTO bike standards, with a minimum 10-foot pavement width.

Neighborhood Access Trails

This county-wide plan focuses on defining a network of facilities that will become the backbone of the bicycle system. However, the plan also recognizes the inherent function of the bicycle as a primarily local form of transportation; thus local trail links and connections are critical. Since such facilities will experience lower levels of use, they can be developed to slightly lesser standards than regional and community-wide facilities.

As a local initiative in individual communities, it is recommended to review proposed developments as they are platted to examine opportunities for where and how local trails can feed into the municipal and/or county systems. Opportunities to provide short sections of paths to link adjacent cul-de-sacs and provide a smaller non-motorized transportation grid within suburban super-block transportation grids should also be encouraged.

Linear greenway parks with trails between planned or emerging neighborhoods that link residents to destinations such as schools or business centers are encouraged to be incorporated into subdivision regulations. Many parks have paths in/through them. While it is a nice amenity, without an origin or destination, the paths do little to serve community needs or foster bike use for transportation.

Facility Recommendation for Neighborhood Trails:

An 8-foot pavement width is acceptable for neighborhood access trails in most locations.

Design Recommendation in Higher-Use Areas:

If a neighborhood trail is to be greater than 1 mile in length, it will likely become a destination for bicycle users and thus should be 10 feet wide.

Trail Design Guidance Details

The design of shared use paths is covered in detail in the *AASHTO Guide for the Development of Bicycle Facilities* and includes separation between paths and roadways, trail width and clearance, design speed, horizontal alignment, grade, sight distance, path-roadway intersections, trail signing and marking, pavements, structures, drainage, lighting, and restriction of motor vehicle traffic.

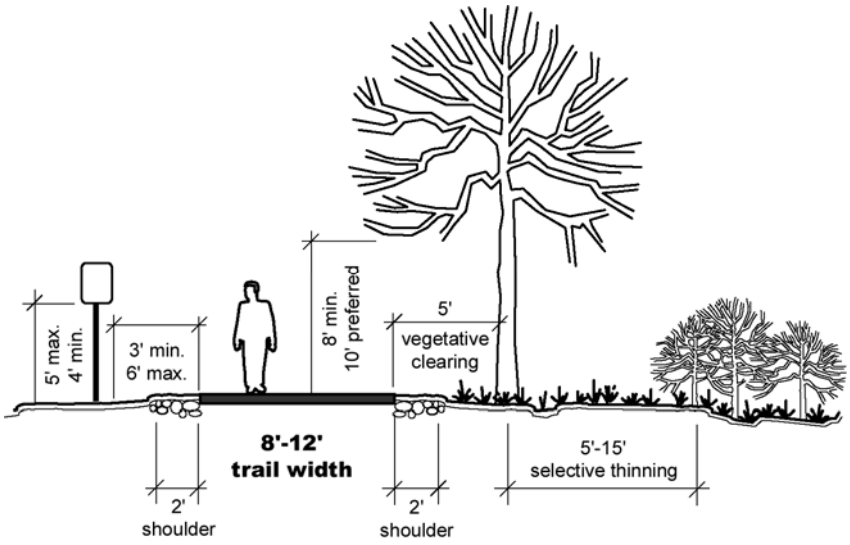
Highlights include:

- Paved width and operating width are primary trail design considerations, determined based upon anticipated levels of use as discussed above and illustrated following.
- In general, a design speed of 20 mph should be used for multi-use trails. Faster bicycle travel is not appropriate in a mixed-use setting and should be redirected from trails onto streets and roadways.
- Cross slopes should not exceed 2 to 3 percent to provide for drainage and to meet ADA requirements. Maximum super elevation rates for curves are 3 percent.
- The minimum curve radius for paths for a 20 mph design speed is 90 to 100 feet, depending on the lean angle of the cyclist.
- A 125-foot minimum stopping sight distance should be provided to give bicyclists an opportunity to see and react to the unexpected.

- Grades are desired not to exceed 5 percent; however AASHTO outlines where steeper grades may be used for restricted lengths as terrain dictates, as well as mitigating design options.
- Lateral and vertical clearances are necessary safety requirements.
- Hard, all weather pavement surfaces such as asphalt and concrete are preferred.
- Design loads for pavements and structures should accommodate occasional emergency, patrol and maintenance vehicles. This includes adequate edge support to minimize trail pavement edge raveling.
- The width of structures should be the same as the approaching trail width, plus minimum 2-foot wide clear areas.
- Intersections between paths and streets are the most critical issue in trail design. Crossings may occur mid-block, adjacent to roadways, or as part of complex intersections. In all instances, intersection design guidance provided by AASHTO and signing and marking standards set forth in the MUTCD should be followed so that unexpected motorized and non-motorized movements are minimized. See Chapter 7 of this plan.

Path Widths and Clearances

Vertical and lateral clearances for all trail types are illustrated as following. Pavement widths range from 8 to 12 feet, depending on anticipated levels of use and type of facility, as previously discussed.



TRAIL MAINTENANCE

Multi-use trails have special maintenance needs since standard street sweeping and snow-plowing equipment often cannot be used on these facilities. Taking future maintenance needs

into account when designing trails can help to alleviate some of the additional maintenance responsibilities, but routine maintenance and repair is required to minimize liability for the managing governmental agencies.
Recommended maintenance actions for off-road trails include:

- Follow the standards set forth in the AASHTO *Guide for the Development of Bicycle Facilities*.
- Design trail cross-sections to withstand loading equivalent to the weight of small maintenance truck or ambulance. Design trail widths so that maintenance and emergency truck wheels do not drive on and deteriorate pavement edges.
- Develop a complete maintenance program for all trails. Develop multi-jurisdictional agreements between Kane County, municipalities, state agencies and homeowner associations, as appropriate, to ensure that maintenance of no section of trail be unaccounted for.
- Sweep debris
- Remove snow on select trails used by bicycle commuters.
- Pave a 10- to 15-foot apron on gravel driveway approaches to reduce loose gravel on paved trail surfaces.
- Regularly overlay unpaved trail surfaces and maintain the full width of paths to prevent deterioration of path edges.
- Inspect for flood damage after each major storm and repair problems as soon as possible. In the interim, prominently use warning signs and markings to identify hazards.
- Keep vegetation cleared to provide a minimum 8-foot vertical and 3-foot horizontal clearance. Selectively remove underbrush and prune lower tree branches to improve sight distances through curves, at intersections, and in any areas where personal safety and security is a concern.
- Give prompt attention to hazards and maintenance problems reported by trail users.

BICYCLE PARKING

An important component of a bicycle plan is the provision for adequate bicycle parking at destinations. Providing bicycle racks at public buildings and encouraging local businesses to invest in bicycle parking will have the following results:

- Increase overall parking capacity at little cost;
- Eliminate the clutter, pedestrian hazards and tree damage from randomly parked bicycles;
- Encourage area residents to shop locally with their bicycles; and
- Attract additional users to the bicycle system.

This plan recommends two basic actions to ensure secure and convenient bicycle parking:

- Incorporation of a bicycle parking requirement into local community's subdivision control ordinance and/or parking requirements; and
- Distribution of information regarding appropriate rack selection and location.

Bicycle Parking Types

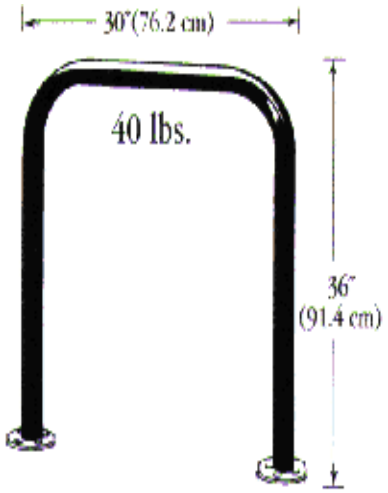
There are two main types of bicycle parking needs: short-term parking and long-term parking. While the siting consideration for both is similar, each has slightly different considerations for rack design.

Short-term bicycle parking is critical near main building entrances for visitors, customers and employees. Short-term parking needs may be met with typical inverted u-shaped or wave racks

Left: Post with loop. Bike parking for up to two bicycles.

Right: Inverted U-Shaped rack provides parking for up to four bicycles.

Below: Wave rack that



Long-term bicycle parking should be encouraged in areas where it is necessary for employees, transit commuters or tenants to park for more than two hours. Installing high-security racks,

bicycle lids, bicycle lockers and/or designating locked rooms or cages for bicycle storage are good long-term parking options.

Bicycle racks that allow only the wheels of bicycles to be locked are not recommended. Because they do not allow the frame of a bicycle to be sufficiently secured, theft can result. Two examples of bicycle rack designs not recommended are pictured below.

Bicycle Parking Facility Design

The two most important considerations to ensure successful bicycle parking are a good rack design and good placement of racks at destinations such as business districts, schools, neighborhood shopping areas, recreational facilities, museums, and libraries. Racks should also be conveniently located and highly visible to ensure their use.

Locating bicycle parking in areas where many people traverse decreases the chances of bike theft. Bicycle racks located in remote areas or behind fences or shrubs give bike thieves cover and time to steal bicycles. Poor rack locations will lead to reduced usage as bicyclists will have a hard time finding them, or will find something else to lock up to.

Bicycle parking rack design should meet the following criteria:

- Provide a simple design that can be permanently installed in the ground;
- Accommodate the use of all popular locking devices used by bicyclists, in particular cables and U-shaped bike locks; and
- Allow a cyclist to easily lock the bike frame and one wheel to the rack.

When placing a bicycle rack in the public right-of-way or in a parking lot, it should be removed from the natural flow of pedestrians, avoiding the curb and area adjacent to crosswalks. Racks should be installed a minimum of 6 feet from other street furniture (e.g., street signs, mailboxes, benches, telephones). Racks should be placed at least 15 feet away from other features, such as fire hydrants or bus stop shelters.

Other bicycle rack installation recommendations that will reduce user conflicts include:

- Anchor racks into a hard surface
- Install racks a minimum of 24" from a parallel wall
- Install 30" from a perpendicular wall (as measured to the closest inverted U.)
- Allow at least 24" beside each parked bicycle for user access, although adjacent bicycles may share this access.

- Provide a six feet aisle from the front or rear of a bicycle parked for access to the facility.

Additional details on siting parking facilities and obtaining product information from various bike rack manufacturers are contained within the publication "Bike Parking for Your Business."

Bicycle Parking Ordinances

A good ordinance requires all public buildings provide bicycle-parking spaces. Sample language for communities within the planning area to consider for adoption into their local codes and zoning ordinances is as follows:

"All residential uses except single family residential and duplexes, and all non-residential uses, shall provide sufficient bicycle parking facilities consisting of not less than one (1) bicycle parking space for every twenty (20) required automobile spaces, with a minimum of two (2) bicycle parking spaces for any use."

Bike parking requirements can be implemented when there is new development or significant modifications to buildings. Site plan review, which includes verifying that bicycle parking facilities are provided, can be incorporated into the permitting process.

Land uses that attract more users, such as grocery stores, libraries and recreational facilities, usually need additional bicycle parking. These types of businesses should provide sufficient parking to accommodate current demand, yet allow room for parking expansion since more racks may be needed later.

Parking spaces that may fulfill this requirement include those where a cyclist can approach the rack and lock up quickly and easily. Racks that are complicated to use or that only hold the wheel of the bicycle, should not be considered for use within the council communities. Table 4 below illustrates recommendations for bicycle parking provisions.

Bicycle parking racks do not have to conform to standard designs and still meets bicycle-parking needs and deters bicycle theft. Racks may be incorporated into a public art or historical preservation efforts. Below are examples of non-traditional, decorative racks.

Note that a typical inverted U-shaped bicycle rack and post with metal loop racks allow two bicycles to park.

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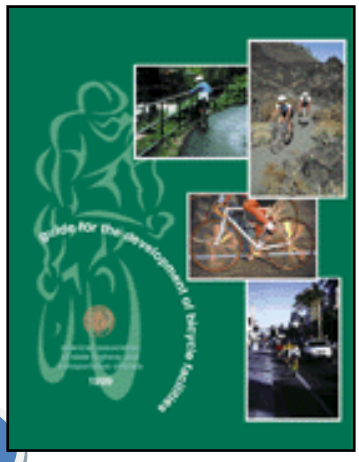
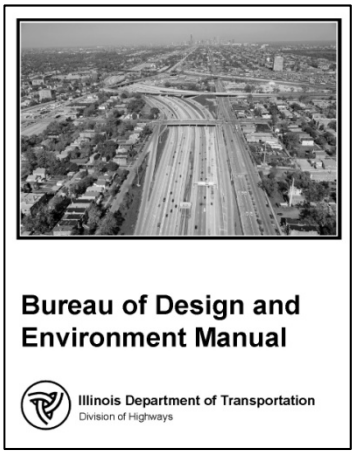
TABLE 4: Bike Parking Recommendations

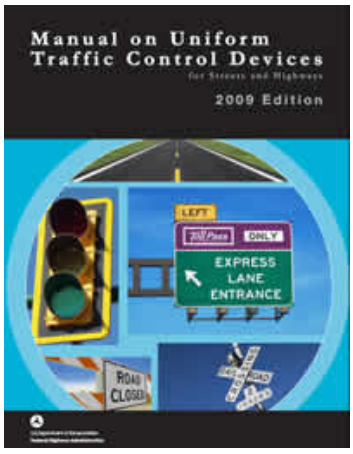
Land Use	Provision Ratio	Minimum to Provide
Commercial & Retail	1 bike parking space per every 20 automobile parking stalls	4
Office	1 per every 50,000 square foot of leasing space	2
Manufacturing	1 bike parking space per every 20 automobile parking stalls	4
Recreation Facility	1 bike parking space per every 15 automobile parking stalls	10
Multi-Family Housing	1 per every 4 units	4
Grade School	1 per every 10 students	Determined on a case by case basis
Middle and High School	1 per every 8 students	Determined on a case by case basis

BIKEWAY DESIGN REFERENCES

To assist in planning and implementing well-designed bicycle facilities, national organizations such as the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) have developed guidelines to accommodate the operating characteristics of bicycles and ensure user safety. Designers of local bicycle facilities are encouraged to follow these established guidelines and standards to promote user safety, limit liability, and qualify for state and federal funding.







The following guidelines have been used as the basis for the Bicycle Design Guidelines, with supplemental detail furnished as necessary to more easily and effectively convey specific design details and adapt them to local conditions. The following reference publications should be consulted directly for additional details:

- ***AASHTO Guide for the Development of Bicycle Facilities***
  The American Association of State Highway and Transportation Officials
  444 North Capitol Street, NW, Suite 249, Washington, DC 20001
  (800) 231-3475

- ***IDOT BDE Chapter 17: Bicycle and Pedestrian Accommodations***
  Bureau of Design and Development Manual, March 2011
  Illinois Department of Transportation, Division of Highways

- ***Selecting Roadway Design Treatments to Accommodate Bicycles***
  U.S. Department of Transportation, Federal Highway Administration
  Document #FHWA-RD-92-073
  Available through the national Bicycle/Pedestrian Clearinghouse: (800) 760-6272
  Bicycle Federation of America, 1506 21st Street NW, Suite 200, Washington DC 20036

- ***Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) 2009***
  Published by the U.S. Department of Transportation, Federal Highway Administration

- ***Traditional Neighborhood Development Street Design Guidelines***
  ITE Publication #RP-027
  Available from the Institute of Transportation Engineers
  525 School Street, SW, Suite 410, Washington, DC 20024-2797

CHAPTER 7 – ARTERIAL ROADWAY INTERSECTIONS

TABLE OF CONTENTS

INTRODUCTION

Arterial roadways in Kane and Kendall Counties may pose safety concerns and act as barriers for bicycle and pedestrian travel. They may be designed and constructed to be unfavorable for pedestrian or bicyclist movements, making it hazardous for pedestrians and bicyclists to cross at intersections or mid-block crosswalks. Arterial street conditions that pose safety concerns include: poorly timed light intervals, high traffic speeds and volumes, wide multiple-lane streets, complex automobile movements, and a low level of pedestrian infrastructure such as crosswalks of pedestrian call buttons. Exacerbating this problem, pedestrians and bicyclists frequently cross roadways wherever it is convenient and/or ignore traffic signals.

Bicycle facilities, whether they are on-street bicycle lanes or wide shoulders, or off-street facilities such as sidepaths and multi-use trails, have similar safety and crossing concerns as arterial streets. Conflicts arise because arterial streets are designed to move high volumes of traffic at high speeds, which conflicts with the bicyclists' desire to travel along these paths.

The function of arterial roadways is to move traffic between communities and activity centers and to provide a connection to expressways. Typically, significant community, retail, commercial, and industrial facilities are located on arterials to take advantage of the high visibility and connectivity. The range of Average Daily Traffic (ADT) on arterial streets is between 4,000 and 50,000 automobiles per day.

Numerous studies have established that roadway junctions are common locations for bicyclist- and pedestrian-motor vehicle crashes. The following roads have been classified as arterial roadways and are thought to be the most significant arterial roads in the KKCOM planning area:

Kane County

- Fabyan Parkway
- Kirk Road
- Randall Road
- IL 47
- IL 72 (Higgins Road)
- IL 64 (North Avenue)
- IL 25
- IL 31
- IL 38 (Roosevelt Road)
- US 20 (Lake Street)
- IL 56 (Butterfield Road)
- Orchard Road

Kendall County

- US 30
- IL 47
- US 34
- IL 71

In the future, development and growth will place additional loads on the roadway system. This will likely necessitate the expansion of roadways with more lanes, more signals, and more turning movements at intersections. The following roads are likely to be improved in the future to increase their traffic capacity; bicycle and pedestrian facilities should be included in their improvements:

Kane County
- Plank Road
- Bowes Road
- McDonald Road
- Silver Glen Road
- La Fox Road
- Dundee Road
- Jericho Road
- Big Timber Road
- Main Street
- Keslinger Road

Kendall County
- IL 126
- Orchard Road
- Eldamain Road
- Wolf Road
- Galena Road
- Plainfield Road
- Walker Road

This chapter of the Bicycle and Pedestrian Plan will accomplish the following:

- Classify arterial street crossings and describe pedestrian and bicyclist crossing issues
- Provide design guidance for intersections of bicycle facilities and arterial streets
- Provide design guidance for pedestrian facilities at arterial intersections
- Quantify standards to construct grade-separated pedestrian and bicycle crossings of arterial streets

TYPES OF ARTERIAL CROSSINGS AND THEIR COMMON PROBLEMS

The first step to address intersection safety is to organize the different types of bicycle and pedestrian crossings at arterial roads and describe the safety concerns for bicyclists and pedestrians. Common types of intersections with arterial streets include:

- Mid-block crossings of trails
- Mid-block crossings of sidewalks
- Sidepath intersections
- Bike-friendly road intersections
- Pedestrian infrastructure at roadway intersections

Mid-block trail crossings – A mid-block trail crossing occurs where a multi-use trail, which does not parallel a street, crosses a roadway away from an intersection. The location of these crossings is usually dependent on a trail's route through an abandoned railroad right-of-way,

utility right-of-way, or greenway. Since it is a multi-use trail, it should be noted that both bicyclists and pedestrians would use these crossing points.

An advantage of mid-block crossings of trails is that they are typically far enough from other junctions, which reduces unexpected motor vehicle turning movements. Ideal mid-block crossings should be at a 90 degree angle in order to reduce the crossing distance.

Problems at mid-block trail crossings include: insufficient crossing gaps/excessive delay, bad sight lines, missing curb cuts, inadequate crosswalk markings or signage (along the road or trail), and skewed crossings. Depending on roadway speeds, the gaps in traffic that allow one to cross the street can present problems.

Mid-block sidewalk crossings – Mid-block sidewalk or pedestrian crossings are typically installed to provide a crossing opportunity near major destinations, such as schools, parks, or commercial areas. Similar to mid-block trail intersections, pedestrian crossings are easier to navigate because traffic is more predictable -- it is flowing in no more than two directions.

Mid-block pedestrian crossings pose similar problems as those found in mid-block trail crossings. The biggest concern is the conflict between pedestrians and the motorist who may not be expecting pedestrians to cross at mid-block locations.

Sidepath intersections – Sidepaths are bicycle and pedestrian facilities parallel to roadways. Sidepath intersections occur at arterial streets and at any residential driveway or commercial entrance accessing the parallel road. In the Bikeway Facility Design Chapter (Chapter 6), both the advantages and disadvantages of sidepaths are described.

An advantage of sidepaths is that they remove less experienced bicyclists from the streets. Sidepaths pose concerns because of potential conflicts with intersections, side entrances and driveways, each of which may present a conflict. This is especially true if a sidepath is along a developed area. Frequently, motorists do not expect sidepath movements or do not yield to pedestrian and bicycle traffic. As described, the accident rate of sidepath-street intersections is unusually high. Sidepath users traveling in the opposite direction of traffic are 4.5 times more likely to be involved in a collision.

Bicycle-accommodating road intersections – Some arterial and non-arterial roads are good for bicycling (because of their width and/or low traffic, etc.) and are important routes for getting around town. A bike-friendly road may have any of the following bikeway facilities: bike lanes, wide curb lanes, or paved shoulders.

Typical problems encountered at these intersections include: no bike-activation at stoplights (either push-button or bike-sensitive loop detectors), excessive turn lanes, narrow approaches at the intersection, gaps to nearby connections, and conflicts with the multiple traffic movements.

Pedestrian Infrastructure at Roadway Intersections

A pedestrian's safety is endangered whenever he/she crosses a roadway. The degree of risk is dependent on the complexity and speed of vehicle movements and pedestrian traffic patterns.

Funneling pedestrian traffic to cross streets at arterial intersections has two advantages. First, there is some predictability for motorists when pedestrians cross with the proper signal cycle. Second, there are many design solutions that can easily improve pedestrian safety at intersections.

Typically, arterials are a significant challenge because of their design and nature to move high traffic volumes. At intersections, turning vehicles and the speed at which they travel is a challenge to pedestrians. A motorist's attention is primarily focused to steer the automobile on the road, not look for pedestrians crossing the street from sidewalks.

Other barriers for pedestrians crossing arterial streets may include:

- Long crossing distances
- Short signal timing
- Lack of or poorly designed curb ramps
- Faded crosswalks
- Blocked sight lines
- Lack of pedestrian signals or pedestrian actuated signals
- Lack of pedestrian medians, where appropriate and feasible
- Motorists turning right on red lights into pedestrians

TRAIL INTERSECTION DESIGN GUIDANCE

Intersection Design Factors

The type of arterial street intersection treatment for most intersections, either for a bicycle facility, multi-use facility, or a pedestrian facility, will depend upon the traffic speeds and volumes. Generally, the higher the traffic speeds and traffic volumes (defined not only as automobile traffic, but also bicycle and pedestrian traffic), the more engineering and safety devices will be necessary.

Factors such as stopping sight distance, intersection sight distance, decision sight distance, and estimated crossing time must be considered when designing intersections. These factors are briefly described below, but for a more thorough description, please refer to the AASHTO Guide for the Development of Bicycle Facilities.

Stopping Sight Distance – According to the Florida Department of Transportation (FDOT), the stopping sight distance required for either an automobile or bicyclist to stop when traveling at design speed of the roadway or trail is defined as the distance covered in the perception - reaction time plus the actual braking distance. The AASHTO's Guide for the Development of Bicycle Facilities describes methods to calculate the stopping site distance.

Intersection Sight Distance – A person must have sufficient sight distance at an intersection in order to make a safe departure for a right turn, left turn, or, especially in the case of trail users, crossing maneuver.

Decision Site Distance – Decision sight distance is the additional protection beyond the minimum afforded by stopping sight distance. According to FDOT, it is the distance required for a driver to detect an unexpected object or hazard in the roadway, recognize the hazard or its threat potential, select the appropriate speed and path, and initiate and complete the required maneuver efficiently.

Decision sight distance may also be applied to bicyclists, but differs in concept. For bicyclists, it involves providing clear sight lines that are based on the distances that approaching motor vehicles will travel in the amount of time a bicyclist takes to fully clear the intersection from a "stop- go" decision point.

Estimated Crossing Time – Estimated crossing time describes the time required for a pedestrian or bicyclists to cross at an intersection. Estimated crossing time is a function of trail user reaction time, crossing performance or speed, and the crossing width. Some generalities will allow us to quantify trail user reaction time and crossing speed to determine the crossing time.

FDOT calculates estimated crossing time for bicyclists as a complex function of trail user reaction time, mean acceleration, and bicyclist speed. An approximate measure of bicyclist crossing speed at intersections, beginning from a stop, is 5.4 feet per second, plus a 2.5 second perception-reaction time to read traffic patterns, understand them, make a decision, and begin to act.

The 2009 Manual on Uniform Traffic Control Devices (MUTCD) identifies 3.5 feet/second as a standard walking speed to calculate crossing speed for pedestrians. Designers of multi-use trail intersections are faced with accommodating the slowest users, who are typically pedestrians. Therefore, intersection design should take into consideration slower moving pedestrians who share the trail with bicyclists.

Mid-Block Trail Intersection Design

Taking into account the above factors, FDOT developed suggested guidelines for treating intersections of trails with two-lane and four-lane roadways. At each intersection, engineering judgment, based on specific location conditions, is necessary.

TABLE 5: Suggested Treatments on Two-lane Road Crossings

Two-Lane Road Crossings				
ADT / Speed	< 2,000	2,000 - 4,999	5,000 - 9,999	10,000 +
< 30 mph	Traffic calming at trail intersection	Trail STOP sign, optional traffic calming	Trail STOP sign & traffic calming	Consider traffic signal
	Roadway YIELD sign	Road YIELD or STOP, refuge island optional	Road STOP sign with refuge or traffic signal	
30 - 35 mph	Trail STOP sign, calming optional	Trail STOP sign & traffic calming	STOP signs for trail & road with refuge or traffic signal	Consider traffic signal
	Road STOP or YIELD	Road STOP sign, refuge island optional		
40 - 45 mph	Trail STOP signs, refuge island optional	Trail STOP sign with refuge island	STOP signs for trail with refuge or traffic signal	Consider traffic signal
+ 50 mph	Trail STOP signs, refuge island optional	Trail STOP signs with refuge island	Consider traffic signal	Consider traffic signal

Note: A speed table is acceptable as traffic calming solution where traffic ADT<2000 only. If ADT>2000, optimal traffic calming includes lane narrowing via refuge island or choker or another accepted method. Source: Florida Department of Transportation

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TABLE 6: Suggested Treatments on Four-lane Road Crossings

Four (or more) Lane Road Crossing			
ADT / Speed	< 9,999	10,000 - 19,999	20,000
< 35 mph	Refuge island, preferably protected	Protected refuge island or traffic signal	Traffic signal or grade separation
> 40 mph	Protected refuge island or traffic signal	Traffic signal	Traffic signal or grade separation

Source: Florida Department of Transportation

There are basic safety markings that every intersection of a trail and an arterial street should use. These features include:

- *Crosswalk striping* – Crosswalks provide visual warning to motorists that pedestrians or bicyclists may be present. Municipalities and transportation departments have experimented with several types of striping designs, such as standard crossbars, solid crossbars, zebra stripes, and ladder. Where weather permits, some communities are experimenting with crosswalks with reflectors or lights inset in the pavement. There is no conclusive evidence that alternative crosswalk striping improves pedestrian safety.

- *Curb cuts* – Curb cuts or curb ramps allow for wheelchair and non-motorized vehicle accessibility of trails or sidewalks. For trails, the width of the curb cut should be equal to that of the trail. According to ADAAG, curb ramp width for sidewalks is recommended to be 48 inches and should never be less than 36 inches wide. A curb ramp slope between 8.3 percent and 10 percent is permitted for a maximum rise of 6 inches. At sidewalks, there should be tactile materials, such as textured pavement, for the visually impaired.

