Section I- Existing Conditions

Introduction

Introduction

The Illinois Department of Transportation's (IDOT) mission is *to provide safe, cost-effective transportation for Illinois' residents and visitors in ways that enhance quality of life, promote economic prosperity, and demonstrate respect for the environment.*

Bicycling, which is on the rise in Illinois and around the country, has benefits in many areas directly and indirectly related to accomplishing this mission, such as:

- Transportation efficiency
- Cost effectiveness
- Social equity
- Public health
- Safety
- Environmental sustainability
- Economic development
- Overall quality of life

Cycling can be an equitable form of transportation for people of all ages, abilities, and communities. *Photo Credit: Gordon Walek*

Chapter *1* presents a comprehensive report on Public Outreach. This Chapter summarizes the outreach process, data collected to date, and preliminary analyses. The input, in conjunction with research on best practices and analyses of Illinois' existing policies and regional bikeway networks, informed the Plan's ultimate priorities and recommendations.

Chapter 2 summarizes federal, state, and regional policies and regulations relevant to bicycling.

Chapter 3 discusses how Illinois compares to other states on various measures, to help provide benchmarks for future growth.

Chapter 4 provides an overview of state-level best practices pertaining to bicycling, and discusses opportunities for Illinois to be more cohesive with national best practices.

Chapter 5 reviews federal and state design guidelines, as well as opportunities for improvement.

Chapter 6 reviews federal, peer state, and selected city plans and policies for relevant performance measures.

Chapter 7 focuses on education, encouragement, and enforcement programs in Illinois.

Chapter 8 inventories and analyzes innovative technological advances related to bicycling and discusses opportunities for these practices' contribution related to improving Illinois Biking.

Section 1- Existing Conditions
Chapter 1- Public Outreach

Chapter 1- Public Outreach

The Illinois Bike Transportation Plan was developed in consultation with a wide variety of stakeholders from across the State. This is to ensure it reflects the needs of residents and visitors, the knowledge of local experts, and the overarching goals of the State's Long Range Transportation Plan: *Transforming Transportation for Tomorrow*. This Chapter summarizes the outreach process, data collected to date, and preliminary analyses. The input, in conjunction with research on best practices and analyses of Illinois' existing policies and regional bikeway networks, informed the Plan's ultimate priorities and recommendations.

During the summer and into the fall of 2013, IDOT and the project team engaged in an extensive, multi-faceted outreach effort. To date, more than 4,000 individuals have participated through the outlets described on the following pages.

This 'word cloud' draws from the most common words the project team wrote on posters during the public meetings. The bigger the word, the more often it was mentioned. While not scientific, the graphic provides a sense of topics discussed.

Steering Committee and Advisory Committee

This planning effort established two separate committees to guide the Plan's development: a Steering Committee and an Advisory Group. The Steering Committee, composed of IDOT members, representing various departments with a stake in the plan, have guided the planning process and offered valuable input and insight to ensure that the plan is both visionary and pragmatic. The Advisory Group, made up of representatives of metropolitan planning organizations, state and national agencies and State non-profit organizations, have thus far played a significant role in the planning process as well. Members of the advisory group have provided local context and input regarding bike facilities and facility development, helped organize and build support for public meetings in their areas, and disseminated information to local stakeholders and to the general public.

What We Heard

Advisory Group Meeting Input

During the August 2013 meeting, the Advisory Group was asked to rank a list of several broad bicycling-related recommendations for IDOT on a 1-5 scale, with five being the most important and one being the least important. These recommendations were generated from input the team had gathered up to this point in the planning process, such as the IDOT district interviews.

The ten members of the Advisory Group who were present at the meeting, on average, ranked all recommendations on the list greater than three – indicating some importance for every item listed. The five highest-ranked recommendations from the list include (average rank in bold):

4.80 - IDOT should build a statewide database of local bicycle (and potentially pedestrian) plans.

4.67 - Include more complete recognition of bicycle travel needs in early stages of design.

4.67 - A priority (of IDOT) in bicycle facility design should be providing bicycle facilities that are safe and attractive to users of all ages and abilities.

4.60 - IDOT should improve designs and policies to better reflect context (ex. urban vs. rural roadway design).

4.50 - Facility selection guidance should include bicycle accommodations on nearby, alternate routes.

A full list of the recommendations and average rankings is included in **Appendix A**.

Advisory Group Formal Comments and Recommendations

In September 2013, the project team asked the Advisory Group members to provide formal comments and recommendations, representative of their respective agencies. These comments were reviewed and are being considered in the Plan's development. Comments that the team are located in **Appendix A**.

League of Illinois Bicyclists (LIB)

The League of Illinois Bicyclists is the primary statewide bicycle advocacy group committed to improving bicycling conditions in the State. Ed Barsotti, president of LIB, serves as a member of the Illinois Interagency Bikeways Council and the Greenways & Trails Council, along with members of IDOT as well as other organizations.

LIB offered many detailed, technical recommendations on the bike plan, including:

- Road project selection recommendations
- Bikeway warrants
- Improvements to the Bureau of Design and Environment (BDE) Manual Bikeway Selection table
- Secondary or "next highest and best" accommodations
- Resurfacing projects recommendations
- Paved shoulders and rumble strips recommendations
- Local Cost Share recommendations
- Sidewalk construction, and cost share or credit recommendations
- Keeping BDE and Bureau of Local Roads (BLR) manuals current with best design practices
- Intersections and refuge islands recommendations
- Transportation Alternatives Program recommendations
- Highway Safety Plan and 402 Traffic Safety Program recommendations
- Bicycle and pedestrian coordinator recommendations
- Technical training recommendations for design staff and consultants
- State bicycle map recommendations, and
- Performance measures recommendations

Details on these recommendations can be found in **Appendix A**.

In addition, LIB states:

"IDOT and its consultants have done much work comparing IDOT's policies to those in national standards/guidelines and in other states rated highly as "Bicycle Friendly States." LIB supports using these standards, and best practices from other states, to develop recommendations in the plan. For example, Wisconsin's design manual – and its administrative code interpreting its Illinois-like complete streets law – reinforces several of the recommendations… with a high level of practical detail."

Openlands

Openlands is the oldest and largest land conservation group for the greater Chicago region. The organization offered comments, primarily specific regional bikeway connection recommendations, for the greater Chicago region. In addition, they offered the following noteworthy recommendation concerning future bicycle trail opportunities:

"The era of rail-to-trail opportunities is nearing an end, as most such opportunities in urban areas, and a significant number of such opportunities in rural areas, have utilized the most easily-available corridors. The next generation of potential bicycle/hiking corridors could be focused on the many national and state significant historic trails that traverse Illinois. All of these historic trails either were built upon by the state highway system (eg: the National Road/U.S. 40, or the Galena to Chicago Road/U.S. 20), or these historic trails are crossed by the State Highway system…"

The full set of recommendations from Openlands can be viewed in **Appendix A**.

Forest Preserve District of Will County

The Forest Preserve District of Will County manages forest and conservation lands in Will County. The Forest Preserve offered specific recommendations for bikeways in Will County, supported the League of Illinois Bicyclists recommendations, and offered a general policy recommendation:

"It would be beneficial if all state or federally funded local projects required an analysis of bicycle needs during engineering; and that, at a minimum, provisions for future bicycle accommodations are included in those projects regardless of the current level of funding. In rural areas, a paved 4' shoulder (bicycle accommodation) could also be considered a benefit to the roadway, protecting the edge from damage by farm equipment. Road and bridge repairs should also require an opportunity for early review and consideration of bicycle accommodations. Too often our bridges remain barriers to bicycle travel even after they have been upgraded. "

The full set of recommendations from the Forest Preserve District of Will County can be viewed in **Appendix A**.

Active Transportation Alliance

The Active Transportation Alliance is the Chicago region's primary active transportation advocacy group, comprised of over 7,000 members across Illinois. Their recommendations for the plan include:

1. Grow a network of "family bikeways".
2. Reverse IDOT's policy of blocking protected bike lanes on state routes.
3. Boost the efforts of local governments building bikeways.
4. Make state routes truly Complete Streets.
5. Ensure bike and pedestrian projects get a fair share of federal transportation funds.

The full set of recommendations from the Active Transportation Alliance can be viewed in **Appendix A**.

Chicago Metropolitan Agency for Planning

The Chicago Metropolitan Agency for Planning is the Metropolitan Planning Organization for the greater Chicago region. In their opening statement, the organization states:

"CMAP believes that a strong commitment at the highest levels to significantly increasing the safety, comfort, and convenience of non-motorized travel in our region – and throughout the state – is crucial to achieving the goals of livability, access and mobility, health, and sustainability outlined in both the

Illinois Long Range Transportation Plan and CMAP's GO TO 2040 plan. We are hopeful that the Illinois Bike Transportation Plan will embody those goals and effectively translate them into specific policies, routine design and maintenance practices, funding provisions, and ultimately, real-life projects and programs aimed squarely at increasing cycling and walking as safe, convenient, and popular modes of travel in Illinois."

CMAP recommends that IDOT focus on improving policies that affect the bicycling environment, establish bicycling performance measures and develop a statewide training program for Department staff as well as local agencies. In addition, CMAP provides several comments on specific recommendations including:

- Project scoping and prioritization
- The Bureau of Design and Environment and the Bureau of Local Roads Manuals
- Local Complete Streets project cost share
- Data Collection, and
- Establishing priority bicycle routes throughout the state.

Details on these recommendations can be found in **Appendix A**.

Illinois Department of Natural Resources (IDNR)
The Illinois Department of Natural Resources is responsible for the management of a large majority of the State's public lands. It is also in charge of distributing the Recreational Trails Program grant monies and running the Greenways and Trails program, which provides greenways and trails planning assistance to counties throughout Illinois.

IDNR states that it "supports a focus on policies, design and treatments for road based cycling. (IDNR) also strongly supports off-road trails and advocates that they should be given priority focus in the State Bicycle Transportation Plan." They also provide some specific comments, including recommendations on state and national trails, development of off-road trails, development of trail networks, improving the state's ability to develop rail-to-trails and improving the State's bicycle-related grant programs. Details on these recommendations can be found in **Appendix A**.

Springfield-Sangamon County Regional Planning Commission (SSCRPC)
SSCRPC serves as the joint planning body for the City of Springfield and Sangamon County. Along with this on-going responsibility, the Planning Commission staff works with many other public and semi-public agencies throughout the area to promote orderly growth and redevelopment, conducting numerous research studies and planning projects each year. They offered several comments highlighting critical elements in accommodating the near and long term needs of the bicycling community, factors for considering when bikeway projects are selected for funding, current issues with IDOT support of bikeway improvements, the importance of the U.S. Bicycle Route System, appropriate bicycling goals for the Department, and other critical issues to the State Bike Transportation Plan. The main issues cited included:

- A need for an interconnected network of off-road trails
- An interconnected network of bicycling facilities
- Available public funds for bicycling
- Cooperative, continuing, and coordinated planning among all jurisdictions
- Conformance to bicycle plans when selecting bicycle roadway projects
- Transportation Alternatives Program funding
- Continuation of the Illinois Bike Transportation Plan Advisory Group
- Staff dedicated to overseeing the implementation of the Illinois Bike Transportation Plan.

Details on these recommendations can be found in **Appendix A**.

Letter of Collaboration and Support from Illinois Department of Public Health

The Illinois Department of Public Health (IDPH) works to protect Illinois residents against disease and other health problems. The Department extended its intent to support and collaborate with the Illinois State Bicycle Transportation Plan. The Department emphasized their partnership and stake in the Plan's success. Director LaMar Hasbrouck, MD, MPH writes, "Promoting and supporting bicycling in the State is not just a transportation issue but one that also improves health, recreation and quality of life as well as addressing social justice… Transportation policies are public health policies."

Director Hasbrouck details existing IDPH chronic disease prevention and health education programs that correlate with the Plan's intended purpose. For instance, The Safe Built Environment program within the We Choose Health Initiative endeavors to promote safety and active transportation choices for Illinois residents. Details on these recommendations can be found in **Appendix A**.

Illinois Office of Tourism

In a letter dated November 22, 2013, Jen Hoelzle Director, Illinois Office of Tourism thanked IDOT for developing the Illinois Bike Transportation Plan. The letter describes the Office's enthusiasm for the plan and Illinois trails' potential to serve as income generators and as employment for Illinois residents. Director Hoelzle writes that the Office of Tourism looks forward to partnering with IDOT to increase the number of visitors who enjoy Illinois trails. The letter also describes particular interest in the idea of a larger trail network that would link historic trails and increase partnership between communities. The full letter can be found in **Appendix A**.

Illinois Alliance to Prevent Obesity (IAPO)

The Illinois Alliance to Prevent Obesity (IAPO) is a "statewide coalition comprised of stakeholders working for a state-level response to the obesity epidemic". As such, the coalition uses policy improvements and strategic investment to cut the sources of the problem. In IAPO's comments on the State Bike Plan, Executive Director Elissa Bassler writes, "We believe you will agree there is little doubt of the dynamic relationship between the way we build transportation systems and people's health". Executive Director Bassler makes suggestions related to IAPO strategy objectives, including:

- Developing public/private partnerships to develop bike/walking paths along wih other recreational equipment for children such as parks. She describes that they should be close to residential areas and to underserved and low-income communities.

- Develop and implement Safe Routes to School (SRTS) programming including assessment of these impacts on mode share and traffic crash rates.

- Use a variety of means including policies, incentives, facility improvements, and worksite locations to encourage biking, walking, and transit.

- Adopt and implement Complete Streets policies at a variety of levels. Use policy to provide access to safe spaces for physical activity and allow employees to incorporate activity into their work environment.

The complete letter from Executive Director Elissa Bassler and the Illinois Alliance to Prevent Obesity is included in **Appendix A**.

Website and Listserv Participation

IDOT used multiple online platforms to expand the Plan's reach. The project website functioned as the information hub, providing visitors with:

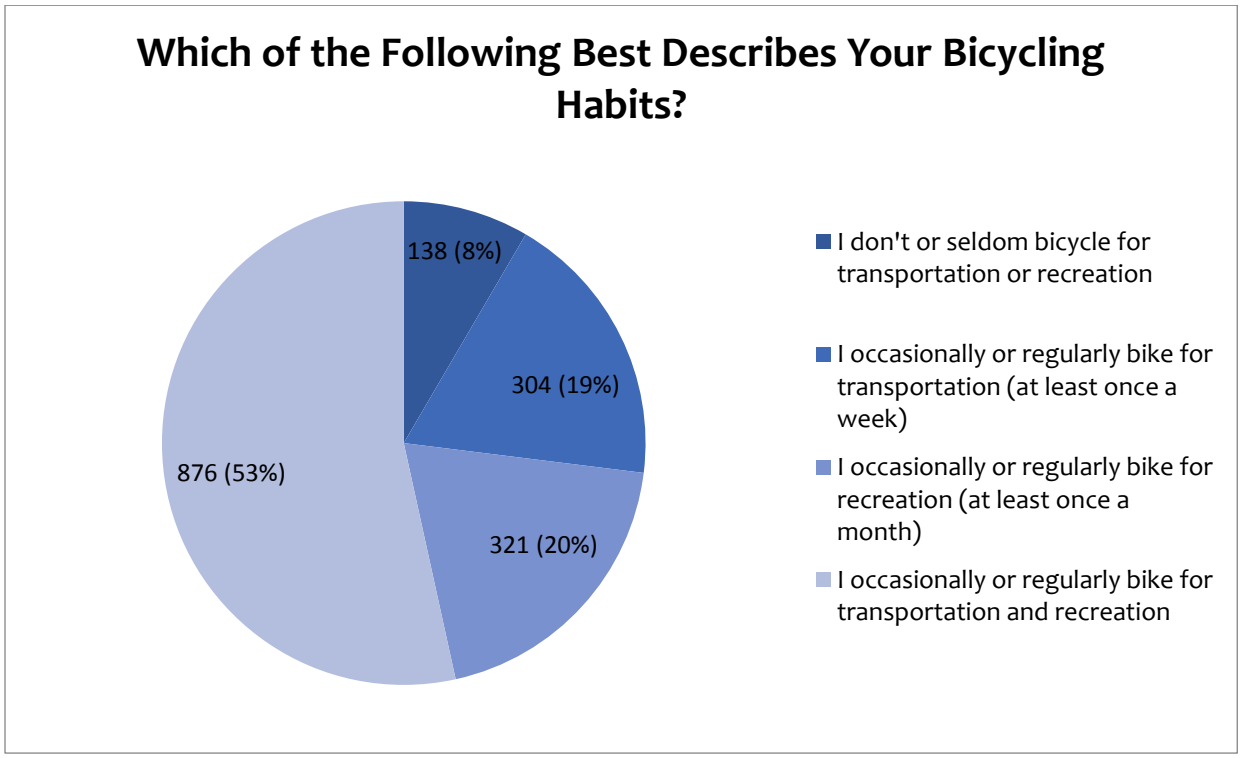
- background information
- updates on the planning process
- a calendar of events and activities
- links to important documents
- materials from the public meetings
- an online survey

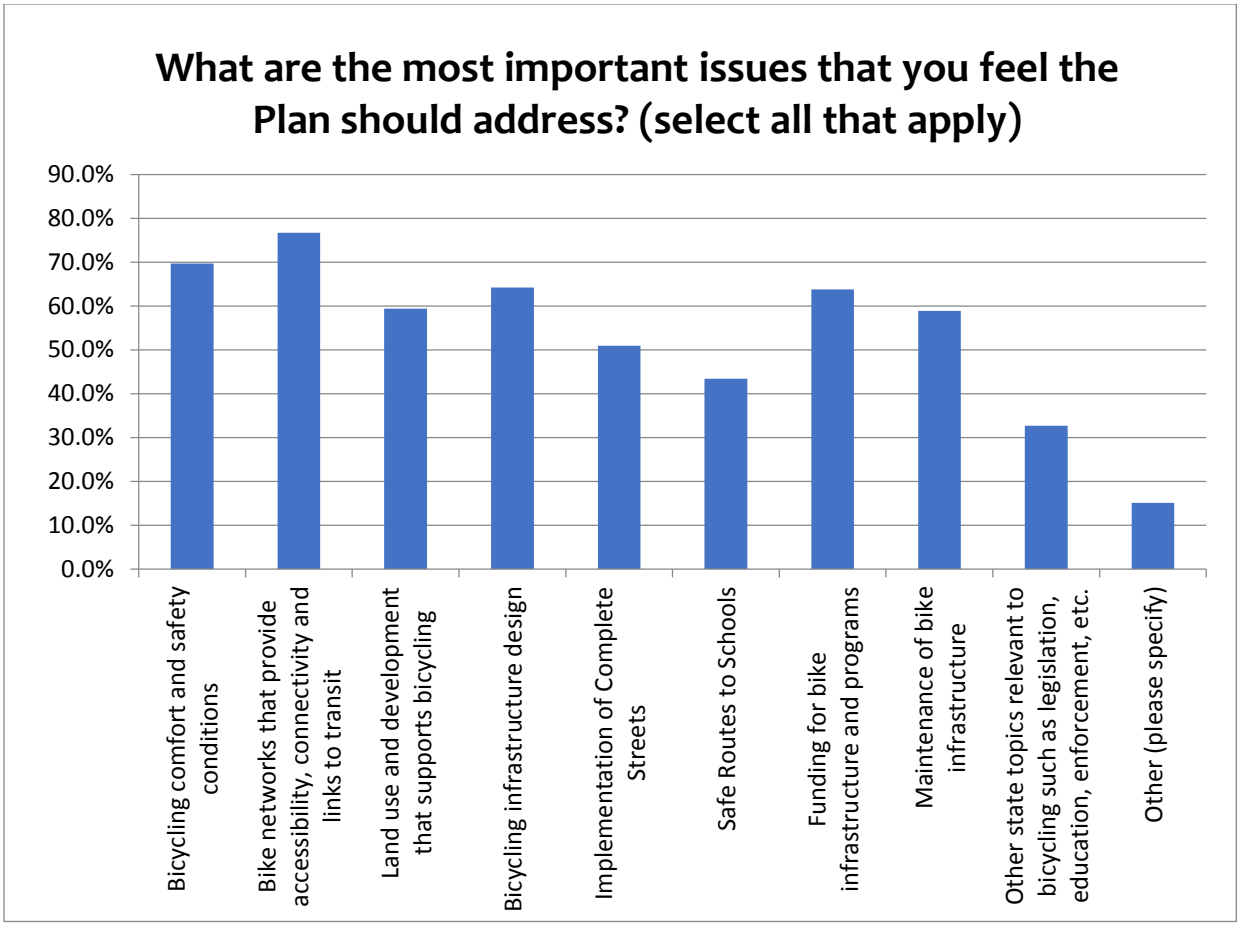
An email distribution list, or listserv, established by the Department at the onset to the Bike Plan process, provided periodic updates and announcements throughout the Plan's course. Over 3,500 individuals were subscribers. The team also used the listserv to solicit input on identifying focus areas for the Plan, below.

What We Heard

A short, four-question survey was distributed via the listserv in late March 2013. As of September 2013, IDOT has received 1,563 responses. The survey asked respondents to select important issues they felt the Illinois Bicycle Transportation Plan should address. Of the nine possible responses, participants cited Connectivity, Safety, and Bikeway Design as the three most important issues. The remaining three questions collected demographic, occupational, and transportation-related information to gain a better understanding of current and future users of the statewide bikeway

network. More than fifty percent of respondents bike occasionally or regularly for transportation and recreation, while less than ten percent indicated they seldom use a bicycle at all. The following graphs show the results from this survey.





FHWA and IDOT Interviews

Phone interviews with FHWA Safety Specialist Greg Piland and IDOT representatives closely associated with bicycling, from the central office and all nine IDOT districts, were conducted in May through September of 2013. Central office representatives included Michael Brand, Acting Bicycle and Pedestrian Coordinator and Policy & Procedures Engineer, and Priscilla Tobias, State Safety Engineer and Bureau of Safety Engineering Chief. The purpose of these interviews was to help gauge what the central office and districts are doing well in terms of accommodating bicyclists, to understand what the prevalent issues are with accommodating bicyclists in the State's transportation system, and to see if the districts have ideas for improving Complete Streets implementation. The discussions were organized in the form of a Strengths, Weaknesses, Opportunities and Threats analysis – the sample questions, interview notes, and summary of interviews are located in **Appendix B**.

What We Heard

District Interviews

The District representatives identified many issues and opportunities for better Complete Streets implementation across several categories including Design, Policy, Public Involvement/Relations, Education, and Communication. Below presents a brief summary of these topics, which are further detailed in **Appendix B.**

Design

Design practices for bicycles were an issue that came up frequently. The major points raised across all districts were:

- Design guidance should clearly specify the difference between urban and rural contexts.
- Policies and design guidelines in Chapter 17 (Design & Environment Manual) should be clean, clear, and in-line with the rest of the BDE Manual.
- Viable alternatives to sidepaths, such as on-street facilities, should be offered in policy and guidance.
- Better guidance is needed on the design of sidepaths at driveways.
- Guidance should be improved on providing alternate routes in a project's development.
- Design guidance should address lane width for inclusion of bike facilities. For example, when are 11' and 10' lanes acceptable, so that bicycle facilities can be incorporated?
- Clear guidance is needed on whether the districts should include shelves for multi-use paths or sidewalks in all roadway projects, regardless of whether these facilities get funded and built.

Policy

Major policy issues that came up in several different interviews included:

- There is a desire for clarification or better methods of measuring warrants. For example, the current method of latent demand forecasting for bicycles is not effective.
- There is a desire for clarification on urban versus rural areas.
- The project selection matrix should account for nearby alternate routes.
- Funding is usually the restriction for acceptance by communities, especially if there isn't local support or they don't understand the reasoning for a project. This is an issue that should be addressed.
- The resolution that communities have to sign if they opt out of Complete Streets improvements is holding up some projects; communities can't afford or don't want to pay for improvements, but they also don't want to sign a resolution against bicycle and pedestrian facilities.
- The 2'-3' shoulder policy in HSIP and 3R projects conflicts with the Complete Streets policy.
- Guidance is needed on where road diets are warranted and what the appropriate designs for them are.

- The project selection matrix and funding policies give preference to bicycle paths and shoulders over bike lanes.
- More guidance is needed for addressing logical termini for bike accommodations in safety improvements and spot improvements.

Public Involvement/Relations

Many districts mentioned that, especially in rural areas, public buy-in is often a barrier to obtaining the local funding match and suggested this could be partly solved through greater public outreach. Public involvement/relations topics and suggestions included:

- Additional public outreach would be beneficial.
- A database of local plans would be helpful for public relations.
- Local plans would be more helpful to IDOT efforts if they included prioritization, facility types, and funding.
- In some areas there is a negative public perception with trails.
- IDOT could require representation on local Bike/Ped advisory committees (such as in District 5) to keep abreast of what's happening locally.
- Communities should be aware that a bike plan helps with ITEP applications.
- Some communities are afraid of the liability of adding bicycle accommodations (Boub v. Wayne)
    - They should know that a bike lane is just a special travel lane.
    - They don't like the idea of children along busy roads.

Education

Some districts offered creative solutions for education and training and indicated that more training is needed, while others indicated that current training on Complete Streets issues is sufficient. Education topics and suggestions included:

- Video tutorials and webinars would be helpful.
- Training needs to be available to all staff, including consultants, construction, and maintenance staff.
- An internal inter-departmental forum and resource-sharing site would be helpful.
- Some districts are not familiar with tools such as Bicycle Level of Service (BLOS), the Bicycle Compatibility Index, etc.
- More frequent training is needed.
- The success of bicycle transportation depends on public and Departmental education.

Communication

Several districts mentioned that greater communication and resources at the Central Office would be helpful to their efforts. Specific issues that were mentioned included:

- Having readily available resources and personnel at the Central Office is key.

- The Central Office should give clear direction on addressing multi-modal considerations. The old mentality was that locals are required to take care of bicycle and pedestrian accommodations.
- Chapter 17 should discuss innovative practices, but maybe not recommend them until they are proven.
- Some districts are not familiar with who makes design decisions.
- It would be good to have bike accommodations on bridges tracked in Illinois Structure Information System (ISIS). It would also be good to have sidewalk information in Illinois Roadway Information System (IRIS). Right now, districts have to keep their own updates.
- There should be a full-time bicycle and pedestrian coordinator in the Central Office.

Interview with Greg Piland – Safety Specialist, FHWA Illinois

Mr. Piland was able to highlight many things IDOT is currently doing well in terms of implementing Complete Streets, and what steps should be taken in moving forward to improve implementation. One of the biggest challenges Mr. Piland noted is that IDOT has not yet filled the bicycle and pedestrian coordinator position left vacant when Todd Hill retired (May 2012). He added that even if this position is filled, just one bicycle and pedestrian coordinator will be difficult to cover the needs of the entire state. He noted that important steps moving forward with Complete Streets in Illinois include:

- Developing a system of regional bike routes.
- There is not a good bicycling/Complete Streets education process in Illinois. The first step is getting the MPOs to push bicycling to all areas within their region. The next is reaching out to communities outside of the MPOs and Colleges
- Bicycle and pedestrian considerations are bigger hurdles in rural areas.
- Bicycle action plans should be attributed to districts to ensure implementation.
- The most important things to increase bicycling include: Education, Action Plans, Linkages, and Funding.
- There needs to be more bikeways planning at all levels to garner support for connecting remote linkages.

Detailed notes from the interview are included in **Appendix B**.

MetroQuest Survey

Throughout the months of July, August and September, nearly 2,800 people completed the MetroQuest survey to share their input on bicycling in Illinois. Roughly 86% of respondents (2,401 individuals) completed the survey on-line, while 14% (397 individuals) completed the survey in-person at one of the public or transportation professionals meetings held throughout the State. Survey results helped identify future bikeway system improvements, preferred facility types, significant user groups, locations of bicycling activity, and other important information. The section below summarizes the findings and a detailed analysis of the results is provided in **Appendix C**.

What We Heard

Based on the self-identification questions included in the survey, two trends emerged. First, survey respondents reflect the diversity of the State's population distribution. From rural to urban, people in all types of communities provided input. Second, the overwhelming majority of survey respondents already bicycle on a regular basis, regardless of the presence or condition of the local bicycle network. While nearly all respondents ride for exercise or recreation, more than half bike for the convenience of bicycling as a mode of transportation, to save money, and for environmental reasons.

IDOT plays a significant role in shaping the bicycling environment in Illinois through system improvements, funding, design, and policies. When asked their priorities, respondents put System, Design, and Policy Improvements at the top of the list, reflecting their desire for a larger, safer, and more connected network of bicycle facilities. Respondents also identified Traffic Safety as the greatest barrier to bicycling, and Route Safety as the most important factor when planning a bike trip. Of the possible facility types and improvements that could be made to enhance the bicycling environment, survey respondents prefer Greater Separation through protected bike lanes, buffered bike lanes, cycle tracks, and off-road trails.

While the survey may not have captured as many responses from the "interested but concerned" group of bicyclists, who represent a key target audience for their potential to become more regular cyclists, the survey results indicate that even more experienced cyclists are concerned about Safety and Connectivity, and desire more Separation from motor vehicle traffic.

Outreach Meetings

In July and August 2013, a series of outreach meetings were conducted throughout the State to inform the public about the Plan and gather feedback. The meeting locations were selected to reach a diverse audience, representative of the State's population distribution and demographic composition. In each of the nine locations, two meetings were conducted: an afternoon meeting to engage transportation professionals, and an evening meeting to engage the general public. The project team coordinated with local IDOT districts, metropolitan planning organizations, local agencies, and advocacy organizations to publicize the meetings and encourage area residents to attend. An additional virtual meeting (webinar) was held on-line to reach out to those unable to attend any of the local meetings. More than seven hundred people attended the meetings, sharing their unique experiences, needs and desires to make cycling an integral part of the local and State transportation networks.

Table 1 displays the locations, dates, and number of participants for public and professional meetings, respectively.

Table 1: Public Meetings

Meeting	Date	Number of Attendees: Public	Number of Attendees: Professional
Chicago	07/09/2013	62	63
DeKalb	07/15/2013	51	29
Peoria	07/16/2013	29	52
Springfield	07/17/2013	26	16
Champaign-Urbana	07/18/2013	20	24
St. Louis/Metro East	07/22/2013	26	37
Quad Cities	07/23/2013	14	18
Rockford	07/25/2013	33	12
Carbondale	08/01/2013	47	33
Online Public Meeting	07/30/2013	124	n/a
Total		**432**	**284**

The number and diversity of attendees and represented organizations suggests a broad interest in the Plan and its potential to impact communities throughout the state. Over 60 local agencies, 50 non-profits and/or bike clubs, and 11 educational institutions participated.

General Structure

The meetings were designed to provide attendees a basic understanding of the Plan's background and components while also offering multiple opportunities for discussion and input. Each meeting began with a guided conversation about experiences and observations of bicycling and bicycling-related conditions in the region. The meeting then transitioned to a formal presentation and slideshow covering the Plan's background, scope and timeframe; national and state trends; and IDOT's role in supporting bicycling as a safe, viable mode of transportation. The project team guided attendees through the on-line survey (distributed in print to attendees) before concluding the meeting with an additional discussion and final comments. Attendees of the transportation professionals meetings were asked to fill out an additional survey to help the project team gain

insight from those who are more familiar with the technical aspects of bikeways implementation and may be involved with implementation of the Plan.

What We Heard

The project team compiled poster notes from each meeting's group discussions, as well as any written comments submitted by participants. Although this input is more qualitative than the surveys, it reveals major themes and concerns related to cycling in Illinois. There was significant overlap among all the meetings in terms of topics discussed; the differences were mostly how often certain issues were raised. For example, the general public meetings tended to focus more on the built environment, with each district reflecting priorities most suited to its context. Policy, funding, and barriers to implementation were more frequently mentioned at the transportation professional meetings. See **Appendix D** for notes taken by team members during whole group discussions at each meeting.[1]

The following questions were the main springboards for discussions:

- **Who do you see riding? Where are they riding and why?** This question served as an icebreaker and warm up for discussion. Building awareness of the myriad roles cycling can and does play in Illinois helped establish a framework for discussing improvements.
- **What are some of the best and worst things about cycling in Illinois?** Sharing positives revealed exemplary projects that can serve as reference points in the future, as well as assets that can help promote cycling in general. It also cultivated an atmosphere of forward momentum, showing that Illinois is not starting from scratch. However, there is much room for improvement, as evidenced by the often passionate comments about the worst aspects of cycling.
- **What changes would you like to see?** This question was part of the icebreaker, and revisited later in the meeting. Participants were encouraged to think broadly. Their comments generally fell into the following categories:
    - Infrastructure and Connectivity
    - Education, Encouragement, and Enforcement
    - Planning and Policy

Who is riding? Where and why?

Participants throughout the state collectively indicated that people from all walks of life use bicycles everywhere for a variety of reasons. However, there was also recognition that cycling is still a niche activity, and that context and culture greatly influence its rate of usage. For example, riding for recreation was noted more frequently in rural meetings, while riding for transportation was a greater focus during urban ones. Despite these differences, both categories of trip purpose were generally considered relevant and important, and not mutually exclusive.

[1] The team has also transcribed written comments from the informal surveys and is preparing a brief summary of each district's meetings, including any local recommendations that might contribute to the upcoming survey on regional networks.

Frequently mentioned trip purposes included:

- Fun/pleasure
- Commuting to work or school
- Fitness/exercise
- Running errands
- Visiting friends and family
- Accessing recreational destinations, such as trails, parks, restaurants, and sporting venues
- Socializing, such as family outings, club rides, and training groups
- Connecting to transit
- Travel and tourism

Discussions about who is seen riding were less robust; the reasons above can generally apply to people of all ages, abilities, and communities. However, some specific user groups were mentioned:

- Children, alone and with adults: They are generally considered more vulnerable, while at the same time in need of independent travel options. It can also be intimidating for adults to ride with children—whether as passengers or on separate bikes—without some kind of protection from fast moving vehicular traffic. Most people indicated that the majority of children cycling are seen on trails, with families. However, it would be desirable for them to have safe means of walking and bicycling independently to school and other activities.
- College/university students: In areas with a large student population, these groups were often mentioned as making up a great deal of the bicycling population and would be able to benefit greatly from the presence of better bicycle facilities.
- Recreational Riders: Depending on the meeting location, many people indicated a significant presence of recreational riders, often in groups, along rural roadways. Some locations often mentioned a significant number of touring "through" cyclists.
- People without routine access to cars: Whether by choice, income, or household logistics, some rely on bicycles as their primary form of transportation, or as a component of multi-modal travel. They can be seen riding year round, to a variety of destinations, at all hours of the day. It was often mentioned that members of this group especially appear to lack education about the rules of the road.
- People unable to drive: This was often related to having a license revoked because of a DUI or traffic violation, not being able to get a license because of legal status, or having a disability that creates a barrier to driving.

Best Things about Bicycling in Illinois

Participants were asked to identify Illinois' bicycling-related strengths and areas of progress. The breadth of comments shows that participants believe Illinois has many inherent strengths for accommodating bicyclists.

- Generally flat, scenic terrain, with hills in the south providing variety.
- Suitable weather most or all of the year (depending on locale and comfort levels).
- Compact communities with grid systems.
- Towns in close proximity.
- Low traffic, rural roads, many of which are hard surfaced.
- Increased number and connectedness of trails.
- Increased number of bike lanes.
- New projects with "Complete Streets" components, such as recent bridge projects over the Illinois River in District 3.
- Increased availability of bike parking.
- Connections to and accommodations on transit, including Amtrak.
- Chicago's bike sharing program.
- IDOT embracing adding bike underpasses and overpasses, or along existing structures.
- Growing bicycle planning efforts complete or underway.
- Growing collaboration among different agencies and municipalities.
- Strong advocacy groups.
- Public health involvement, such as hospitals providing helmet fitting services.
- Use of Transportation Enhancement funds.
- Private partnerships.
- Potential for promoting bike touring.
- A growing number of bicyclists.
- Cultural shifts that embrace cycling.
- Educational efforts.

> *On wide open country roads: "It is like having bike paths everywhere!"*
>
> --Springfield public meeting

Worst Things about Bicycling in Illinois—and What to do About Them

Conversations and written contributions about problems, solutions, and opportunities were often intertwined during the outreach meetings. This section pulls those threads together, and presents them by issue.

Infrastructure and Connectivity

Especially in the public meetings, a major focus was on the need for safe, comfortable, and continuous routes, whether for short trips to the store, or long rides through the State.

Design: There was strong support for making roads within and between communities safer and more comfortable for bicycling, especially busy arterials that provide the only access to key destinations, such as schools, commercial centers, and recreational areas. The ability to travel to other communities—and states—can be compromised when major roads are the only options for through travel. Bridges were noted as particularly important, not just because they provide access over barriers, but because the opportunities for improving them are infrequent.

Referring to Complete Streets principles, participants called for designated room for cycling on roadways, with varying degrees of separation from vehicular traffic depending on context. On rural cross-section roads, there was strong support for paved shoulders without rumble strips (or, if needed, ones that use a bicycle friendly design). In urban areas, especially Chicago, protected bike lanes and/or road diets were called for to make major arterials safer and more comfortable for cycling. There was also support for sidepaths as a way to provide physical separation, but intersection design and cost were noted as challenges. It should also be noted that while support for designated on-road bicycle facilities was greatest, there were also some attendees who prefer to use a vehicular cycling approach where riders are fully integrated into traffic.

Although there was great enthusiasm for trails, especially for recreation, most of the design discussions were related to roads. This might be a reflection of the plan's focus on transportation, and IDOT's primary span of influence. Some participants noted that they don't use trails for commuting or training to avoid conflicts with people walking, jogging, or riding more slowly. Limited access points on trails can also pose a challenge for people using bikes for transportation. In some areas where trail access is restricted during certain hours, participants requested they be open at all times. Intersections and traffic speed were also cited as barriers to both bicycling along roadways and when trails cross roads.

Maintenance: Maintenance also came up as an area of concern. Trail challenges include overgrown vegetation and poor surface conditions. Potholes and debris create problems on roadways. It is not always clear which jurisdiction is responsible for maintaining various sections of trails and roads.