- *Bike Trail Signage* – Signage is necessary for both the roadway and trail on the approach to an intersection. For motorists, this is a second visual aid to alert them that there may be non-motorists in the roadway. Typical pedestrian and trail crossings signs are yellow-green, with a universal symbol of people walking. Trail users, which typically yield to arterial roads, must be advised that the trail is interrupted and a conflict may be ahead. "STOP AHEAD" or "YIELD AHEAD" signs constructed to a pedestrian and bicyclist scale should be used for emphasis on the road or trail, placed approximately 100 feet in advance of the crossing.

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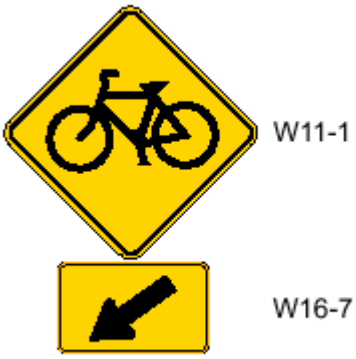
- *Roadway Signage* – For motorists, a clear message must be presented at trail crossing and pedestrian crossing locations on arterial streets in a location where that user will see it. Traditional treatments have included the bicycle crossing sign (WII-I), the pedestrian crossing sign (WIIA-2), the pedestrian crosswalk lines (double lines or zebra stripes) or flashing yellow lights at the crosswalk. These signs should be installed to alert the road user to unexpected entries into the roadway by bicyclists, and other crossing activities that might cause conflicts. An optional supplemental plaque with the legend AHEAD or XX FEET is warranted on a case-by-case basis, depending on sight distances.



Bicycle crossing sign with optional arrow indicating

  It is recommended by MUTCD that these signs be posted 250 feet from the bicycle/pedestrian crossing in urban environments and 750 feet in rural settings. Other variables to consider when designing signage schemes for this type of intersection, include right of way assignment, traffic control devices, sight distance for both bicyclists and motor vehicle operators, refuge island use, access control, and pavement marking.

- *Bollards* – Bollards prevent automobiles from accessing a trail. A typical bollard is a cement pole or a swiveling metal pole that collapses to allow maintenance vehicle access. Bollards should NEVER be placed in the travel lane or restrict bicycle trailer movements onto a trail.

- *Pavement Markings* – A trail should also have some pavement markings, such as a stop line before the sidewalk, and bars to emphasize the approaching intersection and potential conflict.

The following are some traffic calming methods that may be utilized in the design of mid-block crossings for both multi-use trails and sidewalks.

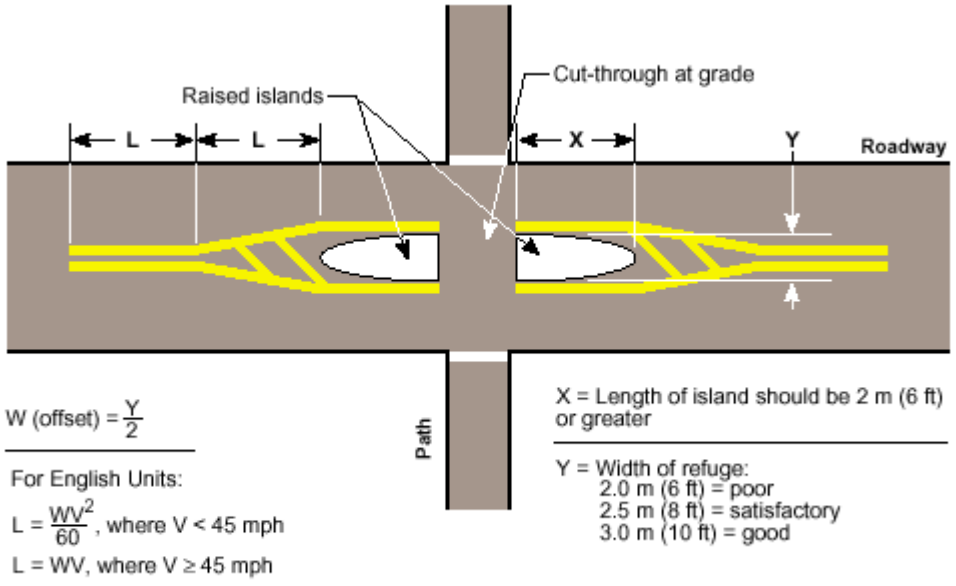
Median Refuge Islands

Median refuge islands provide a high level of pedestrian protection for a relatively low improvement cost. These islands allow for a safe area in the center of the street for pedestrians to determine if they will be able to safely cross the street. They also provide a visual alert to drivers that they are in a popular pedestrian area, and provide a refuge for pedestrians so they can cross a street one half at a time, if they prefer.

The use of median refuges significantly reduces a pedestrian's delay to cross a street. One study found that pedestrians crossing an undivided, multilane street might experience delays 10 times longer than the delay incurred crossing a street with a median.

Median refuge islands should be accessible to strollers, bicycles, and wheelchairs by providing an at grade pass-through in the center or a curb cut on both sides of the refuge. The pass-through is recommended to be at least 3 feet wide. However, a six-foot wide pass-through allows two bicyclists or wheelchairs to pass without a back up into the arterial street.

An ideal median refuge island is 8 feet wide and 20 feet long, depending on traffic volumes and speeds. However, a minimum 5-foot width and 10- foot length is both sufficient to provide a "holding space" for bicyclists and pedestrians and providing separation from automobile traffic. The minimum refuge island size is 50 square feet for urban areas and 75 square feet for rural areas with 100 square feet a desirable minimum for both areas.



Formulas for Ideal Median Refuge Design from the *AASHTO Guide for the Development of Bicycle Facilities*

Pedestrian refuge islands can be used for mid-block crossings but are also useful to improve safety at street intersections. The medians may hold traffic signals and / or pedestrian signals. Designers consider the median's ability to hold snow during storms and not impede snow removal efforts.

A frequent design for median refuges is to have a diagonal passageway on the median. This prevents a straight "pass-through" route on the median, slows the pedestrians through the refuge median, and allows them to better see and understand oncoming traffic.

Flashing Signals

Some crossing situations may warrant flashing red or yellow warning lights. Flashing signals are typically installed with a "Pedestrian Crossing" or "Trail Crossing" sign. Flashing signals

increase the visibility of crosswalks and may reduce traffic speeds, without restricting traffic flows. They are most appropriate in school zones and at major trail crossings and they can be set on a timer to flash during peak use hours.

While flashing signals provide more protection and visibility for pedestrians than just pedestrian or bicycle crossing signs at intersection approaches, the pedestrian or bicyclist must still seek gaps in traffic to cross as the automobile traffic does not typically yield a right-of-way. Therefore, flashing signals provide less protection than a pedestrian traffic signal that can be activated by pedestrians and bicyclists.

Pedestrian Traffic Signal

Pedestrian traffic signals at mid-block crossings are appropriate under certain circumstances. MUTCD states that the distance to the nearest traffic control signal along the major street cannot be less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of traffic. MUTCD describes two criteria to warrant pedestrian traffic signals:

1. The pedestrian volume crossing the major street at an intersection or mid-block location during an average day is 100 or more for each of any 4 hours, or 190 or more during any 1 hour, and

2. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a median-divided road, the requirement applies separately to each direction of vehicular traffic.

Pedestrian signal heads with push buttons or signal actuators should be included at intersections meeting the above criteria. The signal actuation (push button) mechanism should be mounted beside the trail 4 feet above the ground and accessible to both bicyclists and people in wheelchairs. Another method of activating the signal is to provide a detector loop in the trail pavement. However, since pedestrians cannot activate the loop, their use should be limited.

Sidepath Intersection Design

As described earlier, these types of crossings occur where a trail closely parallels a roadway and crosses another roadway (or driveway) near the intersection. Due to the potential multiple automobile movements on both the parallel roadway and intersecting roadway, there is a high degree of potential conflict which are unexpected by both trail users and motorists, thus reducing reaction time.

Sidepath Trail Separation Distance – The distance between the roadway and a parallel sidepath has a pronounced effect on operations. Where possible, this distance should be increased. Safety issues include:

- Turning motor vehicle approach speed to the trail;
- Stacking space between the parallel roadway and trail;
- Driver recognition of the trail;
- Trail user recognition of turning motor vehicles; and
- Trail right- of- way prioritization.

If there is not a crossing at the intersection, a parallel sidepath intersection should be set back at least 20 feet. If the sidepath crosses the street between 3 and 20 feet from the intersection, there is a significantly increased chance for collisions.

Signage – To heighten awareness on the trail, a yellow sign with black lettering warning the trail user to "Watch for Turning Vehicles" can be used. On the crossed roadway, bicycle or pedestrian advance crossing signs and crossing signs should be installed.

Control of turning vehicles – It is important to control the speed of right turning vehicles, especially when the parallel roadway has a dedicated right turn lane or where there is a large turning radius which both tend to encourage high speed turns.

Right Turn on Red – Prohibit right turn on red and motor vehicle advancement across the trail in high volume situations. Where there is a right turn only lane, a speed table in this lane in advance of the trail may be an appropriate treatment. Changing pedestrian signals to coordinate with left-turn signals (for automobile movements to intersect with the trail) is also recommended.

Crosswalk Striping – The crossing should be adequately striped to increase the intersection visibility and motorist awareness.

Bollards – Because of the proximity of motor vehicle traffic to opposing bicycle traffic, bollards are often necessary to keep motor vehicles out of shared use paths and bicyclists out of traffic lanes. Commonly, bollards are used. If improperly placed, bollards can decrease safety for the bicyclist.

Bicycle Accommodating Road Intersection Design

On-road bicycle movements through intersections should be an integral part of a roadway improvement. When practical, existing wide curb lanes should be continued through intersections to accommodate bicycle through movements. If right or left-turn bicycle movements are expected, provide adequate turn-lane widths to allow bicyclists to share the lane

with turning vehicular traffic. When an approach roadway in a rural section transitions into an urban intersection, use the criteria presented in Section 17-2.01(a) of the IDOT Bureau of Design and Environment Manual.

Bicycle lanes on an intersection approach should be continued through the intersection. Traffic-tolerant cyclists will generally mimic vehicular movements and traffic-intolerant cyclists will generally mimic pedestrian movements. Different approaches to accommodating bicycle traffic through intersections are necessary as the level of vehicular traffic and speeds through the intersection increase. Refer to IDOT DBE Manual, Chapter 17 and American Association Of State Highway And Transportation Officials (AASHTO) Greenbook for examples of intersection designs.

According to AASHTO, bike lane striping should not be installed across any pedestrian crosswalks and, in most cases, should not continue through any street intersections. If there are no painted crosswalks, the bike lane striping should stop at the near side cross street property line extended and then resume at the far side property line extended. The only exception to this caveat might be the extension of dotted guidelines through particularly complex intersections or multi-lane roundabouts. The same bike lane striping criteria apply whether parking is permitted or prohibited in the vicinity of the intersection.

PEDESTRIAN INTERSECTION DESIGN GUIDANCE

Arterial corridors usually contain prime destinations, such as job centers, commercial areas, and transit routes. Many arterial intersections are planned and constructed solely for automobiles. However, the use and presence of arterial corridors for pedestrian traffic should not be discounted. It is typically less expensive to design and construct pedestrian facilities when improving motor facilities in an intersection. Although retrofitting is usually feasible, it is more expensive and disruptive to the intersection.

This section will describe common pedestrian improvements for intersections, including low cost solutions for pedestrian safety, and two approaches to analyze pedestrian and automobile movement.

A. Common Improvements

There are several types of design solutions that can be applied to intersections, depending on sidewalk and pedestrian facilities conditions. Two basic elements should be included at every intersection: curb cuts and crosswalks. Signalized intersections should also include pedestrian signals as a basic element. Other pedestrian features or methods of traffic calming can supplement the basics to improve safety. These methods include: bulb-outs, traffic signal cycle improvement, textured crosswalks, curb radii altering, No Right Turn on Red restrictions, refuge medians, raised crosswalks, speed humps, and channeling islands.

Each of these design elements is associated with additional nuances that must be considered and/or applied prior to the implementation stage. Their basics are described below:

Bulb-outs – Bulb-outs are curb extensions at intersections that reduce roadway width curb-to-curb or curb extensions that narrow the street by widening the sidewalk or the landscaped parkway. The purpose of a bulb-out is to make pedestrian crossings easier and to slow traffic at intersections by narrowing the roadway. They effectively improve pedestrian safety by reducing the street crossing distance and improving sight distance. They may also slightly influence driver behavior by changing the appearance of the street. They can be installed either at intersections or mid-block.

Specific design depends on existing conditions. On arterial streets, curb bulb-outs are probably more appropriate for mid-block crossings, as they would impede turning movements on the arterial street at intersections.

Crosswalks – Crosswalks create an awareness of the possible presence of pedestrians in the roadway. It gives them the right-of-way to cross during the appropriate signal cycle. Crosswalk design is discussed in the "mid-block trail crossing" section of this chapter. Crosswalk locations should have the following characteristics:

- They should be clearly identified and easily understood by all roadway users
- Should be highly visible to motorists and pedestrians
- Crossing frequency should be appropriate
- Reduced points of conflict
- Adequate connectivity to adjacent path/sidewalk system
- The crossing should be free of obstacles and/or barriers

Curb cuts or Curb Ramps – Curb cuts allow pedestrian crossings to be wheelchair accessible and improve crossing conditions. Curb cut design for slope and width is discussed in the "mid-block trail crossing" section of this chapter. The cross slope should be a maximum of 2% and a 48-inch flat landing beyond the curb ramp is recommended. For more information on placement of curb cuts and curb ramp design considerations, please refer to Designing Sidewalks and Trails for Access, Part II: Best Practices Design Guide by the U.S. Department of Transportation.

Curb Radii Angle Altering – Changing curb radii to be as close to 90 degrees as possible results in slowing down right turning motor vehicles. This presents a more predictable automobile movement for pedestrians and improves their ability to cross streets at intersections. Evidence of automobiles, buses, or trucks driving over a curb indicates a poor candidate for altering the curb radii, as the turning angle is already too small for these vehicular movements. Where truck

traffic is present, a tight corner radius may require these vehicles to use additional care in making such a turn, potentially slowing traffic or causing delays.

Curb radius changes are appropriate for a limited number of intersections. Before selecting a site to change curb radii, visit the sites to determine its applicability. Check crash records, perform speed studies of cars making turns, look at the curbs to see if trucks or buses are driving over them, and ask pedestrians if they feel safe. Curb radii design recommendations include:

- 10 feet to 15 feet should be used where residential streets intersect other residential streets and arterial streets.
- 20 feet or less should be used at the intersections of arterial streets that are not bus or truck routes.
- 25 feet to 30 feet or less should be used at the intersections of arterial streets that are bus and/or truck routes. (City of Seattle Engineering Department)

No Right Turn on Red – The Institute of Transportation Engineers has taken the position that no overall significant safety detriments occur with right-turn-on-red. However, many traffic professional and interest groups disagree and believe that right turn on red increases pedestrian/ motorist conflicts. Typically the motorist is searching to the left while the pedestrian is being directed by a pedestrian "WALK" signal to proceed. The pedestrian falsely assumes that the motorist will comply with the law and yield to them.

No turn on red restrictions should be made on a case-by-case basis and be sensitive to special problems of pedestrian conflicts. Pedestrian volumes should not be the only criteria for their installation.

The MUTCD Manual states that a No Right Turn on Red sign should be considered when an engineering study finds one or more of the following conditions exists:

- Inadequate sight distance to vehicles approaching from the left (or right).
- Geometric or operational characteristics of the intersection that might result in unexpected conflicts.
- An exclusive pedestrian phase.
- An unacceptable number of pedestrian conflicts with right-turn-on-red maneuvers, especially involving children, older pedestrians, or persons with disabilities.
- More than three right-turn-on-red accidents in a 12-month period have been reported for the particular approach.

MUTCD details the proper placement of No Right Turn on Red signs.

On-Street Parking – On-street parking creates a sense of activity, and some jurisdictions encourage it for this reason. However, in some instances, on-street parking also creates sight line restrictions for both pedestrians and motorists. On-street parking should be at least 60 feet from the approach and 30 feet from the departure of a signalized intersection. (FDOT)

Pedestrian Signals – Pedestrian signals are discussed earlier in this chapter under "mid-block trail crossings." Every pedestrian crossing of an arterial street should have a pedestrian signal head and a push button activator. Without a push button activator, pedestrians may become impatient waiting for a signal to change and attempt to cross the street into on-coming traffic. Crosswalk design is discussed in the "mid-block trail crossing" section of this chapter.

Raised Crosswalks & Speed Humps – Raised crosswalks are a design tool that raises a crosswalk above the typical level of the street at the point of a crossing. They are outfitted with crosswalk markings and signage to channel pedestrian crossings, providing pedestrians with a level street crossing. Raised crosswalks are used to lower traffic speeds at pedestrian crossing points. Raised crosswalks lift the crosswalk height between 3 inches and 4.5 inches and require roadway ramping similar to that of speed humps.

Speed humps are rounded raised areas placed across the road. They are also known as road humps, flat tops, and undulations. It is a traffic management device used for lowering the speed of motor vehicles along specific street sections. A typical speed hump is a 22-foot long raised section of the road and also known as a "Flat Top." A flat top is comprised of two 6-foot long ramps and a 10-foot long top. The hump height may vary from just 3 inches to 4.5 inches.

Speed humps are typically not appropriate for arterial streets, due to traffic volumes and safety concerns for motorists.

Disadvantages of both treatments are: increases in emergency response times and slowing an emergency vehicles and buses, potential drainage problems, increase in noise, and increases in maintenance costs. Raised crosswalks are typically not appropriate for arterial streets, due to traffic volumes and safety concerns for motorists.

Refuge Medians – Refuge median islands design was previously described in the "mid-block trail crossing" section of this chapter. They may also be installed at intersections and, if necessary, contain a pedestrian signal head, pedestrian actuation button, and traffic signal for motorized traffic.

Textured & Painted Crosswalks – Textured and painted crosswalks create a higher awareness of pedestrian crossing areas to motorists than traditionally painted crosswalks. Motorists sense that the pavement is different and tend to slow down. Textured crosswalks are typically made

with bricks, paving stones, or a layer of a different paving material. Colored crosswalks are typically made with colored asphalt or colored and textured paving material.

Some governments have made a significant investment in downtown crosswalks with the installation of colored paving stones to delineate the intersection and crosswalks. If paving stones are used, special design and construction designs are needed to eliminate the movement of the stones or bricks. Other crosswalk materials may be noisy, not friendly to cyclists, pedestrians, wheelchairs or snow blades.

Traffic Signal Cycles – An inexpensive way of providing pedestrians additional time to cross an intersection is to alter the signal timing to increase signal cycles. This is also known as a "leading pedestrian interval." However, this may have an adverse effect on traffic or motorist safety.

Channeling islands – A raised island that forces traffic in a particular direction, such as right-turn-only, narrowing pavement, and channeling traffic promotes safe, more predictable automobile movements, which will assist pedestrians to cross a street.

B. Intersection Analysis Methods

There are two methods to analyze pedestrian and automobile movements at intersections and plan for improvements. First, intersections can be scored based on the pedestrian accessibility or a potential conflict with automobile traffic. This allows planners and engineers to compare the relative safety at intersections and prioritize intersections for improvement. Second, intersection analysis can be analyzed in a hierarchical manner, factoring in traffic speeds and volumes. Both of these methods can work together to determine what improvements may be most appropriate to improve pedestrian safety at arterial street crossings.

Scoring an intersection for pedestrian safety – In prioritizing improvements for pedestrians at intersections, most governing bodies take a complaint-based or accident based perspective. If no complaint has been fielded or no accident occurs, officials may not be aware that there is a problem. Municipalities, however, can be pro-active and inventory conditions at existing arterial intersections to rank and prioritize improvements. A ranking system used by the City of Portland, Oregon, which is known as a leader in bicycle planning, used the following factors as criteria to score, rank and prioritize intersection improvements for pedestrians (Table 7).

TABLE 7: Sample Rating Scale -- Pedestrian Crossings of Arterial Streets

Criteria	Highest Score	Scoring Strategy	Description
Speed	30	2 points for every mph over 30 mph	Average daily speed during non-peak hours, emphasizing speeds over 30 mph.
Volume	25	1.667 points per 1000 ADT	Volume based on the most current ADT volumes.
Density	20	4 points per 100 dwelling units per mile	Based upon adjacent zoning, with both single and multiple-family residential to be factored
Sidewalks	0 or 9	If no sidewalks, 9 points	Street segments lacking continuous sidewalk on both sides of the street segment
School Crossing	7	3 points if school within 3 blocks, 7 points if children cross to get to an elementary school	If school is in the vicinity. Children can be the most common pedestrians
Pedestrian Generator	5	5 points if generators exist	Land uses such as parks, retail centers, transit, and institutional uses generate pedestrians
Street Width	4	If over 40 feet wide, assign 4 points	More lanes of traffic requires more crossing time
TOTAL POSSIBLE POINTS	100	Higher point total indicates a higher priority.	

This ranking scale can be modified to serve the needs of a municipality or change the emphasis, for example, in creating safe school crossing zones. Other factors that could be included to evaluate and rank pedestrian crossings are described below:

- **Lighting** – If there is poor lighting in an intersection, pedestrians or bicyclists may not be visible during non-daylight hours. This decreases reaction time, especially if speed limits are high.

- **Topography** – Crossings near curves or hills may limit sight lines for both pedestrians and automobiles. Both contribute to reduced reaction time and increase the possibility for accidents.

- **Accidents** – Traffic accidents are typically functions of traffic volume and speed, both factors already incorporated into our analysis. However, if there is good pedestrian accident data, this could strengthen the findings of other components of the analysis.

- **Percent Trucks** – Trucks may be more dangerous to pedestrians because of the increased stopping time required and poor driver site lines.

- **Proximity to Public Transportation** – It may be reasoned that there are more pedestrians near transit centers, such as bus stops or Metra Stations. These locations could also be included in a pedestrian attractor category.

- **Streetscape** – A factor for streetscape would allow for some point value for streets with an unusually high number of signs or scenic vistas. These items may distract drivers from noticing pedestrians. This factor may be subjective and difficult to quantify.

Providing adequate crossing opportunities for pedestrians and bicyclists is as critical of an issue as providing connecting routes for vehicular traffic. The primary issue here is "opportunity." Failure to provide crossing opportunities may not only force a pedestrian to cross at non-designated locations but may also discourage walking. Designing responsible crossing facilities for pedestrians and bicyclists can certainly help to neutralize this tendency.

However, opportunities should not be based solely on whether there is demand for the crossing, but should also consider whether there are adequate crossing intervals along a particular roadway. While it could be argued that these intervals are subjective, adequate intervals are typically determined based on locations along the roadway where the safety of pedestrians, bicyclists and motorists is equalized. For example, providing a crossing at a location where sight lines are poor and stopping distance is prohibitive might not be the best candidate for a crosswalk.

The identification of potential crossing candidates should also factor in its relationship to potential traffic generators, such as schools, shopping centers or a transit station. From the perspective of how an agency should prioritize the establishment of crossings, such generators should be given first consideration, for obvious reasons. In some instances however, determining exactly where destinations exist is not completely obvious. To help determine where crossings may be needed, a public outreach program would be beneficial and should be explored.
Once the locations for crossings have been determined, there are a variety of crossing treatments that are available that should be investigated for use to improve safety at the new crossing. Table 8 lists some of the fundamental crossing treatments that may be considered:

TABLE 8: Intersection Crossing Treatments

Crossing Treatment	When may it be appropriate?	When is it not?	Design Recommendations
Median Refuge Islands Crossing (Refuge) Islands	Typically, a roadway width ≥ 60' Vehicular speed and number of lanes pose crossing challenge to pedestrian Signalized & unsignalized intersections Locations where a shorter crossing distance would greatly benefit a user Roadways with speeds over 40 mph Adjacent to right-turn slip lanes	ROW constraints Undesirable crossing location	8 foot width desired, 4 foot minimum Raised curb with cut-through at pavement level or curb ramps for wheelchair Warning of the island's presence through illumination, reflectors, or markings
Curb Extensions Curb Bulb-outs	Low speed, unsignalized intersections or arterial streets with curb parking Improve line of sight at intersections of at mid-block crossing locations Supplement parking restrictions at crosswalk areas	When there are high volumes of stopping buses or high turning volumes of large vehicles.	Inclusion of curb cuts at crossing No landscaping which reduces sight lines
Crosswalk Markings	ADT levels ≤ 1,000 = Marked Crosswalk All signalized intersections	Uncontrolled environment when speeds exceed 40 mph on road with 3+ lanes ADT levels ≥ 12,000 Unsignalized Intersections	2' wide Zebra Stripes Dual 1' wide lines Accompanied by crossing sign

Return to the toolkit

Mid-block Crossings	Observed demand Mid-block attractor	When traffic levels are such that providing a mid-block crossing creates a potential conflict area	Include crosswalk standards with signage
Pedestrian Signal Heads	All signalized intersections	Non-signaled intersections Undesirable crossing location	If deaf community, include audio warning Mount on existing poles
Pedestrian Call Buttons	Within crossing islands where roadway width ≥ 80'	Observed pedestrian levels are low, & fixed-time pedestrian signal cause delays to vehicular traffic High ped traffic areas	Accessible to people with wheelchairs Sign indicating it exists
Curb Ramps and Landings	Every designated crossing location Landings must be provided at ramped crossing islands		Texturized for visually impaired Slope no greater than 1:20, unless rise less than 6 inches No "diagonal" curb cuts

GRADE-SEPARATED CROSSINGS

The most visible way to fix a "dangerous" arterial crossing in the public perception is to construct an underpass or a bridge overpass. However, the cost to design and construct a grade-separated crossing can be prohibitively high. In addition, there are other concerns that affect their feasibility, such as available right-of-way, user demand, maintaining street sight lines, connectivity to pedestrian or bicycle facilities, and proximity to pedestrian or bicyclist destinations.

Factors that impact the need for a grade-separated crossing include street widths, traffic volume and speed of automobiles, pedestrians, and bicyclists, proximity to signalized intersections, and pedestrian destinations. School zones or "Safe Routes to School" areas receive special consideration for these facilities due to their peak volumes of pedestrians around school hours. However, there is no national standard that mandates construction of a grade-separated crossing for bicycle or pedestrian facilities, except to provide pedestrian facilities over interstate highways.

CRITERIA USED TO EVALUATE BIKE/PED CROSSING ALTERNATIVES

As previously discussed, the Florida Department of Transportation (FDOT) uses a general chart to determine which pedestrian facilities may be needed at arterial street crossings. As previously stated in Table 8, a grade-separated crossing is justified on 4 (or more) lane arterial streets when ADT is over 20,000 automobiles per day.

The City of Madison, Wisconsin, has developed a "Pedestrian/Bicycle Grade Separation Worksheet" to evaluate the need for grade-separated crossings. They created this form by taking the various information in Design and Safety of Pedestrian Facilities, a Proposed Recommended Practice of the Institute of Transportation Engineers, and organized it in a tabular form.

To evaluate and prioritize each design alternative, each design option and potential location must be thoroughly analyzed. The following is a list of the criteria used in this evaluation, as well as a description of each associated sub-element.

1. Connectivity. Connectivity to other sidewalks and trails is paramount in ranking the various alternatives for a pedestrian crossing location. This includes evaluating the proximity to the nearest intersection and connections to schools and/or colleges. Also involved in this criterion is whether the facility would contribute to a reduction of bicycle and pedestrian traffic at other intersection(s).

2. Aesthetics. The aesthetics of the structure itself and its connecting ramps are integral in obtaining local support and assuring usage of the facility. Without a pleasing

design, the facility is apt to encourage local indifference and/or foster the "Not In My Backyard" (NIMBY) mentality from nearby residents or businesses.

3. Costs. The cost to construct or make improvements to a facility is an important criterion when ranking design alternatives. This includes taking into consideration the construction costs, maintenance costs and funding availability. Since maintenance costs do not fluctuate much for the overpasses or underpasses proposed for the site and since funding availability from other sources is not affected whether an overpass or underpass is constructed, the predominant criterion is construction costs.

4. Construction-related problems. The design of the facility can either hamper or facilitate construction. It is hopeful that the construction staging of a well-designed facility will result in minimal disruption to roadway users. This should apply during both construction and regular operation of the roadway. Also given consideration are the affects of a structure on motorists' safety, difficulty level to construct a facility, as well as the ease of meeting and obtaining the requisite number of construction permits.

5. Consistency with local and regional plans. The location of the facility must be consistent with local and regional plans. Also, the location and design must be consistent with future roadway modifications. Similarly, the facility must accommodate the projected demand for both local and regional usage.

6. Ability to safely serve users. The facility must be able to safely serve both children and adult pedestrians and cyclists. If the facility is not perceived as safe, people will be more likely to attempt crossing the intersection using another method, thus rendering it unsatisfactory.

Minimum Criteria Requirements that Support Viable Alternatives

Among the criteria discussed above, there are three outstanding criteria that will ultimately determine the viability of a design alternative. Unless a design alternative can meet each of these criteria, a proposed alternative really will not generate the usage or local support it needs to be a success. Listed below, in order of priority, are the three most critical criteria.

1. Connectivity - This criterion ensures that users will be provided reasonable connectivity. Hence, users can be assured that they will not be required to travel unreasonably lengthy distances in order to cross a roadway.
2. Aesthetics - This criterion ensures the facility will be aesthetically pleasing and will garner local support.
3. Costs - This criterion ensures that costs to build a particular alternative will be reasonable.

GRADE-SEPARATED CROSSING DESIGN GUIDANCE

There are a number of design considerations when evaluating improvements to a grade-separated crossing. Poor design and placement discourages their use, and may not alleviate pedestrian crossing problems.

Listed below is a summary of the design characteristics associated with both overpasses and underpasses. These design characteristics will eventually dictate the type of facility improvements warranted by use, topography, and costs.

Guidance on overpass and underpass design is available from a number of sources, but primarily the American Association of State Highway Transportation Official's (AASHTO) Guide for the Development of Bicycle Facilities, IDOT's Bureau of Design and Environment Manual and Rail-To-Trails Conservancy's (RTC) Trails for the Twenty-First Century, Planning, Design and Management Manual for Multi-Use Trails. The AASHTO guide and the RTC manual both represent the national standards for bikeway planning and construction. The IDOT manual incorporates the guidance from AASHTO and RTC and adapts it for Illinois.

A. Overpass Design Characteristics

Bridge Width – The guidance suggests the width of the structure should be the same as the approach paved for the shared use path, plus a minimum two-foot wide clear area on either side of the structure. This additional width provides a minimum horizontal 'shy' distance from the railing or barrier, hence providing needed maneuvering space to avoid conflicts between pedestrians and cyclists. Since the structure would serve as a connecting facility likely not serving more than 100 users per peak hour, the approaching path could be as narrow as 8', although 10' is more reasonable. Assuming the minimum width, the structure should provide 12' of width between the hand-railings. If maintenance and/or emergency vehicles need access to the structure, as they would in a rural area, vertical and width clearances need to provide for that access since many of these vehicles measure 9' in height and 9' in width.

Ramp Lengths / Approaches – IDOT standards for pedestrian structures over Strategic Regional Arterials(SRA) have a minimum of 17'3"clearance. Assuming an additional structural depth of 18", the height of any pedestrian bridge deck is nearly 19 feet. To comply with the 1990 Americans with Disability Act, the slope of the approach to the bridge should not exceed a range of 5% to 8%. If it exceeds 5%, ADA allows a maximum 8% ramp angle, as long as the ramp is combined with a 5-foot long level platform (for resting) at 30' intervals. This slope requirement dictates ramps need to be between 270' and 380'at each end of the structure.

Clear Zones Requirements – When vehicle speeds are over 55 mph, IDOT requires that hazardous objects be set back from the edge of roadways with shoulders by a minimum of 30-

feet "clear zone." If the roadway has curb and gutter, the required clear zone is 1.5 feet. The American Railway Engineering and Maintenance-of-Way Association (AREMA) has prepared standards for pedestrian structures spanning railroad tracks. The minimum vertical clearance for pedestrian bridges is 23.5 feet. This allows vertical clearance of double-decked railcars.

Surface – While many pedestrian bridges are supplied with timber decks, IDOT may require a concrete deck. This decking has many advantages and the additional cost is minimal and is therefore recommended. Advantages of concrete decking include durability, better traction, better wear, and easier maintenance.

Railings and Fencing – On overpasses, AASHTO, in the 1999 version of their bike guide, reduced the required pedestrian bridge railing height to be a minimum of 3'6". IDOT, however, has not adopted this reduced height and continues to require a bicycle bridge railing height of 4'6"on the structure. IDOT has the discretion to require a higher safety fence in areas where there is a history of pedestrians throwing items on the roadway below.

Effects on Traffic Signals – The location and design of an overpass and approaches should avoid the obstruction of motorists' view of traffic signals. This requirement has implications on either overpass location or height (or both). Both IDOT and AASHTO's A Policy on the Geometric Design of Highways and Streets follow the design guidance that a driver must be able to see the signal from a distance of 625 feet from the intersection.

Right-of-Way (ROW) Constraints – Depending on the location, ROW constraints may be problematic for trail users, utility companies, local roadway traffic, and the like. Therefore, the location, design, construction and maintenance costs should be carefully considered when analyzing usage and safety factors.

Advantages and Disadvantages of Overpasses – Overpasses are generally perceived as less threatening and usually safer than underpasses. However, they can be unsightly and require longer access ramps and approaches. If located too far out of the traveled path or 'desire line', trail users may ignore overpasses, finding it quicker to simply cross the roadway at grade.

B. Underpass Characteristics

Advantages and Disadvantages of Underpasses – The main advantage is that underpasses often reduce approach lengths, thus reducing the amount of ROW required and improving connectivity and usage. The disadvantages include posing security problems due to reduced visibility, and collecting trash and graffiti.

Underpass Width and Height – Width and height design considerations for underpasses are generally very similar to overpasses. All design information dictates the minimum width as the

same as the approach path, with a desired additional width of 2' on both sides for a clear zone. This additional width, particularly in underpasses is helpful to improve the users' sense of security. Overhead clearance is 8' minimum, with additional height as required for any vehicles that might need to use the facility. As with underpass width, overhead clearance is important for a sense of security. Guidance from Rails-to-Trails Conservancy suggests that for underpasses exceeding 100 feet in length, larger openings (minimum 10 feet high and 14 feet wide) should be provided to enhance the users' sense of security.

In addition, the alignment of the approaching path should provide a clear view through the structure. On long structures, such as those under multi-lane highways, a shaft opening at the median is suggested to providing natural light and ventilation.

Clear Zones Requirements – While clear zone requirements would not be as much of an issue with underpasses, the opening created by the ramps would have to be protected by a barrier, such as a guardrail.

Surface and Drainage Issues – The recommended minimum pavement cross slope of 2 percent provides adequate drainage. Sloping in one direction instead of crowning is preferred since it usually simplifies the drainage as well as surface construction. A smooth surface is essential to prevent water from ponding and ice forming.

Ramp Length / Approaches – Like overpasses, there are basically two configurations of approach ramps. Both meet the 1990 American with Disabilities standards, as well as AASHTO. The shortest ramp has a run/rise of 12:1, provides a 5-foot landing/rest area for every 30 feet of ramp length and has a minimum ramp length of 168 feet. The longer ramp has no landings, needs a 20:1 run/rise and has a minimum ramp length of 380 feet.

ROW Constraints – ROW constraints are infrequent since the structure is usually constructed within the roadway ROW. However, conflicts with utilities may occur since many drainage systems and electrical utilities are usually located along roadway right-of-way.

Lighting – Fixed source lighting can improve visibility within an underpass and should be considered especially when nighttime security is an issue. Horizontal illumination levels of 5 lux to 22 lux should be considered. Vandal-proof lights, such as Lexan enclosed lights, are recommended, despite their higher initial cost.

CHAPTER 8 – WAY-FINDING

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INTRODUCTION

The existence of way-finding signage on trails is an important amenity to trail users. Signage increases comfort on trails, assists trail navigation, warns of approaching roadway crossings, and guides users through diverse environments. Its purpose is to direct people and provide information about destinations, directions, and/or distances. When applied on a regional level, way-finding can link communities and provide consistent visual indicators to direct bicyclists to their destinations along the route of their choice.

Way-finding signage can achieve public objectives, such as promotion of community's attractions, education, mile marking, and directional guidance.

A good way-finding system functions to achieve the following purposes:

- Help people find destinations from all travel modes (such as driving, Metra trains, Pace buses, walking, and biking).
- Establish clear pathways through the use of signs, maps and other landmarks to direct the user from one point to another.
- Carry messages that are user-friendly and understandable, such as safety messages, welcoming people to a location, identifying nearby services, and measuring distances. If signs are poorly designed, users may get lost.

People are the single most important component in developing a way-finding strategy. By identifying user patterns and destinations, way-finding users understand how the street or trail system operates and how to move through spaces and get directed to their destinations. In designing a wayfinding strategy or system, the following questions need to be considered:

- Where are the facility users going?
- What do the users or visitors want to see and hear?
- Is the goal navigation, directional information, orientation, location information, or interpretation?
- Who are the people who are going to use the way-finding system?
- Is a clear message being sent by the signage?

OBJECTIVES OF WAYFINDING

There are three general objectives in a way-finding signage system. When determining sign locations and messages, achieving these objectives should guide the way-finding plan.

1. *Get people to the paths or trails*
   Promote the trail system by linking people from the community to the neighborhoods. This promotes the trail system as both a destination to enjoy and a transportation route.

2. *Warn motorists that there may be pedestrians or bicycles on the roadway*
   Use cautionary and safety messages to increase motorist's awareness of pedestrians and bicyclists. Walking and bicycling are an important component of the transportation system and should be respected by other modes of transportation. However, since bicyclists are more vulnerable to injury in a collision with an automobile, motorists should pay particular attention to their presence and safety.

3. *Inform people how to get around the network*
   Guide bicyclists and pedestrians through the trail network, assisting their decision-making ability at intersections and decision points. Show a route or trail's role in larger network visually through maps. Utilizing a sign hierarchy can emphasize certain types of messages.

TYPES OF TRAIL WAY-FINDING

TABLE 9: Trail Way-Finding Types

Sign Type	Brief Description	Idea Application / Location
Primary Map /Directional Graphics	Large display to orient user through maps and location information.	At trailheads or near major destinations.
Primary Route Directional	Guide users. Destination information - name, distance & direction	At decision points or intersections.
Secondary Route Directional	Identify bike routes and warn motorists of presence of bicyclists on streets	On-street routes to regional paths.
Welcome signs	Introduce destination and describe amenities with symbols.	Trail heads, parks, & recreational facilities.
Interpretive Kiosks	Educational information. Guidance information.	High visibility areas & destinations.
Cautionary & Regulatory Sign	Warn of hazards; describe trail conditions, rules of trail.	Intersections & trailheads.

1. **Primary Map /Directional Graphics**
   This is a primary sign type that contains an overview of a trail system and an enlarged section map with location information. This sign is designed to educate the viewer of the surrounding community and trail system. This sign type should be located on off-street bicycle paths at primary intersection points. They should be set back from both vehicular traffic and bicycle traffic to reduce potential congestion or conflict. This type of sign should be accompanied with a "Primary Route Directional" and is often used as a part of an interpretive kiosk.

   Enlarged maps orient users allowing them to make decisions and follow progress on the trail. Consistency is key to effective use of maps. By presenting the user with one consistent format, even when maps of varying scales and detail are required, mapping reinforces location recognition and orients the viewer.

2. **Primary Route Directional**
   This sign type is used to designate a route as accessible to non-motorized vehicles, such as bicycles, as well as give both directional and text messages. The location for this type of sign should be at intersections where bicycle routes change directions.

   Primary Route Directional signs can also describe distances to destinations, such as other trails, trail heads, major intersections, cities and major recreational facilities, and should be located at regular intervals. These allow trail users to gauge the relative distance to a location and make a decision if they wish to continue. No more than three destinations should be listed on each sign. On the regional trail system, these signs serve two purposes. First, they direct the public to other bicycle routes outside the system. Second, they give street names, trail names, mileage to points of interest, and other navigational information.

3. **Secondary Route Directional**
   This type of sign is placed along on-street routes. The standard green BIKE ROUTE sign (right) is an example of a Secondary Route Directional. Using signs to identify bike routes to cyclists and motorists raises the awareness of the bicycle network and alert drivers of the presence of cyclists on the street. For these signs to be more functional, supplemental destination plates and directional arrows should always be placed beneath them when located along routes leading to high demand destinations (e.g., "To Downtown", "To Library", etc.).

   Roadway conditions such as adequate pavement width, drainage grates, railroad crossings, pavement smoothness, roadwork schedules, and signal responsiveness to bicycles always should be considered before a roadway is identified as a bicycle route.

Bicycle route signing should not end at a barrier; rather, provide information signing to direct the bicyclist around the barrier.

This is a relatively low-cost technique to expand a region's bicycle facility. In guiding a bicyclist along a route, care must be taken to provide direct and continuous routes connecting to destinations. However, a bicycle route can be relatively short if providing a connection to other bicycle facilities.

MUTCD recommends BIKE ROUTE signs at decision points along designated bicycle routes, including signs informing of route direction changes and confirmation signs for route direction, distance, and destination. BIKE ROUTE signs should be repeated at regular intervals to ensure that bicyclists entering from side streets know that they are on a bicycle route.

In Vancouver, Canada, bicycle route signs are placed approximately every third block along a bikeway. In particular, signs and pavement markings are installed where the bike route turns onto another street, intersects another bikeway, or intersects an arterial street. In urban areas, signs typically would be placed every 500 m (approximately every 1/4 mile), at all turns, and at major signalized intersections.

A signed bicycle route is generally targeted towards the average adult bicyclist. More advanced riders are generally able to assess and select their route.

4. **Welcome signs**
   A welcome sign introduces a user to a trail or destination, such as a city or park. A trail sign, for example, should provide an explanation of the trail and area, orientation information, and rules of the trail. The welcome sign's design may include architectural features, be incorporated with landscaping, or have international symbols indicating available services. If it is a trailhead sign, it should include the name of the managing agency (such as the Kane County Forest Preserve District).

5. **Interpretive Kiosks**
   Interpretive signs provide educational information about the built or natural environment. A principle of interpretation is to provide information that is "not instruction, but provocation." An interpretive plan, in part, can implement methods and tools to achieve objectives.

   Part of the draw to a trail is to gain an understanding of the environment through which it passes. Many trails will offer the opportunity to educate the user on various aspects of the landscape, including native plants and animals, geologic history, local

history, and local economy. The following guidelines offer some general suggestions regarding interpretive facilities.

- Maps on interpretive signage should use graphics or international symbols to be understandable to all ages of users. Symbols should be used to represent locations of path amenities, such as restrooms, water fountains, automobile parking lots, and picnic areas.
- Consideration should be given to providing interpretive information in a format that is accessible to people with vision impairments and people with limited English skills. This may include providing objects that can be examined or manipulated. An example may include seeds, leafs, or flowers to describe native flora.
- Interpretive facilities should be placed wherever there is a significant cultural, historical, or natural phenomenon or where there is sufficient space.

They can revolve around a central theme (such as along a historic trail) or stand individually to describe, for example, flora or fauna. Questions that may help to develop interpretive objectives are:

- What do we want to communicate to visitors?
- What do the visitors want to see and hear?
- To whom or which age group do we aim our information?
- How can an interpretive program make a change in a visitor?

One-way communication through signs, pamphlets, or publications depends on a visitor's willingness to read. The written message needs to be brief; an average person will only stand and read a sign for 1 1/2 minutes. A common pitfall in way-finding signage is to overwhelm or bombard visitors with too much information at one time.

Compared to a visitor center or personal services requiring staff, interpretive signage is relatively inexpensive to build and maintain. They can easily be changed or replaced if the panels are made with posters or the managing agency has the graphic files in a reproducible electronic format. However, careful attention needs to be paid to its maintenance. Interpretive signage can weather or be subject to vandalism if in isolated locations.

6. **Cautionary & Regulatory Sign.**
Cautionary signs warn trail users of hazards or conditions that may interrupt trail movements. They may caution users about upcoming roadway crossings, steep grades,

blind curves, cross slope, surface, clear trail width; slippery trail surfaces on bridges, and obstacle height and other potential trail hazards.

This allows users to make more informed decisions about which trails best meet their needs and abilities. For example, a wheelchair user may be able to travel over very steep grades provided the trail is at least 36 inches wide. Learning this information at the trailhead will help this user avoid the potential frustration and danger of having to turn back if the trail becomes too narrow.

Regulatory signs tell the "rules of the trail" by prohibiting certain uses (such as equestrians or motorized vehicles) or controlling direction of travel.

WAY-FINDING BEST-PRACTICES AND DESIGN

Way-finding strategies and systems do not have to be complicated or overwhelm users with information. Users best respond to simple, clear messages. It is not difficult to recognize when way-finding fails or is absent; people get lost or end up at the wrong destination. It is very important to pay attention not only to the content of proposed signage, but their placement and design.

The following best practice considerations should be factored into way-finding:

- Optimal Sign Location
- Sign Frequency
- General Design
- Message & Content
- Placement Guidelines
- Regulatory Signs
- Best Practices – Vancouver Case Study
- References

Optimal Sign Location

The inclusion of signage in a trail project should be planned from the onset, but each project may be vastly different, and signage should be considered on a case-by-case basis. The following guidelines relate to the general placement and design of trail signage:

- Signs should be placed where they will be clearly visible. Placement is dependent on the sight lines (relative to user speed) of each trail.
- Signs should be placed at a constant distance from the trail edge, 3 feet 6 inches is preferred.
- For directional signs, lettering should not be less than two inches in height.
- Do not use text on regulatory or cautionary signs unless necessary.
- Multiple signs can be mounted on the same post, but the top sign should have the primary message.

Way-finding signs should be placed at *high traffic areas and decision points.* By doing this, signage not only guides users to destinations, but also invites people to explore nearby neighborhoods and business districts. Decision points are where the navigator must make a wayfinding decision (for example, whether to continue along the current route or to change direction). Decision points may include trailheads, street intersections, and trail intersections.

When determining sign location placement, one should ask, *"should a sign be placed here?"* Signs have navigational information that is authoritative and unambiguous. If the cost of making a wrong choice is high for the navigator or insufficient information or landmarks are available at the decision point for the navigator to make the correct choice, a sign is necessary.

Sign Frequency

Periodic way-finding signs at regular, predictable intervals are recommended. This may be in the form of mileage markers and/or destination signs. These ensure users of proper guidance and instill a sense of security to those unfamiliar with the trail. Intervals no greater than one-half mile for destination, direction, and mile marking signs are recommended.

However, providing too much signage can be confusing or even considered visual pollution. Avoid placing too much signage along a trail. Effective programs achieve the greatest impact with the fewest number of signs. Careful attention to the development of a hierarchy of sign types that communicate through their message character, location and overall appearance creates a system that saves on hardware costs and maintenance and best serves the user and owner.

Design

All types of signs can be constructed in a wide array of support material, styles, general designs, text fonts, and colors. Selection of a material depends on the size of the information to convey, available funds, and planned cost of maintenance or replacement.

In deciding on material for the panel, consider long-term durability, permanence, maintenance, vandalism risk, cost, and color and graphic needs. Design items to avoid include:

- billboard appearance
- use of plywood sheet
- perfectly square panels and rectangular shapes are more visually appealing
- materials that produce glares

For certain types of signs, like regulatory and safety-oriented signs, MUTCD or state regulations may limit the color, size, and posting location options.

Message & Context

One important question in creating way-finding signage is, *"What information or destinations should be included on a sign?"* Considerations that come into play are the destination's frequency of visit or popularity (*how often is it a navigator's goal?*), its importance (*is it a landmark, a place that could be used as a point of reference for other destinations?*), its immediacy (*how close is it?*), and its utility (*does the destination help navigator complete a task?*).

Typical destinations to print on way-finding signs may include: libraries, schools, museums, parks, police stations, commercial districts, path amenities (such as rest rooms), landmarks, and central business districts. Other important items for the message and content of way-finding signage are below.

- Be aware of language barriers; many people may not read English. The message conveyed by signs should be easily understandable by all users and symbols are preferable to text. International style symbols or a "picture language" are often more effective than words in communicating functions such as food, stop, rest rooms, or telephones.

- Choose appropriate sign design and content for the main group of users (children, elderly, visually impaired, etc.). For example, simple language is recommended for younger users and larger print is recommended for the elderly.

- Graphics should be legible, direct to the point, and visible from a reasonable distance. The information should be easily digested at any speed.

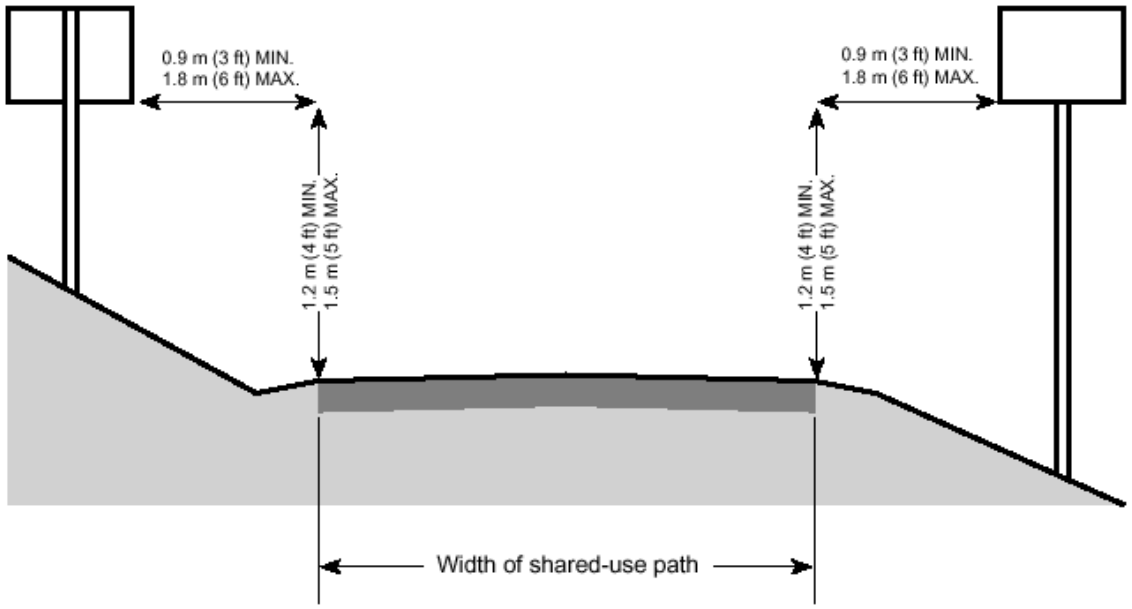
- For interpretive signs, concentrate on one topic. In displaying information, be specific and selective. Everything that could be included cannot always be presented.

Placement Guidelines

The *Manual on Uniform Traffic Control Devices* (MUTCD) is recognized as the guideline for the placement of signage for both roadways and trails. MUTCD details rules for bikeway signage setbacks from roadways and trails, horizontal clearance, and sign posting heights. The basic guidelines for signage placement are listed below.

Typical way-finding signage is placed 25 – 75 feet before and after intersections so as not to interfere with cyclists, yet still be visible.

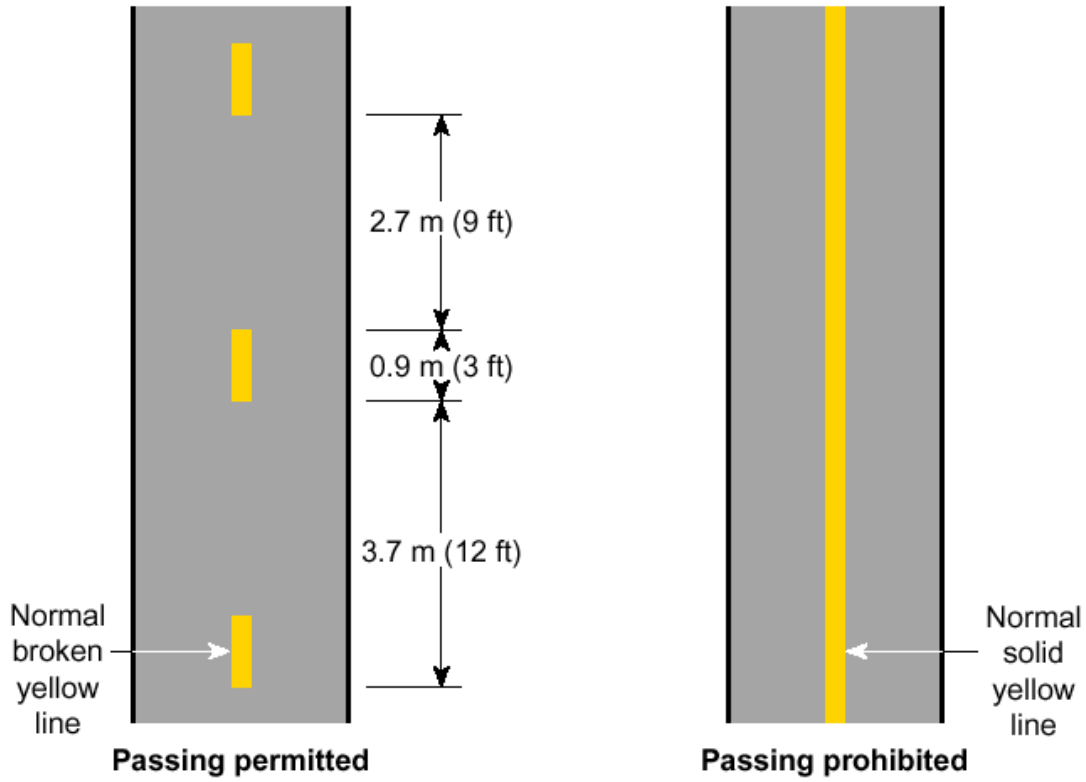
On shared-use paths, the lateral sign clearance must be a minimum 3 feet and a maximum of 6 feet from the near edge of the sign to the near edge of the path. Because of cyclists' and pedestrians' lower line of sight, the bottom of signs should be about 5 feet above the path. If a secondary sign is mounted below another sign, it should be a minimum of 4 feet above the path



The mounting height for ground-mounted signs on shared-use paths is a minimum of 4 feet and a maximum of 5 feet, measured from the bottom edge of the sign to the near edge of the path surface.

When overhead signs are used on shared-use paths, the clearance from the bottom edge of the sign to the path surface directly under the sign is a minimum of 8 feet. The clearance for overhead signs on shared-use paths should be adjusted when appropriate to accommodate typical maintenance vehicles.

For trail pavement markings, a dashed 4 to 6 inch wide yellow centerline should be used to separate opposite directions of travel. A single yellow centerline should be painted where passing is prohibited. A solid double yellow centerline should be used on curves, especially those with restricted sight distance. White edge lines, 4 to 6 inches wide also can be beneficial where significant nighttime bicycle traffic is expected.



Most directional signs are installed for the benefit of motorists. They are large, mounted fairly high, indicate destinations relatively far away, and may not adequately serve pedestrians. In contrast, most walking trips are short and the pedestrian's line of sight is fairly low. No standards have been developed yet for pedestrian directional signs.