> *The little things are big things.*
>
> --Champaign Public Meeting

Connectivity: There was recognition that increased miles of trails and on-road bikeways have provided more options for cycling. However, missing connections on busy roads—even for short distances—can undermine their usefulness, especially for more vulnerable riders. In addition to filling gaps, wayfinding was discussed as a strategy for directing people to the best available routes. End of trip needs were also discussed, primarily bike parking.

Education and Enforcement

Across the State, there were strong calls for better education relating to using the road. Dangerous driver behavior—whether through distraction, hostility, or ignorance of law—was noted as a serious problem. People on bikes who do not follow the rules of the road were also a concern. Requests included:

- Add more content related to bicycling in driver's education and driver's license test.
- Add an on-bike component to driver's education and driver's license test.
- More bicycling-related instruction for elementary school children.
- If driver's education is required in High School, bicycling education should be as well.
- Greater enforcement of traffic violations for all roadway users.
- Education of public officials, transportation professionals, and residents at large about the benefits of cycling and reasons to accommodate it.

Policy and Planning

An underlying theme was that bicycle (and pedestrian) accommodations should not be considered add-ons, but rather integral parts of Illinois' transportation networks. To help realize the goals of Illinois' Complete Street policies, participants talked about:

- Design flexibility and context sensitivity.
- Streamlined project development process.
- Using routine maintenance projects as opportunities to improve cycling conditions.
- Full funding of bicycle components as part of state projects.
- Increased coordination between agencies.
- More consideration of latent and future demand.

Transportation Professional Surveys

Local engineers, planners, advocates, and other professionals have first-hand knowledge and experience with the implementation and programming of bicycle facilities in the Illinois. The insight they shared at these meetings has helped to determine how this Plan can be crafted to better meet their needs and address some of the issues and challenges they face in making Illinois a better place to bike. At each of the nine transportation professionals meetings held in July and August of 2013, participants completed a brief survey to share their needs and experiences as they relate to the development of bicycle infrastructure as a part of their daily work. The survey gauged transportation professionals' familiarity with current IDOT and national design resources, perceptions of current

policies and procedures, and desired assistance to support the development of bicycle facilities in their region. The complete survey results and a detailed summary are included in **Appendix E**.

The results of this survey reveal some of the challenges that professionals face on a daily basis, as well as their visions for bicycling as a form of transportation in Illinois. Survey findings show that, while many resources exist for the planning, design and construction of bicycle facilities, these resources may not be known and widely referenced by professionals throughout the state. Many of the planners, designers, engineers and other professionals that completed the survey acknowledged their limited familiarity with these resources and expressed their desire for access to more guidance and information that can help them be successful in making bicycling a viable transportation choice.

For example, when asked to rate their need for additional design guidance for different bicycle facility types, participants expressed a strong desire for additional guidance for separated facilities, both on-road and off. The high ratings for additional guidance on protected and buffered bike lanes reflects transportation professionals' need for resources to develop innovative facilities, as well as the growing interest in and demand for these bikeway types, particularly in larger urban areas. Bicycle-friendly shoulders, and trails are common throughout the State, and their high ratings indicate that, despite their prevalence, local transportation professionals still have a need for additional guidance.

Many transportation professionals expressed their support for the State's commitment to Complete Streets. However, they were concerned that this commitment is not supported by the funding, design resources, and engagement efforts with local communities that are necessary for it to be successful. IDOT policies pertaining to Complete Streets and non-motorized transportation are traveling faster than the resources that support them, and many local transportation professionals feel this disconnect creates additional hardships in meeting these policy goals.

Additional Input and Outreach

The team gathered additional input and conducted additional outreach as needed throughout the development of the plan. This included targeted interviews with key stakeholders outside of IDOT, meetings with local stakeholder groups such as the Network of Chicagoland Bike Planners at Higher Education Institutions, and Trails Linking Communities in Bartlett, IL, and fielding questions and comments via email from the Plan's website. The results of these activities are discussed below:

Tabling

In addition to the formal outreach meetings, the project team conducted several tabling events throughout the state at events where bicycling stakeholders were likely to be present. These events included Bike the Drive in Chicago (May 2013), The Illinois Bicycle Summit (May 2013), Tour De Fat in Chicago (July 2013), the Illinois State Fairs in Springfield and Du Quoin (August 2013), and the 2013 UIC Sustainability Days Cycling Extravaganza & Transportation Fair (September 2013). The purpose of

these events was primarily to spread awareness about the Plan and engage participants, but some informal input was gathered during the process as well.

The setup and participation at these events varied widely. For example, in the case of Tour De Fat in Chicago, the team set up posters giving basic information about the plan, had a large board to let people record their vision for bicycling in Illinois and what they would like to see out of the plan, and handouts were distributed giving information about the online public input tool. The State fairs presented similar information, but did not collect input and feedback from the public. The Plan's presence at the Illinois Bike Summit included presentations by IDOT staff members Bola Delano (Deputy Director of Office of Planning and Programming), Gabe Sulkes (Plan Project Manager, Office of Planning and Programming), and Andre Ashmore (Deputy Transportation Secretary), as well as a table providing additional information on the Plan, such as outreach dates. The presence at Bike the Drive was simply a poster giving people basic information on the Plan.

Depending on the location, participants had a varying degree of understanding of IDOT's role in bike transportation in Illinois. For example, at Tour De Fat in Chicago, many participants cited specific, local roadway improvements that they felt should be addressed to improve bicycling – many of these being under the jurisdiction of the municipality. However, participants and advocates at the Illinois Bike Summit had more general, statewide policy and infrastructure questions and comments, possibly indicating a greater understanding of IDOT's role in bicycling statewide.

The team did not record how many people were engaged in this process, but it is likely that this number is well over 200, based on the attendance at the Illinois Bike Summit and observations gathered from other events.

Open Response Website Comments and Listserv Photo Contest

A unique email address for the Bike Transportation Plan was set up through the plan's website, where people could email with questions about the plan or open-ended comments. Many comments on specific roadways were received and are being considered in the development of the Plan's analysis and recommendations. For example, one individual pointed out several bicycle and pedestrian concerns with the new Route 30 path design between New Lenox and Harlem Avenue in Frankfort, such as roadway crossings, maintenance, and connectivity.

In addition, a photo contest was initiated via the Plan's email listserv to collect photos of bicycling and engage stakeholders. Approximately twenty photos were collected, several of which have been incorporated into the final plan document.

Value and Limitations of the Process

The input process was very extensive and has added a great deal of value to the Plan, helping guide and support the development of many Plan recommendations. The participation numbers and geographic representation show thorough coverage of all areas of the State, which helps give this study credibility.

While it was successful in many ways, the process did have some limitations that have been considered in the development of the final plan:

- Outreach often drew a large amount of input from supporters and advocates of bicycling, as indicated in the public outreach meetings and MetroQuest surveys, but didn't necessarily provide a representation of the general public. Although, several of the information outlets, such as IDOT's 'IDOT in Motion,' and IDOT's Facebook pages, are widely broadcast to all transportation user groups. The attendance numbers do indicate that there is strong support for bicycling in Illinois.
- The amount of informal input, largely in the form of emails and conversations, was very large and often difficult to record and analyze.
- The outreach meetings were centered near population centers, possibly under-representing stakeholders that live in towns further away.
- Much of the information broadcast and received was in a digital, online format, possibly excluding less technology savvy stakeholders or those without access to the internet.

Section 1- Existing Conditions
Chapter 2- Review of Federal and State Bicycle Policies

Chapter 2 - Review of Federal and State Bicycle Policies

This Chapter provides a broad overview of federal and State policies related specifically to bicycling. The purpose is to:

1) Ensure the plan's recommendations are consistent with federal guidance.
2) Identify IDOT policy guidance that affects decisions related to bicycling.
3) Identify aspects of State policy that might need to be amended or changed in order to provide more clarity and/or support for accommodating and promoting bicycling.

Federal Policy

In March of 2010, the Federal Highway Administration (FHWA) issued a policy statement which calls for transportation agencies to "incorporate safe and convenient walking and bicycling facilities into transportation projects". It further states, "Every transportation agency has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems."[1]

The FHWA also issued a recommended approach to accommodating bicycle and pedestrian travel which states in part:

"1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.
- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project. This 20 percent figure should be used in an advisory rather than an absolute sense.
- Where sparsity of population or other factors indicate an absence of need. For example, the Portland Pedestrian Guide requires "all construction of new public streets" to include sidewalk improvements on both sides, unless the street is a cul-de-sac with four or fewer dwellings or the street has severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day, as in states such as Wisconsin. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. The particular vehicle volume used to justify the provision of paved shoulders may vary from state to state.

[1] *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations.*
http://www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/policy_accom.cfm

- Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate."[2]

The FHWA also recommends that US transportation agencies:

- "Consider walking and bicycling as equals with other transportation modes.
- Ensure that there are transportation choices for people of all ages and abilities, especially children, persons with temporary or permanent disabilities, people with limited incomes, and seniors.
- Go beyond minimum design standards.
- Integrate bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges.
- Collect data on walking and biking trips.
- Set mode share targets for walking and bicycling and tracking them over time."[3]

Mode Shift: The US Department of Transportation also sets the following goal for walking and bicycling in the United States: "Federal transportation policy is to increase non-motorized transportation to at least 15 percent of all trips and to simultaneously reduce the number of non-motorized users killed or injured in traffic crashes by at least 10 percent. This policy, which was adopted in 1994 as part of the National Bicycling and Walking Study, remains a high priority for the U.S. Department of Transportation."[4]

Transit Access: In 2011, the Federal Transit Administration (FTA) established a formal policy on the eligibility of bicycle and pedestrian improvements for FTA funding. The requirement states that bicycle improvements within three miles of a transit stop and pedestrian improvements within a half-mile are eligible for FTA funding. The reasoning is that it takes the average person 15 minutes to bike or walk these distances, which is the maximum amount of time someone is typically willing to travel via non-motorized means to transit.[5]

Design Flexibility: On August 20, 2013 the FHWA released a policy statement on Bicycle and Pedestrian Design Flexibility.[6] It reads:

"This memorandum expresses the Federal Highway Administration's (FHWA) support for taking a flexible approach to bicycle and pedestrian facility design. The American Association of State Highway and Transportation Officials (AASHTO) bicycle and pedestrian design guides are the primary national resources for planning, designing, and operating bicycle and pedestrian facilities. The

[2] *Accommodating Bicycle and Pedestrian Travel: A Recommended Approach.* http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/design.cfm
[3] *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations.* http://www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/policy_accom.cfm
[4] *Bicycle and Pedestrian Provisions of Federal Transportation Legislation.* http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/bp-guid.cfm
[5] https://www.federalregister.gov/articles/2011/08/19/2011-21273/final-policy-statement-on-the-eligibility-of-pedestrian-and-bicycle-improvements-under-federal
[6] http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/design_flexibility.cfm

National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide and the Institute of Transportation Engineers (ITE) Walkable Urban Thoroughfares guide build upon the flexibilities provided in the AASHTO guides, which can help communities plan and design safe and convenient facilities for pedestrian and bicyclists. FHWA supports the use of these resources to further develop non-motorized transportation networks, particularly in urban areas."

The policy statement builds on this flexible approach by stating: "The vast majority of treatments illustrated in the NACTO (and ITE guides) are either allowed or not precluded by the Manual on Uniform Traffic Control Devices (MUTCD). In addition, noncompliant traffic control devices may be piloted through the MUTCD experimentation process."

The memo also provides two successful examples of innovative facility types: Michigan DOT's use and encouragement of buffered bike lanes and Missoula, Montana's use of green-colored bike lanes.

Illinois Laws and Policies Relevant to Bicycling

Illinois Bikeways Act

State legislature established the Illinois Bikeways Act in 1994, enacting a program for State-sponsored bicycling infrastructure and support programs. Eligible activities include: surveys, safety measures, demonstration projects, research, education, proposed legislation, utilization of existing streets and walkways, provision of bicycle paths to and from schools affording a minimum of hazard from automobiles, provision of comfort stations and weather shelters, provision of facilities in connection with commuter railroads to facilitate the use of bicycles by commuters in traveling to and from the railroad stations, and promulgation of standards, security measures and regulations for the registration and use of bicycles.[7]

The Bikeways Act also established the Inter-Agency Bikeway Council Working Group (IBCWG), which the IDOT Secretary chairs. The group has quarterly meetings and focuses on non-motorized issues such as Transportation Alternatives funding, the development of State bikeways and the implementation of Illinois Complete Streets policy.[8]

Illinois Complete Streets Law

The 2007 "Illinois Complete Streets Law" (sec. 4-220. Bicycle and Pedestrian Ways) is one of the most important pieces of legislation with regard to routine accommodation of bicyclists and pedestrians in State-involved road projects. It creates an environment where consideration and inclusion of bicycle and pedestrian accommodations is the default. However, there are exceptions, such as system preservation projects, where a roadway is being re-paved without widening or shoulder stabilization.

It states the following:

(a) Bicycle and pedestrian ways shall be given full consideration in the planning and development of transportation facilities, including the incorporation of such ways into State plans and programs.

[7] http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1750&ChapterID=45
[8] http://www2.illinois.gov/gov/green/Pages/AgencyBicyclingInitiatives.aspx

(b) In or within one mile of an urban area[9], bicycle and pedestrian ways shall be established in conjunction with the construction, reconstruction, or other change of any State transportation facility except:

(1) In pavement resurfacing projects that do not widen the existing traveled way or do not provide stabilized shoulders; or

(2) Where approved by the Secretary of Transportation based upon documented safety issues, excessive cost or absence of need.

(c) Bicycle and pedestrian ways may be included in pavement resurfacing projects when local support is evident or bicycling and walking accommodations can be added within the overall scope of the original roadwork.

(d) The Department shall establish design and construction standards for bicycle and pedestrian ways. Beginning July 1, 2007, this Section shall apply to planning and training purposes only. Beginning July 1, 2008, this Section shall apply to construction projects.

Illinois Context Sensitivity Policy

The Illinois Context Sensitivity Policy (Sec. 4-219) requires that the Department of Transportation apply Context Sensitive Design processes and solutions to all major transportation projects to ensure they best represent the needs of the surrounding community and environment.

Context Sensitive Solutions (CSS) and Complete Streets may conflict at times. To address this, IDOT includes the following language in the Bureau of Design and Environment Manual (17-2.1): *In instances where the requirements of the Complete Streets Law run counter to the consensus view of project stakeholders, the Regional Engineer will determine the accommodation solution, or lack thereof, in consultation with the Bicycle and Pedestrian Coordinator.*

Boub vs. Wayne

The 1998 Illinois Supreme Court ruling in the case of Boub vs. Wayne has influenced the signing of bicycle routes and implementation of on-road bicycle facilities, especially in rural areas. The case involved Mr. Boub, a cyclist who sustained injuries when he crashed on a road that was under construction. Safety provisions had been made for vehicles, but not bikes. He sued the Township of Wayne for negligence, but the court ultimately rejected the claim based on its conclusion that the cyclist was a "permitted, but not intended," user of the roadway because it was not a designated bike route. This decision created a liability disincentive for jurisdictions in Illinois to develop bikeways.[10]

Illinois Vehicle Code

Legislation and enforcement were ranked a four out of a possible five points in the 2013 League of American Bicyclists Bicycle Friendly State scorecard for Illinois. Overall, Illinois has well-defined laws that support and legally protect bicyclists operating on State roadways. See **Appendix G**.

[9] The Illinois BDE Manual, chapter 17 defines urban areas *as those places identified by the US Bureau of Census as having a population of 50,000 or more.*
[10] http://www.illinoisbicyclelaw.com/2011/11/legacy-of-il-supreme-courts-boub-v.html

2012 Illinois Long Range Transportation Plan: *Transforming Transportation for Tomorrow*

As mentioned earlier, this comprehensive State Bike Plan sets the stage for many new policies and initiatives to promote and improve bicycling statewide. The State Bike Transportation Plan is considered an extension of the LRTP, and will be incorporated upon approval. There are many connections between bicycling and the LRTP's key policy areas. The bullets below give a summary of how bicycling fits into the LRTP policy items; a full overview of LRTP policies and goals that pertain to bicycling can be found in **Appendix H**:

- **Develop a Sustainable Transportation System –** Bicycling is one of the most efficient forms of transportation, especially for short trips, in terms of energy consumed, even more so than walking. In addition, bicycling-related infrastructure generally costs less to build and maintain than other forms of transportation.
- **Improve Transportation Safety –** Bicycle safety is an issue which IDOT continues to address as it works towards its zero deaths initiative. Although Illinois is ranked as the 9th most bicycle friendly state[11], it also currently ranks 21st in bicycle safety[12]. Improving State facilities, supporting local bicycle planning efforts and projects, educating road users, and encouraging bicycling are some of the ways IDOT can have an impact on bicyclist safety.
- **Provide a Transportation System that Offers a High Degree of Multi-modal Connectivity, Mobility and Accessibility –** This policy directly relates to bicycling. One of the action items supporting this policy is to "provide bikeway and walkway systems that are integrated with other transportation systems by exploring network options that promote interstate connectivity, increasing intermodal options with transit and intercity rail, and completing and implementing the State bike plan."
- **Preserve and Manage the Existing Transportation System –** Adding bicycle facilities to a roadway and increasing ridership helps increase the capacity of that roadway. When significant mode shift from driving to bicycling occurs, a road is subject to less wear and tear associated with auto traffic.
- **Address Congestion and Maximize Efficiency through Transportation Operations –** Similar to the possibilities above, mode shift can help reduce congestion. Also, dedicating space to bicycling—on and/or off road—can help all roadway users behave more predictably, which in turn can help with operations and safety.

> *Bicycling and walking facilities are typically very low-cost investments compared to other forms of transportation infrastructure and have a very high rate of return on investment. In a 2010 study, it was shown that $240 million had been spent in Wisconsin on bicycle-related improvements since 1967. As a result of this investment, $1.5 billion of revenue is generated annually, $535 million from out of State tourism alone. In addition, bicycling contributes to over 13,000 jobs across the State (2010, Gabrow, et. al.).*

[11] http://www.bikeleague.org/content/states
[12] http://peoplepoweredmovement.org/site/images/uploads/2012%20Benchmarking%20Report%20%20-%20Final%20Draft%20-%20WEB.pdf

- **Follow a Comprehensive Planning Process –** By compiling regional and statewide bikeway data, the Illinois Bike Transportation Plan will be a resource for future planning efforts, within and outside of IDOT.
- **Target Transportation Investments to Support Business and Employment Growth –** Investing in bicycling transportation yields economic returns. It makes communities more attractive to live in, and can play a key role in State tourism promotion.
- **Ensure a Compatible Interface of the Transportation System with Environmental, Social, Energy and Land Use Considerations –** Bicycling produces no emissions, is good for personal health, is an equitable form of transportation, improves quality of life, and supports dense, local development.

Bureau of Design and Environment (BDE) and Bureau of Local Roads (BLR) Manuals

The BDE and BLR Manuals provide guidance to IDOT staff, local jurisdictions and other organizations in the development of State highways, local roads, and bikeways. They are typically the primary references on bikeways policy and design and have an important role in guiding how the State's roadway network functions. Chapter 17 in the BDE Manual and Chapter 42 in the BLR Manual are the primary sources of guidance for bicycle and pedestrian considerations. Following the establishment of a bikeway policy in 1995 (BDE 95-21), IDOT began the process of updating the BDE Manual and incorporated the guidance on bikeways design and policy.

Both of these documents have many similarities, especially in terms of what is covered in the bicycle and pedestrian chapters. A new version of the BLR Manual bicycle and pedestrian chapter has recently been released. This revised version contains supplemental guidance that is not currently included in the BDE Manual:

- It shows flexibility in vehicular lane width in both policy and roadway cross-section drawings.
- The BLR Manual addresses BLOS and crash data analysis.
- The BLR Manual provides design guidance on standard road diets.

Discussion:

- The manuals compartmentalize much of their bicycle-related guidance into one chapter. This type of organization is helpful in terms of easy access to critical project development and design information, but risks making bicycle accommodations appear to be supplemental instead of integral to system maintenance and roadway design.
- The manuals do not offer guidance on the use of tools such as BLOS or Complete Streets scorecards to help evaluate the effectiveness of certain bicycle improvement options prior to construction. More information on these types of tools can be found throughout this Section.
- Narrower lane widths can help accommodate bicycle facilities where cost and ROW acquisition is a*n issue.* The manuals do state that reducing lane widths to accommodate bicycle facilities is allowed, but this option is not always apparent.
- Bicycle accommodations are currently not required (they are described as optional) in projects that do not require roadway widening such as 3P and SMART projects. These could

be cost effective opportunities to add bicycle accommodations through lane reconfigurations (for example: road-diets and lane-narrowing).

- The 80% State/20% local cost sharing formula can be cost prohibitive for local jurisdictions, leading them to 'opt out' of accommodations. In district interviews, some staff indicated that having IDOT bear the full cost of bicycle and pedestrian improvements would help speed up the project development process in some cases, and result in more bicycle and pedestrian facilities being built.

A detailed review of both documents can be found in **Appendix I**. Section II- Policy, Design, and Program Review and the Process Review and Integration Matrix also provide more in-depth discussions of national and local design practices.

Bridge Manual (2012)

The IDOT Bridge Manual is the Department's primary guiding document on bridge policy and design. It offers the following guidance for bicycles in reference to bridge widths: *as structures are an extension of the adjacent roadway, structures should, whenever possible, duplicate the accommodations made for bicyclists on the roadway. These projects should be coordinated with the District and the BDE Bicycle and Pedestrian Coordinator. Policies and procedures are given in Chapter 17 of the BDE Manual. (2-65).*

Discussion:
Bridges typically have a long life cycle and are often the only reasonable point of access over a barrier for vehicles, bicycles and pedestrians. If not designed properly, they can be a substantial barrier for non-motorized users. Federal policies require the safe accommodation of bicyclists at at-grade railway crossings and federally funded bridge projects, and that they do not have a disproportionally adverse impact on minority and low income populations.[13]

There appears to be some inconsistency between the Bridge Manual, which calls for accommodating cyclists if the approaches have accommodations (page 2-14), and Chapter 17 of the BDE Manual, which states that "Bicyclists will be accommodated on the bridge unless bicycles are otherwise prohibited to operate on the roadway approaches" in projects proving provide unique access, which is often the case. See 17-1.3

While the practice in Illinois is to typically provide wide shoulders on bridge projects even when approaching bicycle facilities or shoulders are not present, the manual does not clarify that one of the intents of this practice is to provide for bicyclist accommodation. Another consideration in bridge design is how bicyclists will be accommodated across a structure if a roadway is to be expanded in the future utilizing currently available shoulder space on the bridge deck.

Traffic is a relatively broad term that encompasses more groups than just passenger cars and large trucks. Pedestrians, pedal cyclists, motorcyclists, and other alternative transportation mode users, all deemed "vulnerable users," are part of the everyday roadway environment and attention should be paid to their presence. Even though vulnerable users are legitimate roadway users, they are frequently overlooked in the quest to develop today's transportation systems, and understanding the associated traffic safety issues has proven difficult for engineers and planners.

[13] 23 U.S.C. Section 130, 23 U.S.C. Section 217(e), Executive Order 12898: Environmental Justice

Highway Safety Improvement Program

The Bureau of Safety Engineering within the Division of Highways manages the federally funded Highway Safety Improvement Program (HSIP)[14]. The program's goal is to "produce a measurable and significant reduction in fatalities and serious injuries resulting from crashes on the highway system."[15] Project types include intersection realignments, at grade railroad crossings, shoulder rumble strips, improved signal timing, pedestrian countdown signals, turn lane additions, and pavement markings. Remediation strategies are drawn from the Crash Modifications Factors Clearinghouse, which is maintained by FHWA.[16] Project evaluation for HSIP funds includes a Benefit-to-Costs tool. Projects must also support the State's Strategic Highway Safety Plan (SHSP).

The 2009 SHSP includes "Vulnerable Users" as a focus area, and discusses current and future safety improvement efforts in the categories of engineering, education, and enforcement, such as installing pedestrian countdown signals and funding a 50,000-copy reproduction of "Safe Bicycling in Chicago" in Spanish and English.

The 2011 SHSP Progress Report identifies significant improvements in bicycle crash rates between 2006 and 2009 in spite of increased ridership. It identifies that the Chicagoland region has a disproportionately large percentage of bicycle crashes and injuries in the State. The report cites accomplishments such as the establishment of the Safe Routes Ambassador outreach program in Chicago, the Safe Routes for Seniors event in Chicago, Complete Streets legislation, recording "dooring" incidents, and the IDOT Safe Routes to School Program (SRTS). It is noted that IDOT conducted a Roadway Safety Analysis (RSA) for the Illinois Medical District Area because of high-level bicycle crashes. They have also done some RSAs as part of SRTS.

Discussion:
The State Bike Transportation Plan will be considered during IDOT's update of the SHSP. This presents an opportunity to identify additional bicycle-related challenges and recommendations regarding administration of HSIP, and the SHSP in general, such as bicycle-friendly rumble strip design, data collection, and conflicts between users of all modes. Section II- Policy, Design and Program Review incorporates the Bureau of Safety Engineering input in the development of the final recommendations presented therein, as does the Process Review and Integration Matrix.

[14] http://www.dot.state.il.us/illinoisSHSP/hsip.html
[15] IDOT Safety Engineering Policy Memorandum, November 1, 2006. http://www.dot.state.il.us/safetyEng/HSIP%20Policy%20Safety%201%2006.pdf
[16] http://www.cmfclearinghouse.org/

Section 1- Existing Conditions

Chapter 3- Illinois and Comparisons with Other States

Chapter 3 - Illinois and Comparisons with Other States

This Chapter presents various comparisons of Illinois to a variety of states for the purpose of benchmarking where Illinois has been and is currently ranked, and how IDOT might use those rankings to formulate action to accomplish the proposed recommendations in Section II, Section III, Section IV, and the Process Review and Integration Matrix. Safety statistics are presented first, followed by rankings by national organizations.

Chapter 3 also compares Illinois to three 'aspirational' states: Wisconsin, Oregon, and Minnesota, which have been lauded for their bicycle policies, designs and programs. In addition, Wisconsin and Minnesota have similarities to Illinois in terms of climate, geography and population. Detailed reviews of policies and practices in these states can be found in the Appendices.

Safety Statistics for Illinois and Other States

Each year, on average, 139 pedestrians and 22 bicyclists are killed in collisions with motor vehicles on Illinois roads, with many more seriously injured or experiencing evident or possible injuries. This rate of pedestrian and bicycle crashes places Illinois' ranking roughly in the middle (21st) for walking and bicycling fatality rates among US states. 15% of all traffic-related fatalities in Illinois are bicyclists and pedestrians.

Fortunately, Illinois bicycle fatalities declined between the years 2006 and 2009. The chart below presents a comparison of Illinois to a number of other states.

Table 1 - 2007 – 2009 ACS (3-Year Average) Bicycle Traffic Safety

State	Bike Commute Mode Share	Annual Reported Bicyclist Traffic Fatalities	Bicyclist Fatalities as % of Total Traffic Fatalities	Annual Bicycle Fatalities per 10,000 Daily Bike Commuters
Illinois	0.6%	21.7	2.0%	3.0
Colorado	1.3%	11.0	2.1%	1.7
Minnesota	0.8%	9.0	1.9%	2.2
Oregon	2.1%	11.0	2.6%	1.4
Virginia	0.3%	10.3	1.2%	3.8
Washington	0.9%	10.7	2.0%	1.9
Wisconsin	0.7%	8.7	1.4%	2.1
California	1.0%	105.7	3.0%	3.0
New York	0.5%	40.7	3.3%	4.4
Texas	0.3%	49.7	1.5%	7.9

Table 1 only looks at fatalities. Crashes involving bicyclists and pedestrians are historically under-reported because they are generally only recorded if the crash involves a motor vehicle. These numbers show the prevalence and severity of bicycle crashes in Illinois and highlight why Illinois is making bike and pedestrian safety a priority.

Safety Benefits of Bicycle Treatments and Increasing Bicycling Rates

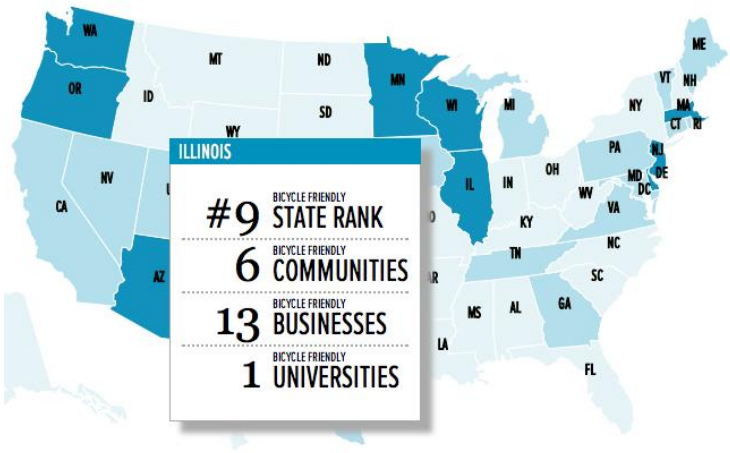
Bicycling improvements create safety benefits. Studies show that installing bicycle facilities and reducing roadway widths directly improve safety by reducing the risk of bicycle-automobile crashes. A recent statewide study in Iowa showed that the presence of on-road bicycle pavement markings decreases bike/auto crash risk by as much as 60%, while the presence of bicycle-related signage decreases bike/auto crash risk by 38%. Conversely, every 10 feet increase in curb-to-curb width increases crash risk by 37%.[1]

Studies also show that an increase in the number of people bicycling can, by itself, improve safety. When walking and cycling rates double, per-mile pedestrian-motorist collision risks can decrease by as much as 34 percent. This safety-in-numbers principle results in improved environments for walking and bicycling, and contributes to a safer transportation system in two important ways: by directly reducing collision risk and by making bicycling a more visible and common mode of travel.[2]

Bicycle Friendly America Programs

In an effort to determine common measures to compare Illinois to other states, this report compares available state-to-state comparative rankings generated by the League of American Bicyclists (LAB), and the Alliance for Bicycling and Walking. LAB, for example, organizes the following 'Bicycle-Friendly America' ranking programs (www.bikeleague.org/bfa):

1. Bicycle Friendly State
2. Bicycle Friendly City
3. Bicycle Friendly University
4. Bicycle Friendly Business



[1] http://www.researchgate.net/publication/234823184_On-road_bicycle_facilities_and_bicycle_crashes_in_Iowa_2007-2010

[2] Jacobson, P. (2003). Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling. Injury Prevention 9: 205-20

"The Bicycle Friendly State Program ranks states annually based on their level of bike-friendliness. States receive feedback, technical assistance, training and further encouragement to improve their bicycling legislation, projects, and programs."

State	State Ranking	Communities	Businesses	Universities
Illinois	9	6	13	1
Michigan	12	8	14	4
Indiana	42	8	25	1
Kentucky	47	2	25	1
Missouri	30	5	4	1
Iowa	21	5	8	0
Minnesota	426	39	39	2
Wisconsin	8	10	29	1

Illinois has participated in the Bicycle Friendly State program since its inception in 2005. Each year, IDOT fills out and submits an application describing its efforts to become more bicycle-friendly. For the State comparisons, in 2012, LAB ranked Illinois 9th out of the 50 states, which continues a trend of significant improvement (22nd in 2010, 11th in 2012 and 2011), especially in the areas of Policies and Programs and Education and Encouragement. The State's highest ranking came in 2008 when it placed 8th in the nation. This past year's improvement in Evaluation and Planning can likely be credited to the State Bike Transportation Plan effort. This standing was assigned following the annual League questionnaire in 2012. LAB ranks states according to six criteria. The grade received by Illinois for each criterion is shown in Table 2. The LAB's definition of each criterion can be seen in Table 3.

Table 2 - LAB Evaluation for Illinois

Area of Evaluation	2011 Grade	2012 Grade
Legislation (& Enforcement, 2012)	A	4 (B)
Policies and Programs	D	4 (B)
Infrastructure	C	3 (C)
Education and Encouragement	C	4 (B)
Evaluation and Planning	F	2 (D)
Enforcement	B	n/a
*2012 rankings are on a 1-5 scale, a 5 is the highest score attainable		

Table 3 - LAB Evaluation Criteria for Illinois

Legislation: The Legislation component of the Bicycle Friendly State (BFS) ranking questionnaire covers basic laws and regulations that govern bicycling. Questions include whether cyclists can legally use the shoulder, signal turns with either hand or leave the right-hand portion of the road when their safety requires it. This section also covers motorist responsibilities like passing at a minimum of three feet and making sure traffic is clear before opening automobile doors.
Programs & Policies: The Programs & Policies component of the BFS questionnaire covers what state agency requirements are for accommodating cyclists, be it a Complete Streets policy, a plan or agreement for mountain bike trails, how much state agency staff time is dedicated to bicycling, and whether or not bicycling is included as part of the state's carbon-reduction plan.
Infrastructure: Infrastructure is a critical element of the BFS questionnaire, and the questions aim at collecting data on specific performance measurements, i.e. in the amount of facilities and spending amounts for bicycling. Other examples include the percentage of state highways with shoulders, signed bike routes, trail miles, and bicycle-related project obligation rates for available federal funding. As states improve their numbers for many of the BFS questions, the bar will continue to rise for states in regard to bicycle-friendliness.
Education and Encouragement: In the Education and Encouragement portion of the BFS questionnaire, the section covers the amount of bicycling education in the state for adults and youth alike, as well as for motorists. A few ways that states can educate drivers on the road about cycling, for example, are Share the Road campaigns and questions concerning cyclists' rights in state drivers' exams. States can encourage more and better bicycling by promoting bicycling tourism, producing bike maps and collaborating with state and local advocacy groups, along with education efforts.
Evaluation & Planning: The Evaluation & Planning section of the BFS questionnaire surveys how bicycling is incorporated into each state's yearly planning. Questions include how bicycling is included in the highway safety plan, outdoor recreation plan or a bicycle transportation plan. This section also measures results of the state's crash and bike commuting rates.
Enforcement: The Enforcement section of the BFS questionnaire gathers data on the types of training law enforcement officers and traffic court judges receive to ensure protection of cyclists' rights to the road and safe travel on our shared roadways.

Alliance for Bicycling and Walking Rankings

In its 2012 benchmarking report, the Alliance for Biking and Walking ranked Illinois 21st for bicyclist safety.

The Alliance for Bicycling and Walking (ABW) produces a regularly published report detailing walking and biking conditions and trends in major U.S. cities, U.S. states, the US, and the world. The most recent report was published in 2012; its purpose is to provide benchmarking and support data to citizens, students, organizations and jurisdictions for improving walking and bicycling conditions throughout the country. ABW's Benchmarking report is compiled and based on existing data reported in the Census and by safety agencies.

The State Rankings are broken down into two categories: Ranking by Percent Walking and Bicycling Mode Share, and Ranking by Walking and Bicycling Safety.

Illinois Ranking by Percent Walking and Bicycling Mode Share

According to ABW:

"This report looks at the share of commuters who walk or bike to work using data from the 1990 and 2000 decennial Census, and annual ACS between 2005 and 2009, and the most recent 3-year average (2007-2009) and 5-year average (2005-2009) from the ACS. Although work trips account for only 16% of all trips (NHTS 2009), these data provide a glimpse into trends in bicycling and walking levels over the last 19 years. (p. 30)" [3]

Based on this study, AWB estimates that in Illinois, 0.6% of residents commute by bicycle to work. Compared with other states, Illinois ranks 19th in the nation for bicycling commute rates. This is consistent with the national average of 0.6 percent.

Illinois Ranking by Bicycling Fatality Rate

According to ABW:

"To measure risk, the Alliance divided the number of annual bicycle fatalities by population (weighted, or multiplied, by share of the population biking to work). Multiplying population times commuter mode share allows us to better estimate exposure levels for bicycling. Unlike the ACS, national travel surveys including all trip purposes have sample sizes that are too small to disaggregate to the state and city level. Thus, our method is a rough approximation of exposure levels that takes both population and cycling levels into account. (p.52)" [4]

Based on this study, it was estimated that on average, 21.7 bicyclists are killed each year due to traffic accidents, accounting for 2.0% of all state traffic fatalities. Compared with other states, Illinois ranked 21 out of all states for bicycling safety.

America's Health Rankings – 2012 Rankings of Healthy States

America's Health Rankings (AHR) conducts an annual ranking of the 50 states in terms of health. In 2012, Illinois was ranked 30th in the Nation.

While improving the state's health is not stated in the Department's mission, both the Governor and the Illinois Department of Transportation recognize the health benefits of making communities more walkable and bikeable. IDOT has been actively working with IDPH on their built environment section, ensuring that there is more coordination on SRTS and Complete streets initiatives.

Providing safe, accessible and comfortable bicycling facilities is one way the State can contribute to a healthier region. Two of the benefits of active transportation are that it promotes active, healthy lifestyles and it is an equitable means of transportation. Improving active transportation is one of the keys to improving social mobility, overall health, and quality of life for residents.

[3] http://peoplepoweredmovement.org/site/images/uploads/2012%20Benchmarking%20Report%20%20-%20Final%20Draft%20-%20WEB.pdf

[4] http://peoplepoweredmovement.org/site/images/uploads/2012%20Benchmarking%20Report%20%20-%20Final%20Draft%20-%20WEB.pdf

This excerpt from Green.Illinois.gov portrays the role of transportation in a healthy community:

"A robust bicycling policy offers unique opportunities to promote community health and livability while sustaining the environment for future generations. Bicycling initiatives produce a multitude of benefits including:

- Environmental sustainability
- Community-based economic development
- Congestion mitigation
- Social capital enhancement
- Educational and student curriculum opportunities
- Physical fitness"

Section 1- Existing Conditions

Chapter 4- Best Practices Review

Chapter 4: Best Practices Review

Although best practice guidance from many states are referenced throughout this document, the report focuses on three in particular: Wisconsin, Minnesota and Oregon. These states were chosen because they have been acknowledged for their innovative bicycle practices, have shown dedication to addressing pedestrian and bicycle issues, and have similarities to Illinois in terms of geography, population, demographics, land-use, etc. Table 4 presents a summary of Illinois compared with its peer states in national benchmarking programs for bicycling.

Table 4 – Summary of Illinois and Peer State Standings

Illinois Compared With Peer States in National Standings				
State	2013 LAB Bicycle Friendly State Ranking	2012 ABW Ranking by Percent Walking and Bicycling Mode Share	2012 ABW Ranking by Walking and Bicycling Fatality Rate	2012 America's Health Rankings Healthiest States Ranking
Wisconsin	8	17	15	16
Minnesota	4	18	10	5
Oregon	3	5	13	13
Illinois	9	20	21	30

Funding Comparisons

Generally, a state spending more per capital on bicycling and pedestrian projects will construct more miles and higher-quality facilities, which has been shown to contribute to increased bicycling and walking activity.

Dedicated funding has been critical to the development of bicycling infrastructure in Illinois. IDOT currently tracks spending on projects built under the ITEP, CMAQ or RTP programs. However, spending on bicycle and pedestrian projects as a component of general fund roadway projects is not independently tracked. The Department notes that the reporting mechanism for tracking bicycle and pedestrian spending within roadway improvements could be improved, since the bicycle or pedestrian project cost is not broken out.

Table 5 presents a summary of spending on Bicycle and Pedestrian projects among Illinois and peer bicycle-friendly states, as reported by the FHWA. Again, as noted above, this amount does not account for many bicycle and pedestrian improvements made as part of many roadway projects.

Table 5 - State Obligated Funding for Bicycle and Pedestrian Projects in Illinois and Peer States

State Obligated Funding for Bicycle and Pedestrian Projects in Illinois and Peer States *				
Fiscal Year	2011	Per Capita (2011)	2012	Per Capita (2012)
Minnesota	$17.0m	$3.16	$30.1m	$5.60
Oregon	$18.1m	$4.65	$12.6m	$3.22
Wisconsin	$12.8m	$2.23	$7.8m	$1.37
Illinois	$19.7m	$1.53	$30.4	$2.36

*It is critical to note that not all states follow the same reporting procedures so actual spending may vary by state. Population estimates are based on the US Census Bureau 2012 Population Estimates

Bicycle Program Staffing

As the State bicycle program expands, coordination and organization become increasingly important. Bicycle program staffing structures differ among states. For example, while Oregon has several dedicated staff people, Illinois has several staff people who dedicate a significant amount, but not all of their staff time to bicycling and pedestrian issues. Some states report that having several people involved in the bicycling program can increase staff capacity, provide multiple points of view and foster an exchange of ideas.

The review of Illinois staffing notes many central-office staff are involved with bicycle and pedestrian planning. In addition to this, every Illinois district office identified one or more staff members as bicycle and pedestrian staff specialists. Other peer states most likely have staff that play a supportive role in bicycle and pedestrian planning at the central office and district levels in addition to the staff members listed here.

Table 6.1 - Bicycle Program Staffing in Illinois and Peer States

State	Staff With Bicycle Related Duties
Minnesota	8 – Full time staff in central office bicycle/pedestrian planning division
Oregon	3 – Full time staff in central office
Wisconsin	6 – 1 Full time coordinator and 5 district liaisons
Illinois	12 – Staff involved part-time (varying degrees) with bicycle planning

Table 6.2 - Bicycle Program Staffing Among Top LAB Bike Friendly States

BFS Ranking	State	FT State Employees Working on Bicycle and Pedestrian Issues	FT DOT Employees Working on Bicycle and Pedestrian Issues	Percent of Time State DOT Bike/Ped Coordinator Spent on Bike/Ped Issues	Number of Full Time Staff Working On Safe Routes to School	Has your state created a position to manage the new Transportation Alternatives program?
1	Washington	15	7	100	1	No
2	Colorado	10	8	100	1	No
3	Oregon	14.4	13	100	1	Yes
4	Minnesota	17.5	16	100	2.5	No
5	Delaware	10	8	100	1	No
6	Massachusetts	34.7	23.7	100	5	Yes
7	New Jersey	50	50	100	60	Yes
8	Wisconsin	16	12	100	1	Yes
9	Illinois	5-6	6	100	1.5	Yes
10	Arizona	10.5	9.5	100	2.5	Yes

*Note that figures presented in this table are not fact-checked by LAB

**States were asked to enter a value of 1 for full-time employees and .5 for part-time employees

Safe Routes to School Staffing

The status of standardized curriculum and percentage of schools participating in SRTS programs vary from five percent to 14 percent among Illinois and its peer states, as shown in Table 7. Illinois falls into the middle of the range, at 10 percent.

Table 7 – Safe Routes to School Comparisons among Illinois and Peer States

Illinois Compared With Peer States in Safe Routes to School (SRTS) Programs				
State	Full Time SRTS Coordinator	Standard SRTS Curriculum	% of Schools Participating	State Provides Additional Funding Beyond Federal Funds
Minnesota	Yes	No	5%	Yes
Oregon	Yes	Yes	12%	No
Wisconsin	Yes	Yes	14%	No
Illinois	Yes	No	10%	Yes

Peer State Program Review

This section identifies three peer states: Wisconsin, Minnesota and Oregon. With each state, their respective programs are described for comparison.

Minnesota

The MnDOT bike program includes eight dedicated staff people and provides a number of policy, planning and design related services including:

1. Publication of bike maps
2. Share the Road Campaigns
3. Planning & Design, including technical guidance for bikeways and support for Metropolitan Planning Organization bicycle plans
4. Funding resources
5. Safety Information
6. State Non-Motorized Transportation Advisory Committee, which coordinates and develops bicycling goals, objectives policies and standards in Minnesota

Highlights of MnDOT's programs and policies include the following:

- MnDOT Bicycle Modal Plan. The Plan provides prioritization guidance and targets for increased bicycle mode share of 4% from the 2000 Census across the State for communities of 5,000 people or more. In addition to increased mode share, the plan calls for progress towards the zero fatalities initiative, progress on the Scenic Bikeway System and participation by each district in special bicycle improvement projects.

Project Funding on State Roadways. MnDOT pays 100% of the cost for bicycle facilities within the trunk highway system right-of-way.

Legislative Report on Complete Streets. State policy allows cities and counties with complete streets policies to be exempt from the Minnesota Statute 161 requirement that necessitates a commissioner's speed study before establishing a speed limit other than the statutory defined limit. Cities with Complete Streets design policies are also exempt from State Aid design standards and may waive the State Aid variance requirement that requesting agencies assume all liability.

Additional information on Minnesota statewide plans, policies and programs is located in **Appendix J**.

Oregon

Oregon DOT has three dedicated staff in their Bicycle & Pedestrian program whom provide direction to ODOT in establishing pedestrian and bicycle facilities on state highways. The program's secondary function is to support local governments, governmental and non-governmental organizations and citizens in the planning, design and construction of bicycle facilities.

The program provides the following services to ODOT and other State organizations:

- Policies and Programs
    - Formulating policies
    - Implementing programs
    - Identifying and prioritizing bikeway and walkway projects
    - Facilitating the increased use of non- motorized modes of transportation
- Information
    - Developing products such as bicycling maps and accident reports
    - Giving presentations and organizing conferences to local government staff and the general public
    - Coordinating the Oregon Bicycle and Pedestrian Advisory Committee activities
- Technical Assistance
    - Providing technical assistance within the Department and to local officials regarding walk-way and bikeway design, construction, and maintenance
    - Recommending design standards for walkways and bikeways
    - Reviewing construction plans to ensure that pedestrian and bicycle needs are met
    - Reviewing local Transportation Systems Plans for pedestrian and bicycle compatibility

Highlights of Oregon's programs, plans and policies include:

- Bicycle and Pedestrian Design Guide (2011). The recent Bicycle and Pedestrian Design Guide, is one of the most up-to-date statewide design guides and is one of the first DOT Manuals to reference the NACTO Urban Bikeway Design Guide. In addition to basic information of facility planning, the guide provides consideration for bicycle user types and innovative treatments including protected bike lanes and bike boxes.
- Transportation Planning Rule (OAR 660-12). The Transportation Planning rule implements Goal 12 of the Statewide Planning Goals and is considered one of the first laws of its kind. The rule mandates development of a balanced transportation system, one that ties land use to transportation and reduces reliance on any single mode of transportation. Highlights include the provision of 'reasonably direct routes for bicycle travel' in new development, requires bicycle parking as part of new residential and commercial developments and requires bikeways along arterials and major collectors.

Additional information on Oregon statewide plans, policies and programs can be found in **Appendix K**.

Wisconsin

Wisconsin DOT policies have benefitted bicycling in the State, and Wisconsin has long supported bicycling as an important transportation option. Even before the passage of the original ISTEA bill, the Wisconsin legislature prescribed a "bicycling role" for WisDOT. According to State Statute 85.023, amended in 1979, WisDOT is to provide assistance in the development of bicycle facilities: "The Department (WisDOT) shall assist any regional or municipal agency or commission in the planning, promotion, and development of bikeways."

In 2009, the Wisconsin legislature passed the Wisconsin Pedestrian and Bike Accommodation law, State Statute 84.01(35), a Complete Streets Act, requiring all state and state-funded transportation projects to accommodate walking and bicycling, except in narrowly defined circumstances. This was incorporated as an administrative rule as Transportation 75, noted below:

http://www.dot.wisconsin.gov/projects/state/docs/complete-streets-rules.pdf

Highlights of Wisconsin's programs, plans and policies include:

- Comprehensive planning and design documents for bicyclists.
    - The 1998 Wisconsin Bicycle Transportation Plan 2020 outlines a vision for bicycle transportation and provides a statewide assessment of State roadways for cycling in their current condition.
    - The Wisconsin Bicycle Facility Design Handbook (2004 and updated in 2009) outlines minimum standards for facilities, both on State roadways and for state-funded projects. The handbook also provides design guidance for local communities on a variety of topics.
- Supportive policies. For many years Wisconsin has had a policy of paving the shoulders of most State roads and roads utilizing State funding. Although this policy benefits non-motorized travel, WisDOT does not use limited bicycle funding, such as Transportation Enhancements/Transportation Alternatives funding for this purpose.

- Providing adequate cycling space in rural settings. WisDOT has a history of recommending wide shoulders for bicycling and bicycle-friendly rumble strip design in their existing design guidelines. In 2012, about 75% of the 12,000 miles of State roadways had 3' or wider paved shoulders. Listening to recommendations from the Wisconsin Bike Fed, the majority of WisDOT's current rumble-strip installation efforts have been centerline rumble strips. Where rumble strips are necessary, only the most bicycle-friendly rumble strip designs are permitted on roadways with 3' or greater shoulders.[1]
- Providing statewide support for education and education-programs. WisDOT is also involved in education and trainings for citizens and law enforcement officials to enhance bicyclist and pedestrian safety and comfort. Teaching Safe Bicycling is a one-day course offered free for those wishing to teach bicycle safety to children. It is offered in various locations each spring and frequently attracts participants from surrounding states who do not have similar opportunities locally. WisDOT, which also oversees the State highway patrol, offers Enforcement for Bicycle Safety, a 12-hour course to train officers on the most important law enforcement practices to reduce bicycle crashes.
- Explicit information regarding exceptions to Complete Streets policy. One of the issues that was noted repeatedly in Illinois district interviews was that many designers weren't sure when a bicycle facility was warranted or excluded from a roadway project. The Wisconsin Facility Design Handbook explicitly states when projects are excluded through rules, diagrams and examples.

Additional information on Wisconsin statewide plans, policies and programs is located in **Appendix L**.

Peer States Best Practice Matrix

As discussed earlier, the League of American Bicyclists (LAB) conducts an annual state ranking based on each state's level of bike-friendliness. States receive feedback, technical assistance, training and further encouragement to improve their bicycling legislation, projects, and programs. The LAB ranks states in the following five areas:

Legislation & Enforcement	Policies & Programs
Infrastructure & Funding	Education & Encouragement
Evaluation & Planning	

The best practice matrix in **Table 8**, showcasing notable bicycling policies and documents, is organized around these five areas. For more information on the guidelines, policies and programs listed in this table, refer to Appendices E through G.

[1] http://bfw.org.s132128.gridserver.com/2012/09/11/get-ready-to-rumble/

Table 8 – Peer State Best Practices per LAB Emphasis Areas Summary

	Wisconsin	Minnesota	Oregon
Legislation & Enforcement	• Statute 85.023 – Planning for bicycle facilities • Statute 85.024 – Bicycle and Pedestrian Facilities Program • Statute 84.01 (35) – Bikeways and Sidewalks in Highway Projects (Complete Streets Act)	• Minn. Stat. § 160.264 and Minn. Stat. § 165.02. Requirement to provide bicycle facilities • Legislation on Complete Streets	• ORS 366.460 Construction of sidewalks within highway ROW • ORS 366.514 Use of highway fund for footpaths and bicycle trails
Policies & Programs	• Provide high quality facilities along State roadways • Explicitly states how Wisconsin addresses federal policy requirements for the accommodation of bicyclists and pedestrians. Explicitly defines exceptions to required accommodations	• Trunk Highway Bridge Improvement Program • Cyclist consideration in rumble strip installation on State roadways	• Transportation Planning Rule • Includes bicycles in State Safety Action Plan • Design guide advocates for application of innovative designs for context sensitive solutions
Infrastructure & Funding	• Uses general fund money to pave shoulders on State highways • Inventoried cycling quality of all State roadways	• MnDOT pays 100% of cost for bike facilities on trunk highway system	• Provides State funding for bike projects
Education & Encouragement	• Teaching Safe Bicycling • Enforcement for Bicycle Safety • Safe Routes to School Program	• Safe Routes to School Program	• Safe Routes to School Program
Evaluation & Planning	• Wisconsin State Bicycle Transportation Plan 2020 • WisDOT Guide for Path/Street Crossings • Bicycle Crash Analysis for Wisconsin • Wisconsin Rural Planning Bicycle Guide • Wisconsin Bicycle Facility Design Handbook	• MnDOT Bicycle Modal Plan • Trunk Highway System Bicycle Or Recreational Vehicle Minimum Design Standards	• Oregon Bike and Pedestrian Plan • Oregon Highway Plan • Transportation Safety Action Plan • Bicycle and Pedestrian Design Guide

Section 1- Existing Conditions

Chapter 5- Design Practices

Chapter 5 - Design Practices

Chapter 5 reviews federal and state design guidelines, as well as opportunities for improvement. Further recommendations are found in Section II and summarized in the Process Review and Integration Matrix.

One of the issues that came up in stakeholder outreach is the need for more design options in Chapter 17 of the BDE Manual. Some stakeholders felt the current list of design options, especially with on-street accommodations, may lead to the installation of bicycle and/or pedestrian facilities that are sub-optimal from a safety, accessibility, and comfort standpoint.

National Perspective

The field of bicycle design has been moving rapidly forward over the last decade, and even more rapidly in the last several years. As a result, several design documents have been produced in the U.S. to promote innovative designs that were developed in Europe and have been used successfully in many U.S. communities.

Examples of these documents include:

- *Designing Walkable Urban Thoroughfares: A Context-Sensitive Approach*, ITE / CNU
- *Complete Streets: Best Policy and Implementation Practices*, American Planning Association
- *Pedestrian and Transit-Oriented Design*, Urban Land Institute and American Planning Association
- *Urban Bikeway Design Guide*, National Association of City Transportation Officials
- *Guide for the Development of Bicycle Facilities*, 2012, AASHTO

The AASHTO Guide for the Development of Bicycle Facilities has traditionally been the guiding document for states around the US. The original AASHTO bike guide was developed in 1974, then updated in 1981, 1991 and again in 1999. The latest version was published last year, in 2012. Even though the AASHTO guide has long been respected as the definitive guide, it has often been criticized for its lack of inclusion of commonly-used design practices. Indeed, the process for review and approval is arduous and lengthy – it took 13 years to get the latest version published; participants in the review process report that innovative designs were often controversial and thus omitted in order to facilitate the approval process.

The AASHTO bike guide, much like AASHTO's Green Book, the bridge manual and the roadside design manual, are all intended to represent best practices and provide guidance to states, so that the states will review and adopt content that is appropriate for their respective design manuals. The guides are not meant to be all-inclusive or to present every available design option for all 50 states. The intent is that states will utilize the guides and select design manual content that is appropriate for their individual states.

Likewise, the MUTCD has a similar reputation for a lengthy and difficult approval process. The latest version was published in 2009, with the previous version published in 2003. Reports are that the next edition will likely be in 2015 or 2016.

In the last decade, the interest in creating Complete Streets plans and then implementing the projects within those plans has led to a tremendous demand for sharing best practices and solutions to common bike and pedestrian design issues. Some communities have expressed frustration with

the limited design options in the traditional guides and standards (such as AASHTO and MUTCD) and the lack of responsiveness of higher governing bodies. This has led to many communities proactively sharing information outside of the traditional forums, such as is the case with the NACTO Urban Bikeway Design Guide.

IDOT

IDOT's first formal bicycle policy document was adopted in 1995, with the BDE Technical Memorandum 95–21. At that time, running changes to the Design and Environment Manual were done via technical memoranda. In the late 90s, the Bureau of Design and Environment undertook the monumental effort to update the entire BDE Manual. IDOT's BDE Manual Chapter 17 incorporated the content of 95-21 and included the first designs specific to bikeways. This chapter was originally drafted in 1998; Chapter 17 was largely based on the 1991 AASHTO Bike Guide. As background, from 1995 until 1998, the Department had adopted the 1991 AASHTO Guide as the Department's design guide (since no design guidance existed prior to Chapter 17 being published around 1999).

The designs contained in today's edition of Chapter 17 are largely the same as those designs from 1999, which were based on the aforementioned 1991 AASHTO Bike Guide. Policy changes and design application guidance were updated with the Complete Streets revisions, but the designs are largely the same. Thus, there are opportunities to provide enhanced design guidance.

Complete Streets

With the broad acceptance of Complete Streets as a concept that many cities and states want to embrace, many communities are turning to supplemental documents to provide solutions to common Complete Streets design challenges. Nationwide, more than 500 cities and states have adopted Complete Streets policies or resolutions since the movement began in the mid-2000s. Several of these communities have developed design guidelines that address specific local needs. Fifteen communities and 2 counties have adopted policies in Illinois, the majority being in the past 2 years.

Retrofitting bicycle and pedestrian facilities into a built environment often requires ready access to design solutions. Thus, a strong need exists for more comprehensive design options, consistent with those available from national publications.

Opportunities for Improvement

As the State and the Department has clearly stated in policy, considering the needs of all roadway users in a manner that is sensitive to the local context is the intent of Complete Streets in Illinois. In order to embrace this concept, the design manual needs to include a comprehensive palette of potential designs. If those designs are not available, engineers are forced to seek out and propose alternate designs that typically require the design variance process. A limited palette, therefore severely constrains the Department's and municipalities' efforts to easily provide progressive and inclusionary Complete Streets designs.

Overall, Chapters 17 in the BDE Manual and 42 in the BLR Manual are tailored for bicycle accommodations, and to a lesser degree, pedestrian accommodations. Supplemental documentation and designs are often provided in referenced chapters. Both chapters provide fairly comprehensive information about off-street independent pathways, which logically was the focus in the 90's when the Department was fostering the design and construction of bike trails and shared-use pathways. Both chapters, however, are lacking in details about on-street design specifics, as well as sidepath characteristics and proper design.

For example, the Bicycle Facility Selection matrix provided in Section 17-2.01 of Chapter 17 leans heavily toward Bi-directional sidepaths along arterial roadways, yet provides limited guidance on when they are appropriate, and how to choose between the safety advantages of on-street bike lanes vs. sidepaths. The 1999 AASHTO bike guide provided this guidance:

Separation Between Shared Use Paths and Roadways

"When two-way shared use paths are located immediately adjacent to a roadway, some operational problems are likely to occur. In some cases, paths along highways for short sections are permissible, given an appropriate level of separation between facilities." Some problems with paths located immediately adjacent to roadways are as follows:

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 bi–cyclists is a major cause of bicycle/automobile crashes and should be discouraged at every opportunity.
3. At intersections, motorists entering or crossing the roadway of- ten will not notice bicyclists approaching from their right, as they are not expecting contra-flow vehicles. Motorists turning to exit the roadway may likewise fail to notice the bicyclist. 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 turning 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. Bicyclists using the roadway may be harassed by some motorists who feel that in all cases bicyclists should be on the adjacent path.
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 drive-ways. 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 bi–cycle 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.

For the above reasons, other types of bikeways are likely to be better suited to accommodate bicycle traffic along highway corridors, depending upon traffic conditions. Shared use paths should not be considered a substitute for street improvements even when the path is located adjacent to the highway, because many bicyclists will find it less convenient to ride on these paths compared with the streets, particularly for utility trips."

Other examples include the use of median refuge islands and 'pork chop islands' as key tools towards allowing pedestrians (and cyclists) to safely cross arterial roadways. These are one of the most effective tools we have to ensure safe pedestrian crossings, yet linked chapters of BDE Manual are lacking supportive language and sometimes contradict guidance in Chapter 17. As an example, while Chapter 17 does mention the use of median islands, Chapter 36 says, "In general, the use of corner islands is discouraged," yet it does describe them as useful for pedestrians.

Some of the significant issues facing IDOT in their efforts to provide a system that could adequately serve a multi-modal traveling public are:

- Lack of sidewalks or sidewalk continuity on existing roadways
  - The department is lacking an existing mechanism to retrofit existing sidewalk gaps, other than utilizing supplemental funding sources such as ITEP or CMAQ
- Pedestrian (and bike) crossings of arterials
  - Median and corner islands
  - Reasonably-spaced crosswalks
  - Pedestrian pushbuttons (in the median also)
- Lack of on-street bike facilities
  - Lack of policy support and designer reluctance to providing on-street facilities, particularly on State roads
- Designing within the surrounding context of the roadway
  - Context sensitive design is a good start; the concepts need to apply to a broader range of projects
  - Ability to retrofit roadways with bicycle-friendly designs
- Exclusion of 3P and SMART projects from Complete Streets-type improvements
  - Language allows bicycle and pedestrians additions, but Plan outreach and input indicated that resurfacing projects are rarely considered for roadway reconfigurations to provide bikeway accommodations

Complete Streets Standards Compliance Table

In order to identify the most common tools used in the national bicycle facility design field, the team examined the 2009 MUTCD, the 2012 AASHTO Guide for the Development of Bicycle Facilities, the Urban Bikeway Design Guide, and the ITE Designing Walkable Urban Thoroughfares guide. The BDE Manual Chapter 17 and BLR Manual Chapter 42 were then reviewed to see where these documents included and didn't include the designs from the aforementioned guides. The intent of this review was to point out opportunities for expansion of these key Department design chapters.

Refer to **Appendix H -** Bicycle and Pedestrian Facility Design Treatments - National Guidelines & IDOT BDE/BLR Manuals.

Section 1- Existing Conditions

Chapter 6- Evaluation and Performance Measures

Chapter 6 – Evaluation and Performance Measures

The new federal transportation bill, Map-21, establishes goals and creates a national vision for the transportation system. States and regions will be encouraged to make goals and fund projects that support progress towards these goals. Among the goals, only safety will have a goal statement and performance measure directly related to bicycle and pedestrian planning, though it is likely that other goals will indirectly relate to bicycling and subsequently potential project funding.

Performance measures are an effective tool for evaluating the health and function of a transportation system and tracking overall progress towards implementation. To determine project priorities and whether bicycling improvements are meeting the needs of bicyclists, it is useful to set up a system of quantitative and qualitative performance measures. This in turn results in informed decision making and efficient investments in bicycle infrastructure and programs.

This Chapter reviews federal, peer state and selected city plans and policies for relevant performance measures.

Performance Measures in Illinois State Planning Documents

The Illinois State Transportation Plan 2012 includes development of performance measures under the following guiding policies: Develop a Sustainable Illinois Transportation System and Preserve and Manage the Existing Transportation System. While the former goal states that plans, programs and projects will be measured from a multi-modal perspective, the latter describes a more general, but holistic system of management and performance measures for bridges and structures, highways, traffic congestion, public transportation, airports, safety and intermodal connections.

An Action Plan is included within the larger plan document that provides additional details of how the Illinois Department of Transportation (IDOT) will develop performance measures to guide future project and policy implementation. An overview of relevant policy items is provided in the table below and specific goals and action items are analyzed in **Appendix H.**

Guiding Policy: Develop a Sustainable Illinois Transportation System
Policy Item #1: Improve Transportation Safety
Policy Item #2: Provide a Transportation System that Offers a High Degree of Multi-modal Connectivity, Mobility, and Accessibility
Policy Item #3: Integrate Human Capital into Department Planning, Programs, and Policies
Policy Item #4: Preserve and Manage the Existing Transportation System
Policy Item #5: Address Congestion and Maximize Efficiency and Effectiveness through Transportation Operations
Policy item #6: Follow a Comprehensive Transportation Planning Process
Policy Item #7: Promote Stable Funding for the Public Component of the Transportation System
Policy Item #8: Target Transportation Investments to Support Economic Development
Policy item #9: Ensure a Compatible Interface of the Transportation System with Environmental, Social, Energy, and Land Use Considerations

It should also be noted that IDOT has a 'zero roadway deaths' initiative. This initiative is described on the Department's website, and that safety is the number one priority.

Bicycle-related Performance Measures in Other State Plans

The project team researched practices in several other states to provide IDOT with an understanding of how performance measures are used elsewhere in regards to accommodating bicyclists. This section begins with a summary of lessons learned from reviewing the bike plans of North Carolina, Minnesota, Oregon and Wisconsin. A summary of performance measure application in each state completes this section. Wisconsin has bicycling goals and objectives with associated recommended actions, but does not have a bicycling benchmarking system. Therefore, it is excluded from this review.

Lessons learned from this review include:

- Performance measures are more effective when they are phased so that progress can be tracked over time rather than referencing a single action to be completed by a certain date in time (e.g., number of schools participating in SRTS programs rather than 30% of all schools in Illinois will participate in SRTS programs by 2020.)
- Performance measures are more effective when they are tied to planning goals and objectives. Each objective should have at least one related measure.
- Defining specific parameters for data sources, frequency of measure and party responsible for measuring may result in a system of metrics that is easier to track over time.
- Linking metrics to other modal plans, or an existing planning framework within federal or state plans can create a more efficient and effective measurement system.
- Integrating partner jurisdictions and MPOs into the process can result in better statewide data sources and foster a sense of cooperation.
- Publishing a periodic report card is encouraged to track progress and determine when strategy adjustments may be needed.

North Carolina

The draft 2013 *Walk Bike NC, Statewide Pedestrian and Bicycle Plan* found that existing benchmarks and performances measures in the State are limited and are not always tracked on a statewide basis. Policy direction recommends that NCDOT identify and track progress over time on the goals and objectives identified in the Plan.

The Plan includes an assessment of performance measures that fall into 5 performance categories: mobility, safety, health, economics and environment. Performance measures are chosen based on commonly available data, which ensures that identified metrics can be tracked over time and allows comparisons among other states. Finally, the Plan recommends development of an annual report card that tracks performance measures that can easily assessed using readily available data. The recommended priority bicycle performance measures for NC are listed in **Table 9. Appendix L** lists the comprehensive metrics toolkit and the recommended project-specific priority performance measures for North Carolina.

Table 9. Bicycle Priority Metrics Identified in Walk Bike NC.

Category	Metric	Category	Metric
Mobility	Bicycle commute mode share	Mobility	Compliance with Complete Streets policy
Mobility	Percentage of trips made by bicycling	Mobility	Percentage of eligible projects built as complete streets
Mobility	Jurisdictions with bicycle plans	Mobility	Customer bicycle counts
Mobility	Jurisdictions implementing bicycle plans	Mobility	Percent state-owned roadways with designated and / or separated bike facilities
Health	Physical inactivity rates/obesity rates	Health	Percent projects that are ADA compliant
Safety	Bicyclist crash and fatality rates per capita	Safety	Bicyclist crash and fatality rates relative to other states
Safety	Number of schools participating in bicycle safety events	Safety	Increase in bicycling in schools
Safety	Cities, businesses, and universities designed as Bicycle Friendly by LAB and the Highway Safety Research Center	Economics	Return-on-investment measure (small business development, tourism, home prices, individuals)
Environment	Reduction in transportation-related emissions due to increase in walking/bicycling trips	Accountability	Percentage of customers satisfied with pedestrian and bicycle transportation

Minnesota

The *2004 MnDOT Bicycle Modal Plan* includes a series of performance measures to "guide MnDOT's investment decision making process as it relates to bicycle accommodations." The measures and targets are built on the *Minnesota Statewide Transportation Plan* framework. Measure and targets are divided into the following categories and are listed in **Table 10.**

- Broad outcomes to which MnDOT contributes, such as increased user participation and reduced crash rates.
- MnDOT outputs, such as the percentage of projects that are completed and that include safe and effective accommodations, specific project types that are accomplished, and the participation of MnDOT districts and partners in accommodation projects.

- MnDOT process, such as planning, design, construction and maintenance manuals, State-aid rules and staff training, and the effective collection of data related to bicycle infrastructure.

Table 10. MnDOT Bicycle Modal Plan Measures and Targets

Category	Measure / Target
Broad outcomes to which MnDOT contributes	By 2010, bicycle commute rates in Minnesota communities of 5000 or greater population will increase an average of 4% from 2000 levels.
Broad outcomes to which MnDOT contributes	Fatal and A Injury bicycle crash rates in 2010 will be reduced from 2000 rates, contributing to the Toward Zero Deaths program and US DOT goals.
MnDOT output targets	One free-right turn traffic calming pilot project will be completed by 2006.
MnDOT output targets	By 2008, new construction and reconstruction projects in 20-year urban areas, and pavement preservation projects where possible, will include safe and effective bicycle accommodations on those project elements where bicycles are legal, barring exceptional circumstances.
MnDOT output targets	By 2008, all crossings of 20-year urban IRC improvement projects will include safe and effective bicycle accommodations, barring exceptional circumstances.
MnDOT output targets	By 2007, partners will be identified, MN Scenic Bikeway route concepts and partner contributions will be defined, and target values for miles of tour routes will be identified, approved, signed and mapped will be established.
MnDOT output targets	By 2008, each MnDOT district will participate in one or more special bicycle improvement projects per biennium.
MnDOT Process Targets	By 2006, all pertinent MnDOT design, planning, construction and maintenance manuals and State aid rules will include effective bike guidance.
MnDOT Process Targets	By 2006, a process for project reviews will be developed, evaluated, and institutionalized.
MnDOT Process Targets	By 2006, a pilot program for innovative treatments will be developed and launched.
MnDOT Process Targets	Beginning in 2006, 30% of MnDOT engineers, planners, and transportation specialists and consultants engaged in planning, design and contract management or cooperative agreements will have completed a one-day bike/pedestrian design training session each year.
MnDOT Process Targets	By 2011, comprehensive data will be up to date and managed on MnDOT infrastructure to do effective bicycle and pedestrian facility planning, and work will have been done with other partners to develop similar data for their on-road and trail bicycle and pedestrian systems and accommodations.

Oregon

The 1995 Oregon Bicycle and Pedestrian Plan tracks four performance measures that relate to the following plan implementation strategies:

- STRATEGY 1A. Integrate bicycle and pedestrian facility needs into all planning, design, construction and maintenance activities of the Department of Transportation and local units of government.
- STRATEGY 1B. Retrofit existing roadways with wide paved shoulders or bike lanes to accommodate bicyclists, and with sidewalks and safe crossings to accommodate pedestrians.

The following performance measures track progress towards implementation of Strategies 1A and 1B. Other implementation strategies lack associated performance measures.

1. Projects that meet criteria for accommodating pedestrians and bicyclists

Baseline: In fiscal year 1993-1994, 97% of projects met these requirements.

Goal: 100% compliance by 1995.

2. Bikeway and walkway projects that meet adopted criteria

Baseline: In fiscal year 1993-1994, about 80% of projects met adopted criteria.

Goal: 100% by 1995.

3. Miles of rural State highways suitable for bicycling

Baseline: 89% in 1994

Goal: Add appropriate shoulders to highways as they are constructed or reconstructed.

4. Miles of urban State highways that accommodate pedestrians and bicyclists

Baseline: In 1994, 32% of urban highways had bike lanes or shoulders, 30% had sidewalks on both sides of the road.

Goal: By 2005, provide needed bike lanes and sidewalks on 80% of urban highways. By 2015, provide needed bike lanes and sidewalks on 100% of urban highways.

Performance Measures in City Plans

A survey of the bike plans for the most populous cities in Illinois revealed the following performance measures in **Table 11.** Only Chicago and Springfield explicitly called out performance measures in their plans, though Aurora had goal statements associated with plan implementation actions that were similar to performance measures. Though most performance measures identified in the Chicago and Springfield plans can be tracked over time, several strategies measured success as a single action or accomplishment (e.g., application of new trail standards or printing x copies of a bike map). In such cases it may make more sense to reword or rephrase success as a progress along a continuum (e.g., apply and update new trail standards every x years measured as the number of successful standards updates since the previous planning effort).

Table 11. Review of Performance Measures in Selected City Plans

City	Bike Plan	Performance Measures/Format	Notable Performance Measures
Chicago	Yes	Objectives with associated strategies and performance measures. Best practice references and potential funding sources are provided.	• Miles of bike facilities installed (bike lanes, bike boulevards, shared roadways, colored bike lanes, trails and shared bike / bus lanes) • New routes signed • Relevant plans updated regularly • Trail standards updated • Test innovative treatments and determine their feasibility • Number of new connections to educational institutions, transit stations, neighboring municipalities and other priority destinations • Data collected to evaluate plan impact • Upgrade on street bike network on a regular basis • Metal grate bridges retrofitted
Aurora	Yes	No	n/a
Rockford	Unable to Find	n/a	n/a
Joliet	No	n/a	n/a
Naperville	Yes	None	n/a
Springfield (SATS Plan)	Yes	Goals with associated objectives and performance measures	• % buses with bike racks • % buses within ¼ mile of bikeway • Miles of bikeway • Number of bike parking facilities • Number of people participating in bike to work week • Number of times existing programs used to promote bicycling safety • Number SRTS Plans created / completed • Number of intersections with bike detection • Number of brochures distributed
Peoria	No	n/a	n/a

Section 1- Existing Conditions
Chapter 7- Education, Encouragement and Enforcement Programs in Illinois

Chapter 7 - Education, Encouragement and Enforcement

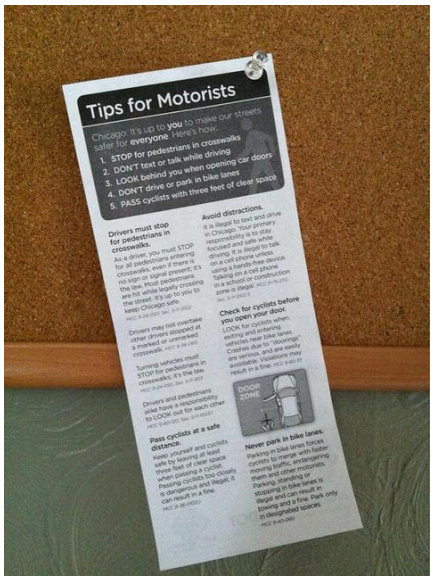
Education, encouragement and enforcement are key components to creating a safe environment for people riding bikes. Educating all users of the roadway about how the rules of the road apply to bicycling, walking, and driving will reduce conflicts and create a safer transportation environment. IDOT and the State have implemented several programs in recent years aimed at educating and encouraging people to ride bicycles. This section discusses existing State programs and provides examples from other states.

Illinois Programs

IDOT produces bicycle-suitability maps and has developed and is currently implementing a Share the Road PSA campaign, has published several educational brochures on safe bicycling behaviors aimed at different age and population groups[1], has implemented a statewide Safe Routes to School curriculum, manages Safe Routes to School grants, and offers "Share the Road" driver training for State employees.

In addition, Illinois includes information on the rights and responsibilities of motorists and cyclists in the drivers manual, includes questions on motorists' rights and responsibilities towards cyclists in the State driver's license and commercial driver's license tests, and provides specific bicycle safety and enforcement training to police officers.

IDOT has offered internal training on Complete Streets and Context Sensitive Solutions in recent years, although no trainings on these topics are currently offered. In 2009, IDOT conducted Context Sensitive Solutions technical workshops in Springfield and Chicago to address CSS implementation and the incorporation of National Environmental Protection Act (NEPA) Principles. More recently in 2013, IDOT partnered with the Congress for the New Urbanism (CNU) and hosted a workshop for district engineers centered around the concepts presented in the CNU and Institute of Transportation Engineers guidebook: *Designing Walkable Urban Thoroughfares.*[2]



CDOT Tips for Motorists Safety Campaign

As indicated in the State Highway Safety Plan 2011 Progress Report and Department interviews, the majority of IDOT Highway Safety funds aimed at addressing bicycling safety go to the Chicago region, because this area has a disproportionately high incidence of bicycle and pedestrian crashes compared with the rest of the State.