Regulatory

In general, uniform application of traffic control devices (regulatory signs) will tend to encourage proper bicyclist behavior. For the path user, stop signs, stop bar pavement markings, yield signs, caution signs or other devices should be used as applicable. When deciding whether to install a sign, the designer should ask whether he or she would install one on a roadway with a similar situation.

Adequate signing and marking are essential on shared-use trails, especially to alert bicyclists to potential conflicts and to convey regulatory messages to both bicyclists and motorists at highway intersections.

Regardless of the type of path-roadway intersection, there are several other design issues to consider. A regulatory traffic control device, such as a stop sign or traffic signal should be installed at all path-roadway intersections. Warrants from the MUTCD combined with sound

engineering judgment should also be considered when determining the type of traffic control device to be installed. Traffic signals for path-roadway intersections are appropriate under certain circumstances. The MUTCD manual lists eleven warrants for traffic signals, and although path crossings are not addressed, bicycle traffic on the path may be functionally classified as vehicular traffic and the warrants applied accordingly.

Pavement markings at a crossing should accomplish two things: channel path users to cross at a clearly defined location and provide a clear message to motorists that this particular section of the road must be shared with other users.

Well-designed roads make it clear to users how to proceed, and require very little signing. Conversely, an over-abundance of warning and regulatory signs may indicate a failure to have addressed problems. Over-signing degrades the usefulness of signs, causes distractions, creates a cluttered effect, is ineffective and wastes resources. The signs below are commonly used regulatory signs for bicycle paths and on-street facilities.


W2-5


W3-1a


W3-2a


W3-3


W5-2a

W5-4


W7-5

R1-1

R1-2

R3-16

R3-16a

Regulatory signs should also warn motorists on roadways that there is the presence of bicyclists on roadways for on-street bikeway facilities. Many motorists do not respect bicyclists on the roadway or believe that they should be restricted from roadways. Not only can signage warn motorists of the presence of bicyclists on roads, but verify that their presence is permitted.

Signs for the exclusive use of bicyclists should be located so that drivers do not see them and get confused. The sign sizes for shared-use paths shall not be used for signs that are placed in a location that would have any application to other vehicles.

Best Practices Case Study -- Vancouver

Vancouver, British Colombia, Canada, has an innovative street sign system that identifies bicycle routes. This signage system was identified in the Vancouver 1999 Bicycle Master Plan and has been successfully implemented. This signage scheme guides bicycle users along a bicycle route and serves notice to motorists that bicycles will be present on the roadway.

In the 1999 Vancouver Bicycle Master Plan, it recommends that existing street name blades along bikeways are replaced with new name blades that contain a bicycle logo, such as that shown below. This new street name sign features a green and white bicycle symbol on a black street name sign. The street name and hundred-block also features a new, modern typeset. This will help to further identify a street as a bikeway and increase driver awareness of the presence of cyclists on the street. Also proposed is the installation of overhead street name blades containing a bicycle logo at all signalized intersections along the bikeways. Along the bikeways, the majority of traffic control signals are currently pedestrian and cyclist actuated, however, they lack overhead Bicycle Route identification signs.

Above: Sample street sign blade that signifies a Bicycle Route

Right: Actual signage at an intersection of two Bicycle Routes

References

The *Manual on Uniform Traffic Control Devices* (MUTCD) published by the Federal Highway Administration is an invaluable reference for standard signage. The signs listed in the MUTCD are an industry standard and can be easily fabricated.

Whereas MUTCD is generally geared for roadway use, many of the signs may be adapted for trail use. The MUTCD contains a chapter detailing signage for bikeways.

Note that there are no national or statewide standards for primary maps, welcome signs, and kiosks. On trails, MUTCD standards do not have to be applied to directional signs. If receiving funding assistance from IDOT, signage will require their approval.

EXISTING COUNCIL WAY-FINDING

The regional trails, including the Fox River Trail, the Illinois Prairie Path, the Virgil Gilman Trail, and the Great Western Trail, form the spine of the trail system in Kane County. The majority of these trails are under the jurisdiction of the Kane County Forest Preserve District. No inventory of their way-finding signage exists nor is there a proposed new way-finding strategy.

Route and Directional Signage

The Kane County Forest Preserve District has used several different types of strategies in their way-finding efforts. Prior way-finding signage has experienced vandalism; signs are stolen or destroyed on a regular basis. The Forest Preserve District has experimented with a variety of materials, none of which have been able to solve the vandalism problem. Officials are concerned with the liability issues for signage. Up to this date, the Forest Preserve District has not yet considered a directional or mileage signage strategy for trails within its jurisdiction.

The Kane County Forest Preserve District has extensively used pavement markings as a means of mile marking and way-finding. It is relatively inexpensive, only requiring stencils and annual re-painting. There are mileage markers painted at regular one-half mile intervals. This strategy has successfully combated vandalism, as there is no structure or sign to vandalize or replace.

The Forest Preserve District utilizes pavement markings for three reasons. First, most modern bicycles are designed for the user to be low and over the handlebars. The rider typically is looking at the pavement at all times and will notice the markings. Second, once a rider has used the system more than one time, there is no need for pavement marking. They are familiar enough not to need them or other trail way-finding. Finally, it is inexpensive to establish and maintain such as system.

However, pavement markings do have drawbacks.

- They are often easy for bicyclists to overlook, especially those not looking down or those traveling at relatively high speeds. This can cause a cyclist to miss a destination or arrive at the wrong location.
- Pavement markings are especially difficult to read if there is wet pavement or the markers are covered with leaves.
- If the wrong type of paint is used, pavement markings can be slippery and a hazard.

Along regional trails, there are signs that signify locations on the "Fire Grid." The markings are every one-half mile interval and used to describe a location for emergency services. However, most trail users probably are unaware of their function or how they measure intervals or destinations. They are not quite the same as mile markers and may confuse users.

Portions of the Fox River Trail are under the jurisdiction of local municipalities, such as in Elgin and St. Charles. In these areas, the local municipalities have placed some of their own way-finding. There are some way-finding signs indicating destination information and direction. However, there is no coordinated way-finding sign strategy for the length of the trail.

On-Street Bike Route Signage

There are a growing number of marked on-street bicycle routes in Kane and Kendall County. The most significant on-street routes in Kane County are those that connect segments of the Fox River Trail where no separated facility exists along the river. Additionally, Bicycle Level of Service Ratings for selected roadways in Kane and Kendall County are on the Kane and Northern Kendall County Bicycle Map.

Interpretive Signage

In the past, the Heritage Partnership constructed a series of ten way-finding kiosks around the Fox River Valley with the theme "The Fox Runs Through It - Tales and Trails of the Fox River Valley." Many of these kiosks are on the Fox River Trail. The kiosks have resisted vandalism, which can probably be attributed to their placement in highly visible locations and their design. The Heritage Partnership is a regional agency, funded through matching grants from Kane County, Department of Commerce and Community Affairs' Illinois Bureau of Tourism, and the Aurora Area, St. Charles, and Elgin Area Convention and Visitors Bureaus.

The development of additional interpretive way-finding maps or a strategy to develop kiosks are not goals of the Kane County Forest Preserve District at this time. A barrier to producing a region-wide strategy is the coordination and approval of the municipal jurisdictions crossed by the trail system.

COUNCIL WAY-FINDING STRATEGY

Way-finding signage on trails and on-street routes is an important component of the bikeway and pedway systems. Signage provides safety warnings or important information on trail conditions and guides users along the trail network. Especially where there are many decision points, it is important to adequately direct people along a trail network to their destinations.

The Fox River Trail and the Illinois Prairie Path have been promoted as local regional tourism attractions. For the regional trails, it should be assumed that on a daily basis, facilities would have first time users who need guidance. For on-street routes, it should be assumed that riders need assistance to select the most suitable roads for on street riding.

Below are several way-finding recommendations that can be used to establish a comprehensive way-finding system for the council area.

System Design

The goal of developing a countywide way-finding strategy is to create a safe and predictable environment for bicyclists and pedestrians. Consistent application of way-finding removes the

notion that a trail is an independent bikeway instead of part of a network. It also creates a common identity for trails, despite passing through multiple communities.

The way-finding system should be planned and installed to appear logical to trail users. Described earlier in this chapter is a hierarchy of way-finding signage types. Each level of the hierarchy emphasizes its importance and role through sign size, font size, and type of message.

On-Street Bike Routes Local jurisdictions should identify and designate on-street bicycle routes through a signage program. As a part of this study, streets were graded for their "Bicycle Level of Service (BLOS)." The BLOS is a relative rating for bicycle friendliness of streets for bicycle use. As streets are improved and BLOS rating are improved, they should be designated as a bicycle route, if leading to a major bicycling destination.

Local streets, such as neighborhood streets, do not need to be designated as bicycle routes. A typical neighborhood residential street is adequate for most bicycle riders, and they realize this. However, many residential streets do not lead to destinations; they dead-end within a subdivision. They do not foster a bicycle transportation network nor provide the most direct route to destinations.

Designation of on-street bicycle routes on collector or arterial streets can be controversial, whether marked on the street with signage or designated on a local map. Local residents may be concerned about the safety of sharing the road with bicyclists, making their streets a bicycling destination, and losing right-of-way to bicycle infrastructure.

In 1998, the Illinois Supreme Court in the Boub v. Wayne Township decision ruled that with respect to Illinois liability laws, bicyclists are not "intended" users of roadways unless the roadway is signed as a bike route or marked with bike lanes. This caused two problems. First, local governments have no duty of care to bicyclists on normal roads. Second, because signing or striping indicates that a road is 'intended" for bicyclists, many government agencies are reluctant to sign bike routes, paint bike lanes or provide any kind of safety warnings. There is now a liability disincentive to providing safety improvements for bicyclists. The "liability question" has slowed or stopped many communities from planning the safest bike routes for children and adults. (Source -- League of Illinois Bicyclists)

The bicycling community is actively lobbying state government officials to overturn the Boub decision and eliminate the liability disincentive for local governments to designate bicycle routes. Many communities are active in designating on-street bicycle routes, with Chicago taking a lead role by actively expanding its on-street network.

Another obstacle for designating bicycle routes is the question of jurisdiction. Many of these routes, in order to link trails and destinations, must pass through multiple communities. Each local government must adopt their portion of the plan to make it official. A lack of buy-in or cooperation, which prevents bike route designation, causes a gap in the bikeway network, leaving bicyclists confused.

Application of MUTCD

MUTCD recommends standards for highway and bicycle signage. The illustration to the right shows typical bicycle route sign as recommended by MUTCD. Because the signs are green, they must be strictly informational. This means that putting up bike route signs to warn or regulate is wrong.

It is recommended for Kane and Kendall Counties that on-street bike routes be established to guide people along the safest streets to the regional paths, similar to the illustration above. As illustrated above, secondary directional signs should always list a destination, such as a regional trailhead, and have directional arrows. Central business districts and large recreational facilities are the other appropriate uses for the destination signs.

The manual also identifies an alternative bike route sign approach, which involves the use of numbered routes. This approach is primarily useful when used in conjunction with widely distributed maps. Some jurisdictions have identified individual bicycle routes with signs containing specially designed graphic images. Examples include Seattle, San Francisco, Pennsylvania, and Chicago (see below).

Regulatory signs and cautionary signs are also described in the MUTCD. The manual describes typical signs, required distances from hazards, posting heights, and recommended horizontal and vertical clearances.

Sign Design

The following are recommendations for the sign design and placement. It is not exhaustive and the implementing agency may elect to hire a graphic design firm for the final design and implementation of any way-finding program.

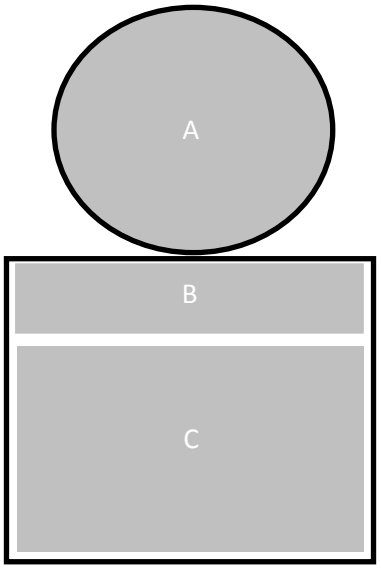
General design and placement guidelines include:

- Identification of the trail name at all trail heads.
- Consistent spacing of way-finding signs as recommended in the best practices.
- In downtown areas, directional and cautionary way-finding should also be considered on a pedestrian basis. Way-finding for bicyclists can be spaced further apart because bicycle travel is better for longer distances of travel.

- Care should be taken to use vandalism resistant signs materials and construction techniques. Metal signs, similar to those used on highways, are relatively inexpensive and damage resistant.
- Locate way-finding at distances from decision points as recommended by MUTCD.
- Special care should be given to placing kiosks and maps in a highly visible location. Location will avoid loss, theft or vandalism of signs.
- Do not over-sign and create visual pollution.

Directional Signs

Primary and Secondary Route Directional signs with destinations should be placed on all regional trails. MUTCD standards for sign design could be used, but this is an opportunity for the planning area to take advantage of its extensive regional trail network and promote it. The illustration to the right shows a sample directional sign design for a regional trail.



REGIONAL TRAIL SIGN

A -- Medallion sign with regional trail symbol. Approximately 15" diameter.

B -- Route Direction and / or Prairie Path Spur Name

This design could be used as a primary route directional sign and placed every two miles, depending on the number of nearby destinations. A secondary route directional sign, which would include just the circular medallion identifying the regional trail and directional arrows, should be implemented at one-mile intervals, depending on the number of decision points.

For local trails, use of standard MUTCD Bike Route signs are recommended with information on local destinations of interest or regional trails.

Pavement Mile Marking

Pavement mile markers are important to first time users of a trail. Popular mile marking strategies used elsewhere include wooden posts, decorative signs, small metal signs and pavement inserts. However, there is a concern that these types of signs will be vandalized and there is a need to construct and maintain mileage markers relatively inexpensively.

It is recommended that the regional trails utilize pavement markings to measure distances. There is some concern that existing pavement markings are not visible enough, especially if the pavement is wet. It is recommended to highlight the pavement markings with broad, horizontal striping, use a larger stencil size, and/or bright paint. Reflectorized tape or paint, which is

slippery to bicyclists, should NOT be used as a pavement marking. Mile markers should be painted on one-half mile intervals, which is appropriate for both pedestrians and bicyclists.

Interpretive Kiosk

Interpretive kiosks should be placed along the trails at major destinations or trailheads. Kiosks with maps are especially important at trailheads or access points where those unfamiliar with the trail access it. Examples of an ideal location are Clark Island or near IL38 in downtown Geneva. A variety of useful and educational material can be supplied to the trail users.

*Panel A: Header / Title Informatio*n. The header panel contains trail name and managing agency information.

Panel B: Enlarged Map Section . The enlarged map section focuses on a select area of the overall bike pathway system, such as a downtown area. Call-outs designated by color, type, and symbology identify the viewer's location, the bikeway system, cultural attractions, shopping, and other important destinations.

Panel C: Overall Bike Pathway Map. The overall bike path map gives the viewer a comprehensive picture of the entire bike pathway system. Call-outs designated by color, type and symbols identify the viewer location in relationship to the highlighted area of the enlarged map section or the bikeway system.

Panel D: Historical and/or Cultural Information. This area highlights information relating enlarged map section (Panel B). This information includes photos, illustrations, and text describing elements including historical information, architectural landmarks, local history, and natural features. If desired, one section of Panel D could be used as an advertising panel to offset construction and maintenance costs.

Funding & Implementation

Once a decision has been made to initiate a way-finding strategy, there may be logistical difficulties to implement it. The following issues may arise: lack of leadership in implementation, funding, and prioritization.

Implementation Leadership

The Heritage Partnership implemented a way-finding kiosk program in ten different communities in the Fox River Valley. That effort was successful because they led the effort, obtained approval for design and placement from the numerous jurisdictions, and implemented the program. Similarly, any way-finding program, including route directional signage, will require leadership on a regional basis.

A regional governing body that includes multiple jurisdictions, acts as the focal point to coordinate the way-finding program, obtains the necessary agreements, acquires funds, and installs the signage, is necessary to realize a regional way-finding plan. If there is no regional effort, way-finding development will occur on an incremental basis and the signage system shall not adequately meet the needs of its potential users.

Promote Supporting Planning Efforts

Future planning efforts can incorporate way-finding into their design and construction. There are three primary examples where this is applicable. First, some communities along the Fox River are developing downtown plans. Pedestrian way-finding and directional way-finding guiding people to the trails should be an integral component of the pedestrian elements.

Second, with the improvement of streets, bike route signage should be added if the road is a part of the on-street bikeway network. This would be a very small part of the roadway improvements overall costs.

Local transportation plans should include consideration for way-finding in the bicycle and pedestrian infrastructure improvement components of the plan. The way-finding can be implemented with the bicycle and pedestrian facility construction.

Funding

Way-finding is not expensive, relative to the cost to construct a multi-use trail. However, it is rarely an item in a capital budget improvement program. A directional route sign costs approximately $150 to manufacture and install. An interpretive kiosk may cost between $500 and $2,000. However, if constructing a way-finding system along a regional trail, these sign costs can quickly add up, so there should be a strategy to pay for the program. Strategies may include:

- Obtaining matching funds from each jurisdiction
- Forming partnership with tourism agencies or chambers of commerce to produce kiosks and accompanying maps for distribution
- Soliciting grant funds from sources, such as IDNR
- Soliciting funds from philanthropic agencies, such as casinos
- Public partnership or sponsorship of signs

The Kane County Forest Preserve District has considered using paid advertising along the trails to offset a portion of way-finding costs. Precedence on a similar program is difficult to find. Advantages of such a partnership include a promotion of services adjacent to the trail, defraying the costs of way-finding strategy, and promoting people to explore the local communities along a trail. The disadvantages include: potential clutter, visual distractions, additional administration costs, and poor public perception.

After considering a public partnership proposal, the Forest Preserve District fears that the trails will change from linear parks to linear shopping malls. The public has also responded negatively towards the visual distraction. However, the Forest Preserve District believes that there is a misconception of the partnership's goal and eventual form. Their goal is sponsorship without commercialism. Some sponsorship would not involve signs, but rather actual events at which company personnel mix with users of the facilities, who also happen to be potential customers. It is a more subtle partnership or a type of niche marketing where the companies are looking at interactive events, rather than just putting up a sign. A precedence for this is sponsorship of fishing events in the DuPage County Forest Preserve.

The following factors should be considered for a public-private partnership: limiting the number of advertising signs, creating a relatively uniform set of signs, and not creating a visual obstruction from the natural beauty of the path.

Recommended Prioritization Strategy for Planning Area

If there are limited funds, way-finding improvements may have to be prioritized so the most important components are implemented first. The following is a potential set of criteria to prioritize improvements:

- *Agency Interest and Intergovernmental Cooperation*. Those projects receiving local government support can be realized more quickly and may have no other barriers for implementation.
- *Available Right-of-Way.* Lack of existing right-of-way to construct certain types of way-finding, such as kiosks and welcome signs, are significant barriers to way-finding implementation.
- *Regional Trails.* Regional trails are the spine of the bikeway system. More users from outside of the council area will explore the regional trails first, and should have good signage to orient them.
- *Local Trails.* If relatively close to regional trails, directional signage is important to create a bicycle network.
- *On-Street Bikeways.* On-street bike route signage is important to direct bicyclists to the safest roads for on-street bicycling.
- *Cost-Benefit.* Which signs will have the most user exposure and cost the least to implement? Which signs connect missing gaps of the bikeway network?

A strategy for the development of a countywide way-finding system is described below. It is based on the above-mentioned factors. In creating this strategy, important criteria include the cost-benefit, regional application, and agency interest. The items to implement are listed from the most important to the least important.

1. *Painted Mile Markers.* Painted mile markers for the regional trails is the most important strategy to implement. They are relatively easy and inexpensive to implement and do not require much design consideration. Mile markers allow trail users, both new and regular users, the ability to measure their progress, train, and easily determine how far one wants to travel on a linear path before returning to a their starting point.

   Currently, the Kane County Forest Preserve District has implemented a mile-marking program along trails in their jurisdiction. The Kane and Northern Kendall County Bicycle Map depicts mileage markings; trail markings should be consistent with that map. For trails that extend into adjacent counties, some coordination may be needed to establish a mileage system.

2. *Primary Route Directional Sign on Regional Trails*. A high priority is to install Primary Route Directional signs on regional trails to guide people and provide destination information. The primary importance should be to emphasize the regional trails and movements on these trails. This offers an opportunity to explore the communities along the trail. Signs can initially be installed at two -mile intervals, which can be reduced to one-mile intervals, as dictated by available funds and location, relative to trail decision points.

   Primary Route Directional Signs should focus on the regional trails, as they are the spine of the KKCOM bikeway system. Primary Route Directional Signs on isolated, local trails could be implemented to direct people to the regional trails, but this requires coordination with many jurisdictions and a much larger expenditure.

3. *Secondary Route Directional Sign on Regional Trails.* Secondary Route Directional signs are also important to install on the regional trail system. Their purpose is to reinforce the trail name and route direction for users. If there is a Primary Route Directional, no Secondary Route Directional sign is needed. These two types of signs could be alternated at mile or half-mile intervals, depending on the number of decision points and proximity to destinations.

4. *Secondary Route Directional Signs for the On-Street Network.* A key component of the KKCOM Regional Bikeway System is the on-street routes. Bicycles will be expected to be on most roads. Sidepath or off-street paths are not feasible in all situations to all destinations that are frequented by bicyclists and pedestrians.

Secondary Route Directional Signs are frequently used to designate bicycle routes. They should establish an on-street network using roads determined to be most feasible for bicycle traffic according to their Bicycle Level of Service (BLOS). Secondary Route Directional Signs or Bicycle Route signs should be installed at decision points or every two to three blocks to reinforce the direction of travel.

1. *Primary Maps / Directional Graphics near Downtown Areas*. Primary Maps contain an overview of the regional bikeway network. They are designed to inform users of the trail network and the surrounding neighborhoods. They encourage trail users to leave the trail and frequent local businesses. They orient first-time and infrequent users of relative distances to destinations.

   Primary Maps may be relatively expensive, compared to directional or route signage. They may also be more prone to vandalism, so their location should be chosen carefully to permit maximum visibility. Along the regional trail system, they are most appropriate at trailheads near downtown areas. There are currently some Primary Maps along the Fox River Trail. Communities lacking a Primary Map or way-finding kiosk with a regional map should receive one in a style similar to those existing.

2. *Interpretive Kiosks*. Interpretive Kiosks are the lowest identified priority. There are currently some kiosks along the regional trails. These kiosks are more map-oriented than educational or interpretive. It would be interesting or informative for families or new users to the trail to have information on native flora, historical information, or landmarks. For example, the interpretive kiosks could describe the original use of the rail-trails or describe historical transportation modes along the Fox River.

Providing educational and interpretive information is important, but guidance is the primary concern.

CHAPTER 9 – FUNDING

TABLE OF CONTENTS

INTRODUCTION

If there were no state or federal programs to assist in the funding of pedestrian improvement projects, it is likely that few could be implemented. Generally, bikeway funding comes from either the State of Illinois or federal government sources. These government entities recognize the need to establish programs to assist local governments and public agencies to fund diverse transportation projects that include pedestrian or bicycle components.

The most common funding sources of bikeway and pedestrian facility funding available to KKCOM communities can be divided into two groups: infrastructure programs and planning programs. The level of funding assistance, a sponsor's requirements and grant administration methodology vary greatly among the respective programs. Basic information for each funding program is described below. It is important to note that the standard maximum federal participation is 80%. State and or local resources may comprise the minimum 20% "local" match required for federal funds.

The Chicago Metropolitan Agency for Planning (CMAP) provides a website for community assistance and have prepared an extensive guide to funding resources for economic and community development.

INFRASTRUCTURE PROGRAMS

The major funding programs listed below are the most reliable sources of funding assistance. They typically apply to most types of bicycle and pedestrian improvements.

BIKE PATH GRANT PROGRAM (IDNR)

Objective:
To financially assist eligible units of government in acquiring, constructing and rehabilitating public non-motorized bicycle paths and directly related support facilities.

Examples of Eligible Project Types:

1. Linear corridor land acquisition (including associated appraisal fees).
2. Bike path development / renovation to include site clearing and grading, drainage, surfacing, bridging, and signage and directly related support facilities such as potable water and restrooms.

Funding Ratio:

IDNR	Local
50%	50%

Funding Limitations:

1. Maximum participation for engineering costs cannot exceed 15.25% of the project.
2. *No maximum participation on land acquisition projects costs.*
3. *The IDNR will not provide more than $200,000 for development projects per annual request.*

How to Apply:

Applications are available on-line for the Illinois Bike Path Program. Each application is evaluated on a competitive basis according to criteria set by IDNR. Awards are usually announced within six months following the application deadline.

Contact Person / Agency:

Illinois Department of Natural Resources
Division of Grant Administration
One Natural Resources Way
Springfield, Illinois 62702
(217) 782-7481
dnr.grants@illinois.gov

For More Information Visit: www.dnr.state.il.us
or download the Illinois Trails Grant Programs Manual

ITEP - ILLINOIS TRANSPORTATION ENHANCEMENT PROGRAM (IDOT)

Objective:

This program was designed to broaden the transportation focus from Interstate and highway building to making our communities more livable and improving our overall quality of life.

Examples of Eligible Project Types/Categories:

1. Provisions of facilities for pedestrians and bicycles.
2. Scenic or historic highway programs (tourist and welcome centers).
3. Landscaping and other scenic beautification.
4. Historic preservation.
5. Rehabilitation of historic transportation buildings, structures, or facilities.
6. Provisions of safety and education activities for pedestrians and bicyclists.

7. Acquisition of scenic easements and scenic / historic sites.
8. Preservation of abandoned railway corridors for the conversion and use of pedestrian and bicycle trails.
9. Control and removal of outdoor advertising.
10. Establishments of transportation museums.
11. Environmental mitigation due to highway runoff and reduce vehicle caused wildlife mortality.
12. Archeological planning and research.

Funding Ratio:

	Federal	Local
Utility Relocations, Construction Engineering and Construction	80%	20%
Right of Way Acquisitions and Easements	50%	50%

How to Apply:
The Illinois Transportation Enhancement Program (ITEP) application process is being reopened in 2012. IDOT intends to establish a bi-annual application process following the same basic schedule for each application cycle.

Contact Person / Agency:

Chad Riddle, Federal Aid Program Engineer
Bureau of Local Roads and Streets
IDOT District 1 Office
201 West Schaumburg Court
Schaumburg, Illinois 60196
(847) 705-4406

Tim Milam
Highway Planning Manager
IDOT – Statewide Program Planning
2300 South Dirksen Pkwy, Room 307
Springfield, Illinois 62764
(217) 785-2910

For More Information Visit: www.dot.state.il.us/opp/itep.html

CMAQ - CONGESTION MITIGATION & AIR QUALITY IMPROVEMENT PROGRAM (CMAP)

Objective:
The CMAQ program funds transportation projects that help non-attainment areas meet the requirements of the Clean Air Act Amendment. The CMAQ program encourages the construction of projects that will reduce congestion and / or provide an air quality benefit through transportation improvements.

Examples of Eligible Project Types:

1. Bike / Pedestrian Projects,
2. Transit service improvements,
3. Traffic signal interconnects,
4. Bottleneck Elimination,
5. Demonstration Projects.

Funding ratios:

Federal	Local
80%	20%

How to Apply:
The Chicago Metropolitan Agency for Planning holds an annual Call for Projects. Project applications submitted by Municipal agencies (villages, cities, park districts, school districts, townships, etc.) are required to be reviewed by their Council of Mayors staff. Projects are reviewed by the CMAQ Project Selection Committee and submitted to the Work Program Committee for approval. Project sponsors are usually notified of funding approval in November. In 2011 CMAP began implementing GO TO 2040 through the CMAQ program by having Program Focus Groups prioritize submitted projects on how they support the goals and action areas of GO TO 2040.