Funds from the sale of State Share the Road license plates support the League of Illinois Bicyclists (LIB), the statewide bicycle advocacy group. LIB publishes and distributes several education and encouragement resources. Recently, LIB unveiled their Illinois-specific online Bicycle Safety Quiz (www.bikesafetyquiz.com), which targets bicyclists of all ages and

[1] http://www.buckleupillinois.org/pieshopping/htdocs/managecart.aspx#Pedestrian_Bicycle_Safety

[2] http://www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=RP-036A-E

motorists alike to educate them on proper behavior when bicycling or encountering a bicyclist on the road. This quiz is an in-depth, savvy tool training participants on proper roadway operations. It offers awards, certificates, and group tracking that allows schools, driver education programs, and other groups to track results internally, which can be used for incentivizing, and allows LIB to track results statewide. IDOT currently plans on incorporating this tool into their website and encouragement efforts.[3]

In addition, there are several local programs and advocacy groups that run targeted outreach programs, especially in the Chicago region. One notable example, recently implemented by Chicago DOT, is the mailing of 1.55 million flyers to City drivers on safe roadway behavior. The flyers were included in City (parking) sticker mailings and cost about $9,000 in printing and postage fees.[4]

Discussion:

- Many of the resources the State has produced in the past have not been updated in several years or are out-of-print. For example, the IDOT Department of Public Information and Educational Materials no longer prints its *Kid's on Bikes* Brochures. Also, State bicycling maps are missing relevant information for bicyclists such as bicycle facilities and trails, and the BLOS roadway rating system is often criticized as not being accurate in urban areas (specific bicycle map recommendations are presented in the *Innovative Use of Technology* Memo).
- The IDOT bicycling website is the face of the IDOT bicycling program for many visitors and residents. Currently, navigating the website requires sifting through multiple layers of information before accessing any of the literature on bicycling. Creating a more user-friendly site will help more people access information on bicycling in Illinois.
- District staff reported that past IDOT training on Context Sensitive Solutions and Complete Streets Principles has been helpful, and suggested additional workshops in the future. Online resources, such as videos, webinars, or internal blogs/forums, could be helpful.
- Currently, IDOT's Division of Traffic Safety provides the majority of funding for bicycle programs, and this funding is largely concentrated in the Chicago region since the majority of bicycle/motor-vehicle crashes occur in this region. While this approach is logical from a cost-benefit perspective, it risks neglecting other areas of the State where encouragement, educational and enforcement programs may be needed as well. Identifying new funding sources for vulnerable user programs is a potential solution for addressing this issue.

[3] http://www.bikelib.org/safety-education/online-bike-safety-quizzes/

[4] http://chi.streetsblog.org/2013/06/11/cdot-ups-the-outreach-to-11-with-mailing-to-1-5-million-drivers/

Examples from Other States

Intra-departmental Workshops and Webinars

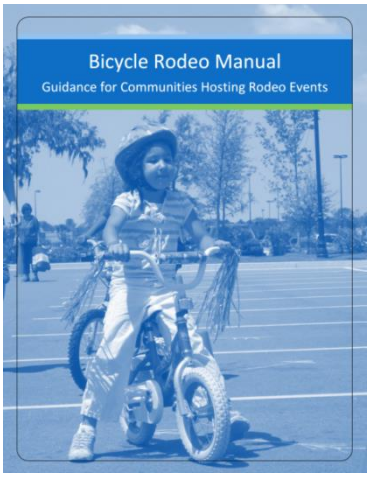
Just like other modes of transportation, pedestrian and bicycle best practices are constantly evolving. North Carolina State University provides training specifically for employees of NCDOT. The two training programs currently available are: Fundamental Engineering Principles (FEP) and Highway Engineering Concepts (HEC). In the past, NCDOT contracted with the Institute for Transportation Research and Education at North Carolina State University to provide up to seven day-long workshops on topics including bicycle facility design, liability in design, traffic calming, planning and design for pedestrians, and designing pedestrian facilities for accessibility (compliance with American with Disabilities Act). When offered, over 100 NCDOT staff members participated. Through a contract with the Highway Safety Research Center, these workshops will be held as part of the Complete Streets training program.

Safe Streets Save Lives Campaign

The PCC Safe Streets Save Lives Campaign is a public outreach campaign developed and run by the Palmetto Cycling Coalition, the South Carolina State bicycling advocacy group. The program is aimed at conducting public awareness through public service announcements and outreach through traditional educational opportunities.[5]

Bicycle Rodeo Kit

Bicycle rodeos are a hands-on educational tool for training youth in on-bike skills and safety through a fun and interactive event. As an example, Palmetto Cycling Coalition (PCC) has created a Bicycle Rodeo Kit that South Carolina communities can use as a resource.[6]



A Community Guide to Pedestrian and Bicycle Events

Local bicycling events are an important component of creating or supporting a pedestrian and bicycle friendly environment. For example, NCDOT provides an example of such a guide (for bicycling events) on their pedestrian and bicycling safety and education page.

Resource: http://www.ncdot.gov/bikeped/safetyeducation/manuals/

Moving Forward

Illinois is poised to become one of the most bicycle friendly states in the country. IDOT's Long Range Transportation Plan recognizes that cycling can play an important role in ensuring safe, convenient

[5] http://www.pccsc.net/education.php

[6] http://www.pccsc.net/pdfs/Bicycle%20Rodeo%20Manual.pdf

transportation options for residents and visitors. Policy changes prompted by recent federal transportation bills and Illinois' Complete Streets law have created more opportunities for routine accommodation of cycling in road projects. IDOT-administered programs such as ITEP, CMAQ, and SRTS have helped fund those efforts as well as stand-alone projects.

Learning from peer states and IDOT staff responsible for implementing local policies provides insight into what's working and helps identify areas for improvement and clarification. This information, in conjunction with outreach efforts has informed the Illinois State Bicycle Plan's goals and recommendations.

Section 1- Existing Conditions
Chapter 8- Innovative Technology

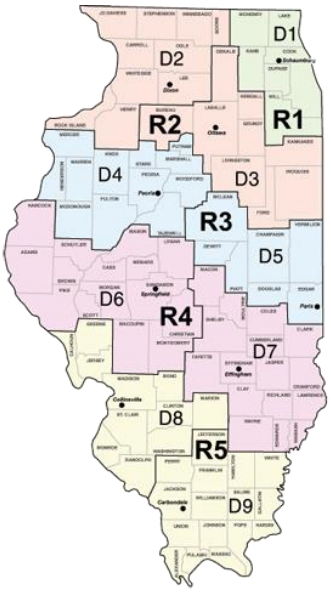
Chapter 8- Innovative Technology

This Chapter explores best practices involving innovative technological tools that could help improve monitoring and evaluation practices in Illinois, while simultaneously engaging bicyclists and encouraging greater levels of bicycling. The Chapter also explores current data practices throughout the United States (for example: crowdsourcing point data and crowdsourcing trip data) and current practices in Illinois.

A 2011 survey of Utah municipalities by Alta Planning + Design found that improved tracking of maintenance and construction activities, along with online updates to bicycle data, were among the most important data needs for bicyclists in the state.

There is a potential synergy between the needs of governments and bicyclists in the shared desire for more and better information. Yet feedback loops between network planners and network users are often incomplete. In some cases, governments lack the knowledge or resources to convey information on bike infrastructure to users (e.g. locations of bike parking, traffic volumes and roadway condition). Bicyclists, in turn, are generally unable to communicate maintenance needs or network suggestions to network planners (or to fellow users).

Bike counts are conducted to obtain useful ridership data and are essential for establishing information feedback. Bike count data is collected for the purposes of measuring changes in ridership, assessing current and future demand, evaluating route choices, calculating mode shares, and estimating the utility of specific bikeway facilities and improvements. The fact that most bicycle trips are not counted in any way is one facet of an incomplete feedback loop between bicycle network designers and users.

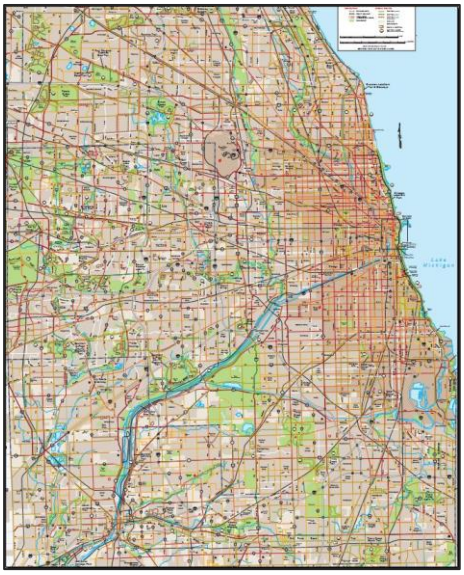


The Illinois Department of Transportation provides free PDF maps for each county in the state.

By harnessing available technologies, such as mobile apps, and other new and emerging tools, IDOT and other agencies in Illinois can tap into the knowledge base of the bicycling population, and provide resources that promote bicycling in Illinois. These tools have the potential to reduce data acquisition costs and increase data reliability thereby saving time and resources in efforts to improve monitoring, evaluation and encouragement processes. As discussed in Chapter 1 (Outreach) and Chapter 6 (Education) of Section I, these technologies can also be employed to disseminate bicycle education and safety information. This two-way sharing of information establishes a more meaningful engagement with people who bicycle and improves the relationships between government and citizens.

Bikeway Data Provision

Many U.S. municipalities, in addition to an increasing number of county and state governments, maintain digital files (spatial data) of their bikeway network. This spatial data is stored in a Geographic Information System (GIS), in file formats such as Shapefiles and Geodatabases. The data is usually maintained by the agency's GIS or Information Technology (IT) department, although in certain cases it may fall under the auspices of Community Development, Planning or Transportation. In some cases, these files are freely shared with the public in its raw format—as downloadable KML (Google Earth) files, for instance.



Illinois Practice: The IDOT District 1 Bike Map is best printed on oversized paper, given its scale and route density.

Bikeway network GIS layers are typically line files. A wide variety of supporting information can be attached to this linework in the form of searchable and sortable database *attributes*. The most common attributes tracked by U.S. municipalities are: facility name, facility type, status (existing or proposed), width, surface, jurisdictional responsibility and average daily traffic (ADT). However, any data can be tracked as an attribute in a spatial database, as long as the information can be associated with a bike network segment.

Chicago Metropolitan Agency for Planning's (CMAP) Bicycle Inventory System (BIS)

This geodatabase has been successfully used in the Chicago area for more than ten years[1]. Local agencies maintain their own plans, then contribute these plans to CMAP's regional geographic database[2]. The system allows analysts to see each contributing agency's bikeway plans. By design, the BIS contains areas of duplicated or overlapping line-work. This is a result of: 1) the decision to include all available datasets, and 2) the fact that jurisdictions may overlap or be nested within other jurisdictions. This is preferable since the purpose of this database is to maintain a record of all existing proposals throughout the Chicago region. Moreover, this duplicate/overlapping data allows jurisdictions to identify discrepancies between local agency plans for a given facility.

IDOT-produced Illinois Bicycle Maps rely on Bicycle Level of Service (BLOS) data from The Illinois Roadway Information System (IRIS). IRIS is the IDOT repository for data collected on roadways in the state. IRIS data is kept in a GIS geodatabase and includes information on most Illinois roadways.

[1] http://data.cmap.illinois.gov/opendata/uploads/CKAN/NONCENSUS/TRANSPORTATION/BISManualRevised_200

[2] Abbotts, R and O'Neal, J. Bikeway Inventory System – Final Report. 2008. http://data.cmap.illinois.gov/opendata/uploads/CKAN/NONCENSUS/TRANSPORTATION/BISManualRevised_2008.pdf

BLOS is a mathematical model that calculates the levels of comfort and convenience for bicycle routes based on collected Illinois roadway data. The Illinois BLOS model takes into account roadway ADT, Truck ADT, number of travel lanes, roadway speed, pavement condition, lane width and paved shoulder width. The Illinois model was developed in 1994 by IDOT before other formulas for BLOS existed and is primarily suited for determining the bicycling suitability of rural roadways. Currently, information on multi-use paths adjacent to roadways and whether a roadway has bicycle accommodations (such as marked bike lanes) is not included in IRIS and these factors are not incorporated in BLOS calculations[3] . The inclusion of this data would be useful in future mapping efforts and project evaluation. This is covered in greater detail throughout other Chapters in Section I-Existing Conditions, for instance: Chapters 4 and 5 .

Bicycle Maps

Bike network data is the basis for several products and services, including maps and online route planners. It is common practice for municipalities to publish bike network maps, either as foldable paper booklets or as printable PDFs. These maps are usually provided free-of-charge, and often include major destinations, topographical information and connections to other transportation modes. For tourists and other non-locals, a hard-copy map is a light-weight and simple way to access bike information "offline."

IDOT-produced bicycle maps show off-roadway bicycle trails and rank roadways on a 6-tier scale from "Not Recommended for Bicycling" to "Most Suitable for Bicycling." This ranking is based on BLOS calculations, described this Chapter. As noted, the IDOT BLOS formula is more appropriate for bicycle suitability on rural roadways and currently does not take the presence of bicycle facilities into account. For this reason, most roadways in urbanized areas of the State are ranked as either "Caution Advised" or "Not Recommended for Bicycling." Alternative BLOS models, such as the BLOS model included in the 2010 Highway Capacity Manual (HCM2010), may be more appropriate for urbanized areas in Illinois. Although , IDOT does not currently collect this data, Including information on existing on-street bicycle facilities or multi-use paths parallel to the roadway would improve the usefulness of these maps in urbanized areas as well.

> *A key issue for both governments and individuals is the need for coordinated, consistent statewide planning and mapping efforts, combined with precise, up-to-date information at the municipal or even neighborhood level.*

Chicagoland Bike Map: Produced by the Active Transportation Alliance in the Chicago region, the map is currently in its fifth edition. The roadway ranking for this map is done by a combination of volunteer observations and available roadway data that includes traffic volume, traffic speed, lane width and bicycle facility/shoulder width. These maps also include points of interest specific to bicyclists such as Chicagoland bicycle shops and bicycle trails. Anecdotally, this map is often

[3] Barsotti E. and Kilgore, G. The Road Network is the Bicycle Network: Bicycle Suitability Measures for Roadways and Sidepaths. 2001. http://www.bikelib.org/wp-content/uploads/2009/09/TransChi2001.pdf

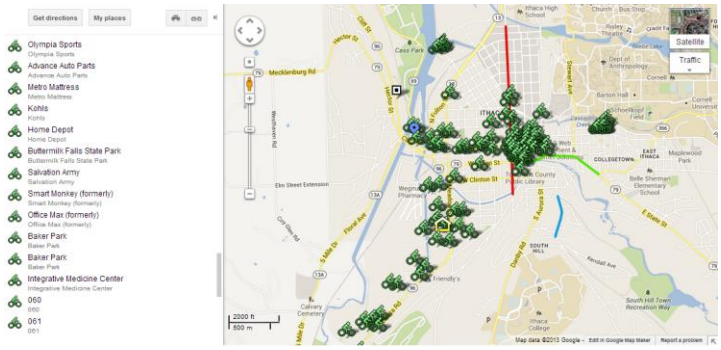
considered the best bicycling map of the Chicagoland region in terms of accuracy of roadway conditions and wayfinding value.

Chicago Bike Guide and City Maps 2 Go: These mobile applications provide offline navigation of static map data such as the location of bike facilities, bike shops, bike share stations and other points of interest[4]. The advantage of these offline apps is that users can utilize map data on their mobile devices without being connected to a data source. While these maps do not provide the navigation or bicycle facility ranking/suitability features of online bicycle mapping mobile apps, they may be attractive to bicyclists who want to limit cell phone data use or are bicycling in rural areas where cell phone data coverage may be limited. These types of downloadable mapping apps could be effective for use on a statewide scale for example, IDOT's county bike maps.

The production of statewide bicycle maps provides several benefits. One advantage of statewide maps is that data is represented consistently across the entire state. This means, for example, that facility types are classified in the same way across county and municipal lines, lessening confusion for bicyclists traveling long distances.

Another benefit of statewide maps is that they cover rural areas, which are typically less likely than large cities to produce and distribute bicycle maps. Bike maps are an important element of statewide tourism efforts, especially the accommodation of long-distance touring cyclists. Long-distance touring cyclists often rely on state maps to traverse rural areas of the state.

The principal drawback of statewide bike maps is the level of scale and detail that can be offered. Large bike networks cannot be adequately represented on a single bike network map. Moreover, PDFs of large bike network can be unwieldy; maps larger than 10Mb are difficult to download and view. As a result, it is common practice for states to offer maps at smaller geographic scales, such as counties or municipalities. IDOT distributes paper State bicycle maps by IDOT District boundaries and maps by county are available for download online.



Bike Ithaca, an Ithaca, NY Bicycle Advocacy Group, provides a map of all Parking in the City of Ithaca in a Google Maps online format and includes pictures of facilities.

Bicycle Parking Maps

Bicycle parking (along with the bike network itself) is a vital component of a city's bicycle infrastructure. The locations of bike parking—like motor vehicle parking—can be stored in a Geographic Information System as point values that can be plotted on a map or shared through public download (e.g. Google Earth). Much like the linework of bike network data, this point data can

[4] http://www.offlinebikemap.com and https://itunes.apple.com/us/app/city-maps-2go-offline-map/id327783342?mt=8

hold a number of useful attributes, including street address, type of parking facility and number of parking spaces. In reality, however, many municipalities have a limited understanding of their own bicycle parking supply. In some circumstances, shared jurisdictional responsibilities for bike parking—between municipalities, counties, transit agencies and states—mean that the bike parking supply is difficult to quantify and geo-code without significant inter-agency collaboration. In other cases, an overwhelming number of bike parking locations makes effective visualization a challenge. Chicago and Minneapolis, for instance, have among the highest numbers of bike parking spaces in the country—with over 30,000 and 16,000 individual spaces, respectively5. Such quantities of bike parking are difficult to visualize on a single map using point values; further, the data is of limited use to a bicyclist who is only interested in finding a single, available bike parking space.

One way to circumvent these challenges is to intentionally omit individual curbside racks, focusing instead on large-scale facilities such as bike stations, transit hubs and parking garages. San Francisco took this approach on its latest Bike Map, using an inset map of Downtown to identify sheltered, secure bike parking facilities, delineating between: Garages with Bicycle Parking, Bike Lockers, Bicycle Parking (Racks and/or Lockers) and Bike Stations.

This type of approach helps bicyclists to identify secure parking locations and assists planners in assessing the spatial distribution of bike parking across a city—identifying coverage gaps and bike parking "hot spots." However, static GIS datasets do not describe the actual *availability* of parking at a given location. There is thus great potential for technological solutions that not only identify the location and type of bike parking, but track the supply of available spaces in real-time. This data can then be integrated into online route planning tools in order to provide door-to-door directions that incorporate both route preferences and available bike parking supply.

IDOT could potentially support the provision of municipal bicycle parking inventories by setting up a central database, either through Google Maps or as an online, editable geodatabase that could serve as a statewide repository for bicycle parking data. This data could be provided to the public and roadway planners in the form of an online, interactive map.

Online Route Planners

Online route planners are another application of bike network GIS data. Route planners analyze a traveler's origin and destination and recommend the shortest path along the bike network. Many other factors can be considered, at the user's discretion, to customize the results. For instance, the Metro Vancouver Bicycling Route Planner allows users to restrict maximum uphill slope, target the route with the least air pollution, or find the path with the most vegetation. In order to further individualize the results, the user can also input their expected speed and specify their willingness to use links that are not part of the designated bicycling network, such as major roads.

[5] Pucher, Buehler and Seinen. 2011. Bicycling Renaissnace in North America? Transportation Research Part A, 45. http://policy.rutgers.edu/faculty/pucher/TRA960_01April2011.pdf

Ride the City Chicago: This is a route planner (available online or on mobile devices for a modest fee) with similar options in terms of route preference[6]. A user can specify three levels of confidence and experience, choosing a "safe route," "safer route" or, for the user who feels comfortable riding on any roadway, the most direct route. Ride the City Chicago also includes innovative map layers that are of great value to users. These layers include the bike network itself, plus point locations for bike shops and bike rental locations. Ride the City Chicago has the capability to display bike share stations on the map, although no stations are plotted currently. A sister site, Ride the City New York, already includes this functionality, displaying the number of available bikes and number of empty docks for all bike stations in Manhattan and Brooklyn[7].

Cyclopath: Similar to Ride the City, the browser-based and mobile app for the Twin Cities region relies on open-source data and local input[8]. Local bicyclists can provide local destinations, feedback on how bike-friendly they believe certain roadways to be and share their personal, preferred routes for bicycling in the region. This feedback is reviewed and roadway ratings that play into the route calculator function are adjusted accordingly. Users can use the route finder to find routes that either minimize distance or favor bikeability.

Online route planners may also be accessed from mobile devices, although tailoring route planning software to smart phones is a relatively new practice. Most mobile apps (including Ride the City Chicago) are third-party products that borrow spatial data developed by the city or county. Some municipalities, however, are providing official mobile apps. The City of Calgary developed a free iPhone/iPad App, The City of Calgary Pathways & Bikeways Map, that includes up-to-date information on the bike network, including closures, detours and weather[9].

Although less sophisticated in terms of customization than the Metro Vancouver or Ride the City Chicago, Google Maps now provides bicycle directions for all North American cities and is available on both web browsers and mobile devices. For GPS-equipped devices, such as smart phones and tablets, the app will automatically detect the user's location (i.e. origin) and provide turn-by-turn or mapped directions to the desired destination.

The underlying architecture of Google's product is its database of bikeway GIS layers that have been provided by cities and other governments over the years. By offering bicycle route planning (in addition to driving, transit and walking), Google has ensured that a minimum level of information is available to anyone with Internet access, regardless of whether their city has developed customized bicycle route planning tools. Further, Google's continent-wide bicycle network layer—like its road network layer—crosses jurisdictional boundaries and simplifies the often-complex bike network hierarchies used by cities. As a result, bicycle trip planning through Google Maps is seamless at any scale—a marked improvement over many online route planners that cover only a single metropolitan area.

[6] http://www.ridethecity.com/chicago
[7] http://www.ridethecity.com/nyc
[8] (http://www.ridethecity.com/nyc
[9] http://www.calgary.ca/CSPS/Parks/Pages/Pathways/Calgary-pathways-and-bikeways-map.aspx

The Iowa Interactive Bike Map: The state of Iowa uses Google Maps as their primary platform for providing online bikeways and route information to bicyclists[10]. The map was launched as a multi-year effort by Iowa DOT to inventory all bikeways in the state, develop a comprehensive bicycle facility geodatabase and provide this information in an easily accessible platform to the public. The map supplements Google Maps data with information on on- and off-road bicycle facilities, trailheads, restrooms and bike shops. Iowa DOT utilized Google Map Maker to input the data into Google's map database and is now a member of the Base Map Partner Program, which allows the DOT to update maps quickly and import large amounts of map data to Google's servers at once[11]. As data is updated, jurisdictions re-submit data to the DOT and the geodatabase and Google maps data are concurrently updated. The online map serves as an interim update to the statewide printed map, which is updated every three years. This geodatabase is also utilized by Iowa DOT district offices in their roadway planning efforts.

Online route planners and paper maps depend on quality, up-to-date data. Paper maps are often released on an annual basis, reflecting the ever-changing extent of bike networks that are growing quickly in most parts of the country. Online route planners are updated on similar timetables. Without regular updates, GIS data used to generate these resources will quickly become obsolete. It is crucial for governments to have processes in place to regularly update datasets in accordance with maintenance and construction activities. This process is typically more challenging for smaller municipalities, which often lack technical or financial resources. For all jurisdictions, however, maintaining current bikeway network data is an ongoing challenge that can only be partly solved through the implementation of regular update processes.

Currently, real-time information on changing traffic conditions, roadway maintenance and weather information along state roadways is made available, but is primarily targeted towards motorists. There is thus a need for services that provide information on bikeway maintenance and conditions to bicyclists in real-time. As the next section suggests, there is great potential in technologies that facilitate data feedback loops: from governments to users, users to governments, and users to other users.

Trip tracking with GPS allows planners to visualize bike traffic across the entire network, like this example from the City of Winnipeg.

Crowdsourcing Trip Data

By establishing feedback loops with network users, governments can harness the knowledge of local residents on a day-to-day (or even minute-to-minute) basis, providing updates on traffic conditions, road closures, parking availability, and a host of other topics that cannot be readily stored in a GIS dataset. This concept is known as *crowdsourcing,* and it thrives in

[10] http://www.iowadot.gov/iowabikes/bikemap/home.html
[11] Information on how to sign up for the Base Map Partner Program can be found at http://maps.google.com/help/maps/mapcontent/basemap/index.html

circumstances where real-time information is required, yet cannot be reasonably provided by an individual or agency monitoring the situation.

One way that crowdsourcing can be valuable to local governments and other agencies is in tracking trips. Whereas manual bicycle counts and travel surveys were once the only tools available to measure volumes of bike traffic at a given location, new technologies are now pointing the way toward higher-quality, richer data. Several technologies have emerged, including station-based tracking (lightweight electronic tags combined with roadside transponders) and a variety of potential applications based on Global Positioning Systems (GPS).

By harnessing these technologies, information can be relayed accurately and instantaneously to network planners. This information can then be disseminated back to network users—completing the feedback loop—and integrated into robust analyses of bicycling conditions (e.g. gap analysis).

Station-Based Tracking

Dero ZAP Program: One good example of trip tracking technology is found in the Minneapolis Metro Area. Launched in January 2012 with the motto of "more bike trips more often," the University of Minnesota's Gopher ZAP program has helped to incentivize bicycling for UM students and staff[12]. Gopher ZAP is a rewards-based program that offers points in return for bike trips to campus. Points can be redeemed for a growing number of products and services, the most popular of which include discounts on university health insurance, bike accessories (such as lights and fenders) and discounts at nearby retailers and restaurants.

Gopher ZAP employs electronic chip technology, similar to that used for running and bicycling races. The system relies upon ZAP reader stations, strategically placed to capture trips along popular bikeways around the city. The location of the ZAP readers is widely advertised so that commuters can plan trips accordingly. The ZAP readers require only a small, tamper-proof RFID tag—attached to the participant's bicycle—to register and electronically record a bike trip. After a trip has been logged, the bicyclist can login to the Gopher ZAP web site to view statistics and track points and rewards.

The Gopher ZAP system was initiated by the University of Minnesota with Congestion Mitigation/Air Quality funding. The program was so successful that, in late 2012, the program was expanded from the UM campus across the region and re-branded ZAP Twin Cities. 20 new ZAP readers were installed—half in downtown St. Paul, and half in downtown Minneapolis.

There is great value in ZAP for governments, businesses, universities and other employers as a bicycling encouragement tool within the context of Transportation Demand Management (TDM) programs. Universities, in particular, are increasingly seeking to implement TDM in an effort to reduce parking costs, alleviate congestion, improve student health outcomes and serve intra-campus

[12] https://www.derozap.com/zaptwincities/

transportation needs. ZAP offers a way for institutions to promote these goals. It also provides a way for institutions to engage with students, employees and citizens.

For bicyclists, ZAP offers benefits in the form of incentives, but also in providing fun. Like other fitness-oriented apps like Fitocracy and Strava, ZAP taps into healthy competitive impulses, with its scanners serving as goal posts and its expansive points system keeping score[13]. Individual bicyclists also receive the many benefits of increased bicycling, from transportation cost savings and to both physical and mental health benefits[14].

The major drawback of the ZAP system is that ZAP readers are finite in number—38 stations total across UM, downtown St. Paul and downtown Minneapolis. Unlike traditional screenline counts, ZAP readers can only record bicyclists who pass by a station and who have pre-registered for the program. As a result, the data generated by ZAP is less indicative of actual routes than GPS-based programs such as Winnipeg's OttoCycle and CycleTracks, discussed later in this Chapter. For a theoretical bicycle trip, the ZAP system can track which ZAP readers were passed by the bicyclist and clock the time and distance between readings. It cannot, however, identify origins and destinations, analyze routes taken between or beyond ZAP reader locations, or provide statistically significant data on bicyclist volumes or trip distances.

A similar program on a much smaller scale exists at Urbana Middle School in Champaign/Urbana, Illinois. This program runs on the Boltage platform and rewards children for walking or bicycling to school[15].

One tool that has proven successful both nationally and internationally combines bicycle screenline count methods with electronic recording: automated bike counters. Communities are beginning to

Lions Gate Bridge, Vancouver, BC

Hawthorne Bridge, Portland, OR

[13] https://www.fitocracy.com/ and http://www.strava.com/

[14] Pucher and Buehler, 2012. City Cycling. MIT Press, Cambridge, MA.

[15] http://www.boltage.org/index.html

install permanent electronic bicycle counters, the most basic of which consist of a small sensor cable draped across the bikeway. Some of the more sophisticated and expensive counters not only track bicyclist volumes, but display this information back to cyclists in real-time. One of the best examples of this type of automated counter is on the Hawthorne Bridge in Portland, OR. The Hawthorne Bridge counter features a large digital readout of "cyclists today," and also includes a vertical chart of total bicyclists counted. Providing real-time feedback to cyclists that their trip is being counted is a positive message that helps encourage further bicycling.

Bike counters: Bike counter devices do not necessarily have to be sophisticated or expensive. For example, a new company called WayCount recently introduced a product to the market that allows users – city planners, engineers, researchers, students, property/business owners, advocates and communities - to crowdsource automobile and bicycle count data. After the data is collected, the user submits the data to a central database and it is shared over the web. Perhaps the most attractive characteristics of emerging open source products like WayCount are their simplicity and cost. At around $200/unit, they are very affordable and therefore more accessible to a broader market and range of applications. An additional benefit of crowdsourced platform is that the data is also "processed" and made available for public consumption as soon as it is uploaded.

For system planners, the benefit of automated bike counters is that every bicyclist crossing the counting mechanism (often on a bridge or off-street path) will be counted. The results will be statistically significant, and can be compared year-over-year to observe growth in bicyclist volumes. (Although ZAP data can provide the same, the results are distorted by the constantly-changing size of program participants.) Data from single-reader stations is simple to analyze and visualize on a map, and provides a useful input into bicycle network analysis (e.g. Bicycle ADT).

GPS-based Tracking

Global Positioning System (GPS) technology harnesses satellite power to geo-locate points on the earth's surface. The advantage of GPS is that it can accurately locate a device in a specific location (generating a point file) or track a device continuously as it travels (generating a line file). These simple capabilities have powerful implications for data gathering.

One early example of trip tracking using GPS transponders comes from Winnipeg, Manitoba. In 2009, the City initiated a program called OttoCycle whereby 712 volunteers were equipped with GPS-linked bicycle tracking devices for six months[16]. Although the OttoCycle study was temporary, it yielded rich results, including bike volumes along all roadways and paths; data on speed, distance and time of day; and information on origins and destinations.

In recent years, GPS has become ubiquitous as a feature on mobile devices, such as smart phones and tablets. This development has changed the landscape of transportation data, offering a way to gather transportation data from potentially large samples of the population.

A number of smart phone apps today use GPS functionality. Google Maps, for instance, automatically geo-locates the device when the app is started up as a means to provide accurate directions and

[16] http://www.code-med.com/Jolene/PDF/Mediakit09.pdf

customize content to the user's immediate vicinity. Under typical use, this type of software does not involve tracking or recording of movement, although these devices have the capability to do so. Any data-gathering program involving GPS has obvious privacy concerns and the need for full permissions from participants.

Specialized apps are already emerging which use GPS to provide transportation data. Two examples of these apps are TrailBlaze Chicago and CycleTracks[17].The purpose of these apps is to communicate bicycling network use and needs to system planners. These apps track the movement of users using GPS or WiFi and anonymously report the path of your travel route, which is effectively GIS line data. TrailBlaze also includes some features, such as speed and distance tracking.

Although the premise of using these apps to guide bicycle network improvements may be somewhat flawed—suggesting a new path by riding along a non-existent or unsafe facility is a difficult task for most cyclists—it could help system planners identify network links that are *de facto* parts of the bicycle network, yet are not shown on maps or identified in plans.

The real potential for these types of applications is in its underlying technology, which could track movement just as Winnipeg's OttoCycle study did, yet for a fraction of the cost and the potential for involving a large sample of the bicycling population. However, one of the drawbacks to using smartphone-based apps for data collection is that only the portion of the population who chooses to use smartphones or can afford them are represented. Extra steps must be taken in utilizing such apps for data collection in order to include underrepresented populations.

Crowdsourcing Point Data

Bike network status updates are a prime candidate for the use of crowdsourcing technologies. As mentioned in the previous section, crowdsourcing technologies have tremendous potential to improve the way jurisdictions collect and share real-time information about bicycling conditions, service needs, crash data, and bike parking.

Service Requests

Open311: One of the most advanced applications of crowdsourcing technology has emerged in Chicago, with the Open311 program. Open311 was developed in partnership with the City of Chicago to harness the information-sharing

Table 1: Chicago's Open311 Service Request Options

Open311 Service Request	Departmental Responsibility
Traffic Signal Out	Division of Electrical Operations, CDOT
Street Light Out	Division of Electrical Operations, CDOT
Pothole in Street	Division of In-House Construction, CDOT
Tree Debris	Bureau of Forestry
Abandoned Vehicle	Bureau of Traffic Services
Graffiti Removal	Bureau of Street Operations
Rodent Baiting/Rat Complaint	Bureau of Rodent Control

[17] https://play.google.com/store/apps/details?id=edu.nortl
http://www.sfcta.org/modeling-and-travel-forecasting/cycletr

power of the City's roughly three million residents. Open311 allows road users to flag problems in the transportation network, generating service requests that are passed instantly to the City. Requests are categorized by theme, allowing for issues to be forwarded to the appropriate department[18].

Using a mobile device (e.g. smart phone, tablet or laptop), Open311 users can provide a text description of the problem and a photograph (if desired), all tied to a single GPS location. After the request has been submitted and assigned to the appropriate department, users can track progress of their request through the Open311 Service Tracker Chicago web site. An e-mail notification option means that users can be alerted instantly when the problem has been fixed, completing the feedback loop. The feedback loop is an important element of this program in that it serves as a type of public outreach for the City of Chicago. It fosters a sense of support by letting users know that officials are actively listening to and addressing their concerns.

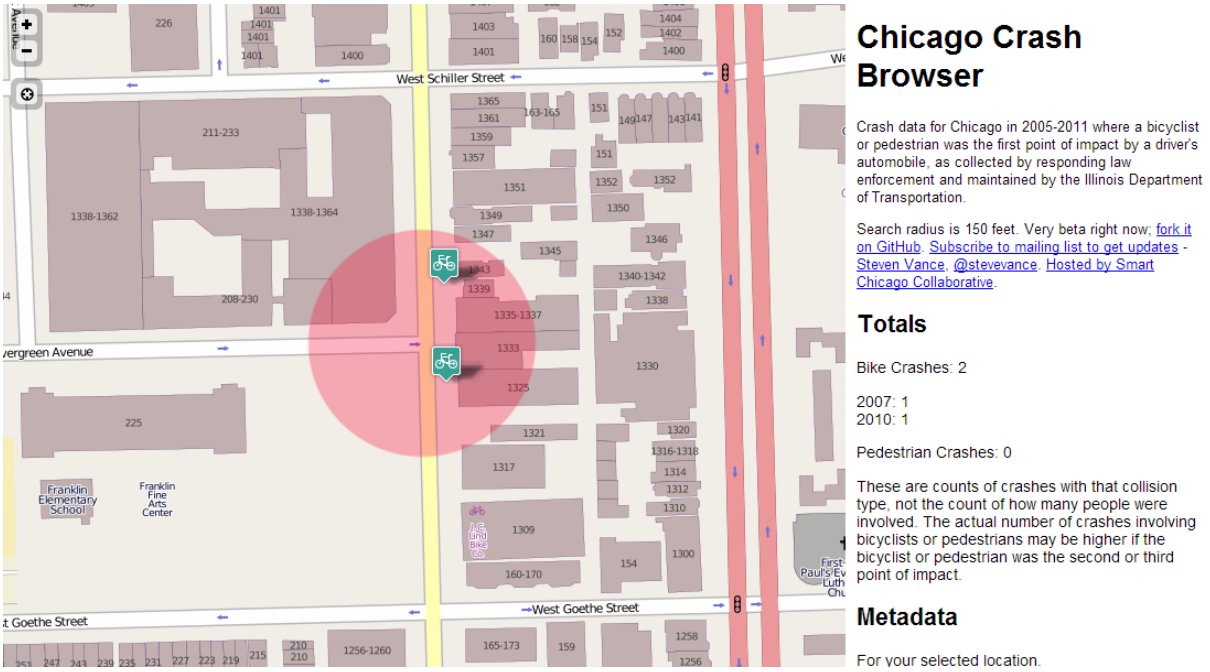
Although Open311 allows users to view a list of active service requests, it does not yet provide a map interface. In other cities where Open311 has been implemented, however, this functionality has recently become available. The Daily Brief is a third-party, map-based representation of Open311 data that currently includes the cities of Boston, Baltimore and Bloomington, IN. Harnessing the coordinate information (GPS- or address-based) included in Open311 requests, **The Daily Brief** translates these locations into GIS point data and plots them on an interactive map. A number of attributes are attached to each point, allowing map users to filter service requests on the basis of neighborhood, request type and status.

A number of other cities around the country have since adopted the Open311 platform. An online maintenance reporting interface also has the potential for statewide application and could be used to improve maintenance reporting and feedback. The California Department of Transportation has an online system for reporting maintenance issues, but lacks the data transparency and public feedback that Open311 provides[19]. Given the origins of the program in Chicago, IDOT is well-positioned to be the first to develop this technology for application at the state level.

Crash Reporting

A second application of the GPS and database technology driving Open311 is in crash incident reporting. Traditionally, the standard for crash incident reporting in the U.S. has only involved collisions with at least one motor vehicle on public roads. As a result, crashes involving bicycles and no motor vehicles, bicycles with parked vehicles, bicycles and pedestrians, or collisions that occur on private property are often unaccounted for. Crash records that rely entirely on police reports also have their limitations. Harnessing Open311-style technology is key to improving the quality of bike crash data, providing an avenue for improved real-time reporting, sharing and access of the data, and effectively applying the data toward more informed program, planning and policy decisions.

[18] http://www.cityofchicago.org/city/en/depts/311.html
[19] http://www.dot.ca.gov/hq/maint/msrsubmit/



IDOT should strive to make safety data as accessible and user-friendly as possible. This of course involves providing both quality data, and a clear and convenient means of accessing the data. The Chicago Crash Browser, an independently developed online application allows users to sort and browse historical, police-reported bicycle and pedestrian crash data, but does not include real-time updates. (http://chicagocrashes.org). The development of third-party apps when IDOT provides the same data, online, in a similar format, may indicate that many users are having difficulty accessing or interpreting the same information provided by IDOT.

When bicycle crash-related GIS data are maintained by municipalities or law enforcement agencies, incidents are tracked in the same database as motor vehicle crashes and can be filtered using attributes such as "vehicle type." However, crash databases typically include only those crashes reported to police, regardless of the vehicular or pedestrian character of the accident. In New Jersey, for instance, the NJDOT crash database consists only of police records.

There are limits to the accuracy and completeness of law enforcement databases since bicycle crashes—which tend to incur low amounts of property damage and are more likely to involve underrepresented members of society—may go unreported by victims or unnoticed by bystanders. Records of bicycle crashes not involving a motor vehicle are equally unreliable. The Bay Area Bike Accident Tracker assigns a violation category (i.e. the reason for the crash) to each accident, yet a full 15 percent of bicycle crashes are listed as "Other" or "Unknown." This suggests that police reporting methods lack the clarity and specificity needed to accurately describe bicycle crashes. However, police reports are evolving, albeit slowly; the Illinois Department of Transportation's 2011 decision to begin tracking "dooring" crashes among bicyclists is an example of how crash reporting is improving representation of bicyclists.

There is thus a need for improved reporting methods that provide an alternative to police reports and are better-suited for describing collisions involving bicycles. By developing tools that are driven by crowdsourcing and rely upon the knowledge of bicyclists, the richness and reliability of bicycle crash data can be enhanced. Such tools should offer customized inputs, developed in consultation

with bicycle stakeholders, that reflect the most common causes of bicycle accidents. Dooring, right-turn hooks, left-turn rear-endings, intersection blockage from left-turning vehicles, vehicles parked in the bikeway, "pass and stop" maneuvers by vehicles, and failure among motorists to yield the right-of-way are examples of common causes of bicycle accidents that could be included in a 311-style crash reporting app. Crash datasets produced through crowdsourcing could be used to validate police records and would provide system planners with a more robust understanding of bike collision patterns throughout a city or state. It would also provide an avenue for data sharing. At a minimum, crowdsourced crash data should be shared openly: offered for download and presented using interactive web tools. Like Open311, users would be given the ability to sort and filter crashes using maps and database search tools. While developing an Open311-like platform is not technically under IDOT's purview, there is a lot of potential for the agency to take a lead role in coordinating the development and expansion of these technologies among other local agencies and organizations, and promoting their use within the department in project planning and evaluation.

Although real-time crash data is less useful for trip planning purposes than bike parking and route closure information, it could indeed be integrated with trip planners on a real-time basis—showing, for example, if there is an active crash site that should be avoided.

Potential Future Applications of Crowdsourcing Data

A look at Boston's Daily Brief map reveals that bicyclists are already using this system to log suggestions relating to the bike network, albeit in an unofficial way[20]. This hints at a potentially powerful application of Open311 technology: allowing users to crowdsource information that goes beyond service issues, extending into the realm of suggested facilities, problem intersections, crash and near-miss reporting, and the locations of existing or suggested bike parking.

This type of service would be very useful for governments seeking to improve evaluation and data acquisition practices. First, it would allow network planners to amass large datasets to validate and update existing data. Bike parking datasets, for instance, are a prime candidate for crowdsourcing because municipal data is often non-existent or incomplete (see crowdsourcing section of this Chapter). For example, providing an avenue for bicyclists to supply information about parking locations is the surest way for municipalities to build reliable datasets of this infrastructure. Location information (i.e. GPS coordinates) can be combined with attributes such as *rack type* and *number of spaces* to further enhance knowledge of bike infrastructure. The options provided for each of these attributes can be limited through the use of a drop-down list, which ensures consistency between users.

After crowdsourcing the data, the next step is to share it by integrating it into trip planners. In the bike parking example, a bicycle trip planning service—equipped with the GIS point layer of parking locations generated by participating bicyclists—could suggest the nearest parking spot for a user's intended destination. The user could customize the results: if they are seeking a sheltered locker or a rack with plenty of spaces, they would be directed to different parking locations. These inputs could

[20] http://dailybrief.311labs.org/boston

be adjusted in an infinite number of ways, depending on the attributes that are initially collected about each location.

Bicycle parking is generally not installed at a fast enough rate to warrant real-time updates to the GIS layer. Rather, crowdsourced bike parking data could be utilized here to provide information about available facilities and demand. This data would be verified by city staff (through comparison with existing datasets, Google StreetView, site visits, etc.) before being integrated into trip planners to ensure accuracy and objectivity. Data update schedules would likely vary from jurisdiction to jurisdiction, with those cities with the fastest-growing bicycle infrastructure having the greatest need for frequent updates. In Illinois, Chicago would likely have the greatest need for relatively frequent updates. There is potential here for accurate bike parking data to be integrated into statewide mapping efforts and used as a resource in project planning.

Some other data elements that are well-suited to crowdsourcing are temporary bicycle route closures and hazards. This type of data has the potential to be tied into trip planners in a similar manner to bike parking, and would serve as a valuable enhancement to trip planning software. The presence or absence of obstacles (route closures and hazards) would influence route selection algorithms, directing cyclists toward lower-stress routes when those obstacles are present. The difference between obstacle identification and parking identification is that obstacles are temporary or unexpected. As a result, knowledge about obstacles—much like knowledge of traffic among motorists—is only powerful if the information is current.

For bicycle maps using a BLOS-style visualization, crowdsourced obstacle data would impact the BLOS on a given route and result in dynamic changes to the map similar to the Cyclopath tool. Using the Illinois DOT's rubric, the placement of obstacles along a corridor in the bicycling network might cause the link to fall from "most suitable to bicycling (green)" to "caution advised (yellow)." BLOS arithmetic is relatively simple—online tools exist for such calculations. The innovative aspect of this example is the implementation of a dynamic map that not only responds to the inputs of users (i.e. through crowdsourced point data) but displays this data back in a way that is useful—both to network users and planners.

Another potential application of crowdsourcing technology is facility recommendation. Arguably the simplest program to implement among those discussed in this Chapter, a facility suggestion app could be achieved through simple extension of the Open311 program. In Boston and Baltimore, Open311 users are already using the system to flag issues in the bike network.

A fully-developed infrastructure recommendation software would allow users to flag locations (points) that would be associated with a service request. Request themes would be tailored to the needs of bicyclists—for instance, "dropped bike lane," "bike parking needed" or "street sweeping required"—in addition to an open field for notes and comments. Path drawings (lines) would also be critical in suggesting network links; the interface would need to accommodate users drawing lines on a map to indicate a desired path. A straightforward voting mechanism, similar to a Facebook "Like," would reduce redundancies among facility suggestions and allow network planners to compare the demand for various improvements. It will also be necessary to solicit service requests

and facility improvement recommendations through other channels to give voice to those that do not have access to or knowledge of the program. Statewide education and marketing campaigns would help to elevate the profile of the service.

A growing dataset of bicycle-related infrastructure suggestions would be invaluable to network planners undertaking bike network analyses. From a bicyclist's perspective, the data would be most meaningful if suggested facilities were tied to municipal funding priorities. Municipalities and states could, for instance, track the most popular network requests on an annual basis and commit to including high-demand projects in long-range Bike Plans and annual construction budgets

Other Technologies

Sports and Fitness

Several recent applications, targeted toward fitness bicyclists, have harnessed the power of GPS to precisely measure distance and speed. These include Strava[21], MapMyRide[22], Fitocracy[23] and a variety of similar offerings. These applications use the same technology underpinning TrailBlaze Chicago or CycleTracks: mapping a bicyclist's route dynamically. These systems track a number of variables, including speed, cadence, elevation, distance and calories.

One application of these technologies, discussed previously in this Chapter, is using crowdsourced data to improve understanding of bicyclist movements. Whereas GPS tracking studies were once limited to a small number of participants with specially-designed GPS equipment (e.g. Winnipeg's OttoCycle study), governments can now harness the information-sharing power of large populations equipped with GPS-enabled mobile devices. Data that could be gathered includes: bicyclist volumes along network links, origin and destination data, time of day, day of week, speeds and acceleration/deceleration patterns. One consideration that planners must make before utilizing such data on a large-scale is that most trips logged with fitness-based mobile apps would likely be for recreation. This data should be used in conjunction with other data sources to provide a more balanced sampling of bicycle trips.

Social Media

The primary challenge for a municipality or state in harnessing GPS-tracking technology is the development of a mobile platform to encourage widespread participation. Strava serves as an instructive example, since it not only tracks bicyclists' trips but incorporates a sharing mechanism through social media. Integrating Strava with social media hubs like Facebook and Twitter means that bicycle trips are advertised through bicyclists' social circles. Individual routes, furthermore, gain publicity as users compete for the fastest times and discuss strategies for specific network segments.

[21] www.strava.com
[22] http://www.mapmyride.com/
[23] https://www.fitocracy.com/

While state and local governments may not wish to encourage bicycling for the same reasons as Strava or MapMyRide, these applications, along with systems like ZAP Twin Cities, highlight the importance of interactivity among users. Bicyclists are more likely to respond positively to an information-gathering program led by a state DOT if the application is open and user-friendly, allowing for real-time data downloads and map-based visualization. Furthermore, integration with social media (e.g. sharing information about route choice) is a crucial element in engaging and encouraging the bicycling population. Social media integration provides a degree of low-cost or free advertising for the program, and is key in attracting the market segment of under-40 individuals who are both technically savvy and more likely to bicycle.

Lessons And Opportunities

This Chapter has discussed a number of existing technologies that could assist governments in improving bikeway data quality by facilitating user feedback.

The success of programs such as Open311 and Dero ZAP suggests that bicyclists are eager to participate in programs to improve information about cycling in Illinois. However, in general, bicyclists lack the specific tools, in terms of process and technology, to provide feedback for governments.

Mobile apps could serve a dual purpose of providing both bicyclists and governments with up-to-date information and keeping datasets current. Simple mechanisms, like the ability to report a pothole or flag a problem intersection, are powerful engagement tools that also assist in tying maintenance work directly to the needs of citizens. The table below summarizes bicycle network information that can be gathered using mobile apps, and outlines which of these are conducive to real-time sharing. For example, the crowdsourcing potential for bike rack locations is high, because data on these locations is often incomplete. At the same time, cyclists do not need minute-by-minute updates on newly-installed bicycle racks, indicating a low need for real-time data sharing (in this case, a regularly scheduled update would suffice).

Table 2: Crowdsourcing Potential for Potential Bike-related Datasets

Data	Crowdsourcing potential	Need for real-time data sharing
Bike rack locations	High	Low
Available bike parking in lockers and bike stations	Low	High
Trip tracking	High	Low
Route closure	High	High
Hazard identification	High	High
Crash reporting	High	Low
Route suggestion	High	Low

Opportunities and Potential for Statewide Implementation

1. Revise current mapping practices so that they better represent urbanized areas of the State. Bicycle Level of Service recommendations are provided in the Chapters contained in Section I- Existing Conditions.
2. Harness the embedded GPS technology in mobile devices to facilitate Open311-style bicycle network service requests and real-time route closure, obstacle and hazard identification;
3. Harness the embedded GPS technology in mobile devices to glean continuous information on cyclist travel patterns from a large sample of the population;
4. Develop an application which functions as a route planner, map and bikeways database and consider embedding the data collection elements discussed in (1) and (2) within this app. This presents an opportunity to collaborate with the Illinois Office of Tourism;
5. Enhance and expand datasets pertaining to bicycling in the state (e.g. bicycle parking, bicycle crashes);
6. Use existing web site platforms to and share bicycle infrastructure data (e.g. network lines, bicycle parking, bicycle crashes), both through download and through interactive mapping and database tools; and
7. Work with data providers to improve the quality and quantity of available data for IDOT and local jurisdictions, so as to enhance the consistency, correctness and completeness of data across all jurisdictions.

The State of Illinois can implement several of these generalized recommendations in specific ways. Its IRIS database, which serves as the basis for the State's published bike network maps and Bike Level of Service (BLOS) maps, can be enhanced by improving both data quality and data access.

Some of these recommendations would involve initial costs in terms of product development and licensing, while others would incur some labor costs over the long-term (primarily in data management and quality assurance). However, the overall cost of these recommendations is low, because these technologies are generally already in use. Furthermore, hardware costs for GPS are included in the price of mobile devices, which are paid by the consumer. Crowdsourcing implies that labor costs are generally low, and are distributed over a large group of individuals. Passive data collection, such as TrailBlaze Chicago, involves minimal effort from the user.

IDOT policies may have to be enacted to ensure that programs like the ones discussed herein will be funded, developed and maintained. One way in which the department can ensure that bicycle support programs like these are implemented is by incorporating them into policy action items and long-term performance measures. An example of a potential policy action item and performance measure might be: *establish an online database of existing and planned bikeways throughout the state that can be continually updated by jurisdictions before the end of 2014. Provide this information to the public and roadway planners in an easily discernible and accessible online format by the end of 2015.*

Table 3: Potential Action Items that Could Improve Bicycling Data Quality and Accessibility in Illinois

Potential for Improving Data Quality	Potential for Improving Data Access
Develop a customized application similar to Open311 to crowdsource point data such as bike racks and route closures across Illinois. This application could build off of the existing Getting Around Illinois (http://getaroundillinois.com) or Travel Midwest (http://www.travelmidwest.com) interactive mapping platforms but would offer enhanced crowdsourced mapping functions, notice and report services.	Produce a customized application, similar to RideTheCity Chicago and built on Google Maps technology, which functions as a bicycle route planner and map. Bicycling routes and mapping functions on the current regional/county bike maps should be displayed on the main map interface rather than linking to pdf maps. Attributes should be clear and easy to identify with an interactive legend.
Develop a customized application similar to TrailBlaze Chicago and Strava to crowdsource trip data (e.g. bicycle volumes, speed, origins and destinations). Data should supplement agency trip data.	Integrate crowdsourcing-enhanced data into the bicycle route planner/map. Layers for these data could be toggled on/off with a simple navigation panel instead of drop down menus.
Establish a live transportation database configured to accept and transmit real-time data.	Anticipate the inclusion of selected real-time data (e.g. bicycle route closures, maintenance issues) into the bicycle route planner/map.
Establish an online database of existing and planned bikeways throughout the state that can be continually updated by jurisdictions	Provide this information to the public and roadway planners in an easily discernible and accessible online format. Share all data for download in multiple formats (xls, shp, kml/kmz).
	Continue to produce PDF and print maps for all mapping products. Continue telephone notice and reporting services to provide resources to those without internet access.

Section II- Network Recommendations

Introduction

A key objective of the State planning effort was a focus on developing regional connections. These bicycle facilities were envisioned with the overall goals of connecting popular destinations with population centers, as well as connecting population centers to one another. The Plan's team underwent a detailed data collection effort to visualize existing and proposed bikeway facilities—both on- and off-roads. Using a variety of existing databases, information was compiled into one source. The geodatabase is a key tool for future planning efforts. Stakeholder input was collected to augment existing maps. The two rounds of MetroQuest surveys collected local knowledge and synthesized it into the final system maps. The Plan email address received a variety of recommendations and alerts regarding dangerous connections on trails and roads throughout the State. These items were reviewed and added to the GIS database.

Proposed and existing bikeways in Illinois. A full-size image is included in Chapter 2 of this Section.

The Department should note that although the final Plan presents a set of regional bikeways, it is imperative that future planning efforts not only focus on these routes, but also incorporate bicycle facilities throughout a variety of road types in all Districts. Doing so would provide ample opportunities to make any road bicycle-friendly. The findings of this State Plan recommend the Department be open to long-term planning efforts that would allow the State to arrive at such an end goal.

Section III summarizes the methods used to develop the final proposed bikeway system and analyzes the potential costs and benefits of these recommendations.

Chapter 1 addresses the methodology used to create the bikeway inventory. It provides the Department with information regarding geodatabase organization and opportunities for its future use.

Chapter 2 summarizes the recommended corridors as a series of statewide routes. The section leaves the question of facility type open, since this requires feasibility studies and further community needs assessments. The Chapter also presents cost/benefit analysis for selected facility types.

Chapter 3 uses Effingham, Illinois as a case study to address the relationship of IDOT jurisdiction roads and municipality-led development of bicycle/pedestrian networks. The case is relevant to a variety of population centers across Illinois.

Section II - Network Recommendations
Chapter 1 - Illinois Regional Bikeway Inventory Methodology

Chapter 1 - Illinois Regional Bikeway Inventory: Methodology

Introduction

To assess the current status of the bicycle network in Illinois, the Illinois Bike Transportation Plan project team collected, formatted, and created GIS data documenting the state's existing and planned regional bike network. Previous to this effort, a unified statewide dataset did not exist for bicycle facilities in Illinois. The data collected in this project was used to support the planning and development of the proposed Illinois bikeway network. This Chapter summarizes the methodology used in the process of developing this regional bikeway inventory in GIS format.

Data Collection

Beginning in March 2013, IDOT and the Illinois Bike Transportation Plan project team reached out to MPOs, municipalities, park districts and other agencies around the state requesting the collection and submission of geographic data on existing and planned bicycle facilities. Data submitted by collaborating agencies was received by in varying formats, including GIS, written plans, scanned maps, image files, and online reference links.

In addition to IDOT, several other state agencies and MPOs provided substantial inputs to the data collection effort. Illinois Department of Natural Resources (IDNR) contributed several statewide trail shapefiles, and IDNR's Greenways & Trails Technical Assistance Program offered county-level greenways and trails plans in areas across the state. Maps from these plans were used to inventory existing greenways, trails and paths as well as planned bikeways. Chicago Metropolitan Agency for Planning (CMAP) also provided significant resources to the project. CMAP's Bicycle Inventory System (BIS) anchors the IDOT's catalog of bikeways in the densest areas of the state, and the BIS served as a technical template for the creation of IDOT's bikeway geodatabase. Many additional municipalities and entities from around the state also contributed their data, plans and maps.

Illinois Department of Transportation
Office of Planning and Programming
2300 South Dirksen Parkway / Springfield, Illinois / 62764

alta PLANNING + DESIGN

To: Illinois municipalities, park and forest preserve districts, counties, and regional governments

CC: Gabe Sulkes, Bola Delano, Illinois Department of Transportation

From: Craig Williams, Jack Cebe, Alta Planning + Design

Date: March 25, 2013

Re: Illinois Bike Transportation Plan Existing Data Collection

For the purposes of bicycle and pedestrian planning and programming in Illinois, IDOT is collecting statewide bicycle accommodations data. The Department seeks data on all bicycle facilities including:

- On-road bike lanes (bicycle lanes, buffered bicycle lanes, protected cycle tracks, etc.)
- On-road, marked "bike routes" (this includes paved shoulders, shared-lane markings or "sharrows" and roadways marked with wayfinding signage and/or pavement markings that provide route information to bicyclists.)
- Shared use side-paths (designated, paved off-street multi-use facilities adjacent to and running parallel to a roadway. Must be a minimum 8' wide.)
- Off-road bicycle or multi-use paved or crushed stone paths or trails

IDOT requests that municipalities, park and forest preserve districts, counties, and regional governments that did not already provide bikeway data to IDOT (Form OPP 102-515) instead provide GIS data (preferable) or paper maps that delineate existing and planned bikeways or shared use paths within their respective boundaries. For areas served by Metropolitan Planning Organizations (MPOs), the MPO may, at its discretion and in cooperation with member communities, coordinate this data collection effort within their planning area. Counties may coordinate the bikeway accommodation data for township road districts within their counties.

The State will use the information received for three primary purposes:

1. to develop and maintain a State Bikeway Plan with a focus on inter-regional connectivity,
2. to implement this plan through various policies and funding programs, and
3. to create a GIS bike accommodations database (geodatabase) that will serve as a reference for the State in the planning and development of future bikeways and roadways.

The format of the State's bikeways geodatabase will be based on the Chicago Metropolitan Agency for Planning's Bicycle Inventory System (BIS) that was developed as a part of the Agency's Soles and Spokes Planning process (http://www.cmap.illinois.gov/bike-ped/soles-and-spokes-plan). The geodatabase has been successfully used in the Chicago area for more than ten years. Local agencies

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maintain their own plans, they contribute these plans to the regional geographic database. The system allows analysts to see each contributing agency's bikeway plans.

The benefits of this format and the reasons for utilizing it for this effort are described in Attachment A. In the future (following this data request), IDOT requests that agencies format their bikeway plans' GIS data as shown in Attachment A to facilitate the regular updates of the geodatabase as plans and projects are approved.

1) Responsible agencies:

Municipalities and other forms of local, county and regional government organizations should fulfill this data request. For areas served by Metropolitan Planning Organizations (MPOs), the MPO may, at its discretion and in cooperation with member communities, coordinate this data collection effort within their planning area. Counties may coordinate the bikeway accommodation data for township road districts within their counties.

2) Submission instructions:

Email a digital copy of GIS data or scanned maps to:

Jack Cebe
jackcebe@alta planning.com
Alta Planning + Design
53 W Jackson St., Suite 1642
Chicago, IL 60604
Phone: 312-265-0628

Illinois Bike Transportation Plan
Transforming Transportation for Tomorrow

Example bikeway data collection solicitation letter sent to state agencies and municipalities.

Geodatabase Organization

Feature Datasets

Drawing upon the organizational structure endorsed by the CMAP BIS system, the Illinois Bike Transportation Plan project team elected to establish three separate feature datasets in the regional bikeway inventory geodatabase to reflect the three main sources of the state's bikeway data. These feature datasets are:

- CMAP – the latest version of CMAP's BIS (unedited).
- IDNR – existing and planned bikeways from IDNR's County Greenways & Trails Plans, and several existing statewide trails layers.
- SPC (State Plan Collection) – existing and planned bikeways from other sources around the state, including municipalities and other entities.

Feature Class Names

Following the example of CMAP's bikeway inventory system, feature classes within each feature data set are named after the plan, municipality or agency, or facility that they represent. Feature classes in the geodatabase are generally mixed between these types – existing and planned facilities from a city or county planning effort, or a city's own maintained bikeways GIS data, or a single trail alignment, usually existing, not represented in another dataset.

Fields and Domains

The Illinois Regional Bikeway Inventory uses identical domains and feature class properties as the CMAP BIS, encompassing 17 unique fields that can contain attribute data describing each geographic feature. A comprehensive summary of the 17 BIS fields is presented in Table 1. Four of these fields utilize domains to maximize the efficiency and accuracy of data entry and maintenance. Geodatabase domains and domain values are summarized in Table 2.

Table 1. BIS Feature Class Properties (adapted from CMAP's Bicycle Inventory System Final Report, 2008).

Field Name	Data Type	Alias	Allow <NULL>?	Default Value	Domain	Length
OBJECTID	Object ID					
SHAPE	Geometry (line)		Yes			
STNAME	Text	Street Name	Yes			80
FACNAME	Text	Facility Name	Yes			80
GITRAIL	Text	Grand Illinois Trail	Yes		GITRAIL	3
SYSDES	Text	System Designation	Yes			32
FROMREF	Text	From Reference	Yes			50
TOREF	Text	To Reference	Yes			50
STATUS	Text	Status	Yes		STATUS	24
FACTYPE	Text	Facility Type	Yes		FACTYPE	24
SURFACE	Text	Surface Type	Yes		SURFACE	24
TOTWIDTH	Double	Total Width	Yes	Precision and Scale = 0		
SORNAME	Text	Source File Name	Yes			24
AGENCY1	Text	Primary Agency	Yes			50
AGENCY2	Text	Secondary Agency	Yes			50
COMMENT1	Text		Yes			80
COMMENT2	Text		Yes			80

Table 2. BIS Domains (adapted from CMAP's Bicycle Inventory System Final Report, 2008).

Field Name	Alias	Domain	Domain Field Values
GITRAIL	Grand Illinois Trail	GITRAIL	Yes, No
STATUS	Status	STATUS	Existing, Programmed, Planned, Future, Unknown
FACTYPE	Facility Type	FACTYPE	Bike Lane, Bike Route, Path, Unknown
SURFACE	Surface Type	SURFACE	Paved, Aggregate, Dirt, Unknown

Data Processing

As a result of a flexible and wide-ranging data collection process, the Illinois Bike Transportation Plan project team received data from over 30 entities around the state, not including several dozen county greenway plans obtained via IDNR. The files collected included:

Table 3. Regional Bikeway Data Collection Inventory (approximate).

Source Data File Type	Number of Files
PDF	58
Text (Word, Notepad)	20
Image (JPEG, etc.)	12
Spreadsheet (Excel, etc.)	2
GIS (SHP, GDB, etc.)	41

In addition to this data, the project team also received several references to internet resources (such as online mapping services, park websites, etc.) where bikeway information was available.

GIS Data Inputs

Many of the resources contributed to the inventory were existing GIS data sets, in the form of shapefiles or geodatabases, from IDNR, IDOT or other state and local agencies. These data were of varying quality and detail. Some shapefiles received had extensive attribute data and appeared to be well-maintained. Some other datasets had little to no attribute data to indicate key characteristics such as the name of the facility, the facility type, or whether the facility already exists or is merely planned.

Each GIS data set received was converted into a feature class in one of the three feature datasets of the Illinois Regional Bikeway Inventory geodatabase. This conversion involved two main steps: interpreting and cleaning the available data fields to match BIS fields, then importing the dataset into a feature class in the database and mapping fields to populate the available attribute data. For many feature classes in the geodatabase, only minimal attribute data is available, such as facility type and status. For a small number of features in the database, data to populate key fields used in mapping symbology was not available, leaving these features unsymbolized on bikeway inventory maps. In the future, the remaining fields can be populated as the geodatabase is refined, maintained, and reviewed by IDOT's municipal and agency partners.

Non-GIS Data Inputs

The Illinois Bike Transportation Plan project team conducted an inventory of non-GIS bikeway inventory inputs, comparing the contents of these maps, plans and figures against the content already existing in GIS sources. The project team then prioritized digitizing facilities from non-GIS sources based on the following criteria:

- Presence of bike facilities not recorded in other GIS data currently available
- Presence of regional facilities, defined roughly as over 5 miles
- Legibility of the data source (ability to create the alignment of the trail accurately based on available reference data)

For some city and county plans collected during the data gathering process, a few trails and bike lanes met the established criteria as regional facilities while other facilities – commonly facilities such as short, planned on-street bike routes – were not significant at the statewide level. For PDF and image format inputs, the project team manually digitized the centerlines of bike facilities shown in the maps. In some cases, text documents, spreadsheets and PDFs without maps did not provide enough geographic specificity to give the project team a reliable location to digitize facility alignments. Where possible, the project team compared existing bikeways shown on PDF maps with aerial photos and online mapping resources to verify the correct alignment. For non-GIS data inputs, the most commonly available attribute data were facility type and status, which were commonly symbolized on maps. Other types of attribute data, such as surface and width, were not commonly available.

Additional Information

A detailed description of source metadata and the digitization/conversion process used for creating each feature class in the geodatabase is available in the **Appendix N**.

Regional Bikeway Inventory Status and Future Use

The current draft of the Illinois Regional Bikeway Inventory has likely captured the majority of regional bikeways throughout the state, defined as facilities five miles in length or greater. When creating the inventory, many smaller facilities were also brought into the inventory where possible, in order to give a more detailed picture of the density, service, and connections of the state's bicycle network. However, there are likely many other sub-regional bikeways that are not yet represented in the inventory, especially on-street bikeways. This data may become available as additional municipalities and agency partners throughout the state share their data with IDOT in the future.

Detailed Geodatabase Feature Class Summary Data

Overview

This summary contains detailed tables describing each feature class in the IDNR and SPC feature datasets of the Illinois Statewide Regional Bikeway Inventory geodatabase. The geodatabase's third feature dataset, CMAP, is maintained externally and should be updated periodically through a data sharing relationship with CMAP.

CMAP Feature Dataset

This feature dataset (current as of June 2013) contains 101 feature classes sourced via the Chicago Metropolitan Agency for Planning and includes existing and planned bikeway facilities located within the CMAP jurisdictional boundary. Data and metadata requests should be directed to the CMAP GIS department.

IDNR Feature Dataset – Feature Class Summary Data

This feature dataset contains 25 feature classes sourced via the Illinois Department of Natural Resources and contains existing and planned regional bikeway facilities located across the state.

Feature Class	Features	Key Fields Populated	Source Format	Source Data Year
IDNR_County_Boone_Winnebago	75	FROMREF, TOREF, STATUS, FACNAME	PDF	2000
IDNR_County_Woodford_Mclean	34	FACNAME, STATUS, FACTYPE	PDF	2002
IDNR_County_Champaign	19	STATUS	PDF	2004
IDNR_County_JoDaviess	22	STATUS, FACTYPE	PDF	2009
IDNR_County_HenryRockIsland	16	FROMREF, TOREF, STATUS, FACNAME	PDF	2001
IDNR_County_Fulton	5	FACNAME, STATUS, FACTYPE	PDF	2007
IDNR_County_Ogle	15	-	PDF	2003
IDNR_County_Lee	14	STATUS, FACTYPE	PDF	2002

Feature Class	Features	Key Fields Populated	Source Format	Source Data Year
IDNR_GIS_2011_ADT_North	21	FACNAME, SYSDES, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2011
IDNR_GIS_2011_ADT_South	30	FACNAME, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2011
IDNR_GIS_MackinawValleyTrail	2	FACNAME, STATUS, FACTYPE	SHP	
IDNR_GIS_2010_MCT	25	FACNAME, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2010
IDNR_GIS_2011_MRT	54	FACNAME, STATUS, FACTYPE, COMMENT1	SHP	2011
IDNR_GIS_2011_StateTrails	190	FACNAME, SYSDES, STATUS, FACTYPE	SHP	2011
IDNR_GIS_TrailofTears	1	FACNAME, STATUS, FACTYPE	SHP	-
IDNR_GIS_US76BikeRoute	7	FACNAME, SYSDES, STATUS, FACTYPE, SURFACE, SORNAME, AGENCY1, COMMENT1	SHP	-
IDNR_GIS_GIT	379	FACNAME, STATUS, FACTYPE, COMMENT1	SHP	-
IDNR_GIS_TrailMap2008_ILAllTrails	1148	FACNAME, SYSDES, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2008
IDNR_GIS_TrailMap2008_Transamerica	5	FACNAME, SYSDES, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2008
IDNR_GIS_TrailMap2008_CentTrailsMap	22	FACNAME, SYSDES, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2008
IDNR_GIS_TrailMap2008_IllinoisTrails08	226	FACNAME, SYSDES, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2008
IDNR_GIS_TrailMap2008_NTrailsMap	28	FACNAME, SYSDES, STATUS, FACTYPE, SORNAME, AGENCY1, COMMENT1	SHP	2008
IDNR_GIS_TrailMap2008_NETrailsMap	262	FACNAME, STATUS, FACTYPE, AGENCY1, COMMENT1	SHP & PDF	2000
IDNR_GIS_TrailMap2008_Route66Trail	118	FACNAME, STATUS, FACTYPE	SHP	2008
IDNR_GIS_TrailMap2008_STrailsMap	42	FACNAME, STATUS, FACTYPE, AGENCY1, COMMENT1	SHP & PDF	1998

SPC Feature Dataset – Feature Class Summary Data

This feature dataset contains 19 feature classes sourced from various entities across Illinois, gathered during a phase of the Illinois Statewide Bicycle Master Plan known as State Plan Collection (SPC). Feature classes in this dataset contain existing and planned regional bikeway facilities located across the state.

Feature Class	Features	Key Fields Populated	Source	Source Data Year
SPC_RegionalCorridorRecommendations	21	STATUS, FACTYPE	Outreach	2013
SPC_AdvisoryCommitteeRecommendations	17	STATUS, FACTYPE	Text	2013
SPC_LoganCounty	18	STATUS, FACTYPE	SHP	2013
SPC_Dekalb	1	STATUS, FACTYPE	PDF	2011
SPC_Rock_Island	7	STNAME, FROMREF, TOREF, STATUS	PDF	2009
SPC_Rockford	55	STATUS, FACTYPE	PDF	2007
SPC_Kankakee	46	STATUS, FACTYPE, AGENCY1	PDF	2009
SPC_BiState	681	FACNAME, STATUS, FACTYPE, AGENCY1	SHP	2013
SPC_NormalBloomington	3	FACNAME, STATUS, FACTYPE	SHP	2012
SPC_Danville	48	STATUS, FACTYPE	SHP	2010
SPC_SWIllinois_Waterloo	5	FACNAME, STATUS, FACTYPE	SHP	2013
SPC_SWIllinois_Calhoun	52	FACNAME, STATUS, FACTYPE	SHP	2013
SPC_SWIllinois_Columbia	51	FACNAME, STATUS, FACTYPE	SHP	2013
SPC_SWIllinois_Edwardsville	99	STNAME,FACNAME, STATUS, FACTYPE, COMMENT1	SHP	2013
SPC_SWIllinois_MetroBikeLink	18	FACNAME, STATUS, FACTYPE, SURFACE, AGENCY1	SHP	2013
SPC_SWIllinois_MoundsHeritageTrail	13	STNAME, FACNAME, STATUS, FACTYPE, COMMENT1	SHP	2013
SPC_SWIllinois_OFallon	189	STNAME, STATUS, FACTYPE	SHP	2013

Feature Class	Features	Key Fields Populated	Source	Source Data Year
SPC_SWIllinois_RedBud	67	STATUS, FACTYPE, SURFACE, AGENCY1	SHP	2013
SPC_SWIllinois_ShilohTrails	34	STATUS, FACTYPE	SHP	2013
SPC_SWIllinois_Swansea	34	FACNAME, STATUS, FACTYPE	SHP	2013
SPC_SWIllinois_TrailLayer_May2013	217	FACNAME, STATUS, FACTYPE, AGENCY1	SHP	2013

Section II - Network Recommendations

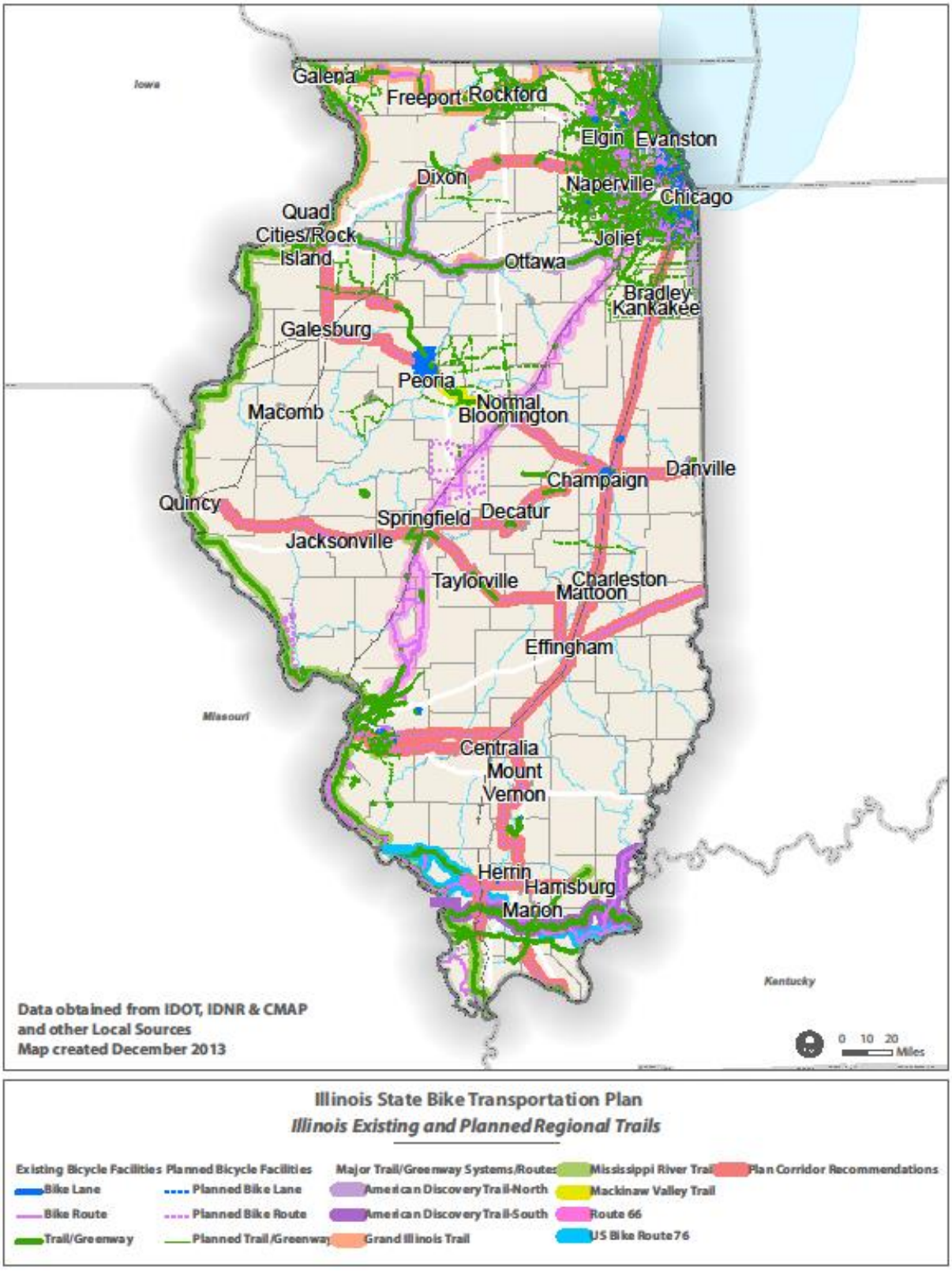
Chapter 2- Summary of Recommended Bikeway Corridors

Purpose for Recommended Corridors

Using data collected from Plan input, the planning and design team created connection recommendations based on user demand, missing links between points of interest, and extensions to current bikeways/trails in Illinois. These recommendations offer planning-level guidance to assist IDOT in prioritizing certain connections and most-needed facilities. Through the course of future planning and feasibility studies, IDOT or other parties may determine that alternatives to these corridor recommendations (for example: trails instead of on-road facilities or alternate routes) are more feasible than current recommendations. In the case of building trails instead of on-road facilities, planners should mindful of increased distance between points of interest. Chapter 3 and the Policy and Design recommendations in Section II discuss transportation cyclists' need for direct routes and their need for access across barriers. Alternate routes should continue to facilitate connections between cities, towns, rural areas, tourism points of interest, economic centers, and more.