Contact Person / Agency:

Mike Sullivan
Kane / Kendall Council of Mayors
41W011 Burlington Road
St. Charles, Illinois 60175
(630) 584-1170

Doug Ferguson
Chicago Metropolitan Agency for Planning
233 South Wacker Drive, Suite 800
Chicago, Illinois 60606
(312) 386-8836

For More Information Visit: www.cmap.illinois.gov/cmaq/default.aspx.

RTP - NATIONAL RECREATIONAL TRAILS PROGRAM (IDNR)

Objective:
Created through the national recreational trail fund as a part of ISTEA, this program provides funding for acquisition, development, rehabilitation, and maintenance of both motorized and non-motorized recreational trails.

Examples of Eligible Project Types:

1. Trail construction and rehabilitation.
2. Restoration of areas adjacent to trails and damaged by unauthorized trail users.
3. Construction of trail-related support facilities.
4. Acquisition from willing sellers of trail corridors through easements or fee simple title.

Funding Ratio:

Federal	Local
80%	20%

How to Apply:
Applications for grant assistance must be received by IDNR no later than March 1 of each calendar year. Awards are generally announced within 180 days following the application deadline date.

Contact Person / Agency:
Illinois Department of Natural Resources
Division of Grant Administration
One Natural Resources Way
Springfield, Illinois 62702
(217) 782-7481
dnr.grants@illinois.gov

For More Information Visit: www.dnr.state.il.us.
or download the Illinois Trails Grant Programs Manual

GRADE CROSSING IMPROVEMENT (ILLINOIS COMMERCE COMMISSION)

Objective:
To help defray the cost of installing necessary improvements and reduce accidents at railroad / highway crossings

Examples of Eligible Project Types:

1. Installation of railroad and highway crossing protection,
2. Grade separation structures,
3. Interconnection of railroad crossing signals with highway traffic.

Funding Ratio:

	ICC/State	Railroad	Local
Standard Projects	85%	5%	10%
Exceptions (multiple crossing)	90%	10%	-
Bridge projects and Grade Separations	60%	-	40%

How to Apply:
The Illinois Commerce Commission accepts applications on a continual basis. Applicants may reapply every year. Project evaluation is based on crash criteria. Separate applications are required for each project type. Applicants are notified when the Five Year Plan is published generally in Spring.

Contact Person / Agency:
Illinois Commerce Commission
Transportation Division
527 East Capital Avenue
P.O. Box 19280
Springfield, Illinois 62794
(217) 782-7660

For More Information visit: www.icc.illinois.gov/railroad/crossingsafetyimprovement.aspx

OPEN SPACE LANDS ACQUISITION AND DEVELOPMENT (OSLAD) PROGRAM AND LAND AND WATERWAY CONSERVATION FUND (LAWCON) (IDNR)

Objective:
This program essentially combines a state program with a federal program and is financed by a percentage of the state's Real Estate Transfer Tax and the federal Land and Waterway Conservation Fund (LAWCON).

Examples of Eligible Project Types:
Bicycle facilities must be developed in conjunction with a park or open space. Any land acquired must be open to the public in perpetuity.

Funding Ratio:
Funding assistance is available for up to 50% of approved project costs. Counties with populations exceeding 2 million residents are eligible for up to $1.15 million annually; municipalities with populations exceeding 2 million residents are eligible for up to $2.3 million annually. Maximum grant funding for all other types of jurisdictions is limited to $750,000 for acquisition projects and $400,000 for development/renovation projects.

How to Apply:
Written applications must be submitted to IDNR between May 1 and July 1 of each calendar year, with grant awards typically announced by December or January. Only those local government agencies having statutory authority to acquire and develop land for public park purposes are eligible to apply for and receive assistance under the OSLAD and LWCF grant programs.

Contact Person / Agency:
Illinois Department of Natural Resources
Division of Grant Administration
One Natural Resources Way
Springfield, Illinois 62702
(217) 782-7481
dnr.grants@illinois.gov

For More Information Visit: www.dnr.state.il.us.
or download the Illinois Trails Grant Programs Manual

SAFE ROUTES TO SCHOOL

Objective:
The Illinois SRTS Program supports projects and programs that enable and encourage walking and bicycling to and from school. The program applies to schools serving grades Kindergarten through 8th grade.

Examples of Eligible Project Types:

1. Costs for data gathering, analysis and evaluation reporting at the local project level,
2. Sidewalk Improvements,
3. Traffic Calming/Speed Reduction,
4. Traffic Control Devices,
5. Traffic Diversion,
6. Pedestrian and Bicycle Crossing Improvements,
7. On Street Bicycle Facilities,
8. Off Street Bicycle and Pedestrian Facilities,
9. Secure Bicycle Parking Facilities,
10. Costs for additional equipment needed for enforcement activities,
11. Creation of educational materials,
12. Bicycle and pedestrian and pedestrian safety curricula, materials and trainers,
13. Creation of promotional materials,
14. Modest incentives for SRTS contests,
15. Incentives that encourage more walking and bicycling over time,
16. Safety and educational tokens that also advertise the program.

Funding Ratio:
No local match is required.

How to Apply:
Annual call for projects. Application available on-line.

Contact Person / Agency:
Safe Routes to School Coordinator
Illinois Department of Transportation
(217) 785-2932
SafeRoutes@dot.il.gov

For More Information visit: www.dot.state.il.us/saferoutes/SafeRoutesHome.aspx

KANE/KENDALL COUNCIL OF MAYORS – SURFACE TRANSPORTATION PROGRAM (STP)

Objective:

The STP provides funding to municipalities for projects on the Federal-Aid Highway System. Northeastern Illinois is divided into eleven Council of Mayors, which are allocated STP funding on the basis of population for local transportation projects. The Council Regional Planning Liaisons oversee the planning, programming, and monitoring of these projects as well as ensure their inclusion in the Transportation Improvement Program (TIP).

Examples of Eligible Project Types:

1. Roadway rehabilitation, reconstruction, restoration,
2. Widening / add lanes,
3. Intersection improvements,
4. Traffic signal improvements.

Eligible Participating Costs and Funding Ratio (per the Kane Council's Policies):

- STP funds may be used for ROW, Phase II engineering and construction, including street lighting, sidewalks, storm sewers and right-of way.
- Phase I engineering is not eligible for federal funding.
- ROW shall be at a maximum federal participation of 50%.
- Construction and Construction (Phase III) Engineering shall be at a maximum federal participation of 75% if the sponsoring agency fully funds Phase II engineering; otherwise the match ratio for construction and construction engineering shall be at a maximum federal participation of 70%.
- LAPP projects shall be at a maximum Federal participation of 75%. Phase I and II engineering shall be entirely locally funded. The Council shall allocate a minimum of 5% and a maximum of 20% of the Council's annual STP allotment to LAPP projects.
- The Council discourages the use of STP funds on State jurisdiction routes. The Council strictly enforces their policy that requires municipalities sponsoring projects on State routes to provide half the local match.
- No project shall receive more than 100% of one year's total federal allotment.
- All project cost increases greater than 20% of the Phase I engineering cost estimate (including inflation) will be the sole responsibility of the project sponsor.

How to Apply:

Applications are available during the Call for Projects, usually held in conjunction with the mandatory STP Workshop. For specific dates contact the Regional Planning Liaison.

Contact Person / Agency:
Mike Sullivan
Kane/Kendall Council of Mayors
41W011 Burlington Road
St. Charles, Illinois 60175
(630) 584-1170

For More Information visit: www.co.kane.il.us/dot/com.

RTA-CMAP COMMUNITY PLANNING PROGRAM

Objective:
The Community Planning program provides funding and planning assistance to communities at the local level for planning projects that benefit both the local communities and the RTA transit system. CMAP is now participating in the Community Planning program to expand the scope of the program to help plan for modes of transportation beyond transit.

Examples of Eligible Project Types:

1. Station Area/Transit-Oriented Development Plans,
2. Transit-Oriented Development Guidelines,
3. Local Transportation or Transit Improvement Plans,
4. Coordinated Paratransit Plans.
5. Detailed Implementation Plans.

Funding ratios:

RTA	Local
80%	20%

How to Apply:
Applicants should submit a detailed pre-application during the Call for Projects. The application cycle usually begins in March and continues through mid-July.

Contact Person / Agency:
Patty Mangano
Regional Transportation Authority
175 West Jackson Boulevard, Suite 1550
Chicago, Illinois 60604
(312) 913-3242

For More Information Visit: programs.rtachicago.com.

APPENDIX A

BICYCLE AND PEDESTRIAN PLAN

Project Review Toolkit

A toolkit for quickly reviewing roadway and development plans for best practices in bicycle and pedestrian design.

In order to promote the principles for the plan, various strategies or "tools" are recommended. The plan includes a "quick check guide" that allows users municipalities to quickly reference specific tools or guidelines depending on plan or project being reviewed.

Pedestrian Guidelines	
- **New Sidewalk Installation**	*FHWA Guidelines for New Sidewalk Installation*
- **Recommended Sidewalk Width**	*Recommended Sidewalk Width Based on Street Conditions*
- **Sidewalk Buffer Areas**	*Planting Strips, Street Furnishing, and Related Clearances*
- **Accessibility Requirements**	*Americans with Disabilities Act Requirements***
- **Intersection Crossing Standards**	*Recommended Intersection Crossing Treatments*

Additional Outside Resources:

Americans with Disabilities Act Accessibility Guidelines
http://www.access-board.gov/prowac/

Designing Sidewalks and Trails for Access (Part I & II)
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/pdf.cfm

Pace Development Guidelines
http://www.pacebus.com/sub/guidelines/guidelines.asp

Pedestrian Facilities Users Guide: Providing Safety and Mobility
Planning and Implementing Pedestrian Facilities in Suburban and Developing Rural Areas,
http://nationalacademies.org/trb/

Bicycle Guidelines	
- **New Bikeway Facility Installation**	*Recommended Bikeway Accommodations by Street Type*
- **Bikeway Guidance**	*Arterial Streets* *Collectors/Minor Arterials* *Local Streets*
- **Bike Lane Design**	*Typical Bicycle Lane Street and Intersection Treatments*
- **Road Diets**	*Typical Road Diet Treatments*
- **Multi-Use Path Width**	*Spatial Requirements for Various Trail Users*
- **Bicycle Parking**	*Bicycle Parking Types and Facility Design*
- **Intersection Treatments**	*Suggested Treatments on Two-lane and Four-lane Road Crossings*
Additional Outside Resources: *IDOT Bicycle and Pedestrian Accommodations* http://dot.state.il.us/desenv/BDE%20Manual/BDE/pdf/Chapter%2017%20Bicycle%20and%20Pedestrian.pdf *AASHTO Guide for the Development of Bicycle Facilities* https://bookstore.transportation.org/Item_details.aspx?id=1943	

APPENDIX B

BICYCLE AND PEDESTRIAN PLAN

Performance Measurement Baseline

A scorecard for identifying tracking progress of the goals of the Bicycle and Pedestrian Plan.

This scorecard is comprised of performance measures developed by an advisory working group of municipal, park district, forest preserve and county staff from Kane and Kendall Counties. Based on the mission and goals of the Bicycle and Pedestrian Plan, each performance measure tracks the progress of KKCOM members. This scorecard will act as a baseline for tracking future progress. Future reports will be provided annually at the Kane/Kendall Council of Mayors committee meetings and posted on the Council's website. If there is not currently any data for a performance measure, Council staff will work with the appropriate government organization or advocacy group to begin collecting data.

December 2011

GOAL #1: Develop a regionally coordinated network of non-motorized facilities and coordinate bicycle and pedestrian facilities through sub-regional and local actions.

Measurement	
Develop a rating system similar the League of American Bicyclists Bicycle Friendly Community Award – rate each of the municipalities in Kane/Kendall County:	**Included as Appendix C.**
Length of regional trails and number of local connections:	**Existing Regional Trails:** *140 miles* **Existing Local Trails:** *305 miles*

GOAL #2: Improve the inter-modal efficiency of the transportation system by enhancing the connections between non-motorized and motorized modes.

Measurement	
Number of transit stops without shelters/pads and number of transit stops lacking sidewalk connections:	*Data Collection Underway*

Number of bicycle parking spaces at Metra commuter stations and utilization rates:		
Aurora: *34 spaces - 91% used* *Good Condition – 8* *Marginal Condition - 26* **National St.:** *46 spaces - 13% used* *Good Condition – 46*	**Geneva:** *65 spaces - 83% used* *Good Condition – 45* *Marginal Condition - 20* *Unusable - 9* **Elgin:** *14 spaces - 57% used* *Good Condition – 14*	**La Fox:** *No Bicycle Parking* **Elburn:** *11 spaces - 64% used* *Good Condition – 11* **Big Timber:** *17 spaces - 18% used* *Good Condition – 17*

*STATISTICS FROM THE METRA 2008 SYSTEM-WIDE BICYCLE PARKING INVENTORY REPORT

GOAL #3: Improve bicycle and pedestrian safety through a variety of methods.

Measurement	
IDOT crash data for bicyclists and pedestrians:	
Kane County: **2007:** *114 Pedestrian Incidents (5 fatalities)* *96 Bicycle Incidents (1 fatality)* **2008:** *98 Pedestrian Incidents (3 fatalities)* *98 Bicycle Incidents (1 fatality)* **2009:** *101 Pedestrian Incidents (4 fatalities)* *73 Bicycle Incidents* **2010:** *78 Pedestrian Incidents (3 fatalities)* *76 Bicycle Incidents*	**Kendall County:** **2007: 8** *Pedestrian Incidents* *8 Bicycle Incidents* **2008:** *7 Pedestrian Incidents* *10 Bicycle Incidents* **2009:** *8 Pedestrian Incidents* *10 Bicycle Incidents (1 fatality)* **2010:** *Data Collection Underway*
Highway Safety Improvement Program (HSIP) funds secured by member communities:	*Data Collection Underway*

GOAL #4: Incorporate bicycle and pedestrian elements into transportation, land use, and development planning and implementation actions on local levels.

Measurement	
Communities with adopted Bicycle Parking Ordinances:	**None**
Communities with Bicycle and Pedestrian Plans:	**See Appendix D**

Communities addressing Bicycle and Pedestrian issues in Comprehensive Plans:		**See Appendix D**
Communities and schools with School Travel Plans:		
City of Aurora: *Cowherd MS & Allen Elem. (2007-08)* **City of Plano:** *Plano MS (2007-08)* **Village of North Aurora:** *Schneider Elem. (2010)*	**City of Batavia:** *HC Storm, Alice Gustafson Elem. & Rotolo MS (2007-08 & 2010)* **City of Yorkville:** *Circle Center and Inter. Schools (2007-08)* **Village of South Elgin:** *District U-46 (2010)*	**City of Elgin:** *District U-46 (2007-08)* *Prairieview Elem. (2010)* **Village of Campton Hills:** *Bell Graham Elem. (2010)* **Village of Pingree Grove:** *Cambridge Lakes Charter School (2007)*
Communities with adopted Complete Streets policies:		**None**

GOAL #5: Promote bicycling and walking to increase their use as a transportation mode.

Measurement	
Results of Community to Work mode share from the U.S. Census American Community Survey – *2006-2010 Estimates:*	
Kane County: *SOV – 80.6%* *Carpool – 9.0%* *Public Trans. – 2.6%* *Walked – 1.5%* *Other modes – 1.8%*	**Kendall County:** *SOV – 84.0%* *Carpool – 7.1%* *Public Trans. – 3.2%* *Walked – .6%* *Other modes – .8%*
Bike Share Programs in communities:	**None**
Number of Bicycle-Friendly Businesses:	**None**

GOAL #6: Provide opportunities for funding bicycle and pedestrian projects.

Measurement
Amount of grant funding secured/available (Safe Routes, ITEP, CMAQ, etc):
Safe Routes to School - *Data Collection Underway* **Illinois Transportation Enhancement Program -** *Data Collection Underway* **Congestion Mitigation Air Quality Program** **2009:** *$63,400,607 awarded to 80 projects regionwide* *$20,717,053 awarded to 21 Bicycle/Pedestrian projects* *From Kane/Kendall Council of Mayors - 7 projects submitted totaling $6,976,800* *$3,141,200 awarded to 3 bicycle facility projects in Kane/Kendall Counties* **2010-11:** *$129,343,778 awarded to 80 projects regionwide* *$26,973,260 awarded to 23 Bicycle/Pedestrian projects* *From Kane/Kendall Council of Mayors - 8 projects submitted totaling $5,086,268* *$91,200 awarded to 1 bicycle facility project in Kane/Kendall Counties* **2012-16:** *$411,451,876 awarded to 115 projects regionwide* *$108,864,468 awarded to 38 Bicycle/Pedestrian projects* *From Kane/Kendall Council of Mayors - 17 projects submitted totaling $20,149,130* *$2,780,800 awarded to 5 bike/pedestrian projects in Kane/Kendall Counties* **Illinois Bicycle Path Program:** **2005:** *$2,500,000 awarded to 13 projects statewide* *No projects in Kane/Kendall Counties awarded funding* **2006:** *$2,552,900 awarded to 11 projects statewide* *$200,000 awarded to 1 project in Kendall County* **2007:** *$2,648,500 awarded to 12 projects statewide* *No projects in Kane/Kendall Counties awarded funding*

2008: *$3,000,000 awarded to 17 projects statewide*
$128,300 awarded to 1 project in Kane County
Funding for the Illinois Bicycle Path Program has not been awarded since 2008.

Federal Recreational Trails Program:

2004: *$474,180 awarded to 4 projects statewide*
$20,000 awarded to 1 project in Kane County

2005: *$582,600 awarded to 3 projects statewide*
No projects in Kane/Kendall Counties awarded funding

2006: *$705,600 awarded to 4 projects statewide*
$268,800 awarded to 2 projects in Kane County

2007: *$1,569,960 awarded to 8 projects statewide*
$156,000 awarded to 1 project in Kane County

2008: *$949,800 awarded to 9 projects statewide*
$242,560 awarded to 2 projects in Kane and Kendall Counties

2009: *$2,020,520 awarded to 14 projects statewide*
$200,000 awarded to 1 project in Kane County

2010: *$2,034,300 awarded to 10 projects statewide*
$200,000 awarded to 1 project in Kendall County

GOAL #7: Include local citizens and advocacy groups in the planning and implementation process.

Measurement	
Number of communities that have Bike/Ped Advisory Committees or other groups:	**City of Batavia** **City of Geneva** **City of Elgin**

APPENDIX C

BICYCLE AND PEDESTRIAN PLAN

Municipal Review Scorecard

A scorecard for identifying Bicycle and Pedestrian strengths and weaknesses in municipal planning and decision-making.

This scorecard is based on criteria from the League of American Bicyclists' Bicycle Friendly Community Program. A Bicycle Friendly Community welcomes cyclists by providing safe accommodation for cycling and encouraging people to bike for transportation and recreation. The purpose of this municipal review is to encourage Kane and Kendall County governments to recognize bicycle and pedestrian travel during their planning processes. A task force will be established to review each of the municipalities within the planning area to score and track their progress on promoting and enforcing the contents included in the KKCOM Bicycle and Pedestrian Plan.

ENGINEERING – This category entails the existence and content of a bicycle master plan, the accommodation of cyclists on public roads, and the existence of both well-designed bike lanes and multi-use paths in the community. Consideration will also be given to the availability of bicycle parking and the condition and connectivity of both the off-road and on-road network.

Measurement	Points			
Does your community have a comprehensive, connected and well-maintained bicycling network?	0	1	2	3
Is bike parking readily available throughout the community?	0	1	2	3
Is there a Complete Streets ordinance or another policy that mandates the accommodation of cyclists on all road projects?	0	1	2	3
			Subtotal	

EDUCATION – Education includes teaching cyclists of all ages how to ride safely in any area from multi-use paths to congested streets as well as teaching motorists how to share the road safely with cyclists.

Measurement	Points			
Is there a community-wide Safe Routes to School program that includes bicycling education?	0	1	2	3
Are there bicycling education courses available for adults in the community?	0	1	2	3
Does your community educate motorists and cyclists on their rights and responsibilities as road users?	0	1	2	3
			Subtotal	

ENCOURAGEMENT – This category concentrates on how the community promotes and encourages bicycling. This can be done through Bike Month and Bike to Work Week events as well as producing community bike maps, route finding signage, community bike rides, commuter incentive programs, and having a Safe Routes to School program.

Measurement	Points			
Does your community have an up-to-date bicycle map?	0	1	2	3
Does the community celebrate bicycling during national Bike month with community rides, Bike to Work Day or media outreach?	0	1	2	3
Does the community host any major community cycling events or rides?	0	1	2	3
Is there an active bicycle advocacy group in the community?	0	1	2	3
			Subtotal	

ENFORCEMENT – The enforcement category addresses whether or not the law enforcement community has a liaison with the cycling community, if there are bicycle divisions of the law enforcement or public safety communities, if the community uses targeted enforcement to encourage cyclists and motorists to share the road safely, and the existence of bicycling related laws such as those requiring helmet or the use of sidepaths.

Measurement	Points			
Do law enforcement officers receive training on the rights and responsibilities of all road users?	0	1	2	3
Does your community have law enforcement or other public safety officers on bikes?	0	1	2	3
Do local ordinances treat bicyclists equitably?	0	1	2	3
			Subtotal	

EVALUATION – Here the community is judged on the systems that they have in place to evaluate current programs and plan for the future. Communities are rated on whether or not they have a bike plan, how much of it has been implemented and what the next steps for improvement are.

Measurement	Points			
Is there a plan or program to reduce cyclist/motor vehicle crashes?	0	1	2	3
Does your community have a current comprehensive bicycle plan?	0	1	2	3
Is there a Bicycle advisory Committee that meets regularly?	0	1	2	3
Does your community have a bicycle program manager?	0	1	2	3
			Subtotal	

Final Calculations

Measurement Criteria	Points
Engineering	
Education	
Encouragement	
Enforcement	
Evaluation	
Final Score	

Final Comments:

APPENDIX D

BICYCLE AND PEDESTRIAN PLAN

Community Bicycle and Pedestrian Plan Inventory

Inventory of municipal, park district and forest preserve bicycle and pedestrian plans.

Community Name	Bicycle/Pedestrian Plan	Bike/Ped Planning Map	Bike/Ped Element in Comprehensive Plan(s)	Bike/Ped Plan as part of Parks Plan	Bike/Ped Task Force
Algonquin	Yes Parks, Trails & Open Space Plan (2008)	Yes Parks, Trails & Open Space Map (2008)	Yes Comprehensive Plan (2008)	Yes Dundee Twsp PD	Yes Dundee Twsp PD
Aurora	Yes Bicycle & Pedestrian Plan (2009)	Yes Bicycle & Pedestrian Plan (2009)	Yes	Yes Fox Valley PD	No
Barrington Hills	No	No	Yes Comprehensive Plan (2005)	Yes Dundee Twsp PD	Yes Dundee Twsp PD
Bartlett & Bartlett Park District	Yes	Yes Bikeway Planning Map (2004)	Yes	No	No
Batavia & Batavia Park District	Yes Bicycle Plan (2007)	Yes Bicycle Plan Map (2007)	Yes Comprehensive Plan (Revised 2009)	Yes	Yes
Big Rock & Big Rock Park District	No	No	Yes Comprehensive Plan (2003)	No	No

Community Name	Bicycle/Pedestrian Plan	Bike/Ped Planning Map	Bike/Ped Element in Comprehensive Plan(s)	Bike/Ped Plan as part of Parks Plan	Bike/Ped Task Force
Burlington & Burlington Park District Park District	No	No	No	No	No
Carpentersville	No	Yes Comprehensive Plan (2007)	Yes Comprehensive Plan (2007)	Yes Dundee Twsp PD	Yes Dundee Twsp PD
Dundee Township Park District	Yes	Yes 2001	Yes 2020 Plan	Yes	Yes
East Dundee	No	Yes Twsp PD Map	Yes Comprehensive Plan (2002)	Yes Dundee Twsp PD	Yes Dundee Twsp PD
Elburn	No	No Bike To Metra Guide (2009)	Yes	No	No
Elgin	Yes Bikeway Master Plan (2008)	Yes Bikeway Master Plan Map (2008)	Yes Comprehensive Plan (2005)	Yes	Yes
Fox Valley Park District	No	No	N/A	Yes	No
Geneva & Geneva Park District	Yes Bike Implementation Plan (2005)	Yes Bike Implementation Map (2005)	Yes	Yes	Yes

Community Name	Bicycle/Pedestrian Plan	Bike/Ped Planning Map	Bike/Ped Element in Comprehensive Plan(s)	Bike/Ped Plan as part of Parks Plan	Bike/Ped Task Force
Gilberts	No	No	Yes	Yes Dundee Twsp PD	Yes
Hampshire & Hampshire Park District	No	No	No	Yes Park District Master Plan (2005)	No
Hoffman Estates	Yes Village Bike Plan (2008)	Yes Village Bike Plan Map (2008)	No	No	Yes
Huntley & Huntley Park District	No	Yes Park District Transportation Plan	No	Yes Park District Transportation Plan	Yes
Kane County Forest Preserve	N/A	Yes	N/A	N/A	Yes
Kendall County Forest Preserve	Yes Trails and Greenways Plan (2004)	Yes Trails and Greenways Map (2004)	N/A	N/A	Yes
Lily Lake	No	No	No	No	No
Maple Park	No	No	No Updated Comp plan will address transportation	No	No

Community Name	Bicycle/Pedestrian Plan	Bike/Ped Planning Map	Bike/Ped Element in Comprehensive Plan(s)	Bike/Ped Plan as part of Parks Plan	Bike/Ped Task Force
Montgomery	Yes	Yes Bicycle and Pedestrian Path Plan (2010)	Yes Comprehensive Plan (2003)	Yes Fox Valley PD	Yes
North Aurora	Yes (2001, Link?)	Yes	Yes Comprehensive Plan (2006)	Yes Fox Valley PD	No
Oswego & Oswegoland Park District	Yes	Yes Transportation Plan (2008)	Yes Strategic Growth Plan (2008)	Yes	No
Pingree Grove	No	No	No	No	No
Sleepy Hollow	No	Yes Twsp PD Map	Yes	Yes Dundee Twsp PD	Yes Dundee Twsp PD
South Elgin	No	No	Yes Comprehensive Plan (2002)	No	No
St. Charles & St. Charles Park District	Yes Bicycle and Pedestrian Facilities Plan (2003)	Yes Bicycle and Pedestrian Facilities Plan (2003)	Yes Comprehensive Plan (1995?)	Yes Bicycle and Pedestrian Facilities Plan (2003)	Yes

Community Name	Bicycle/Pedestrian Plan	Bike/Ped Planning Map	Bike/Ped Element in Comprehensive Plan(s)	Bike/Ped Plan as part of Parks Plan	Bike/Ped Task Force
Sugar Grove & Sugar Grove Park District	Yes Sugar Grove Community Bicycle and Pedestrian Short-term Connectivity Plan (2011 - Current Draft)	Yes Sugar Grove Community Bicycle and Pedestrian Short-term Connectivity Plan (2011 - Current Draft)	Yes Comprehensive Plan (2003)	No	No
Virgil	No	No	No	No	No
Wayne	No	No	Yes	No	No
West Dundee	No	Yes Comprehensive Plan (2005)	Yes Comprehensive Plan (2005)	Yes Dundee Twsp PD	Yes Dundee Twsp PD
Yorkville	Yes Integrated Transportation (2008)	Yes Shared Use Trail Plan (2008)	Yes Comprehensive Plan (2008)	Yes Park & Rec. Master Plan (2008)	No

APPENDIX E

BICYCLE AND PEDESTRIAN PLAN

Bicycle Level of Service Update

Ed Barsotti

July 12, 2011

In Spring 2011, the League of Illinois Bicyclists (LIB) performed the following tasks to update the Bicycle Level of Service (BLOS) ratings shown on the Kane and Northern Kendall Counties public bicycle map:

- Confirm data for roads presently rated on the bike map, and update Bicycle Level of Service (BLOS) scores as needed
- Gather routes not currently on the map, for northern Kendall County and for additional bike-friendly local routes used by cyclists inside the larger towns
- Collect these new roadways' data and convert to BLOS
- Prepare for the map cartographer a list of BLOS updates to make on the map, including the newly-rated roads

The original 2002 BLOS work, detailed in the original memo that follows, gathered data through IDOT's IRIS roadway database, direct inquiries of local road agencies, and some field work. The 2011 update relied solely on the updated IRIS database and on satellite imagery and street view computer tools not available in 2002.

Satellite imagery was used to check all relevant roads for fields such as number of lanes, lane width, paved shoulders, and parking occupancy. This caught many IRIS errors that were not caught in 2002. IRIS' traffic counts were somewhat more extensive than in 2002. Also, its truck volume counts were used to estimate heavy vehicle percentage, whereas a constant value was used in 2002. IRIS' many speed limit errors were corrected sometimes with street views, but most often with estimates based on the road geometry and adjacent land use. As a result of the above, the 2011 BLOS ratings are more accurate than the 2002 ratings.

More roads were rated for BLOS this time, to cover northern Kendall County and to make the map more useful in the larger towns – where most IRIS roads are just too busy for most cyclists. Most northern Kendall roads were in IRIS and followed the data collection procedure above. However, estimates of more parameters were needed for the selected non-IRIS, bicyclist-preferred roads inside the larger towns. Some of these roads were identified by local cyclists, but most were selected based on: 1) my personal knowledge of cycling conditions in many of the towns; 2) previous LIB planning work in Aurora, North Aurora, Batavia, and Geneva, and 3) analysis using satellite imagery. The previous planning work also saved on data collection.

Based on the distribution of resulting scores, a suggestion was accepted to change the map's 5 displayed BLOS levels to A and B, High C, Low C, High D, and Low D and E.

Bicycle Level of Service Application for the Kane County Council of Mayors Bicycle/Pedestrian Plan

A bicycle suitability analysis was done in early 2002 on the most significant roads (urban arterials and collectors, plus paved rural roads) in the Kane County Council of Mayors planning area. The effort coincided with development of the Kane bike/ped plan. It was originally inspired by a recommendation of the Chicago Area Transportation Study's Bicycle and Pedestrian Task Force to try BLOS in Kane County before advocating its use regionwide.

This report includes descriptions of the Bicycle Level of Service (BLOS) measure, the method used in applying BLOS in Kane County, details and assumptions for specific terms, and general conclusions.

In addition to this report, the following products are being given to Kane County:

1. ArcView GIS layer (or other format) with fields for BLOS and its inputs. The fields are described at the end of this report.
2. Maps of BLOS (larger scale) and its individual inputs.
3. BLOS map and disclaimer for use in the Kane bicycle plan's public map.

Bicycle Level Of Service[1]

Bicycle Level of Service (BLOS), together with the FHWA's Bicycle Compatibility Index (BCI) are emerging national standards for quantifying the "bike-friendliness" of a roadway. While other "level-of-service" indices relate to traffic capacity, these measures indicate bicyclist comfort level for specific roadway geometries and traffic conditions. Roadways with a better (lower) score are more attractive (and usually safer) for cyclists.

BLOS evaluation may be useful in several ways:

- A bicycle map can be produced for the public to assist them in route selection.
- The most appropriate routes for inclusion in the community bicycle network can be identified.
- "Weak links" in the network can be determined, and sites needing improvement can be prioritized.
- Alternate treatments for improving bike-friendliness of a roadway can be evaluated.
- Road project selection formulas can include a BLOS term to encourage implementation of bike planning goals.

Landis et al. developed the Bicycle Level of Service (1997) by measuring cyclist reaction to actual field courses. BLOS is similar to BCI in its sensitivity to curb lane width. Its traffic volume dependence is logarithmic, increasing the impact of changes at low and medium traffic levels. Additional paved shoulder or bike lane width has a major impact on the BLOS score, as do bad pavement condition and high numbers of heavy vehicles. The model was originally developed for use in metropolitan areas throughout the United States. Both the BCI and BLOS can be calculated using an on-line web form at www.bikelib.org/roads/blos

$$BLOS = 0.507 \ln(Vol_{15}/L_n) + 0.199 SP_t(1+10.38HV)^2 + 7.066(1/PR_5)^2 - 0.005 W_e^2 + 0.760$$

where:

Vol_{15} = volume of directional traffic in 15 minutes = (ADT * D * K_d) / (4 * PHF)

ADT = Average Daily Traffic on the segment

D = Directional Factor

K_d = Peak to Daily Factor

PHF = Peak Hour Factor

L_n = number of directional through lanes

SP_t = effective speed limit = 1.1199 ln(SP_p-20) + 0.8103, where SP_p is the posted speed limit

HV = percentage of heavy vehicles (as defined in the 1994 Highway Capacity Manual)

PR_5 = FHWA's 5-point pavement surface condition rating (5=best)

W_e = average effective width of outside through lane:

$W_e = W_v - (10' * OSPA)$ where $W_l = 0$

$W_e = W_v + W_l (1 - 2 * OSPA)$ where $W_l > 0$ & $W_{ps} = 0$

$W_e = W_v + W_l - 2 (10' * OSPA)$ where $W_l > 0$, $W_{ps} > 0$, and a bike lane exists.

W_t = total width of outside lane (and shoulder) pavement

OSPA = fraction of segment with occupied on-street parking

W_l = width of paving between outside lane stripe and edge of pavement

W_{ps} = width of pavement striped for on-street parking

W_v = effective width as a function of traffic volume

$W_v = W_t$ if ADT>4000 veh/day

$W_v = W_t (2 - (ADT/4000))$ if ADT<4000 and road is undivided and unstriped.

Bicycle Level of Service ranges associated with level of service (LOS) designations:

BLOS Range	≤ 1.50	1.51-2.50	2.51-3.50	3.51-4.50	4.51-5.50	> 5.50
LOS Level	A	B	C	D	E	F

[1] Landis, Bruce, "Real-Time Human Perceptions: Toward a Bicycle Level of Service," Transportation Research Record 1578 (Washington DC, Transportation Research Board, 1997).

Method Used in Applying BLOS in Kane and Kendall County

These steps were taken to gather the required data:

1. **Collect existing data.**

   The IDOT IRIS (Illinois Roadway Information System) database is available from CATS in ArcView GIS format, with almost all the required data fields for rural and significant urban roads in the 6-county area. I already had the most recent version available, from year 2000. While IRIS is a very good starting point, there is lots of missing, inaccurate, and old data. The best data is from state roads, followed by county and then local roads. This IRIS data was supplemented with Kane DOT (KDOT) traffic volume maps (2000-01) plus some road width, paved shoulder, and speed limit information.

2. **Send data to towns and townships.**

   Each agency (25 towns, 10 western and central townships) was sent a letter (attached) with an individualized map and a table of the best available data for the major roads in the area. They were requested to fill in missing data, correct wrong data, and give estimates if necessary – especially for traffic volumes which have been increasing countywide. Roads with significantly different segments had a data table record for each.

3. **Collect data.**

   Many agencies sent in their replies promptly, some required in-person or phone meetings, and a few never responded after repeated requests. Some informal field work was done for the latter towns. Field work and phone calls were used for follow-up questions.

4. **Calculate BLOS.**

   ArcView GIS data entry was done using the IRIS layer as a starting point. New fields were added for the returned values of the necessary terms. ArcView was used to make maps of the input terms and to calculate BLOS.

Comments on Specific Terms

A particular road's characteristics can change frequently over its course. Some smoothing of the data was done to reduce the number of distinct segments. Road cross-sections were rated away from intersections, where characteristics frequently change. The only intersection effect considered was the narrowing of some specific shoulders at long turn lanes.

Most towns and townships accepted the supplied data without many corrections. While most of the data was fairly accurate, the traffic volumes definitely needed more updates than were received. Most towns did not have these numbers, some were reluctant to make estimates (even when no IRIS data was given), and many just accepted the IRIS volumes. This under-reporting was compensated by two effects: first, the 15-minute volume for rush hour was used, giving a worst-case score; and second, the BLOS sensitivity to traffic volume is not as high as one might think. A doubling of traffic changes the score by 0.35-0.40, less than half a grade. Assumptions taken include D=0.565, Kd = 1/11, and PHF =1.

Heavy vehicles were assumed to be 3% of the total traffic on all roads. Available data from IRIS and other sources was very limited, so a constant value was taken.

Most **lane widths** were either available from IRIS, KDOT, or from the agencies. A few rural road lanes were assumed to be 10', consistent with other roads of that type. Roads with parking but no parking stripes included the entire travel and parking space in the lane width. When parking was striped, the parking area was treated as a paved shoulder or bike lane.

A striped **paved shoulder** had a huge effect on BLOS score. In fact, almost any road with a 10' shoulder would score an "A" – even Randall Road. The BLOS formula was actually derived using 5' shoulders as the maximum, so extrapolating beyond that is suspect. Using the formula directly, each 2' increase above 5' improved the score by approximately another grade. This seemed excessive, so I halved any width increase over 4' (e.g., I used 7' for 10' shoulders). Also, I reduced shoulder width on segments with long turn lanes of narrowed or no shoulders – like northbound Randall in Batavia. These corrections were made after discussions with Sprinkle Consulting.

For the rare roads with on-street parking, I made field estimates of the **percentage of occupied parking** and whether a stripe separated parking from the travel lane.

Surface condition was a difficult parameter to use correctly. Generally, IRIS data was quite old and often inaccurate or non-existent, with no indication of resurfacing since the measurement date. To simplify and to account for degradation over time, I would typically truncate any value less than 5 (newly paved) to the nearest whole number, usually 3 or 4. Sometimes towns would make corrections. Surface condition had an appreciable effect: the BLOS decrease from 4 to 3 is 0.35, with more impact at lower values. Also, the IRIS "Surface Type" parameter is used in the IDOT bicycle maps to determine whether a road is paved or gravel. That parameter and the responses from townships were used to flag only paved rural roads for BLOS rating.

Finally, the BLOS formula has a correction term for low-volume rural roads without **center striping**. The effective widening of the road has a huge impact – up to 1 ½ grades – but the correction does not apply to quiet, striped roads. This seems debatable.

Conclusions

Clearly, no formula for perceived bicyclist comfort level can be perfect. In addition to anomalies with different terms, there is a very wide range of bicyclists. However, after having gone through this project for Kane County, I believe that Bicycle Level of Service is an excellent tool that could be applied regionwide.

As a traffic-tolerant cyclist with experience riding many of the rated roads in central and southern Kane County, I agreed with almost all of the ratings. I feel comfortable on roads of "C" or better, and I'll ride on many "D" roads if necessary. I know more casual cyclists who would ride on only "B" or better roads, while others would ride only on trails or "A" roads. A good bicycle accommodation design policy might call for a minimum level of "C" for all roads and "B" for roads with high latent demand (near important destinations, etc.)

The method and amount of time (90-100 hours) for this project seemed appropriate. IDOT's IRIS database fit in perfectly as a starting point, providing data for rural roads and major roads (collectors and arterials) within towns. Asking agencies for corrections saves on data collection and provides a level of "buy-in"– but factors including traffic volumes and surface condition were not always accurate. Doing a BLOS analysis on a narrower level – like a specific road project – would justify more effort to get full accuracy of the parameters.

The approach of rating rural roads and major urban roads was appropriate for an outer suburban county like Kane. Areas developed within the past two or three decades have much more reliance on arterials and collectors – so rating these roads make sense. However, inner

suburbs built entirely on a grid pattern might require a different approach, since cyclists could frequently use sidestreets as alternative routes.

The inclusion of these BLOS ratings in the Kane "public" bicycle map will increase the transportation and recreational usefulness of the map. The effort by Kane County to try a countywide BLOS analysis will help regional acceptance of this valuable planning tool.

BLOS Explanation and Disclaimer

(The following text is to be included in the public bike map)

This map uses the Bicycle Level of Service (BLOS) methodology to rate key roads in the county. BLOS is a nationally recognized measure of the perceived "comfort level" of a range of experienced adult bicyclists sharing a roadway with traffic. Key factors include traffic speed, daily traffic volume, surface condition, lane width, and the presence of on-road bike lanes or paved shoulders. Scores range from "A" (most comfortable for cyclists) to "F" (least comfortable).

Most paved rural roads and significant urban roads (collectors and arterials) are rated on this map. Urban side streets and residential roads are excluded – these are assumed to have a good BLOS score.

In many places (like modern, non-grid style development), urban arterials and collectors are often the only way to get to specific destinations. In other places, side streets (or nearby trails) provide better alternatives. However, to be consistent, all "significant" urban roads are rated here – even those with alternatives.

The BLOS ratings on this map are in no way an endorsement or recommendation of a particular road or an indication that a road is intended for use by bicyclists. Rather, the ratings are only a quantified trip-planning tool for the individual adult bicyclist in the selection of roads meeting his or her experience, skill, and comfort levels.

Users of this map should be aware that potential hazards and obstructions may exist on the routes shown and that Kane County and the other relevant maintaining agencies in no way warrant the safety or fitness of the suggested routes. This map does not expand the liability of Kane County and the other maintaining agencies beyond existing law. The user of this map bears full responsibility for his or her safety.

Fields in the Kane BLOS ArcView Layer

Field names in **bold**. IRIS database fields in ***bold italics*** – I have a copy of IDOT's manual with explanations of the coded values.

IRIS traffic volume and date are ***AADT*** and ***AADT_YR***, with updated values **AADT02**.

HCV is the IRIS heavy vehicle ADT, if it exists.

The IRIS number of lanes is ***LNS*** with updated values **LANE02**.

The IRIS lane width is ***LN_WTH*** with updated values **WIDTH02**.

The IRIS speed limit is ***SPLIM*** with updated values **SPEED02**.

The IRIS surface type is ***SURF_TYP*** with updated values **SURF02**. Values over 300 are considered as paved and are rated.

The IRIS surface condition and date is ***CRS*** (1-9, 9 is best) and ***CRS_YR*** with converted, updated values **PR5**.

The IRIS shoulder types and widths are ***O_SHD1_TYP***, ***O_SHD1_WID***, ***O_SHD2_TYP***, and ***O_SHD2_WID***. Two distinct sections of shoulder can be rated.

The IRIS parking restriction fields are ***PRK_LT*** and ***PRK_RT***, with updated values **PARKING** (yes or no) and **PRKPCT** (% of occupied parking).

The field for whether the road has center stripes (yes or no) is **STRIPED**.

Wt, **VOL15**, **SPt**, **Wv**, and **We** are defined above in the BLOS section.

VolTerm, **SpdTerm**, **CondTerm**, and **WidTerm** are intermediate values.

BLOS is the BLOS score, with the grade given by **BLOSGrade**.

APPENDIX F

BICYCLE AND PEDESTRIAN PLAN

Bicycle Installation Ordinances

Examples of municipal and county ordinances requiring bikeway facilities in new developments or subdivisions.

The following ordinances are provided as example best practices from around the country of municipal and county ordinances requiring the construction of bikeway and pedestrian facilities with new developments and subdivisions.

Example 1: Tempe, Arizona Subdivision Ordinance

Sec. 30-23. Pedestrian ways and multi-use paths.
Pedestrian ways and multi-use paths may be required where essential for circulation, or access to schools, playgrounds, shopping centers, transportation, and other community facilities. Pedestrian ways and multi-use paths may be used for utility purposes.

Preliminary plat review requirement
Preliminary plat review shall be processed as follows:
On receipt of the preliminary plat, the department shall perform its review for compliance to public objectives, giving special attention to design principles and standards as set forth in Article III of this chapter, streets and thoroughfares, transit, bicycle and pedestrian facilities, neighborhood circulation, utility methods and systems, existing and proposed zoning and land use of the tract and its environs, and land required for schools, parks and other public facilities.

Example 2: Town of Los Altos Hills Site Development Ordinance

Article 6. Pathway Dedication, Maintenance, and Improvement

Sec. 10-2.601. Purposes.
The purposes of this article are to insure that provision is made for public pathways to provide pedestrian, equestrian, and bicycle access for Town residents; to implement the Master Pathway Plan of the General Plan of the Town of Los Altos Hills; and to prevent damage to the Town's pathways from activities that occur on private property. (§ 15, Ord. 299, eff. December 11, 1985)

Sec. 10-2.602. General policies.

(a) Each property shall have direct access to a pathway or indirect access via a vehicular right-of-way.
(b) Undeveloped properties along designated pathways and bicycle routes may be required to dedicate an easement for the extension of the pathway as a condition of site development approval.
(c) Pathways shall be sited and improved in a manner that creates minimal disturbance to the natural environment.
(d) Equestrian and pedestrian paths should generally be separated from roadways.
(e) Pathways shall be of sufficient width to provide a safe corridor for travel and pathway maintenance.
(f) Except for designated regional trails and bikeways, paths shall be designed primarily for local use by Town residents.
(g) Intersections of paths and vehicular rights-of-way shall be kept clear of vegetation which might obscure the view of users.
(h) Pathways shall be designed and maintained to prevent erosion, to prevent injury from landslides or other soil movements, and to assure proper drainage of the path.
(i) Pathways shall be designed and maintained to minimize their impact on adjacent properties.

Sec. 10-2.603. Construction activities near pathways.

Construction activities and tilling undertaken near a pathway shall create minimal disturbance to the pathway. Appropriate measures shall be undertaken to assure that landslides or soil movement do not occur on pathways. Temporary drainage facilities or plantings may be required by the City Engineer during construction to insure that pathways are not eroded or damaged from stormwater runoff. Any damage to a pathway resulting from private activities shall be repaired by the responsible party at their expense. In the event damage creates an irreparable break in the pathway, the responsible party may be required by the Town to provide or acquire an alternate easement for the pathway.

Sec. 10-2.606. Dedication of pathway easements.

Whenever a site development permit is requested for a main residence, a secondary dwelling, an addition to a structure of at least nine hundred (900) square feet of "habitable" floor area (including cumulative additions of nine hundred (900) or more square feet of habitable floor area), or a barn or stable of at least nine hundred (900) square feet in floor area, on a property which is designated on the Master Path Plan for an off-road pathway or for a roadside pathway, but where all or a portion of such roadside path cannot feasibly be located within the existing public or private right-of-way, the Site Development Authority may require the dedication of an easement for public use as part of the Town's pathway system according to the guidelines contained in the Pathway Element of the General Plan. Pathway easements shall be required within emergency road easements. In addition, the following guidelines apply:

(a) An easement should generally be located along the boundary of a property;
(b) The easement shall be located so as to connect to existing or future pathway segments at the boundaries of a property; and
(c) The easement shall not be located on terrain that cannot be safely or conveniently traversed by pedestrians or equestrians.

Example 3: Martin County, Florida -- Martin County Land Development Regulations, Roadway Design

Bicycle and Pedestrian Access.

1. Opportunities for bicycle/pedestrian mobility should be enhanced through site design strategies and bicycle/pedestrian access ways that seek to shorten walking distances and increase accessibility between neighborhoods, schools, recreation areas, community centers, shopping areas or employment center as follows:
   a. Sidewalks connecting residential developments to the sidewalk system of surrounding roadways.
   b. An accessible route within the boundary of a site shall be provided to meet the requirements of the Americans with Disabilities Act.
   c. Bicycle/pedestrian ways connecting residential developments and or nearby schools, neighborhood community centers, churches, parks, commercial and office developments, or other compatible land uses.

2. Where the decision making body (Development Review Committee for minor projects; Board of County Commissioners for major projects) determines that a bicycle/pedestrian connection is desirable from a subdivision to schools, parks, playgrounds, or other roads or facilities and that such access is not conveniently provided by sidewalks adjacent to the streets, the developer may be required to reserve an unobstructed easement to provide such access.

3. Commercial development should be designed to support bicycle and pedestrian mobility in accordance with the following:
   a. Safe and convenient pedestrian ways should be provided between parking areas and from the building entrance to surrounding streets, external sidewalks and development out parcels. Pedestrian ways may be constructed of paver blocks, concrete, or other suitable materials. Pedestrian ways that traverse parking areas should include reflective striping.
   b. Pedestrian circulation should be provided between abutting commercial properties through the use of walkways and similar pedestrian-oriented facilities.
   c. Pedestrian facilities may be incorporated into the required landscape buffer.

4. Bicycle and pedestrian amenities, such as benches, water fountains, or bicycle racks, should be provided for commercial developments of 10,000 square feet or more of gross floor area in accordance with the following schedule:
   a. Bicycle racks should be of the inverted "u" type.
   b. Bicycle racks should be located within fifty (50) feet of the main entrance of the primary building.

APPENDIX G BICYCLE AND PEDESTRIAN PLAN

Sidewalk Installation Ordinances

Examples of ordinances requiring sidewalk facilities in new developments or subdivisions.

The following ordinances are provided as example best practices from around the country of state and local ordinances requiring the construction of sidewalks with new developments and subdivisions.

Example 1: Sidewalk Installation for Southlake, Texas

ORDINANCE NO. 683
AN ORDINANCE AMENDING THE SUBDIVISION ORDINANCE OF THE CITY OF SOUTHLAKE, TEXAS BY ADOPTING REQUIREMENTS FOR THE INSTALLATION OF SIDEWALKS; PROVIDING FOR THE DESIGN, CONSTRUCTION, AND MAINTENANCE OF SIDEWALKS; PROVIDING THAT THIS ORDINANCE SHALL BE CUMULATIVE OF ALL ORDINANCES; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A PENALTY FOR VIOLATIONS HEREOF; PROVIDING FOR PUBLICATION IN THE OFFICIAL NEWSPAPER; PROVIDING A SAVINGS CLAUSE; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Southlake, Texas is a home rule city acting under its charter adopted by the electorate pursuant to Article XI, Section 5 of the Texas Constitution and Chapter 9 of the Local Government Code; and

WHEREAS, the City Council deems that it is necessary to adopt a sidewalk ordinance to require the construction of sidewalks under certain design and construction standards in order to promote the health, safety and welfare of the citizens of the City and the public in general.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SOUTHLAKE, TEXAS:

SECTION 1.
Section 1.04 of the Subdivision Ordinance of the City of Southlake is amended by adding the following definition:

SIDEWALK: A paved area intended for the use of pedestrians and located in a street right-of-way between the curb lines or the edge of pavement of the roadway or within a public access easement and the adjacent property lines.

SECTION 2.
The Subdivision Ordinance of the City of Southlake is hereby amended by adding a new Section 5.06 to read as follows:

A. GENERAL PROVISIONS

The purpose of this section is to provide for the orderly, safe and healthful construction of sidewalks within the City and to promote the health, safety and general welfare of the community. In order to carry out these purposes, it is hereby declared to be the policy of the City to guide and regulate sidewalk construction within the City.

B. REQUIREMENTS

1. General Requirements. Any new development in the city shall provide for the location and construction of sidewalks as provided in this section. This shall include the dedication of necessary right-of-way or public access easement and the construction of sidewalks according to the specifications provided herein.

2. Residential Requirements:
   a. Applicability: Sidewalks shall be required in all residential subdivisions with average lot sizes of less than one acre platted or re-platted after the effective date of this ordinance. A proposed Pedestrian Access Plan must be included as an element of any Concept Plan application, or in the case where no Concept Plan is required, with the Preliminary Plat application and shall be processed concurrently with these applications. The Pedestrian Access Plan shall demonstrate a method for the safe and effective movement of pedestrians both within the subdivision and to and from Trail System connections, where applicable.
   b. Trail Master Plan: Regardless of average lot size, the developer or builder of a residential subdivision platted or re-platted after the effective date of this ordinance shall install sidewalks in accordance with the Trail System Master Plan along the tract being developed adjacent to all arterial and collector streets (as defined by the Master Thoroughfare Plan).
   c. Time of Construction:
      i. Owners/homebuilders: Each owner/home builder within a residential subdivision platted after the effective date of this ordinance shall construct sidewalks at the time of construction of the house. In those circumstances where a sidewalk would impact the construction of driveways and access walks, the sidewalks shall be constructed before the City's final building inspection. A certificate of occupancy will not be issued until required sidewalks are in place.

ii. Developers: Sidewalks shown in the Pedestrian Access Plan to be constructed within common areas shall be constructed by the developer during the development of the subdivision.

d. Exemptions: A residential lot that is platted as a single lot of record is exempt from this requirement unless:
   i. Sidewalks are existing on both sides of the lot; or

   ii. The lot is located within 1,500 feet of a public or private school and is on the same side of the street.

3. Non-residential Requirements:
   a. Applicability: Sidewalks and/or trails, where required by the Trail System Master Plan, shall be required on all non-residential properties platted or re-platted after the effective date of this ordinance. A proposed Pedestrian Access Plan must be included as an element of any Concept Plan or Site Plan application and shall be processed concurrently with these applications, or in the case where no Concept Plan is required, with the Preliminary Plat application. The Pedestrian Access Plan shall demonstrate a method for the safe and effective movement of pedestrians both within the subdivision and to and from Trail System connections, where applicable.

   b. Trail Master Plan: The developer or builder of a non-residential subdivision platted or re-platted after the effective date of this ordinance shall install sidewalks along the tract being developed adjacent to all arterial and collector streets (as defined by the Master Thoroughfare Plan), where applicable according to the Trail System Master Plan.

   c. Time of Construction: Each developer and/or builder of a non-residential subdivision platted after the effective date of this ordinance shall construct sidewalks at the time of construction of the development. In those circumstances where a sidewalk would impact the construction of driveways and access walks, the sidewalks shall be constructed before the City's final building inspection. A certificate of occupancy will not be issued until required sidewalks are in place.

C. SIDEWALK SPECIFICATIONS
   1. Sidewalk Size and Locations: All sidewalks shall be at least four feet wide or in conformance with the Trail System Master Plan, whichever is greater, and shall be located between the curb or grade line of the public street and the ROW line

or public access easement if approved by the city, no closer than two (2) feet to the curb or grade line. The City Engineer or Building Official may alter alignment so that the sidewalk meanders within the area between the curb and right-of-way line.

2. Construction Specifications:
   a. Concrete Requirements: Concrete for sidewalks shall have a minimum compressive strength of three thousand (3,000) psi at twenty-eight (28) days. The quantity of mixing water shall not exceed six and one-half (6 ½) U.S. gallons per sack (ninety-four (94) lbs.) of Portland cement. The slump of the concrete shall not exceed four (4) inches. A minimum content of five (5) sacks of cement per cubic yard of concrete is required. Sidewalks shall be at least four (4) inches thick.

   b. Reinforcement: Sidewalks shall be reinforced with 3/8 inch No. 3 bars set on 24-inch centers.

   c. Expansion and Control Joints: One-half-inch premolded bituminous expansion joints with No. 4 (½-inch nominal diameter) smooth dowels shall be spaced at twenty-foot intervals. Where new work abuts driveways, pavement, curbs or any other work, expansion joints shall be filled with premolded bituminous expansion joint filler or redwood at least one-inch nominal thickness and shall extend six (6) inches deep and the entire width of the concrete sections. Bars used in this joint shall be sleeved to allow for the movement of concrete on the bars. The bars shall be smooth three-eighth (3/8) inch No. 3 bars minimum. No deformed bars shall be allowed. Sidewalk control joints shall be grooved three-eight (3/8) inch deep on four-foot centers.

   d. Sidewalk Finish: The surface of the sidewalk shall have a monolithic broom finish. In no case shall the surface be left slick or with a glossy finish. The edges of the sidewalk control joints and expansion joints shall be tooled to a smooth finish not less than two (2) inches in width. Exposed edges of the sidewalk shall be rounded with an edger to a radius of one-half (½) inch.

   e. Fire Hydrant Locations: Where a sidewalk is to be constructed and a fire hydrant would be within the forms, the forms shall curve around the fire hydrant such that the walk misses the fire hydrant by a minimum distance of one (1) foot. A transition of 10 feet is required in and out of curved areas.

f. Service and Meter Boxes: Where a sidewalk is to be built and a water meter box would be within the forms, a precast, concrete box shall replace the plastic box. This box shall have a hinged metal lid and be set at an elevation that will be equal to the finish grade of the sidewalk. If the builder so chooses, the builder may move the water meter box outside the forms at the builders expense.

g. Drainage: All sidewalks shall be built at an elevation that will not impede or be otherwise detrimental to proper lot drainage, with natural grade preferred.