Creating the recommended connections would create a statewide network of dedicated bikeway routes. The connections pass through many different roadway typologies found throughout Illinois. To remain sensitive to these diverse areas' needs, statewide developments should refer to the recommendations made in Section II regarding facility selection, design guidelines, and other considerations for choosing treatments that match roads' contexts and provide secure travel for bicyclists of all ages and abilities. In addition, IDOT should work with communities to encourage them to see the value in bicycle facilities and the value of becoming a part of a statewide system of bikeways and bike-friendly roadways throughout the state.

The map on the following page shows Plan proposed bikeway connections that, if completed, would create an interconnected network of State bikeways.


Iowa
Galena
Freeport
Rockford
Elgin
Evanston
Dixon
Naperville
Chicago
Quad Cities/Rock Island
Joliet
Ottawa
Bradley
Kankakee
Galesburg
Peoria
Normal
Bloomington
Macomb
Champaign
Danville
Quincy
Springfield
Decatur
Jacksonville
Taylorville
Charleston
Mattoon
Effingham
Missouri
Centralia
Mount Vernon
Herrin
Harrisburg
Marion
Kentucky
Data obtained from IDOT, IDNR & CMAP and other Local Sources
Map created December 2013
0 10 20 Miles
Illinois State Bike Transportation Plan
Illinois Existing and Planned Regional Trails
Existing Bicycle Facilities
Bike Lane
Bike Route
Trail/Greenway
Planned Bicycle Facilities
Planned Bike Lane
Planned Bike Route
Planned Trail/Greenway
Major Trail/Greenway Systems/Routes
American Discovery Trail-North
American Discovery Trail-South
Grand Illinois Trail
Mississippi River Trail
Mackinaw Valley Trail
Route 66
US Bike Route 76
Plan Corridor Recommendations

Connection Recommendations: North – South

Chicago -- Winnetka

Connecting the northern Chicago neighborhoods with Winnetka and other suburbs and towns in northern Chicagoland would improve an already popular bikeway. Sheridan Road (IL 137), for instance, connects Evanston, Wilmette, and Winnetka. Additionally, the Green Bay Trail is used for both recreation and transportation. The Evanston Cycling Club hosts an annual 100 mile ride called the North Shore Century, which leaves from Evanston. Improving connections between areas next to Lake Michigan on both the North and South sides of the city would enhance these recreational areas and strengthen connections between residential and commercial areas along the way.

Oak Park – Chicago -- Champaign – Effingham – Centralia – Mt. Vernon – Marion – Harrisburg

A new north-south connection is recommended from the Chicagoland area, running south across the entire state, ending in the southern region of Illinois, near Harrisburg, for example. Smaller towns included in this connection could include Midlothian, Peotone, Kankakee, Mattoon, Rantoul, Salem, and Mount Vernon as well as larger nodes such as Urbana, Champaign and Effingham. These cities could serve as points where multiple bikeways converge. For example, Champaign is well-placed to serve as a central point in a network that could extend north (towards Kankakee and beyond to connections with Chicago), east (to the Indiana border), south (to Charleston and further south), southwest (to Decatur and beyond), and northwest (towards Bloomington/Normal).

Oak Park - Champaign

Existing Bikeways and Potential New Routes: Urbana and Champaign already have existing bikeways, in part because of the University of Illinois campus. Potential IDOT roads to be included in this route include S Pulaski Rd or IL 50 from Oak Park through Chicago and its southern cities and towns, through Monee and into Kankakee, US 45 across several rural towns in Watseka County to IL 9 near Rantoul, and US 45 into Champaign.

Recreational Opportunities: Several nature preserves dot the geography between Chicago and Champaign. The South Green Belt Forest Preserve in Tinley Park is just one example, managed by the Cook County Forest Preserve[1]. The Monee Reservoir covers 248 acres, located in Monee.[2] Moving farther south towards Champaign, the surroundings contain patches of rural fields and natural landscape.

[1] http://fpdcc.com/downloads/maps/pdf/R8.pdf

[2] http://www.reconnectwithnature.org/preserves-trails/Monee-Reservoir

Champaign - Effingham

Existing Bikeways and Potential New Routes: As mentioned earlier in the planning documents, Effingham created a bicycle master plan in 2011 along with plans to extend the off-road trail system. Potential routes for bicycle treatments (be they on- or off-road) include IL 33, IL 19, IL 120, US 45, and I-57 and more.

Recreational Opportunities: The Lincoln Prairie Grass Trail (12.9 miles) is located in Mattoon. The Fox Ridge State Park, located about 20 miles from Mattoon contains 2,064 acres of thick forests and sweeping valleys,[3] although the focus is on hiking interaction with wildlife, instead of biking trails.

Effingham - Marion

Municipalities between Effingham and Marion include: Salem, Centralia, Mount Vernon, and Marion. Marion is the second most populous city in Southern Illinois, after Carbondale.

Existing Bikeways and Potential New Routes: The corridor does not contain many major bikeways. Although Amtrak stations connect Effingham and Centralia. Adding bikeways would enhance connections between small rural towns as well as provide opportunities for longer distance riding. Marion can also serve as a node for Southern Illinois by connecting east-west routes that will be discussed later in this chapter.

Recreational Opportunities: Stephen A. Forbes State Recreation Area is located in Kinmundy, a small town between Effingham and Salem. The Wayne Fitzgerell State Park is managed by the Illinois Department of Natural Resources, near Sesser and IL 148[4].

Murphysboro -- Carbondale -- Anna

Existing Bikeways and Potential New Routes: A new bikeway corridor could connect Carbondale with Murphysboro to the northwest and Anna, directly south of Carbondale. As the most populous municipality in southern Illinois, Carbondale is an important connection for private motorized vehicles and public transportation alike. Additionally, current bikeways include the US Bike Route 76 that runs through Carbondale and near Murphysboro. IL State Road 149 and IL 13 currently pass through this corridor.

Recreational Opportunities: The existing greenways and trails in this area connect to regional opportunities for cycling. There are also planned bike routes in Alexander and Union county. The end of the proposed corridor would bring riders closer to the Mississippi River Trail.

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[3] http://dnr.state.il.us/lands/landmgt/PARKS/R3/FOX/fox.htm

[4] http://dnr.state.il.us/lands/landmgt/parks/r5/wayne.htm

Metropolis to Brookport

Existing Bikeways and Potential New Routes: Johnson County already contains parts of the American Discovery Trail and US Bike Route 76. The proposed connection between Belknap to Metropolis to Brookport would connect existing greenways with the state's southern border. Depending on additional feasibility studies, the type of bicycle facility could mimic the existing greenways. Alternatively, other options such as on-road facilities could be installed.

Recreational Opportunities: The Tunnel Hill State Trail runs through this area. The Cache River State Natural Area, Fort Massac State Park, and Massac Forest Nature Preserve provide other outdoor recreational facilities.

Corridor Recommendations: East -- West Connections

Sterling -- Chicago

Municipalities along this route include Sterling, Dixon, DeKalb, Geneva, Oakbrook Terrace, and Chicago.

Existing Bikeways and Potential New Routes: Existing bikeways include a bike path near Old Mill Park in Geneva and the Lowell Parkway Trail in Dixon. The corridor would serve as an extension with the American Discovery Trail- North, although the type of bicycle facilities along the proposed corridor would depend on future feasibility studies to assess appropriateness of design features such as required amount of separation from traffic. The proposed corridor also connects to greenways in western Chicagoland and greenways and bike lanes in Chicago. IDOT roads in this corridor's vicinity include IL 38 (the historic Lincoln Highway), which is called Roosevelt Road in Chicago, and State Street new Geneva.

Recreational areas: The corridor could cross Rock River in Dixon and would be close to the DeKalb Nature Trail and the Franklin Creek State Natural Area.

Quad Cities/Rock Island – Peoria

Existing Bikeways and Potential New Routes: Several small towns are included in this corridor including Milan and Orion. The City of Galesburg is home to around 30,000 inhabitants and is located between the Quad Cities and Knoxville, before Interstate 74 continues to Peoria.[5] The Quad Cities/Rock Island touches both the Grand Illinois Trail and the Mississippi River Trail. A number of other planned greenways are planned through Henry County. Peoria, the other node in the proposed corridor has a number of bike lanes within the municipality.

[5] http://www.ci.galesburg.il.us/about/

Recreational Areas: Rock Island Trail, the first rails-to-trails conversion in Illinois is currently 26 miles long and has views of the Illinois River.[6] Peoria County is also a starting point for the Mackinaw Valley Trail. Implementing the proposed corridor would connect the bikeways near Rock Island with the Mackinaw Valley Trail that starts in Peoria. The eastern piece of the proposed corridor would travel east towards Galva until Stark County and beyond.

Bloomington – Champaign -- Danville

Existing Bikeways and Potential New Routes: The Route 66 Bikeway traverses Bloomington/Normal along a northeast/southwest diagonal, as well as bike routes within the municipalities themselves. Illinois State University is located in Normal, which serves as a major origin/destination point. The Constitution Trail also connects Bloomington-Normal for 37 miles.[7] A bikeway corridor between Bloomington-Normal and Champaign would connect these municipalities and areas along the way. It would also enable riders' greater continuity across the state, particularly if the Quad Cities/Rock Island – Peoria corridor is installed along with the Champaign – Indiana border connection. These additions would make the region a central hub for bikeways of various types in addition to the motorists and Amtrak riders that already have connections throughout this area. Connections from Champaign to Danville would improve local bike lanes in Danville and connect these existing facilities with regional options.

Recreational Areas: Recreation areas include opportunities in Mahomet including Barber Park and the Mahomet Village Bike Trail. Farmer City, a small municipality in the region is 12 miles from the Clinton Lake State Recreation Area,[8] known for excellent catfish fishing and boating. The Kickapoo Recreation Area and the Vermillion River are located between Champaign and Danville.

Quincy – Springfield – Champaign -- Danville

The central section of Illinois includes a chain of key municipalities such as Decatur and Jacksonville in addition to those listed above.

Existing Bikeways and Potential New Routes: Quincy in western Illinois has connections with the Mississippi Trail that borders Illinois. Existing greenways offer amenities to riders in Springfield and Decatur in addition to the facilities already described in the section above. The proposed corridor would connect Springfield to the Route 66 Bikeway. Since the corridor traverses the entire state, opportunities for bikeways on IDOT jurisdiction roads are numerous. These include: IL 29, IL 48, IL 41, IL 121, IL 105, and IL 10.

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[6] http://dnr.state.il.us/lands/landmgt/parks/r1/rockisle.htm

[7] http://www.traillink.com/trail/constitution-trail-(bloomington-normal).aspx

[8] http://dnr.state.il.us/lands/landmgt/PARKS/R3/Clinton.htm

Recreational Areas: The Rock Springs conservation Area and Nature Center is located in between Decatur and Springfield. Springfield is a major tourist destination because of its history associated with former US President Abraham Lincoln and because of its role as current state capital. Allerton Park and Retreat Center was voted one of the Seven Wonders of Illinois—it is located 3.5 miles west of Monticello and is associated with the University of Illinois[9]. Kickapoo State Park, near Danville and the Indiana border is a popular destination for its lakes[10].

Effingham – Dennison (Indiana Border)

Existing Bikeways and Potential New Routes: Following US 40/ Old National Highway, or some other route would establish a connection between Effingham and the Indiana border. Effingham and Teutopolis are already connected by paved shoulders and this would create new junctions between towns in the vicinity of Woodbury, Casey, Marshall, and more. The absence of regional bikeways in this area means high opportunity for installing the area's first bikeway facilities, in the form of either on-road or off-road accommodations.

Recreational Areas: The Lincoln Heritage Trail has over 1000 miles of trail through Kentucky, Illinois, and Indiana, part of which is located in Lincoln Trail State Park, near Marshall. [11]

St. Louis – Salem & St. Louis -- Centralia

The area between the space between St. Louis and Salem is characterized by rural areas dotted by small towns such as Lebanon, Trenton, Carlyle, and Odin. Several IDOT roads cross the space, as well: IL 127, IL 161, and IL 157, IL 111, IL 161, to name a few.

Existing Bikeways and Potential New Routes: St. Clair County is planning to add bike lanes, bike routes, and greenways within their borders, to connect to existing facilities including the Mississippi River Trail and the American Discovery Trail. Adding bikeways from St. Louis to Salem and connecting with the Chicago – Marion corridor would connect existing facilities, as well as adding junctions in the central west/ southwest region of Illinois.

A second, parallel corridor would connect St. Louis with Centralia, before continuing to the proposed north-south bicycle artery (Chicago – Marion).

Recreation Areas: The Gateway Arch and the Museum of Western Expansion are popular destinations in St. Louis. Adding bicycle facilities would be an added amenity to destinations along the way and could encourage tourism and connections between and within the two states.

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[9] http:///allerton.illinois.edu/

[10] Dnr.state.il.us/Lands/landmgmt/parks/R3/Kickapoo.htm

[11] Dnr.state.il.us/lands/LandMgt/parks/r3/Lincoln.html

Carbondale -- Harrisburg

Existing Bikeways and Potential New Routes: The area between Carbondale and Harrisburg offers potential to connect two other proposed bikeways. IL 13 is one suggestion for a potential corridor. The connection would connect Harrisburg greenways with connections west to Carbondale, where riders would have access to US Bike Route 76 with bike routes and greenways.

Recreational Areas: The Crab Orchard National Wildlife Refuge, managed by the US Fish and Wildlife Service, in Crab Orchard Estates is located near this proposed connection[12].

[12] http://www.fws.gov/midwest/craborchard/

Bicycling Needs Summary in Illinois and Cost Estimates

Proposed Miles of Bicycle Facilities

Table 2 describes the total proposed mileage as a result of the proposed bicycle network system. The table shows the overall mileage (10,100 miles) of proposed facilities and illustrates mileage displayed in terms of facilities type: greenways/trails (6,300 miles) and on-road bikeways (3,800 miles). The Plan team estimates that 1,558 miles of the system would affect State-jurisdiction roadways. Please note that these numbers depict estimates—the actual resulting figures depend on the amount of actual facilities installed throughout the State.

Table 1 Estimated proposed bikeway miles in Illinois

Need Description	Facility Type	Estimated Needed Mileage
System-wide Estimates	Total Miles of Planned Bikeways	10,100 miles
	Miles Designated as Greenways/Trails	6,300 miles
	Miles Designated as On-road Bikeways	3,800 miles
State-Jurisdiction Roadway Estimates	Miles of Planned On-road Bikeways	1,558 miles

Cost Estimates Per Mile for Selected Facility Types

Table 3 depicts cost estimates per mile according to selected bicycle facilities. When analyzing price estimates, the Department should be aware that the actual prices vary greatly. When pursuing implementation and construction strategies, the Department must be aware that further feasibility studies would reevaluate price estimates. Moreover, the Department should consider the benefit analysis when studying the cost analysis. Many more benefits, besides those depicted fiscally, would accrue based on the development of a statewide bicycle system and improvements to existing facilities.

Table 2 Estimated Construction Cost per Mile of Bikeways (cost estimate sources: Alta Planning + Design, UNC Highway Safety Research Center, Florida DOT)

Facility Type	Price Per Mile
Bike Lanes	$90,000 - $500,000/mi
4' Paved Shoulders	$500,000/mi - $1.5 million/mi
Protected Bike Lanes	$225,000 - $1.3 million/mi
Sidepaths or Greenways	$250,000/mi - $2.5 million/mi

Illinois Bicycling Transportation and Economic Benefits

Introduction

Bicycling is gaining new interest from communities across the United States after decades of neglect when most attention focused on motor vehicle transportation. As fuel prices rise, making short trips by bicycling instead of by car makes sense. However, due to low existing levels of use and funding, bicycling faces an uphill battle to prove its utility as a viable, efficient mode of transportation. Many of bicycling's greatest strengths – such as creating attractive, livable streetscapes and increasing community health through exercise – are not accounted for when evaluating transportation projects. Similarly, many of the external social costs of driving, such as traffic congestion, crashes, and climate change from greenhouse gas emissions, are not sufficiently weighted. Quantifying these factors demonstrates the importance of bicycling transportation and help compare benefits with costs.

The benefits created by bicycling increase with use. For each additional mile traveled by bicycling instead of driving, about one pound of greenhouse gas emissions are prevented, a few less cents are spent on gas, and a person gets a few minutes closer to reaching their recommended healthy levels of physical activity for the week. When bicycling becomes a part of people's daily activity, these benefits add up to create a healthier, more affordable community. To calculate the current benefits of bicycling transportation in Illinois, the first step is to estimate existing levels of use.

Existing Bicycling Demand

User counts and user surveys are the two most commonly used tools for measuring bicycling activity. The following section describes the strengths and weaknesses of each of these tools, and presents a methodology for estimating activity across an entire community.

User Counts

User counts, typically conducted at points across the street network during peak travel hours, capture levels of bicycling activity on street or paths during a short period of time. While user counts can be instructive in comparing relative levels of use between one street and another, they do not fully capture the spectrum of bicycling activity happening across a city, region or state over the length of the year. Counts are well suited to studying where people bike, but do not provide answers to other important questions, such as:

- What destinations are people bicycling to, and where are they coming from?
- How far are they traveling?
- What is the purpose of their trip?
- How often do they make similar bicycling trips?
- How often do they make other kinds of bicycling trips?
- Do other residents also make similar types of trips by bicycling, or do they typically travel by another mode?

Therefore, while user counts are a good tool for measuring bicycling at a certain location, user surveys are needed to estimate the overall role of bicycling in the transportation patterns of residents across Illinois.

User Surveys

Transportation user surveys often ask respondents about their perceptions – e.g., their feeling of safety on a street – and about their usual travel behavior. The American Community Survey (ACS), an ongoing survey conducted by the US Census Bureau, collects social, economic and demographic information from respondents, and includes a question on respondents' commute to work. Sampling over 250,000 households per month, the ACS is the largest survey that asks Americans about their transportation habits, and the most widely available source of bicycling and other commute data in communities. According to the 2007-2011 ACS, about 0.5% of workers in Illinois bicycle to work, while 73.6% drive alone to work. These percentages are known as commute mode share; the percentage of the population making their journey to work by a certain mode of transportation compared to all modes.

Although commute mode share data is able to capture wider information about bicycling than user counts alone, work commutes are just one type of trip. Illinois residents make many other types of trips (to school, shopping, etc.) by a variety of modes. Detailed household travel surveys can provide more information on travel patterns and help measure the full spectrum of bicycling trips happening in the state.

Household travel surveys are usually conducted by phone and include a travel diary in which respondents are asked to record all their trips during a 24-hour period. Information on the qualities

of each trip is collected, including the trip purpose, time of day, duration, length, mode, and more. By collecting this data from a large sample of people across the population, household travel surveys can provide information on where, why, and how far people are bicycling for transportation. Though a recent household travel survey is not available for Illinois, national data from the 2009 National Household Travel Survey (NHTS 2009) can be used to estimate the number of other types of bicycling trips being made in addition to work trips.

Estimating Overall Activity

Overall bicycling activity can be estimated by combining available local data such as ACS commute mode share with national trip purpose information from NHTS 2009. On average, 1.6 utilitarian bicycle trips are made for every bicycle-to-work trip in the United States (**Error! Reference source ot found.** below). A utilitarian trip is one that serves a purpose, as opposed to for recreation or exercise.

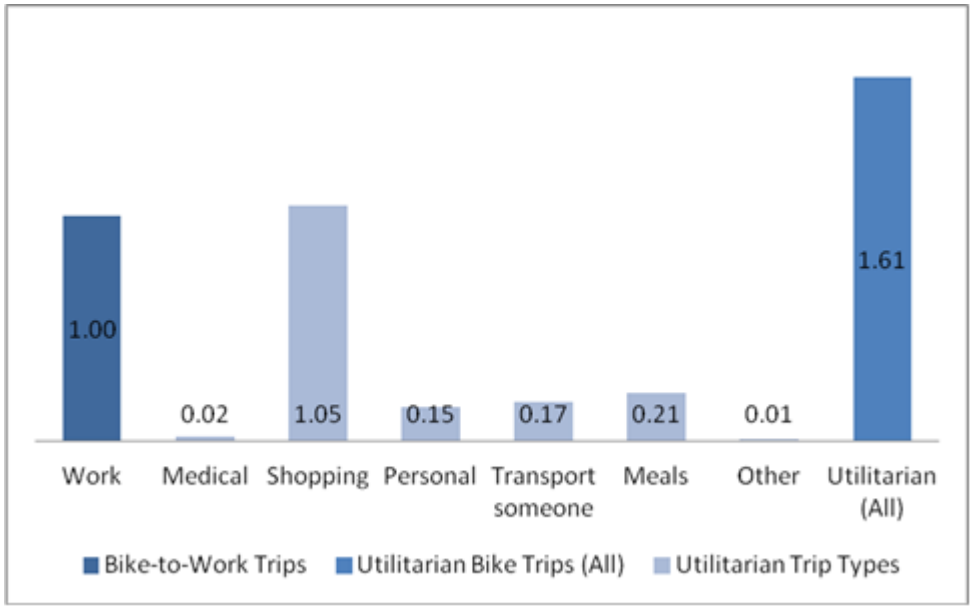


Figure 1. Ratio of Bicycle Commute Trips to Utilitarian Bicycle Trips (NHTS 2009).

Student commute trips to school are estimated independently of ACS data, because the populations making those trips are substantially different from the employed workforce surveyed by ACS. National baseline K-8 school trip data from Safe Routes to School (SRTS) is used to estimate mode share for K-12 school trips.

For each type of trip, average trip distance and vehicle trip replacement multipliers are applied to estimate the total distance traveled by bicycling and resulting vehicle miles traveled (VMT) reduced. National average trip distance multipliers are sourced from NHTS and SRTS, ranging from 0.77 miles

for a K-12 bike to school trip to 3.54 miles per adult bike commute trip. Vehicle trip replacement multipliers assume that for each bicycling trip, the chance of bicycling replacing another mode for that trip is equal to the mode share of that mode among non-bicycling modes. Vehicle trip replacement multipliers are calculated independently using the mode split for each trip purpose available. For example, commute trip mode split is used for commute vehicle trip replacement, and college trip mode split is used for college vehicle trip replacement. Single-occupancy vehicle trip equivalents are used to estimate VMT reduction; replaced carpool trips are weighted at 50% of a replaced single-occupancy vehicle trips.

Figure 1 provides a visual depiction of the steps used to translate local and national transportation data into an annual estimate of bicycling activity currently happening in Illinois.

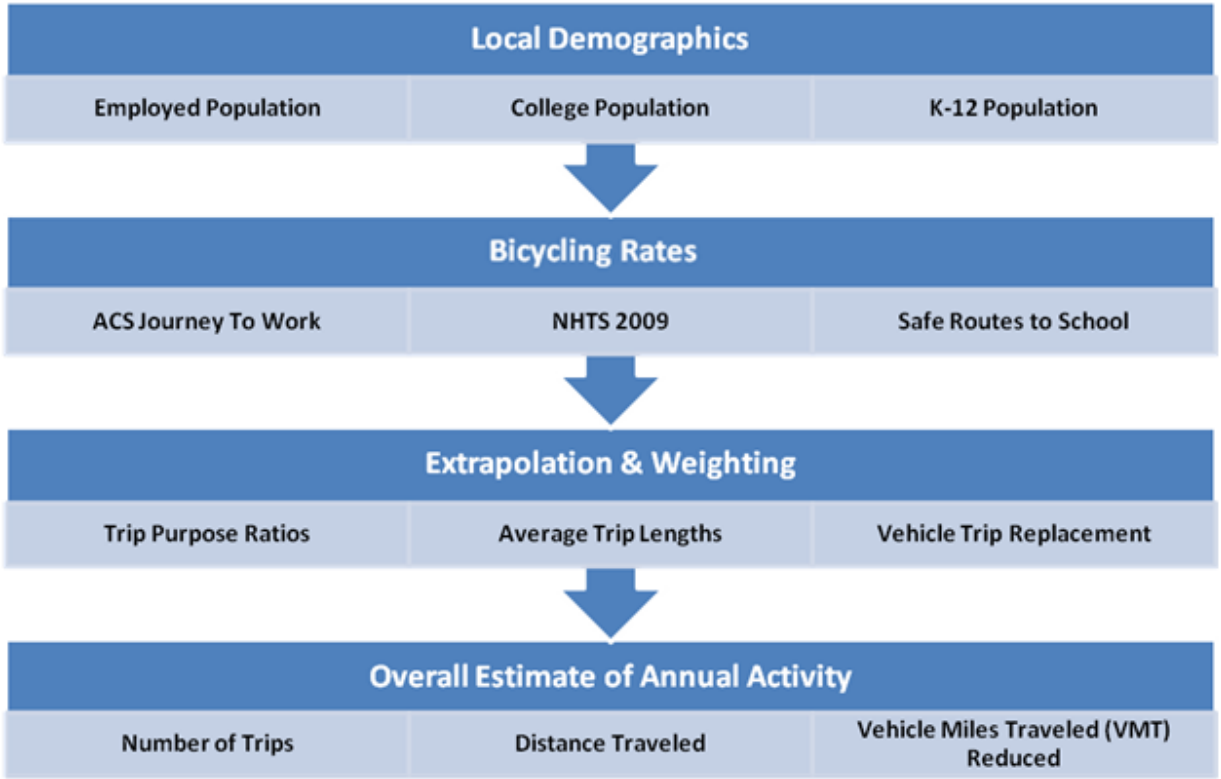


Figure 1. Illinois Overall Bicycling Activity Estimate Methodology.

Estimating Bicycling Benefits

Benefits of bicycling are based on the number of regular bicycle transportation users and miles traveled developed in the overall demand estimate. Numerous studies have estimated the dollar value of the benefits of bicycling such as reduced pollution from the reduction of vehicle travel, improved health from increased physical activity, and other benefits (see Table 2). Using figures

from these studies, overall levels of bicycling transportation activity can be expressed in terms of their dollar value to local residents and the community at large.

Table 3. Bicycling Activity Estimate

Category	Factor/Multiplier	Value	Source
Trip Purpose Extrapolation			
	Commute Trip Bike Mode Share	0.5%	ACS 2007-2011
	College Trip Bike Mode Share	1.7%	NHTS 2009
	K-12 Trip Bike Mode Share	1.0%	SRTS 2009
	Commute Trip to Utilitarian Trip Multiplier	1.6	NHTS 2009
Annual Trip Extrapolation			
	Annual Work Days	251	261 weekdays minus 10 Federal holidays.
	Annual College Class Days	150	Assumes two 15-week semesters/three 10-week quarters, with classes every weekday.
	Annual K-12 School Days	176	Illinois state minimum (Education Commission of the States, 2011)
Annual Vehicle Trips Replaced by Bicycling			
	Commute Vehicle Trip Replacement	78.6%	ACS 2007-2011 (SOV-equivalent, weighted drive alone/carpool rates)
	College Vehicle Trip Replacement	81.5%	NHTS 2009 (SOV-equivalent, weighted drive alone/carpool rates)
	K-12 Vehicle Trip Replacement	42.6%	SRTS 2009 (SOV-equivalent, weighted drive alone/carpool rates)
Annual Vehicle Miles Traveled Reduced			
	Commute Bike Trip Distance	3.54	NHTS 2009
	College Bike Trip Distance	2.09	NHTS 2009
	K-12 Bike Trip Distance	0.77	SRTS 2009
	Utilitarian Bike Trip Distance	1.89	NHTS 2009

Table 4. Bicycling Activity Benefits Multipliers

Category	Factor/Multiplier	Value	Source
Emissions Reduction (pounds per VMT)			
	Hydrocarbons	0.00300	EPA 2007
	Particulate Matter	0.00002	EPA 2007
	Nitrous Oxides	0.00209	EPA 2007
	Carbon Monoxide	0.02734	EPA 2007
	Carbon Dioxide	0.81351	EPA 2007
Reduced Cost of Emissions ($ per ton)			
	Volatile Organic Compounds	$1,700	EPA 2007
	Particulate Matter	$168,000	EPA 2007
	Nitrous Oxides	$4,000	EPA 2007
	Carbon Dioxide	$36.93	EPA 2007
Other Reduced Vehicle Externalities			
	Traffic Congestion	$0.08	AAA, 2008
	Vehicle Crashes	$0.20	AAA, 2008
	Road Maintenance Costs	$0.15	Kitamura, Zhao & Gubby, 1989
Vehicle Operating Costs ($ per VMT)			
	Operational Std. Mileage Rate	$0.57	IRS, 2013
Health Benefits			
	Physically Inactive Population	28.0%	Illinois, 2010 BRFSS (CDC)
	Reduced Healthcare Costs/ Newly Active Person	$585.97	Wang, McDonald et al, 2012

Existing Bicycling Activity Compared with Peer States

Rates of bicycling in Illinois, as measured by commute mode share, are roughly in line with the national average around 0.5%. However, Illinois peer states (profiled in depth in Tech Memo 2: Policies, Procedures and Regulations) all have rates of bicycling notably higher than Illinois and the national average. At 2.1% bicycle commute mode share, Oregon has the highest rate of bicycling in the US, sharply increased from levels in 1990 and 2000. These comparisons illustrate that bicycling rates in Illinois have the potential to grow a significant amount in the next 20 years, and provide a feasible range of rates for goal setting.

Table 5. Illinois Commute Mode Share Compared with Peer States.

State	Drive Alone	Carpool	Transit	Bicycle	Walk	Other	Work at Home
Illinois	73.6%	9.1%	8.7%	0.54%	3.1%	1.0%	3.9%
Minnesota	77.8%	9.2%	3.4%	0.73%	3.0%	0.9%	5.0%
Oregon	72.0%	10.8%	4.2%	2.09%	3.9%	1.0%	6.1%
Wisconsin	79.8%	9.3%	1.8%	0.72%	3.4%	1.0%	4.0%

Key Findings of Existing Bicycling Benefits Analysis

Although current levels of bicycling in Illinois are roughly similar to national averages, local use of active transportation returns significant benefits to the state in the form of improved air quality, reduced transportation costs, and improved health. Frequently, most people do not recognize these factors in their daily routines. Using the VMT reduction estimated in the previous section and the multipliers described in Table 3 and

Table 4, existing rates of bicycling transportation are estimated to generate over $100 million in economic benefits per year for Illinois.

Table 6. Illinois Estimated Annual Bicycling Benefits

Category	Benefit	Estimated Value
Annual VMT Reduced		
	Annual VMT Reduced	**93,312,000**
Air Quality		
	CO2 Emissions Reduced (pounds)	**75,910,000**
	Other Vehicle Emissions Reduced (pounds)	**3,028,000**
	Total Vehicle Emissions Costs Reduced	**$2,205,000**
Social Benefits		
	Reduced Traffic Congestion Costs	**$7,595,000**
	Reduced Vehicle Crash Costs	**$18,532,000**
	Reduced Road Maintenance Costs	**$13,997,000**
Individual Benefits		
	Household Vehicle Operation Cost Savings	**$52,721,000**
	Health Care Cost Savings from Physical Activity	**$7,866,000**
Total Monetized Benefits		***$102,916,000***

Potential Future Benefits

Estimating current bicycling benefits in Illinois shows that active transportation is a boon to the health and economy of the state. Future growth in bicycling would generate economic, environmental and health benefits greater than the current estimate of $100 million in annual benefits to the state. Using peer states as to establish a range of reasonable goals for statewide increases in bicycling, as measure by commute mode share, Illinois could potentially capture an additional $150 million in annual benefits by increasing bicycling rates by 150%, an increase similar to what Oregon has experienced over the last two decades. A more modest midterm goal of increasing bicycling rates by 40% over current levels would bring bicycle mode share in Illinois up to a rates similar to peer states Minnesota and Wisconsin. Table 7 provides monetized annual estimates of the benefits of bicycling at these two example increased rates.

Table 7. Potential Future Illinois Annual Bicycling Benefits

Benefit	Current: 0.54% bike commute mode share	Mid Term Goal (40% increase): 0.75%	Long Term Goal (150% increase): 1.34%
Annual VMT Reduced	$93,312,000	$130,640,000	$233,280,000
CO_2 Emissions Reduced (pounds)	$75,910,000	$106,270,000	$189,780,000
Other Vehicle Emissions Reduced (pounds)	$3,028,000	$4,239,000	$7,570,000
Total Vehicle Emissions Costs Reduced	$2,205,000	$3,090,000	$5,510,000
Reduced Traffic Congestion Costs	$7,595,000	$10,630,000	$18,990,000
Reduced Vehicle Crash Costs	$18,532,000	$25,940,000	$46,330,000
Reduced Road Maintenance Costs	$13,997,000	$19,600,000	$34,990,000
Household Vehicle Operation Cost Savings	$52,721,000	$73,810,000	$131,800,000
Health Care Cost Savings from Physical Activity	$7,866,000	$11,010,000	$19,670,000
Total Monetized Benefits	*$102,916,000*	*$144,080,000*	*$257,290,000*

The potential benefits of increased bicycling rates in Illinois make a strong case for increased investment in active transportation infrastructure. By stimulating increased use, the new bicycling facilities proposed in this plan could become valuable assets that improve the health, affordability and livability of Illinois.

Section II- Network Recommendations
Chapter 3- The Relationship of IDOT Roads and Local Bikeway/Pedestrian Networks

Chapter 3- The Relationship of IDOT Roads and Local Bikeway/Pedestrian Networks

A key goal of bicycle planning is to provide safe, efficient, comfortable bicycling options for people of varied ages and abilities. Local bikeway plans often include a bikeway network - a grid of existing and proposed on and off-road routes that serve key destinations, such as schools, employment centers, commercial centers, recreation areas, transit, and neighboring communities. The examples in this section show how State-jurisdiction roadway projects can affect local access issues, such as:

- Safe Routes to School corridors that intersect State routes
- Travel to, within, and through downtown areas
- Barriers, such as highways, rivers, and railroad tracks.
- Connectivity to destinations beyond municipal boundaries

The need to safely and comfortably facilitate bicycle and pedestrian transportation while concurrently accommodating regional motor-vehicle transportation needs exists on and across State-jurisdiction roadways in communities throughout Illinois. This section uses the City of Effingham and its Bicycle Master Plan to highlight typical relationships between local bicycle and pedestrian networks and State-jurisdiction roadways. The intent is to show how local bicycle and pedestrian planning efforts can assist in identifying where it is most important to consider these users in roadway design within communities, and what design considerations should be made in project development.[1] This section of the Plan is divided into the following topics:

- Local bicycle planning and its relationship with the statewide roadway network
- Relationship between State routes and Safe Routes to School plans
- Bicycle and pedestrian access to and within downtown
- Access across barriers
- Connections beyond municipal boundaries

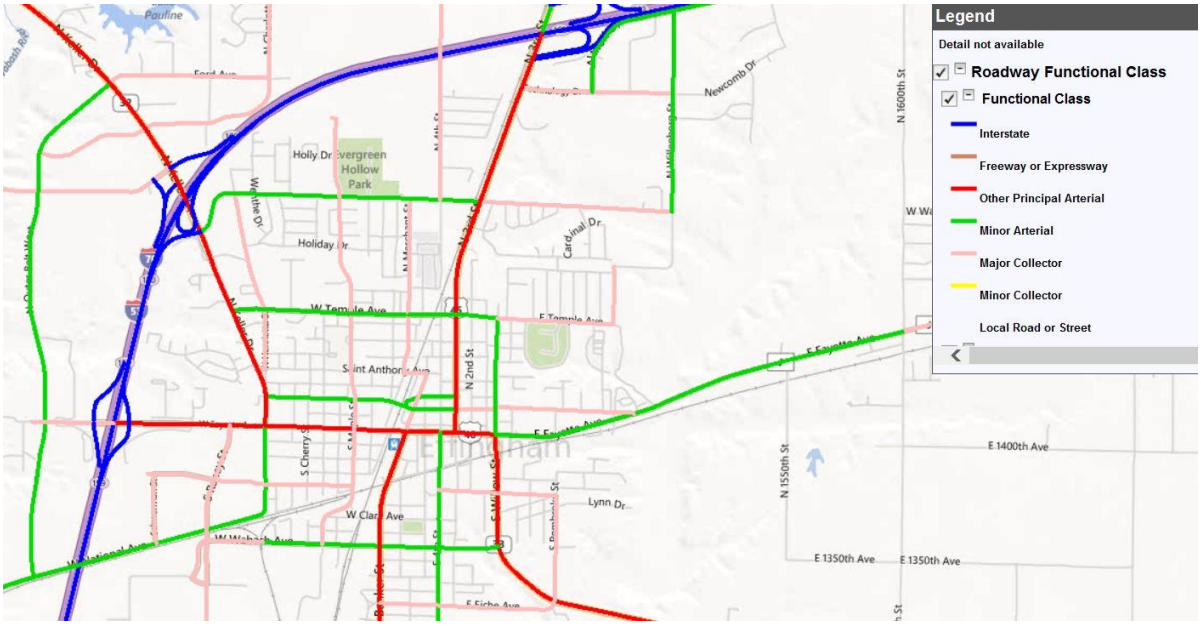
[1] In areas that lack a bicycle plan, or have an outdated plan, the State might need to play a larger role in determining bicycle needs and opportunities. Similarly, roads and/or corridors not included in a planned bicycle network should still be designed within a Complete Streets framework.

Local Bicycle Planning and Its Relationship with the Statewide Roadway Network

> *The City of Effingham is a thriving, growing community in central Illinois. Situated at the convergence of major highways and railroads, the city takes pride in being the "crossroads of opportunity." Just as those transportation options have contributed to Effingham's success in the past, improving conditions for pedestrians and cyclists will ensure that residents and visitors have even more choices for getting around in the future—from children walking to school, to adults biking for errands, to retirees using the trails to stay active.*
>
> *--From Introduction of Effingham's Bicycle Master Plan, adopted in 2011*

Effingham is a small city in central Illinois with a population of 12,328, according to the 2010 census. First settled in 1814, it evolved into a key junction for two major rail corridors; Amtrak's City of New Orleans line still makes daily stops. I 57 and I 70 merge on the northwest side of Effingham, and several major highways and arterials traverse it.