3. Wheel-Chair Access Ramps
   a. Location: A wheel-chair access ramp must be constructed at any point a proposed sidewalk intersects a city street with the exception of walks leading from the street to the door of a residence. Access ramps must be constructed with a maximum 1" wide expansion material between the street and ramp flush with the finish grade.

   b. Grade: Care shall be taken to ensure a uniform grade meeting ADA requirements on the ramp, free of sags and short grades. Access ramps shall be built to grades no greater than 1 ft. of fall per 12 feet in length.

   c. Surface Finish: Surface texture of the ramp shall be obtained by coarse brooming, perpendicular to the slope of the ramp.

   d. Curb and Gutter: The normal gutter line shall be maintained through the area of the ramp. Curb cuts for ramps shall be located as shown on street plans or as approved by the City Engineer.

D. MAINTENANCE
   1. Responsibility for Maintenance:
      a. It shall be the duty and obligation of all owners and occupants of real property abutting upon sidewalks in the city, at their own cost and expense, to maintain and keep the sidewalks bordering their property level and free of depressions, excavations, elevations, inconsistencies, obstacles, obstructions or encroachments, natural or artificial, above or below ground level, or which overlap, impinge upon, or appropriate any part of the sidewalk area or the space eight (8) feet above it.

b. Any damage done to a sidewalk by the City or a City hired contractor shall be repaired by the City or contractor.

c. Any damage done to a sidewalk by a franchised utility shall be repaired by the franchised utility.

2. Provisions for Adequate Maintenance:
   a. Inspection and Notification: When the city determines that any section of sidewalk requires repairs or maintenance, a letter describing the necessary repairs will be sent to the adjacent property owner. The letter shall be given:
      i. Personally to the owner in writing; or
      ii. By regular or certified mail to the owner's post office address; or
      iii. If the letter cannot be delivered by personal service or by regular or certified mail, by publication in the official newspaper at least twice within ten (10) consecutive days.

   b. Time of Response: The property owner shall have 30 days from receipt of the letter described in Subsection D.2.a above to make the necessary repairs. If weather conditions or other extenuating circumstances dictate, this 30 day period may be extended by the Director of Public Works, provided that the property owner has contacted the Public Works Department with a plan for repairs prior to the expiration of the 30 days .

   c. Failure to Repair: Any repairs that are not performed by the property owner, and which are determined to be hazardous to pedestrians or other users of the sidewalk, may be performed by the city or a city hired contractor.

SECTION 3.
This ordinance shall be cumulative of all provisions of ordinances of the City of Southlake, Texas, except where the provisions of this ordinance are in direct conflict with the provisions of such ordinances, in which event the conflicting provisions of such ordinances are hereby repealed.

SECTION 4.
It is hereby declared to be the intention of the City Council that the phrases, clauses, sentences, paragraphs and sections of this ordinance are severable, and if any phrase, clause, sentence, paragraph or section of this ordinance shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences,

paragraphs and sections of this ordinance, since the same would have been enacted by the City Council without the incorporation in this ordinance of any such unconstitutional phrase, clause, sentence, paragraph or section.

SECTION 5.
Any person, firm or corporation who violates, disobeys, omits, neglects or refuses to comply with or who resists the enforcement of any of the provisions of this ordinance or the Subdivision Ordinance shall be fined not more than Five Hundred Dollars ($500.00) for each offense. Each day that a violation is permitted to exist shall constitute a separate offense.

SECTION 6.
All rights and remedies of the City of Southlake are expressly saved as to any and all violations of the provisions of Ordinance No. 483, as amended, or any other ordinances governing the installation of sidewalks which have accrued at the time of the effective date of this ordinance; and, as to such accrued ordinances, same shall not be affected by this ordinance but may be prosecuted until final disposition by the courts.

SECTION 7.
The City Secretary of the City of Southlake is hereby directed to publish the proposed ordinance or its caption and penalty together with a notice setting out the time and place for a public hearing thereon at least ten (10) days before the second reading of this ordinance, and if this ordinance provides for the imposition of any penalty, fine or forfeiture for any violation of any of its provisions, then the City Secretary shall additionally publish this ordinance or its caption and penalty in the official City newspaper one time within ten days after final passage of this ordinance, as required by Section 3.13 of the Charter of the City of Southlake.

SECTION 8.
This ordinance shall be in full force and effect from and after its passage and publication as required by law, and it is so ordained.

Example 2: Pedestrian Accommodations for the State of New Jersey

1. PEDESTRIAN ACCOMMODATIONS
   A. General

   Pedestrian accommodations are an integral part of urban and suburban transportation corridors. They facilitate pedestrian travel and access to public transportation, thereby contributing to alleviation of urban traffic congestion. The most pressing need for accommodation is at points of community development that result in pedestrian concentrations near or along the highway, such as at schools, public transportation stations and stops, local businesses, industrial plants, hospitals, churches, shopping centers, parking lanes, etc. Accommodations can include sidewalks, elevated walkways, grade-separated structures, stairs, curb ramps, and traffic signal devices.

   B. Policies

   Consider the travel needs of all users of a transportation corridor when planning transportation improvements. If during the planning phase of a project, pedestrian travel in the vicinity of the project is determined to be sufficient to warrant consideration, provide appropriate accommodations.

   C. Warrants

   Pedestrian accommodations will be considered appropriate if they are not already available and any of the following conditions exist:

   - there is current evidence of frequent pedestrian activity;
   - there is a history of pedestrian-related accidents;
   - the roadway improvement will create a safety impediment to existing or anticipated pedestrian travel;
   - there is urban or suburban development that would attract pedestrian travel along the route to be improved;
   - pedestrian-attracting development is expected along the route within five years of project completion, either as documented in a local plan or anticipated as a factor of similar development history; and/or
   - the roadway provides primary access to a park, recreation area or other significant destination, or across a natural or man-made barrier.

   D. Design

   Sidewalks normally are 1.5 m wide. When obstructions do not allow a width of 1.5 m for a short distance, provide a clear sidewalk width of at least 1 m for adequate passage of pedestrians and the disabled. Sidewalks wider than 1.5 m may be allowable if compatible with the local sidewalk network or if intended to

accommodate a wider range of users, such as bicyclists. Facilities intended to also accommodate bicycle travel should follow the guidance in Section 17-2.

Project limits may be extended beyond highway improvements for reasonable distances to include necessary pedestrian facilities at nearby intersections, to provide access to public transportation facilities, or to avoid short sidewalk gaps. Any such extensions should be reflected in the Phase I Report.

E. Documentation
Document in the Phase I Report the reasons for providing or not providing pedestrian accommodations. The Report also shall contain a discussion of the coordination with local officials concerning, at a minimum, the selection of access routes for the disabled. Intersection Design Studies should indicate the location of the ramps to be provided. The impact of access routes for the disabled should be assessed in any request for a design exception.

F. Maintenance and Jurisdiction
Jurisdiction and maintenance of pedestrian walkways are considered a local responsibility and should be coordinated with Local Agencies early in the planning process.

Example 3: Required Improvements for Subdivisions, Montrose, Colorado

Ordinance 4-7-6: REQUIRED IMPROVEMENTS

(A) All subdivisions and improvements shall be in substantial compliance with the City Comprehensive Plan.

(B) All subdivisions shall be provided, at the expense of the subdivider, and subject to applicable zoning criteria, with the following public improvements as required to serve the subdivision and to mitigate its impacts.

(1) Street improvements:
  (a) Paved Streets;
  (b) Paved alleys, if required by the City;
  (c) Street signs;
  (d) Street lights;
  (e) On and off-site traffic mitigation improvements.
(2) Curbs, gutters, sidewalks and accessibility ramps.
(3) Blocks and Lots.
(4) Parks, open space and recreation trails.

(5) Public utilities:
  (a) A water system including fire hydrants and fire mains;
  (b) A sanitary sewer system;
  (c) A stormwater system;
  (d) Other public utilities, including if available, gas, electricity, telephone, and CATV;
(6) Piped drainage facilities and waterways.
(7) School land dedication.
(8) Survey monuments.
(9) Berms, screening and buffers, if applicable.
(10) Off-street parking, mailbox location areas and school bus stops, if applicable.

(C) Other improvements required as a condition of approval and found to be roughly proportional to the impacts being mitigated. All public improvements shall be subject to applicable City Minimum Design Standards, Regulations and Specifications.

(D) Following the completion of any required improvements and submission of the as-built plans, the City Engineer shall conduct an inspection and if the improvements are in accordance with the requirements of these and other applicable regulations and good engineering and construction standards, shall issue a certificate of completion. For a period of one year thereafter, the subdivider shall be responsible to correct all defects or failures which appear in such improvements. At the end of said one-year warranty period, the developer shall request of the City Engineer final inspection of the improvements, which inspection shall be conducted by the City Engineer, and upon final approval, the improvements shall be accepted by the City. The warranty shall continue, however, until such acceptance is provided in writing to the developer.

(E) All property, improvements and easements dedicated to the City on any plat shall become property of the City upon execution of the plat, free and clear of all mortgages, liens and encumbrances. All dedicated improvements shall be subject to the one-year warranty as provided above.

(F) The subdivider may provide, at his or her expense, certain private improvements as specifically referenced below, to serve the subdivision and to mitigate its impacts, and in accordance with duly adopted City standards, if applicable.
(1) Recreational facilities, parks, open space and trails;
(2) Piped drainage facilities and waterways;
(3) Mail box location areas;
(4) Berms, screening and buffers;
(5) Other private improvements required as a condition of approval. Such improvements shall be privately owned and/or maintained, and the plat shall

contain appropriate restrictions on the use and covenants for ownership and maintenance in perpetuity enforceable by the City, providing for recovery of the City' s costs by liens or assessment against the property in the subdivision. Such improvements shall be completed or secured similar to public improvements prior to final plat approval.

Example 4: Sidewalk Standards, Durham City / County, North Carolina

Standards for Parking, Loading, Sidewalk, and Trash Handling Facilities

Ordinance 9.8 Sidewalk Requirements

9.8.1 Sidewalks and Trails
Sidewalk, walkway, on-road improvements, and trail systems sufficient to serve both existing and projected pedestrian and bicyclists needs shall be reflected in all site and subdivision plans. Such systems may include either conventional sidewalks along street rights-of-way, wide outside travel lanes or bike lanes on roadways, or walkways and trails in alternative locations as appropriate. Design, location, dimensions, dedications, easements, and reservations, shall conform to applicable City and/or County Urban Growth Area policies and plans for sidewalks, bicycle routes, and trails.

1. Location: Unless an alternate walkway is approved, conventional sidewalks within the Urban Growth Area shall be located as follows:
   a. On both sides of major and minor thoroughfares (as defined by the adopted Thoroughfare Plan) except on freeways;
   b. On one side of collector streets and nonresidential streets with existing or projected traffic of 2,000 or more vehicles per day;
   c. On one side of residential streets of all types that are not cul-de-sacs.
   d. On one or both sides of local streets in nonresidential areas where review indicates that sidewalks are, or will be, needed to accommodate pedestrian traffic.

2. If a conflict exists between these standards and the provisions of the Subdivision Ordinance, than the stricter requirements shall apply.

   When the approving body determines that the construction of a conventional sidewalk or alternative walkway is unfeasible due to special circumstances, including but not limited to: impending road widening, significant street trees, severe roadside conditions, or limited pedestrian volumes; the approving body may require either: (1) payment in lieu of sidewalk construction; or (2) a combination of sidewalk and/or alternative walkways and/or payment in lieu funds.

In general, sidewalks shall be 5 feet in width and shall be constructed of concrete. Alternate dimensions and materials may be approved by the City Engineering Department.

3. Either wide outside travel lanes or bicycle lanes, as determined by the City Public Works Department or the North Carolina Department of Transportation, shall be a part of any road improvements made on roadways which are indicated as bicycle routes on either the City's Durham Urban Trails and Greenways Master Plan or the Metropolitan Planning Organization's Regional Bicycle Plan.

APPENDIX H

BICYCLE AND PEDESTRIAN PLAN

Complete Streets Policies

Examples of local and county Complete Streets policies and resolutions.

The National Complete Streets Coalition released a comprehensive report analyzing local and regional policies that are designed to ensure that future transportation infrastructure investments provide safe options for everyone using the roadways. The following two policies were among the top scoring policies according to the established ten elements of a Complete Streets policy.

Example 1: Hennepin County, Minnesota Complete Streets Policy

Complete Streets Policy
Final Policy approved by Hennepin County Board of Commissioners
July 14, 2009

This Complete Streets policy was created under Hennepin County Board Resolution 090058R1. The resolution demonstrates the county's commitment to develop and maintain a safe, efficient, balanced and environmentally sound county transportation system and to support Active Living - integrating physical activity into daily routines through activities such as biking, walking, or taking transit. The county strives to be a leader in providing opportunities and choices for its residents, and believes that a well-planned transportation system that includes Complete Streets demonstrates this leadership.

Hennepin County will enhance safety, mobility, accessibility and convenience for all corridor users including pedestrians, bicyclists, transit riders, motorists, commercial and emergency vehicles, and for people of all ages and abilities by planning, designing, operating, and maintaining a network of Complete Streets. This policy applies to all corridors under Hennepin County jurisdiction. The county will work with other transportation agencies to incorporate a Complete Streets philosophy and encourages the State of Minnesota, municipalities, other counties and regional organizations to adopt similar policies.

Given the diversity of the natural and built environment in Hennepin County, flexibility in accommodating different modes of travel is essential to balancing the needs of all corridor users. The county will implement Complete Streets in such a way that the character of the project area, the values of the community, and the needs of all users are fully considered. Therefore, Complete Streets will not look the same in all environments, communities, or development contexts, and will not necessarily include exclusive elements for all modes.

Developing Complete Streets will be a priority on all corridors, and every transportation and development project will be treated as an opportunity to make improvements. This will include corridors that provide connections or critical linkages between activity centers and major transit connections, and in areas used frequently by pedestrians and bicyclists today or with the potential for frequent use in the future.

Hennepin County will conduct an inventory and assessment of existing corridors, and develop Complete Streets implementation and evaluation procedures. The Complete Streets policy and implementation procedures will be referenced in the Transportation Systems Plan and other appropriate plans or documents.

Applicable design standards and best practices will be followed in conjunction with construction, reconstruction, changes in allocation of pavement space on an existing roadway, or other changes in a county corridor. The planning, design, and implementation processes for all transit way and roadway corridors will:

- Involve the local community and stakeholders,
- Consider the function of the road,
- Integrate innovative and non-traditional design options,
- Consider transitway corridor alignment and station areas,
- Assess the current and future needs of corridor users,
- Include documentation of efforts to accommodate all modes and all users,
- Incorporate a review of existing system plans to identify Complete Streets opportunities.

Hennepin County will implement Complete Streets unless one or more of the following conditions are documented:

- The cost of establishing Complete Street elements is excessive in relation to total project cost.
- The city council refuses municipal consent or there is a lack of community support.
- There are safety risks that cannot be overcome.
- The corridor has severe topographic, environmental, historic, or natural resource constraints.

The County Engineer will document all conditions that require an exception. The Assistant County Administrator for Public Works will provide the Hennepin County Board with annual reports detailing how this policy is being implemented into all types and phases of Hennepin County's Public Works projects.

Hennepin County will identify and apply measures to gauge the impact of Complete Streets on Active Living and the quality of life of its residents.

Example 2: Lee's Summit, Missouri Complete Streets Policy Resolution

RESOLUTION 10-17

A RESOLUTION ESTABLISHING THE LIVABLE STREETS POLICY FOR THE CITY OF LEE'S SUMMMIT, MISSOURI.

WHEREAS, the Lee's Summit 360° Strategic Plan was received by the City of Lee's Summit to serve as a guideline and list of ideal goals that the City and its partners would like to accomplish over the next 10 - 15 years to create the ideal community where all Lee's Summit residents, visitors, and businesses can live, work, and play; and,

WHEREAS, Lee's Summit strives to be a sustainable and vibrant city with a dynamic spirit of cooperation among its diverse citizens, businesses, organizations, educational systems and governments; and,

WHEREAS, through comprehensive community planning and regional collaboration, Lee's Summit desires economic independence and a high quality of life as a recognized destination city; and,

WHEREAS, the City desires to promote public health by encouraging walking and bicycling as a part of active living; and,

WHEREAS, older citizens and citizens with disabilities often rely on transit, mobility aids, and walking to meet basic transportation needs and benefit greatly from complete and well designed Livable Streets; and,

WHEREAS, the usual and customary users of the City's roads, streets and bridges include pedestrians, bicyclists and transit passengers of all ages and abilities, as well as drivers and passengers of automobiles, motorcycles, buses and trucks; and,

WHEREAS, the Lee's Summit 360° Stakeholders envisioned transportation in Lee's Summit as a planned, regionally integrated, multi-modal, accessible, and well-maintained system that facilitates movement about the city and encourages growth and economic development. This system includes vehicular, bicycle, pedestrian, aeronautical, rail and mass transit components. The system provides safe, efficient, and sustainable transportation of people, goods, and services to and from places where people live, work, worship, shop, play, learn, and seek medical care; and,

WHEREAS, the Lee's Summit 360° Strategic Plan Transportation Key Performance Area, Goal 2, provides for the development, implementation and incorporation of a Livable Streets approach to transportation; and,

WHEREAS, this goal implements the Livable Streets system in conjunction with other policies, regulations and plans, such as the Greenway Master Plan adopted as part of the City's Comprehensive Plan; and,

WHEREAS, the Lee's Summit 360° Strategic Plan recommends the adoption of a Complete Streets Ordinance that includes a "policy focus" to accommodate pedestrians, motorists, bicyclist and mass transit riders of all ages and abilities, and the Lee's Summit 360° Stakeholders as part of plan implementation recommend a Resolution for Livable Streets to support modification and adoption of applicable ordinances, standards, plans and codes to meet this goal; and,

WHEREAS, the terms "Complete Streets" and "Comprehensive Street Design" are also used to identify the same concepts as Livable Streets.

NOW THEREFORE BE IT RESOLVED BY THE COUNCIL OF THE CITY OF LEE'S SUMMIT AS FOLLOWS:

SECTION ONE. TITLE.
This policy shall be known as the "Livable Streets Policy."

SECTION TWO. PURPOSE.
The Livable Streets Policy sets forth guiding principles and practices to be considered in transportation projects, so as to encourage walking, bicycling and transit use while promoting safe use and operation for all users.

SECTION THREE. DEFINITIONS.
"Livable Street" means a transportation corridor for all users including pedestrians, bicyclists, transit riders, cars, trucks, motorcycles and buses. "Livable Streets" are designed and operated to safely facilitate movement of people of all ages and abilities from destination to destination along and across a continuous travel network.

"Livable Street Elements" means transportation improvements, facilities and amenities that accommodate and/or promote multiple modes of travel, including pedestrian, bicycle and transit in addition to cars, trucks, motorcycles and buses. These elements are defined and recognized by the Institute of Transportation Engineers and the American Planning Association.

"Public Improvement Project" means new roads, trails, sidewalks and facilities or reconstruction thereof, as well as private improvement projects constructed and/or maintained in whole or part with City funds, owned or leased by the City, and/or intended to be dedicated to the City.

SECTION FOUR. APPLICABILITY.

1. This Policy applies to the design, construction and maintenance (e.g. resurfacing and striping modification) of Public Improvement Projects.

2. The City shall consider public plans, standards, regulations and ordinances that further this Policy. For example, the City shall consider an ordinance that requires safe access for pedestrians, bicyclist and other forms of travel, in addition to motorists, in any new development or redeveloped areas. This ordinance should establish design standards for future development that incorporate Livable Streets Elements.

SECTION FIVE. GUIDING PRINCIPLES.
Guiding principles and practices of the "Livable Streets Policy" are as follows:

1. "Livable Streets" are designed to serve everyone - pedestrians, bicyclists, transit riders, and motorists - including persons of all ages and abilities.

2. The design and construction of all Public Improvement Projects should include Livable Streets Elements identified in and required by:

   a. public plans adopted by the Planning Commission, such as the Greenway Master Plan, Thoroughfare Master Plan, and Capital Improvement Plan, all which may be independent or a part of the City's Comprehensive Plan; and
   b. development related ordinances, such as the Unified Development Ordinance, Access Management Code, and the Design and Construction Manual.

3. Livable Streets Elements should be considered within the balance of mode and context of the community, including, but not limited to, environmental sensitivity, cost, budget, demand, probable use, space and area requirements and limitations, and legal requirements and limitations.

4. The City intends to incorporate Livable Streets principles into all public strategic plans, standards and regulations, including the Unified Development Ordinance, the Design and Construction Manual, the Access Management Code, the City's Comprehensive Plan, the Traffic Code, and other relevant ordinances, practices and policies, upon subsequent updates. The Livable Streets principles, where applicable and appropriate, should be incorporated into other City plans, manuals, rules, practices, policies, training, procedures, regulations and programs as directed by the City Manager.

5. It is a goal of the City to foster partnerships with the State of Missouri, Jackson County, Cass County, school districts, citizens, businesses, Mid-America Regional Council (MARC), neighboring communities, and neighborhoods in consideration of functional facilities and accommodations in furtherance of the City's Livable Streets Policy and the continuation of such facilities and accommodations beyond the City's borders or maintenance.

6. The City recognizes that Livable Streets may be achieved through elements incorporated into a single project or incrementally through a series of improvements or maintenance activities over time.

7. The City will consider all possible funding sources to plan and implement this policy and shall investigate grants that may be available to make Livable Streets Elements more economically feasible.

SECTION SIX. LIVABLE STREETS SUMMARY.

1. A summary or description of the Livable Streets Elements of all Public Improvement Projects shall be included in:

   - the Capital Improvements Plan; and
   - the development review report of any private development plan that requires City Council approval.

2. If a Livable Streets Element identified in and required by adopted public plans or development related ordinance is not incorporated in the project, such omission shall be documented in the Livable Streets Summary that demonstrates:
   - that the accommodation is not necessary because non-motorized use is prohibited, such as interstate freeways; or
   - that the cost of accommodation is excessively disproportionate to the need or probable future use; or
   - a documented absence of current or future need.

   a. The documentation shall be conducted by appropriate staff; or for private projects, the owner shall conduct the documentation.
   b. The documentation shall be submitted to the City Manager and/or the City Council, as appropriate, for consideration prior to approval of project design.

SECTION SEVEN. LIVABLE STREETS ADVISORY BOARD.
The City plans to adopt an ordinance which would create a Livable Streets Advisory Board (LSAB).

SECTION EIGHT.
This resolution shall be in full force and effect from the date of its passage, adoption, and approval by the Mayor.

APPENDIX

BICYCLE AND PEDESTRIAN PLAN

Walkability Checklist

Checklist to rate your neighborhood's walkability development by the Partnewship for a Walkable America.

How Walkable is your community? Take a walk and use this checklist to rate your neighborhood's walkability.

Take a walk with a child and decide for yourselves.

Everyone benefits from walking. These benefits include: improved fitness, cleaner air, reduced risks of certain health problems, and a greater sense of community. But walking needs to be safe and easy. Take a walk with your child and use this checklist to decide if your neighborhood is a friendly place to walk. Take heart if you find problems, there are ways you can make things better.

Getting started:

First, you'll need to pick a place to walk, like the route to school, a friend's house or just somewhere fun to go.

The second step involves the checklist. Read over the checklist before you go, and as you walk, note the locations of things you would like to change. At the end of your walk, give each question a rating. Then add up the numbers to see how you rated your walk overall.

After you've rated your walk and identified any problem areas, the next step is to figure out what you can do to improve your community's score. You'll find both immediate answers and long-term solutions under "Improving Your Community's Score..." on the third page.

Take a walk and use this checklist to rate your neighborhood's walkability.

How walkable is your community?

Location of walk _____

_____

Rating Scale:

1	2	3	4	5	6
awful	many problems	some problems	good	very good	excellent

1. Did you have room to walk?

☐ Yes ☐ Some problems:

- ☐ Sidewalks or paths started and stopped
- ☐ Sidewalks were broken or cracked
- ☐ Sidewalks were blocked with poles, signs, shrubbery, dumpsters, etc.
- ☐ No sidewalks, paths, or shoulders
- ☐ Too much traffic
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one)
1 2 3 4 5 6

_____

_____

2. Was it easy to cross streets?

☐ Yes ☐ Some problems:

- ☐ Road was too wide
- ☐ Traffic signals made us wait too long or did not give us enough time to cross
- ☐ Needed striped crosswalks or traffic signals
- ☐ Parked cars blocked our view of traffic
- ☐ Trees or plants blocked our view of traffic
- ☐ Needed curb ramps or ramps needed repair
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one)
1 2 3 4 5 6

_____

_____

3. Did drivers behave well?

☐ Yes ☐ Some problems: Drivers...

- ☐ Backed out of driveways without looking
- ☐ Did not yield to people crossing the street
- ☐ Turned into people crossing the street
- ☐ Drove too fast
- ☐ Sped up to make it through traffic lights or drove through traffic lights?
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one)
1 2 3 4 5 6

_____

_____

4. Was it easy to follow safety rules? Could you and your child...

☐ Yes	☐ No	Cross at crosswalks or where you could see and be seen by drivers?
☐ Yes	☐ No	Stop and look left, right and then left again before crossing streets?
☐ Yes	☐ No	Walk on sidewalks or shoulders facing traffic where there were no sidewalks?
☐ Yes	☐ No	Cross with the light?

Locations of problems: _____

Rating: (circle one)
1 2 3 4 5 6

_____

_____

5. Was your walk pleasant?

☐ Yes ☐ Some unpleasant things:

- ☐ Needed more grass, flowers, or trees
- ☐ Scary dogs
- ☐ Scary people
- ☐ Not well lighted
- ☐ Dirty, lots of litter or trash
- ☐ Dirty air due to automobile exhaust
- ☐ Something else _____

Locations of problems: _____

Rating: (circle one)
1 2 3 4 5 6

_____

_____

How does your neighborhood stack up? Add up your ratings and decide.

1. _____
2. _____
3. _____
4. _____
5. _____

Total _____

26–30	Celebrate! You have a great neighborhood for walking.
21–25	Celebrate a little. Your neighborhood is pretty good.
16–20	Okay, but it needs work.
11–15	It needs lots of work. You deserve better than that.
5–10	It's a disaster for walking!

Now that you've identified the problems,
go to the next page to find out how to fix them.

Now that you know the problems,
you can find the answers.

Improving your community's score...