- US 45 (3rd Street to the north; Banker Street to the south)
- US 40 (Fayette/National, leaves Fayette west of US 45)
- IL 32 (Keller until just south of I 57/70)
- IL 33 (Keller, north of I 57/70; Willow, south of Fayette)

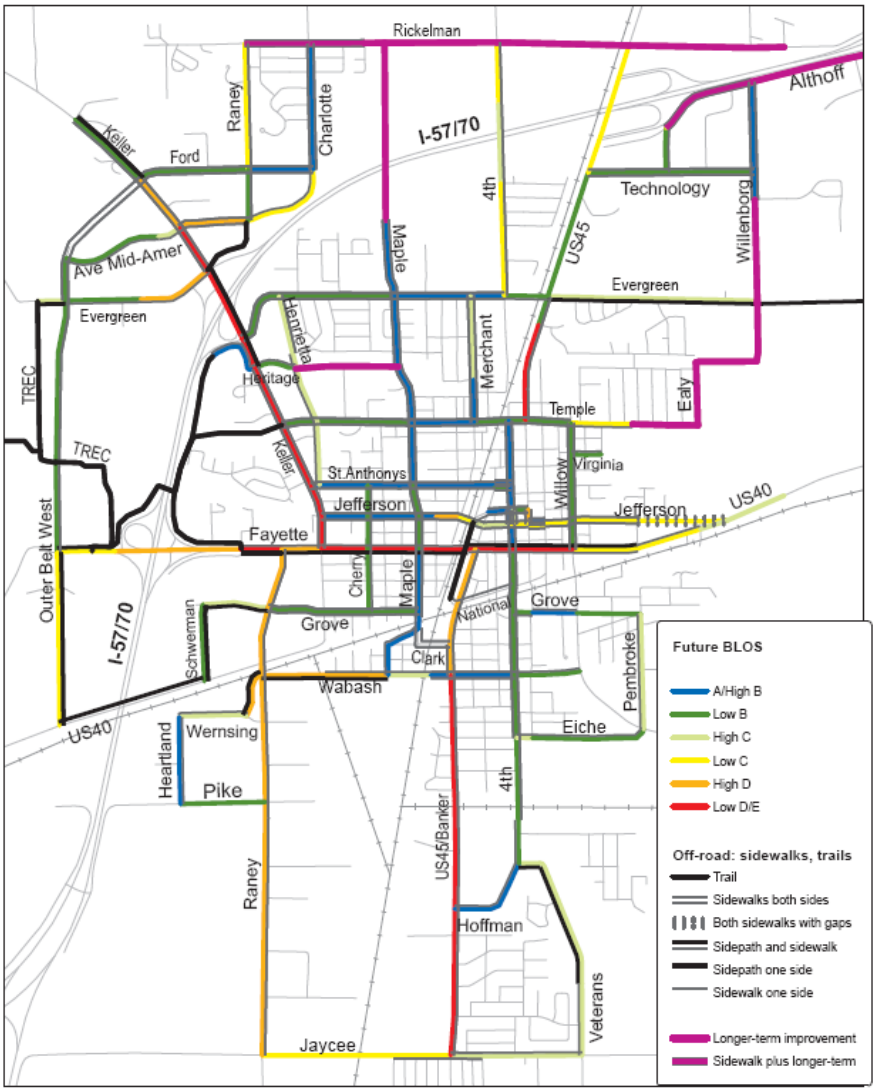


Major roads serving Effingham, IL. Source: www.gettingaroundillinois.com

While these transportation corridors facilitate the movement of goods and people within and through Effingham, they can also act as barriers to bicycling and walking. For example, travel along

and across major arterials can be intimidating, especially for children or those with mobility impairments. Limited crossing opportunities along I 57/70 and rail lines can add distance to trips and necessitate travel on the types of arterials mentioned above. To the east, open land and Salt Creek separate Effingham from its neighbor, Teutopolis (3.93 miles away); there are only a few roadway connections between the two communities.

In 2011, the City of Effingham adopted a Bicycle Master Plan, authored by the League of Illinois Bicyclists, in part to identify the most critical barriers and create a list of short, medium, and long term projects to address these. Effingham County also has a trail plan, reflected in the map below and discussed later in this paper. The examples in the following sections show how a community's bikeway network and priorities can relate to State-jurisdiction roadways, and provides examples of how the State roadway network can better facilitate bicycling in local contexts.



City of Effingham's Map of Future Conditions: Sidewalks/Trails and On-Road Comfort (BLOS), per its 2011 Bicycle Master Plan (Image Source: Effingham Bicycle and Pedestrian Plan, 2011)

Relationship between State Routes and Safe Routes to School Plans

Local bicycle plans often address the travel needs of children, especially for school-based trips. These Safe Routes to School (SRTS) efforts usually include the development of a walking or bicycling network for children travelling to school and strategic walking and bicycling improvements within this network. Preferred roads typically have low to moderate speeds, sidewalks, and intersections with crossing improvements at busier streets. Directness of the route is also a priority. State facilities that intersect SRTS or provide critical access to schools should be particularly sensitive to the needs of these vulnerable travelers.

The City of Effingham is bisected on a north-south axis by US 45 (S. Banker Street/3rd Street), as well as on an east-west axis by US 40 (Henrietta Street/Fayette Avenue). Given that the elementary, junior and high schools are located on the far southwest corner of the community, students walking or biking to any of these three schools must cross at least one, if not both, of these State routes.

Effingham's 2011 Bicycle Plan includes a section focused on Safe Routes to School. Drawing from stakeholder input and on-site analyses of infrastructure and behavior, the Plan identifies key transportation challenges related to schools, such as:

- highway and railroad crossings
- lack of walking and bicycling facilities
- negative driver behavior
- bullying
- travel distance

Effingham's proposed bicycle network includes several corridors that could function as high priority routes for travel by children and families. Many of these corridors cross at least one State route. The Plan provides design and operational guidance to upgrade these key intersections so they meet the needs of traveling school children.[2]

[2] Extra care should be taken in roadway design along identified SRTS routes due to the unique traits of children. These include (but are not limited to): the ability to anticipate speed, impulsivity, balance and traveling in groups.

Safe Route to School Case Study - Fayette Avenue (IL 33) and Cherry St.

Four of Effingham's schools are in close proximity on the southwest side of Effingham. Rail lines, US 45, US 40, and IL 33 can be barriers to cycling and walking for those living to the east and/or north.

Fayette Avenue (US 40/IL 33) is a four lane arterial that provides access across US 45 and under a rail corridor, linking the east side of Effingham to the west, where four schools are located--including two high schools. It also provides one the few crossings of I 57/70, which connects Effingham to Effingham County's existing and planned trail system, discussed later.

Three identified north-south Safe Routes to School intersect Fayette. The two closest to the southwest side schools, Cherry Street and Maple Street, cross Fayette where the average daily traffic (ADT) ranges from 16,200 to 20,400. Due to the proximity of the schools, as well as other trip generators and destinations, designs that improve conditions for bicycling and walking at these intersections should be a priority.

Regarding the intersection of Cherry and Fayette, the Plan notes positive existing features, such as the striped crosswalk and flashing school crossing light, but determines that they are not sufficient. Recommendations include installation of traffic signals and pedestrian refuge islands. Other design and operations strategies that can facilitate safe, comfortable crossings include, but are not limited to:

Median refuge islands

Bulb outs

High visibility crosswalks

Signalizing intersections and signal timing techniques (bicycle/pedestrian interval or extended pedestrian phase)

Rapid Rectangular Flashing Beacons

Pedestrian Hybrid Beacon

Road diets

before

after

Roundabouts

Resources on these design features can be found presented in Chapter 3 – Design Recommendations. Many resources on these concepts can be found through resources such as the CNU/ITE Walkable Urban Thoroughfares Guide.[3]

In addition, Maple St. is offered in the Plan as an alternative for signalization. However, alternate solutions or corridors should only be used as a last resort in pedestrian or bicycling planning as even small detours can add significant travel time for non-motorized users. This may have the unwanted effect of either deterring potential walkers and bicyclists or causing users to utilize less safe "shortcuts." Ideally, all intersections near schools should accommodate bicycling and walking to the fullest extent feasible.

The image below shows the intersection of Cherry St and Fayette Ave where all these treatments could likely be applied. West Side Grade School is located at the southwest corner of the intersection.

[3] (http://contextsensitivesolutions.org/content/reading/designing_walkable_urban_thorou/resources/Walkable_Urban_Thoroughfares_ITE_CSS.pdf/

State Route Adjacent to Schools, and Alternatives Case Study - Fayette Avenue, Grove Avenue, and Jefferson Street

Effingham's SRTS network includes Grove Street, which runs east-west ¼ mile south of Fayette. Along with nearby residential streets, Grove provides child-friendly access to the concentrated area of schools discussed above. Jefferson, though not a designated Safe Route, is in the planned bicycle network and provides an east-west alternative just to the north of Fayette.

Fayette is not designated as a Safe Route to School likely due to factors such as the volume of traffic, including trucks, and the lack of room for on-road cycling; the Bicycle Level of Service is D/E (the lowest score) at the time of the Plan's creation. While several alternate routes are present in the vicinity of Fayette Ave, Fayette is identified as a recommended corridor in the proposed bicycle network likely due to its connectivity to schools, downtown Effingham, and across barriers such as the railroad and I 57/70. The presence of nearby alternatives reduces the need for bicycle and pedestrian through travel along Fayette, but the need for access over barriers and direct access to destinations along Fayette Ave still remains.

Currently Fayette provides basic walking accommodations. The bicycle network shows that a sidepath is proposed for Fayette, but also recommends consideration of bicycle lanes, given the frequency of intersections along the corridor. Because of these recommendations and existing ROW restrictions, this corridor might be a good candidate for protected bike lanes or cycletracks. Protected bike lanes are essentially hybrids between bicycle lanes and sidepaths – they offer many of the good qualities of both sidepaths (more comfortable for the majority of bicyclists, more separated from traffic) and bike lanes (better designs at intersections, better visibility for bicyclists/motorists). If designed according to the Complete Streets principles recommended in this Plan's recommendations Section III, Fayette will improve necessary walking and bicycling access to schools, businesses, and other destinations along the corridor.

Protected bike lanes in Chicago, IL

Bicycle and Pedestrian Access to and Within Downtown

Even though downtowns across Illinois vary in size and character, they typically have similar design and transportation needs, such as:

- Maintaining community identity and preserving historic features,
- Ensuring access to local businesses and institutions for employees, customers, and deliveries,
- Providing for and/or promoting walking and cycling--transportation options well-scaled to denser, mixed-use parts of a community,
- Facilitating transit use, and
- Accommodating through travel while minimizing environmental impact

State routes that provide access to and through downtown areas should be designed and operate to address these needs, especially when they also function as a community's "Main Street"

Downtown Effingham is home to small businesses, restaurants, public agency buildings, an Amtrak station, the historic County Court House, and a substantial amount of public greenspace. As with many pre-World War II towns and cities, the majority of its street network is compact and on a grid. Effingham's Bicycle Plan identifies local roads that are currently or potentially well suited to be preferred bicycle routes for access to and within downtown. Two State routes also traverse the downtown network.

Our Main Streets tell us who we are and who we were, and how the past has shaped us. We do not go to bland suburbs or enclosed shopping malls to learn about our past, explore our culture, or discover our identity. Our Main Streets are the places of shared memory where people still come together to live, work, and play.
www.preservationnation.org/main-street/

ILLINOIS
MAIN STREET

State Route and Local Downtown Street Case Study - 3rd Street (US 45) and Jefferson Street

Jefferson Street, a local road, runs through Effingham's downtown and boasts a range of civic, retail, and dining destinations. The four intersections at Jefferson between Banker Street and 3rd Street (US 45) feature pedestrian friendly treatments such as bulbouts, crosswalks, and curb ramps. A midblock crossing between 4th Street and 3rd/US 45 provides convenient access to the County Courthouse.

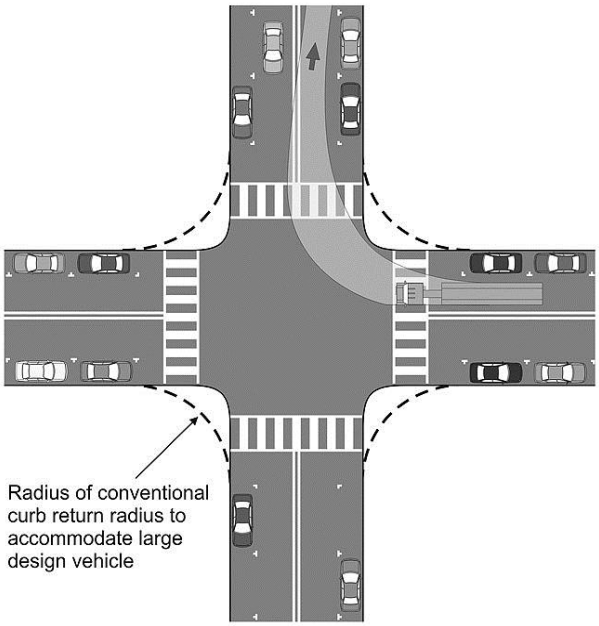
Intersection of Jefferson Ave and US 45

The intersection of Jefferson and 3rd shows how a State route can be more sensitive to a downtown setting. The west leg has bulbouts, similar to the east leg of 4th Street crossing one block to the west. Advantages of bulb-outs are that they minimize crossing distance for pedestrians, and discourage speeding. The corners fronting 3rd/US 45 are consistent with other downtown intersections; in this case, the absence of features typically associated with truck routes and major arterials, such as wide turning radii, helps maintain the area's character.

However, targeted improvements could still improve the bicycle and pedestrian friendliness of this intersection. These could include, high visibility crosswalks, street lighting, additional landscaping, dual curb ramps set back from the intersection (similar to 4th Street intersection), and/or signage or the installation of a Rapid Rectangular Flashing Beacon at the mid-block crossing. If the intersection were signalized, a leading pedestrian interval, longer pedestrian crossing intervals, and accessible pedestrian signals would be considered best practices for signalized pedestrian crossings.

3rd Street and Fayette Ave Intersection

While not an issue at this particular location, another common issue for pedestrians and bicyclists at intersections are large curb radii and free right-hand turning movements. Smaller curb radii reduce crossing distances and slow cars around turns, making for a safer walking/bicycling environment. Just a block and a half south at the intersection of 3rd Street and Fayette Ave (both State-jurisdiction roadways) is an example of an intersection with very wide curb radii – likely designed to facilitate truck turns to and from state routes. While somewhat larger radii may be necessary to accommodate trucks at locations such as this, certain design measures such as smaller curb-radii that allow for some truck lane encroachment in turning coupled with stop-bar setbacks, mountable or painted curb-extensions, and/or the use of median or non-free-right pork-chop pedestrian refuges, would improve safety and comfort for pedestrians and bicyclists.



Smaller curb radii w/ allowable encroachment. (image source: ITE)

Mountable curb extension. (image source centralseattlegreenways.com)

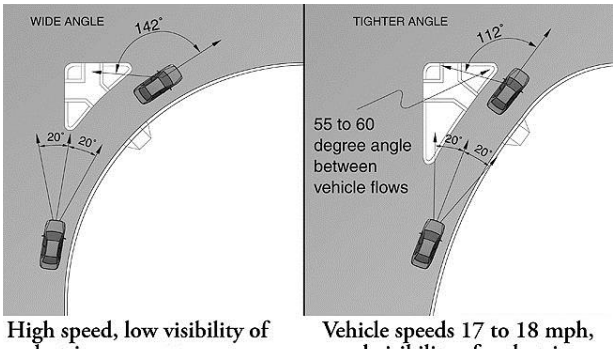
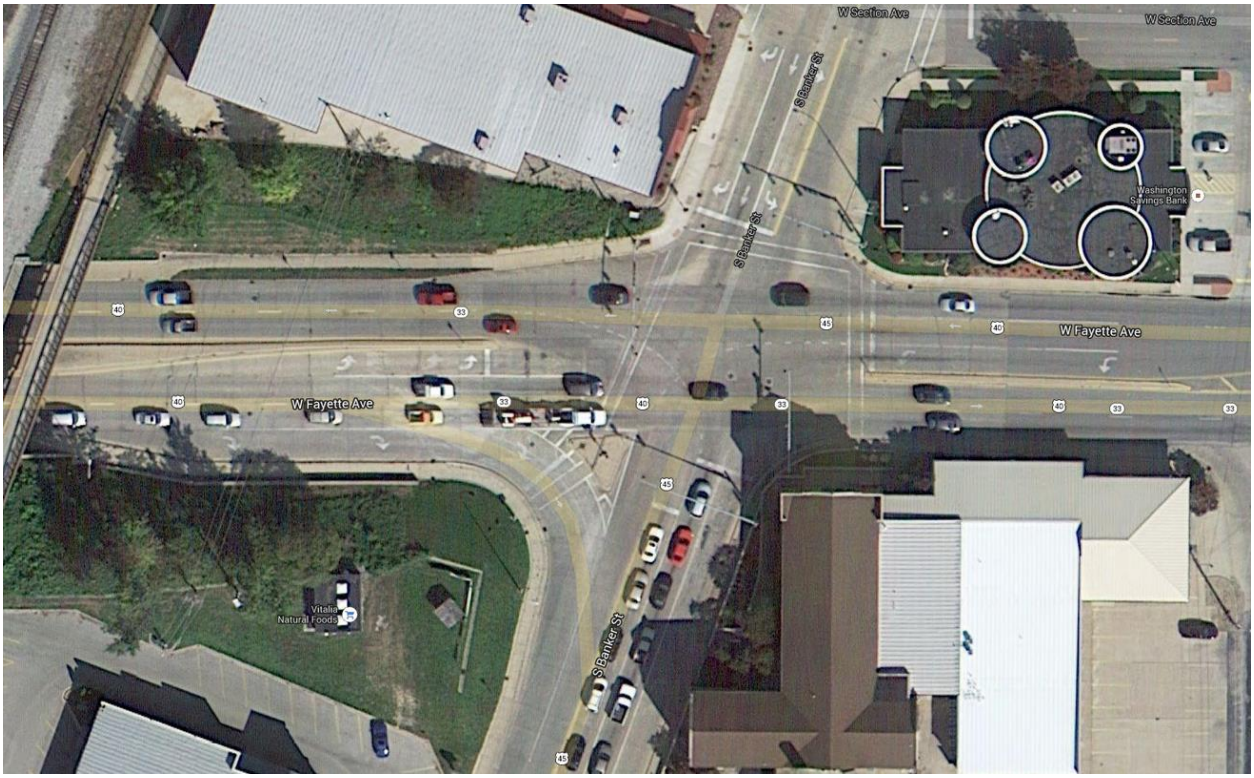


Figure 8 – non-free-right pork-chop pedestrian refuges. (image source: ITE)



Intersection of Fayette Ave and Banker Street

Banker St and Fayette Avenue represent another intersection in Downtown Effingham that would benefit from bicycle and pedestrian improvements. The Effingham Bicycle Plan recommends sidepaths along Fayette Avenue and labels the project as "medium" priority. Current conditions for pedestrians include standard crosswalks across all parts of the intersection (where crossings are present). The southwestern corner includes a pork chop island.

Pedestrian island refuges with mountable noses provide many benefits for pedestrians

In addition to the aforementioned improvements, median island refuges would benefit this intersection by calming turning traffic and providing a waiting space for pedestrians who are not able to cross the full length of the crossing in one signal phase. Additionally, mountable noses would help slow traffic as well (see photograph above). High-visibility crosswalks benefit all intersections.

Finally, there is no pedestrian crossing on the south side of the street – if someone wanted to cross this leg of the street legally, they would have to cross three times to accomplish this. Crossings

should always be provided where a potential pedestrian destination exists on that side/corner of the street.

If bicycle lanes, or protected bicycle lanes were present or added along these corridors, this would be a prime example of an appropriate place to incorporate bicycle intersection markings. These markings serve functions such as highlighting potential points of conflicts with bicycle traffic through and intersection or at locations of turning movements; bike boxes and two-stage turn boxes provide visible waiting spaces for bicyclists attempting to make a left-turn. The NACTO Urban Bikeway Design Guide[4] provides ample guidance on best practices for these facilities.

An example of bicycle intersection markings in Missoula, MT

Mid-block Crossings

Mid-block crossings are also an important consideration along many state-jurisdiction roadways. A good example of this lies in nearby Teutopolis along Main Street/US40. Along the east side of the corridor, mid-block crossings are frequently provided providing good pedestrian access (see below).

Mid-block crossings in Teutopolis, indicated by red circles

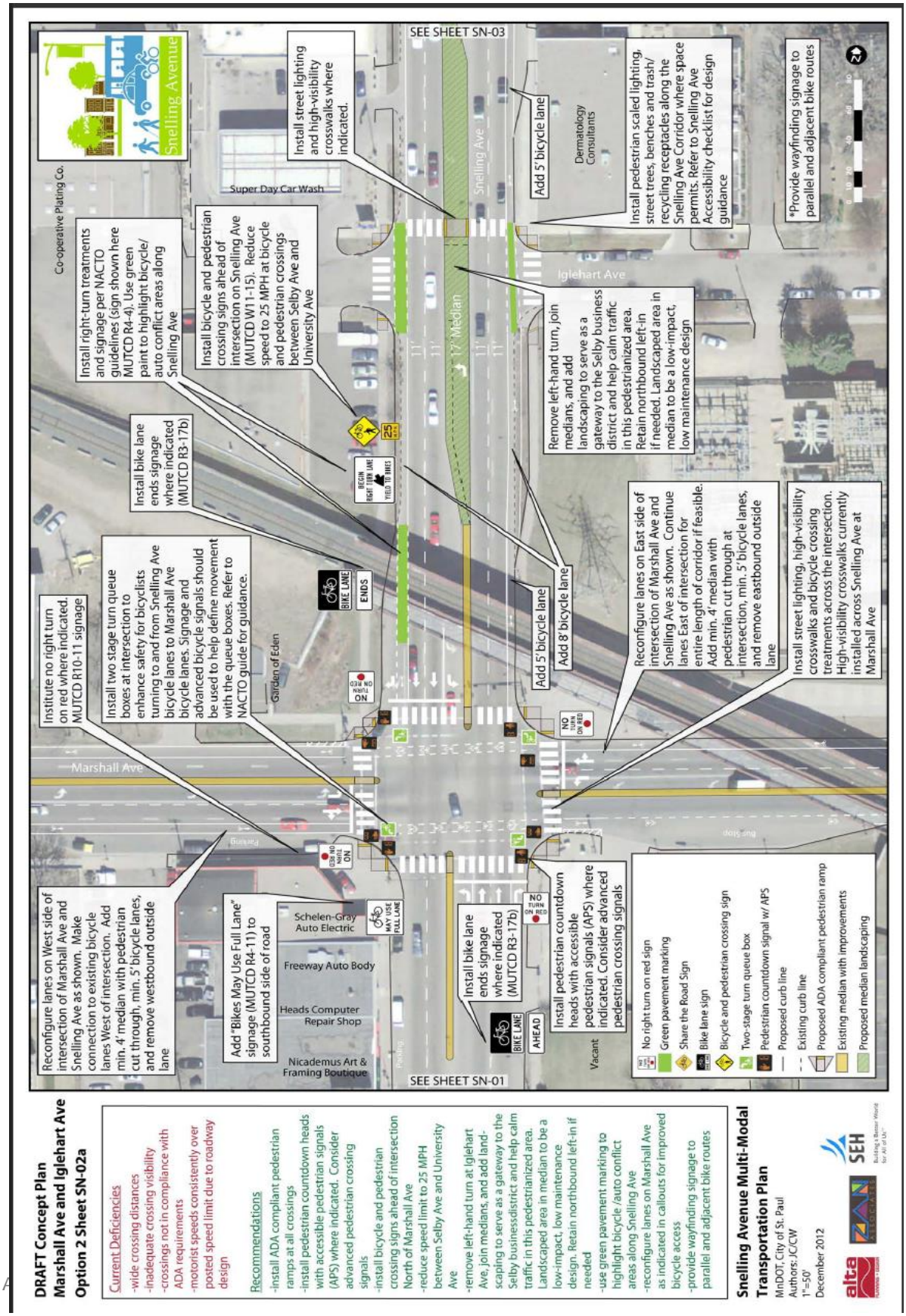
[4] http://nacto.org/cities-for-cycling/design-guide/intersection-treatments/

However, west of the intersection with Pearl Street, no crossings exist for pedestrians for over ¾ of a mile in spite of businesses and residential areas being located on either side of the street. This plan recommends that pedestrian crossings be provided at minimum every ¼ mile in areas where pedestrian travel is warranted. At minimum, High-visibility crosswalks and signage should be included in these locations. Locations where pedestrians must cross more than 2 lanes of traffic should include pedestrian refuges and/or Pedestrian Hybrid Beacons. Further guidance on mid-block crossings can be found in the CNU/ITE Walkable Urban Thoroughfares Guide.[5]

The figure on the following page shows several of the concepts mentioned in this section applied to an urban arterial in St. Paul Minnesota.

5 http://contextsensitivesolutions.org/content/reading/designing_walkable_urban_thorou/resources/Walkable_Urban_Thoroughfares_ITE_CSS.pdf/

MnDOT Snelling Ave. Improvements



Access Across Barriers

Natural and built barriers can create challenges to bicycle and pedestrian travel. While long-distance and recreational cyclists might be willing to travel a mile out of their way to reach their destination, those commuting to work or shopping tend to place a great value on route directness. Often, the shortest (and sometimes only) route options, such as bridges, underpasses, tunnels, and major arterials, can be uncomfortable and dangerous for riding or walking—even for those who are most skilled and confident. This can be a deterrent to many considering active transportation.

Typical barriers include:

- Rivers
- Forest preserves, large parks, and other open spaces
- Railroads
- Limited access highways
- Major arterials
- Large scale land uses, such as intermodal facilities, farms, cemeteries, and athletic fields

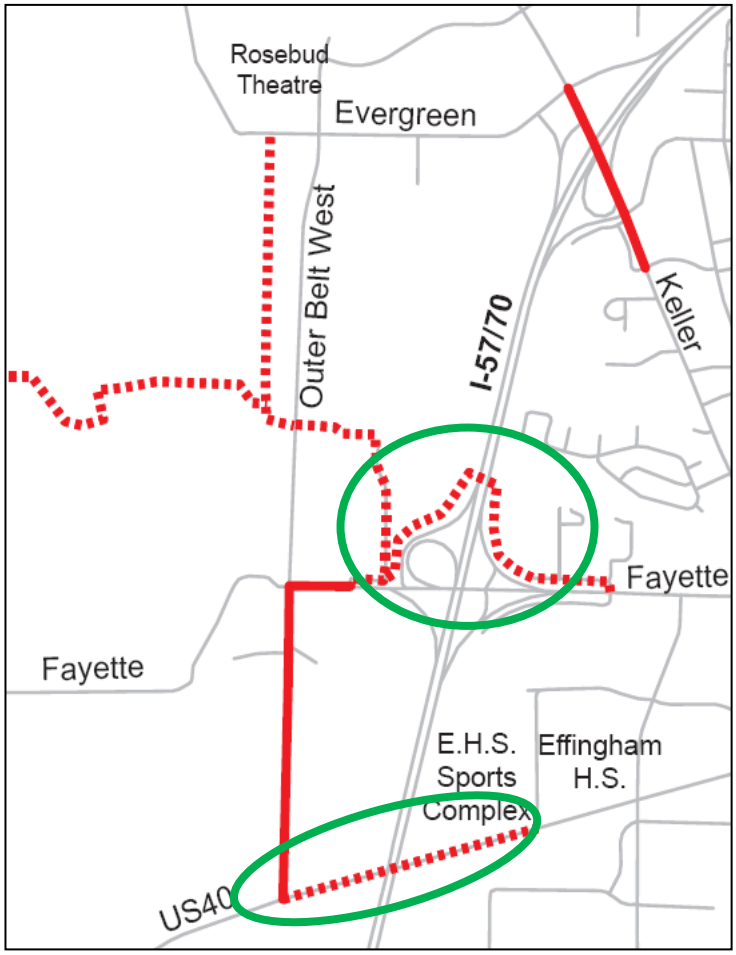
It can be decades before a bridge or underpass undergoes major reconstruction. It is more cost-effective and technically feasible to anticipate multi-modal needs as part of a larger project than it is to retrofit.

Bicycling and walking accommodations should always be included in projects that involve a barrier crossing where bicycle and pedestrian accommodations are warranted. Improved conditions invite usage from people who had been too intimidated to cross by bicycle or foot before. New crossings often spur residential and commercial development, which creates a demand for multi-modal travel options.

Bicycle design considerations should include the approaches to the crossing structure. In some cases, roads widen and have more lanes. In others, lanes might drop due to limited right-of-way or age of structure. The best practice is to maintain consistency in bicycle accommodations. If this is not possible, advance signage can guide bicyclists to shift road position or transition to an adjacent sidewalk or trail. Shared lane markings and signage can also signal to people on bicycles and in cars to share the road.

Access Across I57/70

As noted earlier, some of Effingham's transportation assets, such as rail corridors and I 57/7, can also function as barriers. The section about access to schools discussed ways to improve at-grade intersections of State routes. This section shows how IDOT is increasing and improving crossing options for cyclists and pedestrians at I57/70, a significant limited-access barrier.



While this transportation corridor has helped fuel growth and development, it also separates Effingham from the County's expanding trail network (Figure 14), the popular Lake Sara recreation area, and other destinations. IDOT has recently partnered with the City of Effingham to significantly improve bicycle and pedestrian crossings.

There are three area interstate crossings:

- Keller (IL 33) has a separate bridge for pedestrians and cyclists, with sidepaths on both approaches, and serves the northern section of the community. However, the sidepath becomes a sidewalk just north of the bridge, and then the sidewalk ends.
- To the south, Henrietta (US 40) travels under the interstate. IDOT recently completed a sidepath as part of a larger US 40 project. It connects to Effingham High School, creating a highway crossing suitable for riders of all ages and abilities.
- Fayette, between Keller and Henrietta, serves central Effingham. It provides walking and biking access via curb-separated sidewalks on the approaches and the bridge. Even with these accommodations, travelling close to high volume and high speed traffic can be intimidating and dangerous. As part of the Fayette interchange project, IDOT has added a trail crossing.

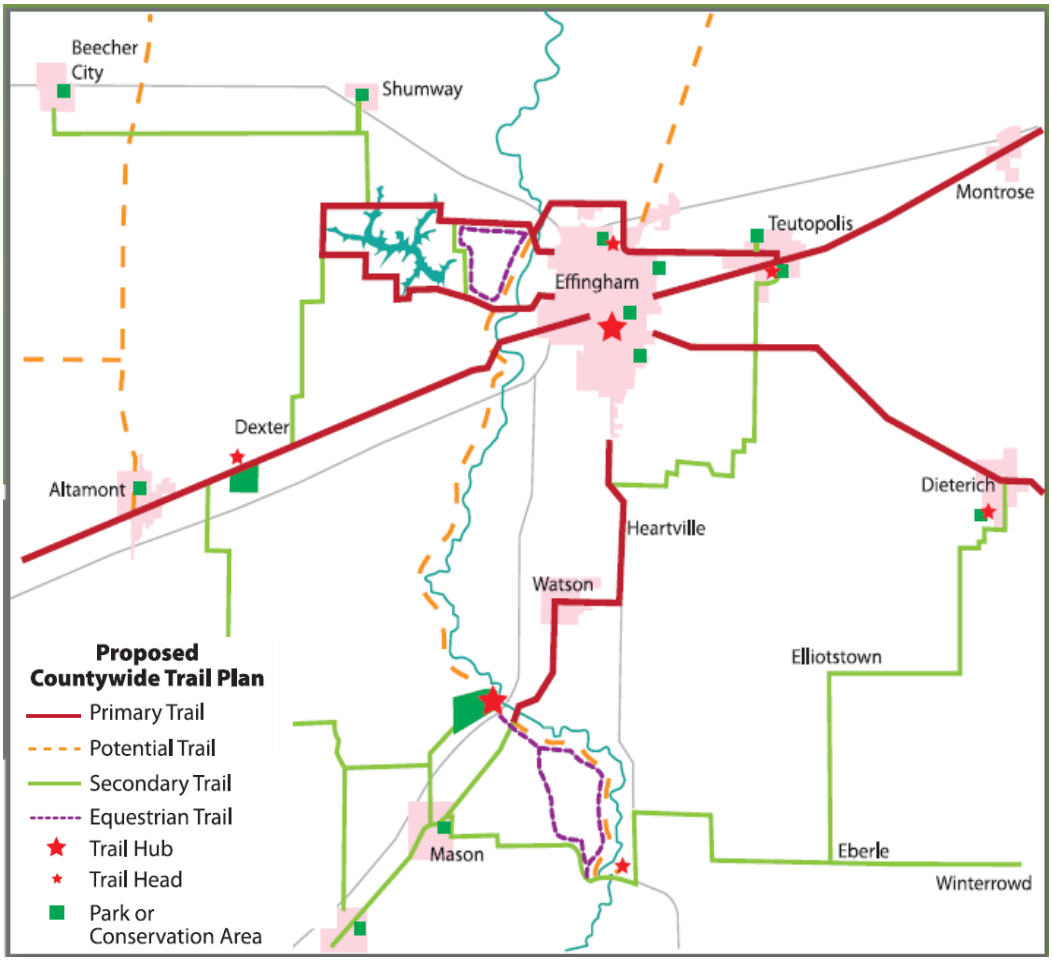
Ed Barsotti, Executive Director of the League of Illinois Bicyclists and lead author of the Effingham Bicycle Plan, commends IDOT's efforts to improve walking and cycling access across I 70/57: "IDOT

persevered with the US 40 sidepath, despite challenges such as drainage. The bridge by Fayette is fantastic. IDOT came through in a huge way financially."

Connections Beyond Municipal Boundaries

Bicycle accommodations that extend beyond urbanized areas are important to consider. State routes often provide critical bicycle connections to destinations outside city limits, such as recreation areas and neighboring communities. There are reasons to support both road and trail connections between major destinations:

- Roads are often the most direct routes and provide access to commercial, employment centers, and other destinations along the way. They are typically cleared of snow more quickly than trails.
- Trails provide mobility options for a wider range of skill levels—including families with young children, and benefit other uses, such as walking and jogging. Trails can also provide economic and public health benefits.
- Depending on context, sidepaths can offer the benefits of both trails and roads.



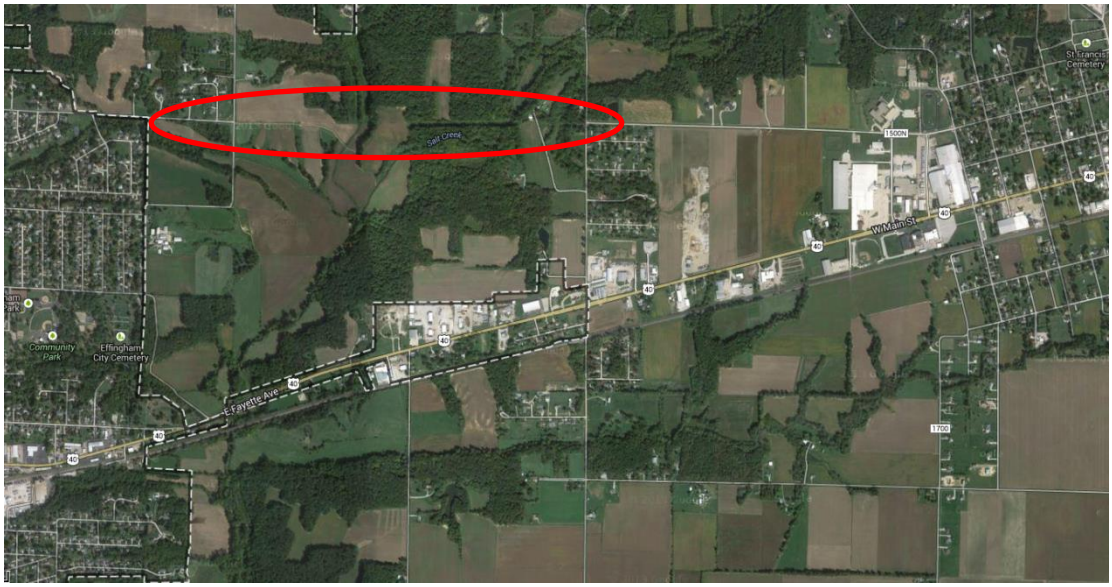
Planned trail network in Effingham County. I-57/70 and the Little Wabash River are barriers that need to be crossed to connect to Lake Sara to the west. Source: www.trectrails.com

Road and Trail Connections to Teutopolis Case Study - US 40 and the "Missing Mile"

As discussed above, State and local efforts to increase bicycle friendly crossings over I 57/70 will make Lake Sara and other locations to the west more accessible. This section discusses bicycle travel east to the City of Teutopolis.

Teutopolis is a rural community about four miles east of Effingham. US 40, which has paved shoulders[6], connects Effingham to Teutopolis. The route serves businesses between the two municipalities. While this route accommodates skilled bicyclists comfortable riding adjacent to fast moving traffic, it is less suitable for families and others seeking a calmer, more pleasant option. It is also out of the way for those travelling from the north or middle sections of Effingham.

The Effingham Countywide Trail Plan (Figure 14), as well as the Teutopolis and Effingham bike plans, call for a trail connection between the communities that can provide a short, direct, pleasant alternative to US 40. Known as the "Missing Mile," this trail would link Evergreen Street in Effingham to 1500th Ave., a rural road that leads to Teutopolis (Figure 15). The Plan also shows that a trail along US 40. IDOT should help facilitate connections such as this to provide a walking and bicycling connection that's safe and suitable for bicyclists and pedestrians of multiple abilities.



US 40 is currently the only connection between Effingham and Teutopolis. With paved shoulders, it serves the needs of experienced, traffic tolerant bicyclists. The bicycle plans for each community call for the completion of the "Missing Mile" trail connection which would serve a wider spectrum of user types.