1. Did you have room to walk?

Sidewalks or paths started and stopped
Sidewalks broken or cracked
Sidewalks blocked
No sidewalks, paths or shoulders
Too much traffic

What you and your child can do immediately

- pick another route for now
- tell local traffic engineering or public works department about specific problems and provide a copy of the checklist

What you and your community can do with more time

- speak up at board meetings
- write or petition city for walkways and gather neighborhood signatures
- make media aware of problem
- work with a local transportation engineer to develop a plan for a safe walking route

2. Was it easy to cross streets?

Road too wide
Traffic signals made us wait too long or did not give us enough time to cross
Crosswalks/traffic signals needed
View of traffic blocked by parked cars, trees, or plants
Needed curb ramps or ramps needed repair

- pick another route for now
- share problems and checklist with local traffic engineering or public works department
- trim your trees or bushes that block the street and ask your neighbors to do the same
- leave nice notes on problem cars asking owners not to park there

- push for crosswalks/signals/ parking changes/curb ramps at city meetings
- report to traffic engineer where parked cars are safety hazards
- report illegally parked cars to the police
- request that the public works department trim trees or plants
- make media aware of problem

3. Did drivers behave well?

Backed without looking
Did not yield
Turned into walkers
Drove too fast
Sped up to make traffic lights or drove through red lights

- pick another route for now
- set an example: slow down and be considerate of others
- encourage your neighbors to do the same
- report unsafe driving to the police

- petition for more enforcement
- request protected turns
- ask city planners and traffic engineers for traffic calming ideas
- ask schools about getting crossing guards at key locations
- organize a neighborhood speed watch program

4. Could you follow safety rules?

Cross at crosswalks or where you could see and be seen
Stop and look left, right, left before crossing
Walk on sidewalks or shoulders facing traffic
Cross with the light

- educate yourself and your child about safe walking
- organize parents in your neighborhood to walk children to school

- encourage schools to teach walking safely
- help schools start safe walking programs
- encourage corporate support for flex schedules so parents can walk children to school

5. Was your walk pleasant?

Needs grass, flowers, trees
Scary dogs
Scary people
Not well lit
Dirty, litter
Lots of traffic

- point out areas to avoid to your child; agree on safe routes
- ask neighbors to keep dogs leashed or fenced
- report scary dogs to the animal control department
- report scary people to the police
- report lighting needs to the police or appropriate public works department
- take a walk wih a trash bag
- plant trees, flowers in your yard
- select alternative route with less traffic

- request increased police enforcement
- start a crime watch program in your neighborhood
- organize a community clean-up day
- sponsor a neighborhood beautification or tree-planting day
- begin an adopt-a-street program
- initiate support to provide routes with less traffic to schools in your community (reduced traffic during am and pm school commute times)

A Quick Health Check

Could not go as far or as fast as we wanted
Were tired, short of breath or had sore feet or muscles
Was the sun really hot?
Was it hot and hazy?

- start with short walks and work up to 30 minutes of walking most days
- invite a friend or child along
- walk along shaded routes where possible
- use sunscreen of SPF 15 or higher, wear a hat and sunglasses
- try not to walk during the hottest time of day

- get media to do a story about the health benefits of walking
- call parks and recreation department about community walks
- encourage corporate support for employee walking programs
- plant shade trees along routes
- have a sun safety seminar for kids
- have kids learn about unhealthy ozone days and the Air Quality Index (AQI)

Need some guidance?
These resources might help...

Great Resources

WALKING INFORMATION

Pedestrian and Bicycle Information Center (PBIC)
UNC Highway Safety Research Center
730 Airport Road , Suite 300
Campus Box 3430
Chapel Hill, NC
27599-3430
Phone: (919) 962-2202
www.pedbikeinfo.org
www.walkinginfo.org

National Center for
Bicycling and Walking
Campaign to Make
America Walkable
1506 21st Street, NW
Suite 200
Washington, DC 20036
Phone: (800) 760-NBPC
www.bikefed.org

WALK TO SCHOOL DAY WEB SITES

USA event: www.walktoschool-usa.org
International: www.iwalktoschool.org

STREET DESIGN AND TRAFFIC CALMING

Federal Highway Administration
Pedestrian and Bicycle Safety Research Program
HSR - 20
6300 Georgetown Pike
McLean,VA 22101
www.fhwa.dot.gov/environment/bikeped/index.htm

Institute of Transportation Engineers
www.ite.org

Surface Transportation Policy Project
www.transact.org

Transportation for Livable Communities
www.tlcnetwork.org

WALKING COALITIONS

America Walks
P.O. Box 29103
Portland, Oregon 97210
Phone: (503) 222-1077
www.americawalks.org

Partnership for a Walkable America
National Safety Council
1121 Spring Lake Drive
Itasca, IL 60143-3201
Phone: (603) 285-1121
www.nsc.org/walkable.htm

PEDESTRIAN SAFETY

National Highway Traffic Safety Administration
Traffic Safety Programs
400 Seventh Street, SW
Washington, DC 20590
Phone: (202) 662-0600
www.nhtsa.dot.gov/people/injury/pedbimot/ped

National SAFE KIDS Campaign
1301 Pennsylvania Ave. NW
Suite 1000
Washington, DC 20004
Phone: (202) 662-0600
Fax: (202) 393-2072
www.safekids.org

WALKING AND HEALTH

US Environmental Protection Agency
Office of Children's Health Protection (MC 1107A)
Washington, DC 20460
Phone: 202-564-2188
Fax: 202-564-2733
www.epa.gov/children/
www.epa.gov/airnow/
www.epa.gov/air/urbanair/ozone/what.html
www.epa.gov/sunwise/uvindex.html
www.epa.gov/otaq/transp/comchoic/ccweb.htm

President's Task Force on Environmental Health Risks and
Safety Risks to Children
www.childrenshealth.gov

Centers for Disease Control and Prevention
Division of Nutrition and Physical Activity
Phone: (888) 232-4674
www.cdc.gov/nccdphp/dnpa/readyset
www.cdc.gov/nccdphp/dnpa/kidswalk/index.htm

Prevention Magazine
33 East Minor Street
Emmaus, PA 18098
www.itsallaboutprevention.com

Shape Up America!
6707 Democracy Boulevard
Suite 306
Bethesda, MD 20817
www.shapeup.org

ACCESSIBLE SIDEWALKS

US Access Board
1331 F Street, NW
Suite 1000
Washington, DC 20004-1111
Phone: (800) 872-2253;
(800) 993-2822 (TTY)
www.access-board.gov

APPENDIX J BICYCLE AND PEDESTRIAN PLAN

Educational Resources

Examples of education resources for bicycle and pedestrian issues.

Educational Resources
Bicycle Coalition of Maine
P.O. Box 5275
Augusta, Maine 04332-5275
(207) 623-4511
BCM@BikeMaine.org
http://www.bikemaine.org/what-we-do

Bicycling Coalition of Massachusetts
State Laws Concerning Bicycles
http://www.massbike.org/projectsnew/legislation

Bicycle Safety Educational Resource Center
Federal Highway Administration
U.S. Department of Transportation
http://www.bicyclinginfo.org/ee/fhwa.html

Bicycling Street Smarts: Riding Confidently, Legally and Safely
John S. Allen
http://www.bikexprt.com/streetsmarts/usa/index.htm

Highway Research Safety Center
University of North Carolina
http://www.hsrc.unc.edu/research_library/index.cfm

"How Not to Get Hit by Cars"
by Michael Bluejay
http://bicyclesafe.com/

League of American Cyclists
BikeEd Program
1612 K Street NW
Washington, DC 20006-2082
(202) 822-1333
bikeleague@bikeleague.org

League of Illinois Bicyclists
Bicycle Education Materials and Programs
Ed Barsotti, Executive Director
2935 Barberry Court
Aurora, Illinois 60504
http://www.bikelib.org/

Pennsylvania Bicycle Driver's Manual
Pennsylvania Department of Transportation
by John S. Allen
http://www.dot.state.pa.us/Internet/Bureaus/pdBikePed.nsf/infoAcknowledgements?OpenForm

Safe Route To School Resources
California Department of Transportation
http://www.dot.ca.gov/

California Department of Transportation Division of Local Assistance (SB10)
http://www.dot.ca.gov/hq/LocalPrograms/

California Walk to School Day
http://www.cawalktoschool.com/

Christchurch, New Zealand
http://www.ccc.govt.nz/saferoutes/latestNews.asp

Clark County, Nevada
http://www.co.clark.nv.us/pubworks/Neighborhood/School_Safe_Route.htm
Edinburgh, England
http://www.spokes.org.uk/sr2snews.htm

Illinois Department of Transportation Safe Routes to School Program
http://www.dot.il.gov/saferoutes/SafeRoutesHome.aspx

National Center for Bicycling and Walking
http://www.bikefed.org/safe_routes_to_school.htm

Walk to School Day
Pedestrian Bicycle Information Center
http://www.walktoschool-usa.org/

APPENDIX K BICYCLE AND PEDESTRIAN PLAN

Model Bicycle Safety Ordinances

Sample ordinances for bicycle safety and bicycle usage.

The following are provided as best practice examples of state and local ordinances requiring the safe usage of bicycles.

Model Bicycle Usage Ordinances Example 1

DEFINITIONS

Section 1(a). VEHICLE. Means every device in, upon, or by which any person or property may be transported or drawn upon a highway, except devices used exclusively upon stationary rails or trucks.

Section 1(b). BICYCLE. Every device propelled by human power upon which any person may ride, having two tandem wheels either of which is more than fourteen (14) inches in diameter.

Section 1(c). LOCAL AUTHORITIES. Every county, municipal, and other local board or body having authority to enact laws relating to traffic under the constitution and laws of this state. Additionally, any school district created under the laws of this state shall constitute a local authority for the limited purpose of designating school crossing guards for schools operated by the school districts.

Section 1(d). STREET OR HIGHWAY. The entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel.

Section 1(e). ROADWAY. That portion of a highway improved, designed or ordinarily used for vehicular travel, exclusive of the berm or shoulder. In the event a highway includes two or more separate roadways, the term "roadway" as used herein shall refer to any such roadway separately but not to all such roadways collectively.

Section 1(f). SIDEWALK. That portion of a street between the curb lines, or the lateral lines of a roadway, and the adjacent property lines intended for the use of pedestrians.

Section 1(g). SHOULDER. The portion of a highway that is:

1. contiguous to the roadway;
2. designed or ordinarily used for parking;
3. set off from the roadway by different design, construction, or marking; and
4. not intended for normal vehicular travel.
5. "improved shoulder" means a paved shoulder.

Section 1(h). DAYTIME AND NIGHTTIME. "Daytime" means from one-half (1/2) hour before sunrise to one-half (1/2) hour after sunset, and "nighttime" means at any other hour.

Section 2. RIDING ON BICYCLES.

(a) A person propelling a bicycle shall not ride other than upon or astride a permanent and regular seat attached thereto.

(b) No bicycle shall be used to carry more personas at one time than the number for which it is designed or equipped.

Section 3. CLINGING TO VEHICLES. No person riding upon any bicycle, coaster, roller skates, sled, or toy vehicle shall attach the same or himself to any streetcar or vehicle upon a roadway.

Section 4. RIDING ON ROADWAYS AND BICYCLE PATHS.

(a) Except as provided by Subsection (c) of this section, a person operating a bicycle upon a roadway at less than the speed of other traffic on the roadway at that time shall ride as near as practicable to the right curb or edge of the roadway, except when:

1. the person is overtaking and passing another vehicle proceeding in the same direction;
2. the person is preparing for a left turn at an intersection or onto a private road or driveway; or
3. conditions on the roadway, including fixed or moving objects, parked or moving vehicles, pedestrians, animals, surface hazards, or substandard width lanes, make it unsafe to ride next to the right curb or edge of the roadway.

(b) For the purpose of Subsection (a) of this section, a substandard width lane is a lane that is too narrow for a bicycle and a motor vehicle to travel in the lane safely side by side.

(c) A person operating a bicycle on a one-way roadway with two or more marked traffic lanes may ride as near as practicable to the left curb or edge of the roadway.

(d) Persons riding bicycles upon a roadway shall not ride more than two abreast except on parts of roadways set aside for the exclusive use of bicycles. Persons riding two abreast shall not impede the normal and reasonable flow of traffic on the roadway. If persons are riding two abreast on a laned roadway, they must ride in a single lane.

Section 5. CARRYING ARTICLES. No person operating a bicycle shall carry any package, bundle, or article which prevents the driver from keeping at least one hand upon the handlebars.

Section 6. BICYCLES: LAMPS AND OTHER EQUIPMENT.

(a) Every bicycle when in use at nighttime shall be equipped with a lamp on the front which shall emit a white light visible from a distance of at least five hundred (500) feet to the front and with a red reflector on the rear of a type approved by the Department which shall be visible from all distances from fifty (50) feet to three hundred (300) feet to the rear when directly in front of lawful upper beams of head lamps on a motor vehicle. A lamp emitting a red light visible from a distance of five hundred (500) feet to the rear may be used in addition to the red reflector.

(b) Every bicycle shall be equipped with a brake which will enable the operator to make the braked wheels skid on dry, level, clean pavement.

Model Bicycle Usage Ordinances Example 2 – City of Pierre, South Dakota

Section 9-5-101 to 199, inclusive. Bicycles - general provisions.

Section 9-5-101. Applicability of traffic laws.
Every person riding or operating a bicycle upon a roadway shall be granted all the rights and shall be subject to all the duties applicable to the driver of a motor vehicle by the laws of the State of XX and the provisions of this chapter declaring rules of the road applicable to the driver of a vehicle except as to those provisions of laws and ordinances which by their nature have no application.

Section 9-5-102. Regulations for operation of bicycles generally.

It shall be unlawful for any person to operate a bicycle in any of the following described manners:

A. At a speed greater than is reasonable and prudent under conditions then existing.

B. Failing to use bike path. Whenever a usable path for bicycles has been provided adjacent to the roadway or as part of the roadway, bicycle riders shall use such paths and shall not use the remaining portion of the roadway. Wherever the City has provided sidewalks and bituminous ramps adjacent to streets for the accommodation of bicycle riders, such sidewalks and ramps shall be regarded as usable paths for bicycles.

C. Failing to yield. The operators of a bicycle shall stop prior to emerging from any alley, public or private driveway or building upon any street or sidewalk or sidewalk area and shall yield right of way to all vehicles and pedestrians approaching upon any street, highway, sidewalk or sidewalk area.

D. Attaching the bicycle or the rider in any manner to any other vehicle anywhere in the city.

E. Towing or drawing any coaster, sled, person on roller skates, toy vehicle or other similar vehicle upon any roadway.

F. Riding more than two (2) abreast.

G. Carrying any package, bundle or article which prevents or interferes with the rider keeping both hands upon the handlebars.

H. Riding with both hands removed from the handlebars or both feet from the pedals or practicing any acrobatic riding upon any bicycle on any roadway, sidewalk or bicycle path. As defined in this section.

I. Failing to signal. Before turning or changing the direction of any bicycle upon any street highway, parkway or public place, it shall be the duty of the bicycle rider to give a proper hand signal by the extension of the left hand to indicate the direction of the intended turn.

Section 9-5-103. Obedience to traffic devices and signs.

A. Any person operating a bicycle shall obey the instructions of traffic control devices unless otherwise directed by a police officer.

B. On any street or intersection where U-turns or other turns are prohibited and signs are erected and in place so indicating, no person operating a bicycle shall disobey the direction of any such sign, except where such person dismounts from the bicycle to make such turn, in which event such person shall then obey the regulations applicable to pedestrians.

Section 9-5-104. Manner of riding.

A. Any person operating a bicycle shall not ride other than upon or astride the permanent and regular seat attached thereto, nor carry any other person upon such bicycle other than on a firmly attached and regular seat.

B. No bicycle shall be used to carry more persons at one time than the number for which it is designed and equipped, except on a baby seat attached to the bicycle, provided that such seat is equipped with a harness to hold the child securely to the seat and that protection is provided against the child's feet hitting the spokes of the wheels or in a seat attached to the bicycle operator.

Section 9-5-105. Equipment required.

A. Every bicycle shall be equipped with a brake adequate to control the movement and to stop the bicycle whenever necessary.

B. Every bicycle when used between thirty (30) minutes after sunset and thirty (30) minutes before sunrise shall be equipped with a light and reflectors of a type

approved by the XX Police Department. A white light must be visible from a distance of at least three hundred (300) feet to the front. An amber reflector shall be located on the frame or the front wheel so that it is visible from fifty (50) to three (300) feet on each side of the bicycle when directly in front of the lawful upper beams of headlamps on a motor vehicle. A red reflector facing the rear must be visible from fifty (50) to two hundred (200) feet when directly in front of the lawful upper beams of the headlamps on a motor vehicle.

C. A bicycle shall not be equipped with, nor shall any person upon a bicycle use, except a police officer or reserve police officer, any siren.

Section 9-5-106. Riding on sidewalks.

A. No person shall ride a bicycle upon a sidewalk in the business district as herein defined. However, persons may dismount and walk their bicycles on the sidewalk in the business district. The business district for the purposes of this ordinance shall be that area on XXXXX.

B. Whenever any person is riding upon a sidewalk in a location other than the business district, such person shall yield the right-of-way to any pedestrian and shall give audible signal or call before overtaking and passing such pedestrian.

C. Wherever the City has provided sidewalks and bituminous ramps adjacent to the streets for the accommodation of bicycle riders, such sidewalks and ramps shall be regarded as usable paths, except within the business districts as stated in this Section.

Section 9-5-107. Parking and parking spaces.

A. No person shall park a bicycle against any window or parking meter or on the main traveled portion of the sidewalk nor in such manner as to constitute a hazard to pedestrians, traffic and/or property.

B. Notwithstanding subsection A, when bicycle parking spaces have been established and designated, no person shall park a bicycle in the vicinity thereof except in such bicycle parking spaces.

CODE OF ALABAMA
TITLE 32. MOTOR VEHICLES AND TRAFFIC.
CHAPTER 5A. RULES OF THE ROAD.
ARTICLE 13. BICYCLE SAFETY.

§ 32-5A-280. Short title.

This article shall be known and may be cited as the "Brad Hudson-Alabama Bicycle Safety Act of 1995."

§ 32-5A-281. Definitions.

As used in this article, the following words shall have the following meanings:

(1) BICYCLE. A human-powered vehicle with two wheels in tandem design to transport by the act of pedaling one or more persons seated on one or more saddle seats on its frame. "Bicycle" includes, but is not limited to, a human- powered vehicle designed to transport by the act of pedaling which has more than two wheels when the vehicle is used on a public roadway, public bicycle path, or other public road or right-of-way, but does not include a tricycle.

(2) OPERATOR. A person who travels on a bicycle seated on a saddle seat from which that person is intended to and can pedal the bicycle.

(3) OTHER PUBLIC RIGHT-OF-WAY. Any right-of-way other than a public roadway or public bicycle path that is under the jurisdiction and control of the state or a local political subdivision thereof.

(4) PASSENGER. Any person who travels on a bicycle in any manner except as an operator.

(5) PROTECTIVE BICYCLE HELMET. A piece of headgear which meets or exceeds the impact standard for protective bicycle helmets set by the American National Standards Institute (ANSI) or the Snell Memorial Foundation, or which is otherwise approved by the Alabama Department of Public Safety.

(6) PUBLIC BICYCLE PATH. A right-of-way under the jurisdiction and control of the state, or a local political subdivision thereof, for use primarily by bicyclists and pedestrians.

(7) PUBLIC ROADWAY. A right-of-way under the jurisdiction and control of the state or a local political subdivision thereof for use primarily by motor vehicular traffic.

(8) RESTRAINING SEAT. A seat separate from the saddle seat of the operator of the bicycle or a bicycle trailer or similar product that is fastened securely to the frame of the bicycle and is adequately equipped to restrain the passenger in the seat and protect the passenger from the moving parts of the bicycle.

(9) TRICYCLE. A three-wheeled human-powered vehicle designed for use by a child under the age of six.

§ 32-5A-282. Purpose.

The purpose of this article is to reduce the incidence of disability and death resulting from injuries incurred in bicycling accidents by requiring that, while riding on a bicycle on public roadways, public bicycle paths, or other public rights-of-way, all operators and passengers who are under 16 years of age to wear approved protective bicycle helmets, and by requiring that all bicycle passengers who weigh less than 40 pounds or are less than 40 inches in height be seated in separate restraining seats.

§ 32-5A-283. Unlawful for person to use bicycle under certain conditions.

It is unlawful for any person to use a bicycle on a public roadway, public bicycle path, other public rights-of-way, state, city, or county public park under any one of the following conditions:

(1) For any person under the age of 16 years to operate or be a passenger on a bicycle unless at all times the person wears a protective bicycle helmet of good fit, fastened securely upon the head with the straps of the helmet.

(2) For any person to operate a bicycle with a passenger who weighs less than 40 pounds or is less than 40 inches in height unless the passenger is properly seated in and adequately secured in a restraining seat.

(3) For any parent or legal guardian of a person under the age of 16 years to knowingly permit the person to operate or be a passenger on a bicycle in violation of subdivision (1) or (2).

§ 32-5A-284. Duties of person regularly engaged in business of renting bicycles.

(1) A person regularly engaged in the business of renting bicycles shall require each person seeking to rent a bicycle to provide his or her signature either on the rental form or on a separate form indicating both of the following:

(a) Receipt of a written explanation of the provisions of this article and the penalties for violations.

(b) A statement concerning whether a person under the age of 16 years will operate the bicycle in an area where the use of a helmet is required.

(2) A person regularly engaged in the business of renting bicycles shall provide a helmet to any person who will operate the bicycle in an area requiring a helmet, if the person does not already have a helmet in his or her possession. A reasonable fee may be charged for the helmet rental.

(3) A person regularly engaged in the business of selling or renting bicycles who complies with this article shall not be liable in a civil action for damages for any physical injuries sustained by a bicycle operator or passenger as a result of the operator's or passenger's failure to wear a helmet or to wear a properly fitted or fastened helmet in violation of this article.

§ 32-5A-285. Statewide bicycle safety education program; manner violations handled.

It is the legislative intent to implement an effective statewide bicycle safety education program to reduce disability and death resulting from improper or unsafe bicycle operation. Violations of Section 32-5A-283 shall be handled in the following manner:

(1) On the first offense, the police officer shall counsel and provide written information to the child relative to bicycle helmet safety. The officer shall instruct the child to deliver the written information to the parent.

(2) On the second offense, the police officer shall counsel the child and provide written information on bicycle helmet safety. A warning citation shall be issued to the child to give to the parent. The citation shall instruct the parent or guardian to contact the police department for further information about the law and where to obtain a bicycle helmet.

(3) Beginning on July 1, 1996, upon a third offense, the police officer shall counsel the child, confiscate the bicycle, and take the child to his or her residence. The officer shall then return the bicycle and give a warning ticket to the parent or guardian. If the parent or guardian is unavailable, the ticket shall be left at the residence with instructions to the parent or guardian to pick up the bicycle at the police department.

(4) Beginning on July 1, 1996, upon a fourth offense, the police officer shall confiscate the bicycle, take the child to his or her residence, whereupon a citation for fifty dollars ($50) will be issued to the parent or guardian of the child. No court costs nor fees may be added to the fine or penalty. The fine or penalty shall be waived or suspended if the operator or passenger presents by the court date, proof of purchase

or evidence of having provided a protective bicycle helmet or restraining seat and intends to use or causes to be used or intends to cause to be used the helmet as provided by law.

(5) Any fine or penalty monies shall be earmarked and used separately by the local school system for the purpose of safety education or the local municipality for the purchase of helmets for the financially disadvantaged.

(6) The Traffic Safety Center of the University of Montevallo, in conjunction with the Child Safety Institute at Children's Hospital of Alabama, shall furnish all materials, handouts, brochures, and other information related to bicycle safety used by police departments.

§ 32-5A-286. Establishment of more comprehensive bicycle safety program by ordinance.

A municipality may establish a more comprehensive bicycle safety program than that imposed by this article by local ordinance.

APPENDIX L

BICYCLE AND PEDESTRIAN PLAN

Definitions

Definitions of common words, phrases or abbreviations used throughout the plan.

AASHTO: American Association of State Highway and Transportation Officials

Accessible: A facility that provides access to people with disabilities using the design requirements of the ADA.

ADA: The Americans with Disabilities Act; civil rights legislation passed in 1990, effective July 1992

ADT: Average Daily Traffic. The measurement of the average number of vehicles passing a certain point each day on a highway, road or street.

Bicycle: A vehicle having two tandem wheels, either of which is more than 14" in diameter or having three wheels in contact with the ground any of which is more than 14" in diameter, propelled solely by human power, upon which any person or persons may ride.

Bicycle Facility: A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking facilities, mapping all bikeways and shared roadways not specifically designated for bicycle use.

Bicycle Lane: A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists.

Bicycle Level of Service (BLOS): A measure of bicyclist comfort level as a function of road geometry and traffic.

Bicycle Path: A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way.

Bicycle Route: A segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without specific bicycle route numbers.

Bikeway: Any road, path , or way which in some manner is specifically designed as being open to bicycle travel, separated from a highway. A bikeway may be designated for the exclusive use of bicycles or may be shared with other modes of transportation (shared use path).

Crosswalk: Portion of a roadway designated for pedestrian crossing, marked or unmarked. Unmarked crosswalks are the natural extension of the shoulder, curb line or sidewalk.

Grade: A measure of the steepness of a roadway, bikeway or walkway, expressed in a ratio of vertical rise per horizontal distance, usually in percent; e.g. a 5% grade equals 5 m of rise over a 100 m horizontal distance.

Grade Separation: The vertical separation of conflicting travelways with a structure.

Highway: A general term denoting the public way for purposes of vehicular travel, including the entire area within the right-of-way.

Intersection: The crossing of two or more highways or bikeways.

Multi-Use Path: A path physically separated from motor vehicle traffic by an open space or barrier and either within a highway right-of-way or within an independent right-of-way, used by bicyclists, pedestrians, joggers, skaters and other non-motorized travelers.

MUTCD: The "Manual on Uniform Traffic Control Devices," approved by the Federal Highway Administration as a national standard for placement and selection of all traffic control devices on or adjacent to all highways open to public travel.

Pavement Markings: Painted or applied lines or legends placed on a roadway surface for regulating, guiding or warning traffic.

Pedestrian: A person on foot, in a wheelchair or walking a bicycle.
Pedestrian Facility: A facility provided for the benefit of pedestrian travel, including walkways, crosswalks, signs, signals, illumination and benches.

Right-of-way: The land existing between lines of a street, parkway, alley or easement dedicated or otherwise acquired for use by the public for transportation use.

Right of Way: The right of one vehicle or pedestrian to proceed in a lawful manner in preference to another vehicle or pedestrian.

Roadway: The portion of the highway or street, including shoulders, typically used for vehicle use.

Shared Roadway: Any roadway upon which a bicycle lane is not designated and which may be legally used by bicycles regardless of whether it is specifically designated as a bikeway.

Shoulder: The portion of a highway that is contiguous to the travel lanes provided for pedestrians, bicyclists, emergency use by vehicles and for lateral support of base and surface courses.

Sidepath: A type of multi-use trail that is parallel to a roadway.

Sidewalk: That portion of a highway designed for preferential or exclusive us by pedestrians.

Sight Distance: The distance a person can see along an unobstructed line of sight.

Street: The entire width between boundary lines of every way publicly maintained when any part thereof is open to use of the public for purposes of vehicular travel.

Street: Arterial - A street which carries vehicular traffic of a federal, state, or through traffic, usually on a continuous route. It is designated to carry traffic, mostly uninterrupted, through an urban area, or to different neighborhoods within an urban area.

Street: Collector - A street which carries traffic from local streets to the arterial system, including the principal entrance and circulation routes within residential subdivisions, commercial or industrial developments.

Streets: Local - A street which carries vehicular traffic usually originating or ending in the properties abutting the street.

Vehicle: Any device in, upon or by which any person or property is or may be transported or drawn upon a highway, including vehicles that are self-propelled or powered by any means.

Walkable: A transportation facility built for use by pedestrians, including persons in wheelchairs. Walkways include sidewalks, paths and paved shoulders.