[6] If rumble strips are added to this and similar corridors where bicycle travel is warranted, they should follow bicycle-friendly rumble strip design, as discussed in the Process Review and Integration Matrix (Section IV Chapter 2) as well as throughout Section II.

Conclusion

The examples presented in this section are intended to provide direction for similar design scenarios along State-jurisdiction roads in communities large and small throughout Illinois. In line with the considerations presented herein, IDOT project planners and designers should consider the following questions when first approaching a roadway project:

- How does this project fit into the context of the bicycle and pedestrian network?
- Are there potential walking and bicycling destinations along the corridor?
- What are the potential barriers for walking and bicycling?
- If there are no sidewalks or bicycle lanes, how are these users accommodated?
- Are motorists sufficiently aware of the potential for bicycle and pedestrian traffic?
- Do speed limits provide a safe environment for all roadway users?
- From where are bicycles and pedestrians entering an intersection and to where will they go?
    - Are bicycle lanes, sidepaths, and sidewalks clearly delineated, consistent and direct through the intersection?
    - Are expected turning movements clear for bicyclists through the intersection?
- Are all potential pedestrian crossings (legs of the intersection connecting two sidewalks or curb-ramps) accessible?
- Are potential conflicts with bicyclists and pedestrians well-highlighted with treatments such as high visibility crosswalks, colored bicycle lanes/intersections?
- Do corners and traffic islands slow turning traffic at pedestrian crossings? Do they provide good visibility for both vehicles and pedestrians at the crossing?
- Are potential visual obstructions such as signs, poles, bridge supports, etc. accounted for at pedestrian crossings?
- Is there ample time for all users to cross the road (are children or elderly users expected?)
    - If a pedestrian must wait mid-crossing, are medians compliant with ADA/PROWAG requirements, extend through the crosswalk, and make pedestrians visible to vehicles?
- If necessary, are crosswalk pushbuttons functioning and follow PROWAG best practices for the context?

Section III- Moving Forward

Introduction

This section summarizes the recommendations presented in Sections II and III by organizing guidelines for their implementation. A key feature of the current federal transportation bill, MAP-21, is the requirement for states to meet performance-based goals. This measure helps ensure a greater degree of care and accountability in the decision making of state DOT's. Similarly, the Team developed performance measures to assist the Department in Plan implementation and Departmental evaluation. Performance measures are based upon this Plan's recommendations (Section II and Section III) and benchmarking best-practices observed in other bicycle-friendly states (Section I). The goals set in these performance measures represent feasible, yet visionary achievements for the Department and State to strive for in implementation of this Plan as well as more general departmental goals.

Chapter One presents a list of departmental goals that were formulated according to those presented in the 2012 Long Range Transportation Plan.

Chapter Two consists of the Process Review and Integration Matrix, which organizes recommendations according to seven categories, each with recommendation steps and implementation resources.

Chapter Three recommends performance measures for the Department and State to use in their assessment of the Plan's impacts on mobility patterns throughout Illinois.

Section III- Moving Forward

Chapter 1- Departmental Goals

Chapter 1- Departmental Goals

Vision for Illinois

Illinois will become a place where all residents and visitors feel equally comfortable using any mode of transportation. They will able to choose from a myriad of transportation options -- bicycling, walking, public transit, and driving -- to meet their transportation needs. Bicycle transportation will be commonplace for daily errands, school or work commutes, and recreational use. In one form or another, bicycling will be accessible to people of multiple ages and abilities in rural areas, towns, suburbs and cities.

As a policy document and action plan, the Illinois Bike Transportation Plan will move the State forward in improving bicycling as a legitimate transportation option. Establishing policy, programming and network recommendations are key elements in planning how to accomplish this vision. Performance measures and other evaluation tools will chart the State's growth as this Plan is implemented, demand for bicycling accelerates, and mobility increases. Together with other partners at the municipal, regional, and state-level, IDOT is committed to making this vision a reality.

As described in the Introduction to Section I, the Plan logo synthesizes five goals pertaining to this vision. The logo's arrowheads represent the idea of a connected network of regional bikeways in Illinois.

Five Goal Categories

Access – Bicycling will be accessible to all Illinois residents regardless of age, ability, background, and income.

Choices- Bicycling will be a safe and viable transportation option, among a host of transportation options, for people of a broad range of ages and abilities in all areas of Illinois.

Connectivity- Bicycling will seamlessly connect with other types of transportation like trains and buses and the State transportation system will provide diverse options for bicycling that connect communities throughout Illinois.

Safety- Bicycling will be a safe and comfortable activity for everyone. IDOT will continue progressing toward its goal of zero traffic fatalities and strive to minimize safety concerns for current and prospective bicyclists.

Collaboration- IDOT will strive to strengthen existing partnerships and to build new and innovative ones to advance its vision and goals for bicycling in the State.

Implementing Departmental Goals

During a meeting held March 8, 2013, the Illinois Bike Transportation Plan team met to discuss a memo regarding a draft of the plan's goals and their relation to the policies and action items identified in the 2012 Illinois Long Range Transportation Plan. The highlighted items justified and/or pertained to the IL State Bike Plan. Using these goals as a guide, work throughout the rest of the planning process corresponded with one or more of the following departmental goals:

- Develop a transportation system in Illinois that supports and encourages bicycling (through a Complete Streets approach) for a wide range of people by improving bicycle access and connectivity at a local and regional scale.
- Expand equitable transportation options, such as walking, bicycling and transit, to increase opportunities for all citizens.
- Improve the safety for all roadway users through infrastructure improvements that balance the needs of all transportation modes and strategic educational and enforcement efforts.
- Promote public health and well-being through active living by providing safe transportation options that encourage walking, bicycling and use of transit.
- Advance economic competitiveness through smart transportation investments that maximize return on investment and attract businesses, residents and visitors.
- Create a transportation system that supports the conservation and preservation of the natural environment in Illinois through reduction in the use of natural resources, improvement in water quality through runoff filtration and reduction in airborne pollution and greenhouse gasses. Also, promote environmental stewardship by improving access to inherent natural areas of the State.
- Continue communication efforts within IDOT and with partner agencies while finding new ways of communicating Departmental goals, building buy-in and educating stakeholders on the planning and design of Complete Streets. This could be in the form of building new inter-agency partnerships and relationships, providing trainings and workshops, providing pertinent information and data, and expanding outreach efforts.

Appendix G contains the complete, highlighted list of Illinois State Transportation Plan policies and action items to illustrate the connection between the two sets of goals, beginning with the Department's Guiding Policy: "Develop a Sustainable Illinois Transportation System".

Section III- Moving Forward
Chapter 2- Process Review and Integration Matrix

Chapter 2- Process Review and Integration Matrix

The Process Review and Integration Matrix summarizes the recommendations contained within the Plan. Action items, tied to Plan goals are given for each objective/recommendation contained herein. The legend on the top of the following page shows the acronym used for each. Please note that that Executive Summary displays only a portion of the objectives described in this, the final State Bike Plan. The objectives are ordered according to thematic grouping (for example, 'Planning & Policies'). These groupings correspond to the thematic groupings presented in Chapter 3- Performance Measures.

Due to the number of proposed recommendations, the Plan team has ranked the highest priority recommendations for the department. High priority recommendations generally include those recommendations that are the easiest to implement and will have the greatest impact. The department should evaluate other recommendations after high-priority recommendations are implemented – for this reason, these columns were left blank. Lead agencies are identified within IDOT, as well as potential lead agencies from outside of the Department. Partner agencies are similarly identified, most of which are outside agencies such as advocacy groups or other governmental departments and State entities. IDOT should remain open to other potential collaborations depending on stakeholder interest throughout the State. The lead personnel column was left blank for the Department to evaluate and determine who would be best suited for addressing the recommendation.

Project Goals Legend: S = Safety, A+C = Access and Connectivity, O = Choices/Transportation Options, C= Collaboration, EJ = Equity/Environmental Justice, H = Public Health and Well-Being, EC = Economic Competitiveness, E = Environment, CM = Communication

No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
1.0	**Planning & Policies**						
1.1	**Ensure that Complete Streets projects have an equal consideration in the Multi-year Planning Process**	Incorporate standalone pedestrian or bicycle improvement projects into the MYP where warranted.	High	High	IDOT – OP&P, Highways		A+C, EJ, S, H, EC, E
		Create Health Impact Assessment requirements for project selection that are appropriately scaled to project or plan size.			IDOT – OP&P, DPH	Illinois Center for Transportation (ICT), Active Living by Design	H
		Develop a system for the Multi Year Program that prioritizes, amongst other items, projects with Complete Streets improvements. This could be framed as a weighted points system as with Tri-County MPO.	High	High	IDOT – OP&P		A+C, EJ, S, H, EC, E
1.2	**Improve Complete Streets inventory and roadway evaluation procedures**	Implement the proposed Bikeway Inventory System. Encourage MPOs and other relevant jurisdictions to participate. Assign staff member to manage the Bikeway Inventory System and promote the system statewide.	High	High	IDOT – OP&P	Illinois Municipal League MPO's, RPO's, local governments	A+C, S, C
		Incorporate recommended Complete Streets inventory items into the Illinois Roadway Information System (IRIS).	High	High	IDOT –OP&P		A+C, S
		Evaluate various tested methodologies and modify the Illinois Bicycle Level of Service model to better represent actual bicycling conditions.	High	High	IDOT –OP&P	League of Illinois Bicyclists	A+C, S, EC
		Incorporate Multimodal Level of Service assessment alongside Vehicular Level of Service on all projects (except limited access roadways).			IDOT –Highways, BDE, BLR		A+C, S
		Develop tools for planners and engineers to assist in bicycle and pedestrian project identification and development.	High	High	IDOT –Highways, BDE, BLR	District Offices	A+C, S
		Distribute data freely for use in planning and encouragement statewide.			IDOT – OP&P, Communications	Illinois Municipal League, MPO's, RPO's, local governments	A+C, S, C
		Re-evaluate IRIS and BIS attributes regularly.			IDOT – OP&P		A+C, S

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Review potential methodologies for bicycle latent demand and incorporate into the roadway planning process			IDOT – OP&P, Highways, BDE, BLR		A+C, S
		Perform targeted before and after pedestrian and bicycle counts to measure the Department's performance on improving conditions for walking and bicycling and gauge statewide walking and bicycling demand.			IDOT – OP&P		A+C, S
		Create a program for identifying and targeting the reduction in sidewalk gaps. This could be done in conjunction with district ADA Transition Plans.	High	High	IDOT – OP&P	MPO's, RPO's, local governments	A+C, S, C
		Create inventory of complete street barriers (especially near schools).			IDOT – SE, Information Processing	MPO's, RPO's, local governments	A+C, S, O
1.3	**Incorporate Environmental Justice considerations in project planning and development**	Update IDOT planning guidelines to include a prioritization of transportation options for vulnerable system users.	High	High	IDOT – OP&P	NAACP, AARP, AAPD, PolicyLink, Equity Caucus at Transportation for America, etc.	A+C, S, EJ
		Encourage plan reviews and planning process reviews from organizations focused on transportation equity. Utilize such coalitions by sending project input letters and inviting MYP/TIP input.			IDOT—OP&P	NAACP, AARP, AAPD, PolicyLink, Equity Caucus at	
		Establish an Environmental Justice working group, with a focus on targeted and vulnerable constituencies.			IDOT – SE, BDE, BLR, OP&P	IL Department on Aging; IL Department of Human Services, AARP	A+C, S, O, EJ, H
		Partner with other Illinois Departments to improve methods of addressing ADA considerations.			IDOT –SE, OP&P	IL Department of Public Health; IL Department of Human Services	A+C, O, C, EJ, H

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Establish equity prioritization points in MYP selection process			IDOT- Highways, OP&P		A+C, O, C, EJ, H
1.4	**Continue to explore ways to improve the quality and completeness of bicycle and pedestrian crash data**	Educate departmental staff about crash data collection and crash data analysis procedures and trends.			IDOT – SE	IDOT - Highways	A+C, S, C
		Investigate ways to supplement currently available crash data.			IDOT - SE	Law enforcement, Hospitals, MPOs/ RPOs, local governments	A+C, S, C
		Modify reporting methods to improve reporting for bicycle-related crashes.			IDOT - SE	Law enforcement, State, ICT, Hospitals, MPOs/RPOs, local governments, LIB	A+C, S, C
1.5	**Develop policies, design guidelines and programs that support the IDOT zero fatality policy**	Evaluate facilities and programs for their capability to improve pedestrian and bicyclist law compliance in addition to motorist compliance.	High	High	IDOT – Highways, DTS	LIB	S
		Adopt and require a roadway safety audit that includes considerations for all users at the onset of the preliminary design phase of a project.			IDOT – OP&P, Highways, BDE, BLR	LIB	S
1.6	**Investigate opportunities for collaboration with the We Choose Health Initiative through the Illinois Department of Public Health**	Encourage collaboration between IDOT and IDPH Healthy and Safe Built Environment program.			IDOT – OP&P, DPH	Illinois Department of Public Health	H, C, EJ, E
		Identify current indicators and implement the collection of new indicators for ongoing surveillance with partner organizations (e.g children walking to school, active commuters, etc. for measuring performance).			IDOT – OP&P, DPH	Illinois Municipal League, State Board of Education, Schools	H
		Prepare health data sets and reports that can be used in transportation planning, implementation and performance evaluation.			DPH, Universities	IDOT – OP&P	H, C

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
1.7	**Develop a state bicycle network that connects with population centers, popular destinations, and national bicycle networks**	Develop an interconnected system of rural bikeways statewide that connect population centers and significant destinations. This may include working with LIB to develop a coordinated signage, wayfinding and mapping effort as well as outreach to advertise these routes.			IDOT- OP&P, Highways, DTS, Communication; IDNR, League of Illinois Bicyclists	Illinois Municipal League, MPO's, RPO's, local governments	A+C, S, EC, E, C
		The Plan's proposed regional connections should automatically warrant bicycle accommodations in roadway improvements.			IDOT -- OP&P, Highways, DTS, Communications	MPO's; RPO's; local governments	A+C, S, EC, E, C
		Regional bicycle routes should incorporate local "business routes" where possible. Signage and infrastructure should be upgraded along these corridors to facilitate bicycling.			IDOT – Highways, OP&P; MPO's, RPO's, local governments	IDNR, LIB	EC, C, A+C, S
		Roadway improvements along identified regional or national bicycle routes should feature highest-quality improvements for bicycling such as wide paved shoulders or sidepaths.			IDOT		EC, A+C, S
		Recognize historic routes such as Route 66 and the National Road as priorities for bikeway improvements.	High	High	IDOT – OP&P, Highways	IHPA	A+C, EC
1.8	**Better integrate land use considerations into the transportation planning process**	Review IDOT and regional partner planning agencies' transportation policies to ensure that land use is a key element in planning.	High	High	IDOT – OP&P; MPO's, RPO's, local governments	Congress for the New Urbanism (CNU)	EC, A+C, H, EJ, E

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Dedicate planners to oversee the development of a land use consideration program.			IDOT – OP&P		EC, A+C, H, EJ, E
		Prioritize projects that develop land use and corridor plans that support multimodal transportation			IDOT – OP&P, Communications ; MPO's, RPO's, local governments		EC, A+C, H, EJ, E
		Modify Traffic Impact Studies to include multimodal component, including off-site improvements from major new developments to high pedestrian/bicycling attractors within ¼ mile of site.			IDOT – OP&P, Highways, BDE, BLR		EC, A+C, H, EJ, E, S
1.9	**Make intermodal connections a priority in bikeways planning efforts**	Plan and prioritize the statewide network so that multimodal connections with and between local transit operator stops are priorities.	High	High	IDOT – OP&P, PIT	Bus Operators	A+C
		Encourage communities and local transit operators to apply for FTA Formula grants.			IDOT – OP&P, PIT	Transit operators; local governments	A+C
1.10	**Continue to support the Safe Routes to School Program and establish goals with performance measures to support its advancement**	Utilize plan SRTS program review and compare with the AASHTO *Safe Routes to School Noteworthy Practices Guide* to assist in improving and streamlining SRTS operations.	High	High	IDOT, SRTS		A+C, S, H, EJ, C
		Assign a dedicated, full-time State Safe Routes to School coordinator.			IDOT, SRTS		A+C, S, H, EJ, C
		Collaborate to incorporate more local school officials into transportation planning efforts.	High	High	IDOT, SRTS	Illinois Municipal League, State Board of Education, local governments, schools	A+C, S, H, EJ, C
1.11	**Improve public and organizational participation in project planning and input**	Reach out to other organizations, including State and local non-profits, to identify appropriate ways to boost resident engagement in transportation planning.			IDOT - Communications , Highways; MPO's/RPO's	Local organizations	C

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
1.12	**Work with public transit and rail partner agencies to improve inter-modality of non-SOV (single occupancy vehicle) transportation**	Work with local transit agencies to ensure bike racks are present or bicycles are allowed on all busses throughout the state.	High	High	IDOT –PIT; Local Transit Agencies		A+C
		Work with Metra and other regional passenger rail carriers within the state to ensure that bikes are allowed at all times on all trains.	High	High	IDOT –PIT; Regional Rail Carriers		A+C
		Work with Amtrak to ensure that bikes are allowed and reasonably stowed on all trains. Old policies can be improved such as stowing accommodation, maximum number of bikes allowed and price of a bicycle ticket.	High	High	IDOT –PIT; Amtrak		A+C
		Consider roadways within the bicycle/pedestrian catchment areas of local and regional transit access (3mi) as high priorities for Complete Streets improvements.			IDOT—PIT; Local Transit Agencies, Regional Rail Carriers, Amtrak		A+C, S
2.0	**Design & Maintenance**						
2.1	**Update design guidance and policies for bicycle and pedestrian projects and programs within department manuals**	Use the detailed BDE and BLR analysis in this plan to make sure that Complete Streets policies and design guidelines are consistent across all chapters of the BDE and the BLR manuals.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Utilize bicycle-friendly shoulder and rumble strip design guidance in Highway and Safety Improvement Plan (HSIP) and 3R projects.			IDOT – Highways, BDE, BLR, SE		A+C, S
		Utilize Complete Streets consideration on resurfacing projects (3P and SMART)	High	High	IDOT – Highways, BDE, BLR		A+C, S, EC
2.2	**Improve and update design policies for bicycle and Complete Streets infrastructure that address a wide range of user types and needs**	The addition of the "Urban Area" definition in Chap 17 has confused some staff that areas under 50,000 are exempt from accommodating bikes. The original intent (in 2000 Ch17) was that populated areas will generate bicycle travel. Replace 'urban' with 'populated' or 'incorporated'. Read: "in or within one mile of an incorporated area." This more appropriately would include all incorporated areas within Illinois.	High	High	IDOT – Highways, BDE, BLR		EC, A+C, H, EJ, E, S
		Clearly define an unjustifiable project expense in terms of Complete Streets accommodations in a roadway project. Federal guidance suggests 20% of total project cost.	High	High	IDOT – BDE, BLR	FHWA	A+C, S, EC
		Modify policy so that roadway/bridge/intersection improvements can have differing logical termini for pedestrians, bicycles and motor vehicles.	High	High	IDOT - Highways, BDE, BLR		A+C, S

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Update the Complete Street requirement to include complete streets improvements along all corridors that are included in a locally adopted bicycle or pedestrian plan.	High	High	IDOT - Highways, BDE, BLR		A+C, S
		Develop a strategy and timeline for updating state design and policy based on the findings of this Long Range Transportation Plan.	High	High	IDOT - OP&P	IDOT - Highways, BDE, BLR, SE, DTS, Communications	All
		Clarify pedestrian and bicycle needs on bridge structures in urban, rural, and transitioning areas that reflect the lifespan of bridges.	High	High	IDOT - Highways, BDE, BLR, B&S		A+C, S
		Chapter 17 of the BDE (and Chapter 42 of the BLR) to be organized around land-use contexts: such as urban, suburban, and rural.			IDOT - Highways, BDE, BLR		A+C, S
		Use Plan recommendations to further update all applicable chapters of the BDE & BLR Manuals to reflect State Complete Streets policies and goals.	High	High	IDOT – Highways, BDE, BLR		All
		Include official policy statements in areas such as lane widths, jurisdictional liability, and the provision of sidepaths vs. bike lanes.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Per Federal guidance from the Departments of Justice and Transportation (http://www.ada.gov/doj-fhwa-ta.htm), the BDE Manual should be amended to clarify that resurfacing is an alteration that requires the installation of curb ramps where street level pedestrian walkways cross curbs.			IDOT - Highways, BDE, BLR	FHWA, DOJ	A+C, S, EJ
		Incorporate more comprehensive standard review procedures for lane widths and capacity in the design phase of all project types (STIP, SMART, HSIP, 3R, 3P) to see if bicycle facilities can be incorporated at little additional cost.			IDOT - Highways, BDE, BLR		A+C, S, C
		Add bicycle parking requirements to projects with bicycle accommodations where on or off-street vehicle parking is present.			IDOT - Highways, BDE, BLR		A+C
		Clarify latent demand requirement and provide better tools for evaluating latent bicycling demand.			IDOT - Highways, BDE, BLR		A+C, S

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Remain current with research regarding bicycle safety and best practices as bicycle planning and design is evolving rapidly in the United States.			IDOT - Highways	LIB, Illinois Center for Transportation	A+C, S
		IDOT policies, practices and standards should be updated within a year of release of new FHWA, AASHTO, and other applicable guidelines.			IDOT – Highways, OP&P	FHWA	A+C, S
		Refer to the BDE and BLR detailed analysis table to identify additional areas where Complete Streets policies can be strengthened.			IDOT - Highways, BDE, BLR		All
2.3	**Review peer states' bicycle policies for policy recommendations or regulations that the peer state believes should have been handled differently**	Look for design fall-back solutions within these policies, to support flexible design choices. Wisconsin can serve as a good model.			IDOT— Highways, BDE, BLR, OP&P		A+C, C, CM
2.4	**Improve the design approval process for local road projects, especially concerning bicycle accommodations**	Streamline Environmental Survey Request and Project Development Report requirements for simple bikeway projects, such as restriping.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Streamline the local project variance process for cities working to implement bike plans, possibly exclusively those with Complete Streets policies.	High	High	IDOT – Highways, BDE, BLR		A+C, S, EC
		Regularly review applicable variances (e.g. annually, or bi-annually).			IDOT— Highways, BDE, BLR		A+C
		Make the documentation for minimal impact Complete Streets improvements easier than larger-scale roadway reconstruction projects. This would encourage more Complete Streets improvements in local jurisdictions.			IDOT— Highways, BDE, BLR		A+C

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Allow flexibility in speed limit reduction within communities, possibly exclusively for communities with Complete Streets policies.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Provide detailed resources for local agencies and consultants who are preparing Complete Streets project documentation.	High	High	IDOT – Highways, BDE, BLR		A+C, S
2.5	**Improve laws that pertain to bicycling to make them safer for all roadway users**	Support the passage of a law that states a bicycle is considered a vehicle.			IDOT; State Legislature		A+C, O, S
		Review Chicago bicycle law best practices and consider adoption at the statewide level.					A+C, O, S
		Review Illinois Municipal Vehicle Code Review for recommendations on how laws can be improved to make the roadway environment safer for all users.			State Legislature	IDOT	A+C, O, S
2.6	**Track and measure the implementation of Complete Streets**	Develop performance measures that evaluate State progress on Complete Streets. Track performance measures both at the central office and within individual districts. Tailor specific performance measures for each district.	High	High	IDOT	LIB	A+C, S
		Develop regular Department-wide reporting methods for performance measures. This may include the development of an annual scorecard to be completed by central office and district bike/ped representatives. Tie to MYP development.	High	High	IDOT – OP&P		All
2.7	**Ensure HSIP equally considers pedestrian and bicycle projects in prioritization and project programming**	Evaluate the existing HSIP prioritization and project programming process and adjust as needed to ensure pedestrian and bicycle safety performance measures are met.	High	High	IDOT - SE		A+C, S

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2.8	**Develop policies, design guidelines and programs related to bicycling that support the IDOT zero-fatality policy**	Develop an injury minimization approach for setting speed limits on new roadways and major roadway reconstruction projects.	High	High	IDOT – Highways, BDE, BLR, SE		S
		Revise Department guidelines for the design of roadways to prioritize safety of all roadway users over vehicular LOS. For example, signal timing procedures at intersections with pedestrian and bicycle crossings.	High	High	IDOT – Highways, BDE, BLR, SE		S
		Mid-block crossings should be provided for pedestrians and bicyclists wherever development or points of interest exist on either side of a roadway and the distance between crossings is over ¼ mile.			IDOT— Highways, BDE, BLR, SE		S, A+C
2.9	**Develop more detailed warrants and triggers for bicycling accommodations**	Add the following question to the checklist in Section 17-1.04 of the BDE: "Does the surrounding community, and/or local agencies representing those communities, express strong desire and support for the accommodation of bicyclists as part of the project?"	High	High	IDOT – BDE, BLR		A+C, C
		The qualitative statements of section 17-1.04 could be strengthened to be more detailed and definitive. For certain land uses, it can be stated that the warrants for Complete Streets would always be met.	High	High	IDOT – BDE, BLR		A+C
		Utilize the BDE and BLR detailed analysis table in this Plan to identify additional areas where warrants and triggers can be improved. Removing the 25 ADT requirement and adding the qualitative statements suggested in Section II, Chapter 2 would reduce confusion regarding needs assessment warrants.			IDOT – Highways, BDE, BLR		A+C

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2.10	**Incorporate green infrastructure and construction principles in Complete Streets projects**	Perform a review of BDE and BLR manuals to determine what practices can be improved upon from an environmental sustainability standpoint.			IDOT	ICT, EPA	E
		Develop performance measures for green infrastructure and construction practices.			IDOT	ICT, EPA	E
2.11	**Review and revise BLR and BDE manuals for bicycle and pedestrian best practices**	IDOT policies, practices and standards should be updated within a year of release of new FHWA, AASHTO, and other applicable guidelines.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Incorporate PROWAG guidance on the design of safe pedestrian accessways in the BDE and BLR Manuals.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Update and improve the project matrix for best practices and design flexibility. For example, currently the policy and design matrix favor sidepaths over on-street accommodations. Also, sidepaths are often not feasible in many urban areas. The matrix should also include additional considerations such as roadway volume, land use and bicycle user comfort. (Facility types could be categorized by the types of riders they would most likely appeal to).	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Additional guidance is needed for bicycle facilities adjacent to parking lanes. Guidance may include buffered bike lanes; parking ticks in bike lanes and left-of-center markings; and sharrows.			IDOT – Highways, BDE, BLR		A+C, S
		Include innovative facility types supported in MUTCD such as protected lanes, green pavement, etc.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Improve design guidance and policy flexibility to increase potential for selecting reasonable alternate routes for bicyclists. Policy should encourage consistency in bicycle or pedestrian facility type across project segments or jurisdictions. Alternate routes should only be used where it is the best solution in terms of bicyclist comfort and safety and where detours are kept at a minimum. IDOT may need to make adjustments in terms of logical termini and project scope policies.			IDOT – Highways, BDE, BLR		A+C, S

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		Improve design guidance for bicycle and pedestrian crossings at intersections including pedestrian/bicycle refuge islands. Revise language in the BDE and BLR manuals to support the use of corner and median refuge islands.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Expand design guidance for mid-block crossings and median refuge islands at mid-block crossings and intersections.			IDOT – Highways, BDE, BLR		A+C, S
		Improve design guidance for sidepaths, including design at intersections and maintenance considerations. Clarify where they are and are not appropriate. This can include details such as benefit of corner islands and using right-in-right-out access management.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Establish criteria for grade-separating trails over state highways.			IDOT – Highways, BDE, BLR		A+C, S
		Improve design guidelines for shoulders and rumble strips to improve these for bike friendliness. For example, Wisconsin and Oregon set minimum shoulder widths for bicyclists based on roadway speed and ADT.	High	High	IDOT – Highways, BDE, BLR, SE		A+C, S
		Expand standard drawings and specifications for common bicycle design treatments in both urban and rural environments. This includes intersection/roadway crossing markings, signal timing and bridges.			IDOT – Highways, BDE, BLR, SE		A+C, S
		Add guidance on burying or extending the gutter pan for added bike lane width.			IDOT – Highways, BDE, BLR		A+C, S
		Improve guidance on the design of safety rails parallel to bicycle facilities.			IDOT – Highways, BDE, BLR, B&S		A+C, S
		Phase I design checklists should include more bicycling considerations.			IDOT – Highways, BDE, BLR		A+C, S
		Provide improved guidance on road diets. In particular, where they are warranted and what are appropriate designs.	High	High	IDOT – Highways, BDE, BLR		A+C, S

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		Add guidance on appropriate transitions between facility types. For example, should bicycle route wayfinding signage be provided at the end of a bike lane or sidepath; and how intersections should be designed when a bike lane is temporarily dropped? Generally, however, consistent facility types should be required where possible. (The NACTO Urban Bikeway Design Guide provides guidance)	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Add guidance on wayfinding signage and develop standard signage for designated regionally-significant on-road bicycle routes.			IDOT – Highways, BDE, BLR		A+C, S
		Set minimum BLOS requirements for all roadway projects that include bicycle facilities.	High	High	IDOT – Highways, BDE, BLR		A+C, S
		Add guidance on light fixtures and lighting considerations in bikeway design. Consider innovative technology such as solar power.			IDOT- Highways, BDE, BLR		A+C, S
		Add guidance on flood protection.			IDOT— Highways, BDE, BLR		A+C, EJ, S
2.12	**Improve response to bicycling maintenance issues**	Set up an online reporting form or app that allows users to report maintenance issues, including those pertaining to bicycling.	High	High	IDOT – Communication, Highways	LIB	A+C, S, C
		Improve bikeway sweeping/plowing programs and procedures as a collaborative effort. Shoulder sweeping should occur at minimum once a year on prioritized roads.	High	High	IDOT –Highways	MPO's/RPO's, local governments	A+C, S
		Institute program to inventory and replace all unsafe drainage grates on the state roadway system.	High	High	IDOT –Highways		A+C, S
		Set minimally acceptable requirements for pedestrian and bicycle facility maintenance by facility type.			IDOT- Highways		A+C, S
		Develop bicycle and pedestrian-specific work zone access guidelines and incorporate these into BDE/BLR Policy Manuals.	High	High	IDOT- Highways, BDE, BLR		A+C, S
2.13	**Provide better mechanisms for bikeway and Complete Streets upgrades in maintenance**	Provide policy direction that requires project planners/designers to look at the possibility of	High	High	IDOT – Highways, SE		A+C, S

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
	projects such as SMART, 3R, 3P	reconfiguring streets for bicycling accommodations in maintenance projects.					
		Provide better coordination with municipalities concerning incorporating bikeways in maintenance projects.	High	High	IDOT – Communications, OP&P	MPO's/RPO's, local governments	A+C, S, C
	Provide better mechanisms for bikeway and Complete Streets upgrades in maintenance projects such as SMART, 3R, 3P	Provide policy direction that requires project planners/designers to look at the possibility of reconfiguring streets for bicycling accommodations in maintenance projects.	High	High	IDOT – Highways, SE		A+C, S
3.0	**Funding**						
3.1	**Improve the effectiveness, administrative efficiency and transparency of the state's grant programs**	Provide funding resources for communities and streamline the ITEP application process. Enhance the online application process by providing tools such as a detailed facility cost-estimation tools.	High	High	IDOT – OP&P, Communications		All
		Continue advertising the program through IDOT media channels. Work with LIB on outreach and community assistance efforts.			IDOT—OP&P, Communications	LIB	C
		Ensure only shovel-ready projects receive funding by requiring minimum phase 1 design and engineering. Alternatively, have separate funding pots and applications for design and construction costs/land acquisition.			IDOT—OP&P		C
		Increase transparency and guidance in the ITEP program by establishing a project ranking matrix based on factors such as project readiness, potential impact, receipt of past ITEP grants, etc. Provide applicants that are not awarded grants feedback on their application.	High	High	IDOT – OP&P		All
3.2	**Incorporate Complete Streets projects as an equal consideration to other project types in the Multi-year Planning Process**	Dedicate funding to Complete Streets projects in the MYP. Possible ideas include relating revenues to mode share, outstanding need, and/or public opinion.	High	High	IDOT – OP&P	League of Illinois Bicyclists (LIB), National Complete Streets Coalition?	A+C, EJ, S, H, EC, E

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Develop a minimum funding requirement for Complete Streets improvements within the general roadway fund.			IDOT—OP&P	IDOT-- Highways	A+C, EJ, S, H, EC, E
		Generate a minimum requirement for Complete Streets funding as part of the Surface Transportation Program (STP) funds. This could be based on projected bicycle and pedestrian mode-share, cost estimate of identified needs, or from public opinion.			IDOY—OP&P	IDOT-- Highways	A+C, EJ, S, H, EC, E
3.3	**Keep better record of Complete Streets improvements and their return on investment**	Develop better tracking of pedestrian and bicycle facility costs and revenues (especially for incidental projects). Consider that return on investment is not only depends on bike/ped counts, but conditions for those who must use those roads.	High	High	IDOT – OP&P, Highways	LIB	EC
3.4	**Provide sufficient funding levels for Complete Streets projects**	Continue to supplement bicycle and pedestrian program funds with Surface Transportation Program (STP) funds sufficiently to meet the goals of this Plan.	High	High	IDOT – OP&P, Highways		A+C, S
		Establish a bike planning program fund for local communities, possibly tying into the STP funds, as in the East/West Gateway MPO, or ITEP program. Establish a funding source for improvements in communities outside of urbanized areas.	High	High	IDOT - OP&P		A+C, S, EC
		Assign adequate Highway Safety Improvement Program funding to meet bicycle and pedestrian performance measures.	High	High	IDOT - SE		A+C, S

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Continue to make 100% of Transportation Alternative Program (TAP) (Map-21) funds available for eligible activities. These funds should not be redirected to other programs.	High	High	IDOT – OP&P, Highways		A+C, S
		Address the issue with the 80/20 funding match for pedestrian and bicycle accommodations by adjusting cost-share levels to 100/0 for most Complete Street Projects	High	High	IDOT – OP&P, Highways	MPO's/RPO's, local governments and businesses	A+C, S
		Establish a bicycle planning/program fund to cover technologically innovative projects that support biking.			IDOT—OP&P	IDOT Bureau of Information Processing, MPO's/RPO/s, local governments and businesses	A+C, S
4.0	**Education & Promotion**						
4.1	**Improve IDOT Bicycling Website so that it is a one-stop bicycling resource for the public, state jurisdictions and state agencies**	Update the navigability and graphic appeal of the website. It may help to give the page an address and look unique from the IDOT homepage.	High	High	IDOT – Communications, OP&P		
		Tie in resources for the public such as safety resources, benefits of bicycling, bicycle trip planning maps and resources, contact information, and information on bikeway project input opportunities.	High	High	IDOT – Communications, OP&P, DTS		
		Tie in resources for state jurisdictions, such as bikeways planning information, funding information, information on SRTS planning, and technical assistance in the form of exemplary design and policy guidelines.			IDOT – Communications, OP&P		
4.2	**Increase dedicated staff for Complete Streets issues within all departments, at both the central office and districts**	Create a dedicated bicycle pedestrian coordinator in both the Offices of Planning and Programming and the Division of Highways.	High	High	IDOT – OP&P, Highways		All
		Ensure that there is at least one person at each district who specializes in bicycle and pedestrian issues – ensure that they are abreast of current departmental policies, design issues, prototypical examples from other districts and national best practices.	High	High	IDOT – OP&P, Highways, Districts		All

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Dedicate specific staff, such as a bicycle and pedestrian coordinator, to oversee the implementation of the State Bike Transportation Plan. Implementation should be tracked using methods such as an annual implementation report.			IDOT – OP&P, Highways		All
4.3	**Continue and expand involvement with State MPO's, RPO's and local governments**	Encourage local government and Division/District Staff to communicate about upcoming construction and rehabilitation projects. This could be done through regular meetings to discuss upcoming projects and the Multi-Year Program planning process.			IDOT – All	MPO's/RPO's, local governments, Illinois Municipal League	C
		Coordinate State bicycle planning throughout Illinois with all jurisdictions – this could be done within the Multi Year Program planning process.			IDOT – OP&P	MPO's/RPO's, local governments, League of Municipalities	C
		Create a bicycle and pedestrian master planning guide for local agencies.			IDOT – OP&P, BLR, Communications	MPO's/RPO's, local governments, Illinois Municipal League	A+C, S, C
		Encourage the development of local design manuals.			IDOT - Communications	MPO's/RPO's, local governments, Illinois Municipal League	A+C, S, C
		Provide regularly updated resources that advertise funding programs for bicycle and pedestrian improvements.			IDOT – OP&P, Communications	Illinois Municipal League, MPO's, RPO's, local governments	All
4.4	**Continue and expand involvement with State bicycling advocacy groups**	Continue involvement in annual Illinois bicycle summit and expand broad engagement of non-traditional groups/organizations. A partnership on the Summit could provide IDOT a forum for training staff and consultants.			IDOT - All	LIB, Trails for Illinois, CNU, other local bicycling advocacy groups	C
4.5	**Establish opportunities for bringing government agencies, jurisdictions, non-profits and advocacy networks together**	Create a statewide Complete Streets coalition, like in Minnesota, Michigan and Indiana, to foster ongoing statewide implementation of Complete Streets processes across all jurisdictions.	High	High	IDOT – Communications, OP&P, Highways, DPH	Multiple government agencies, jurisdictions and	

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
					(Indiana Health by Design supports Indiana Complete Streets Coalition)	NGO's	
4.6	**Gather data, best practice, examples, and lessons learned for design treatments, planning, and policy related to Context-Sensitive Solutions (CSS) and pedestrian/bike planning**	Work with CNU and ITE to update a new edition of the *Designing Walkable Urban Thoroughfares* guide.			IDOT	ITE, CNU, local governments (case study projects)	C, CM, EC
4.7	**Establish outreach programs directed at community leaders showing the benefits of Complete Streets and bicycling for their communities**	Coordinate with partner organizations to develop educational materials and outreach for local leaders, elected officials and boards/commissions regarding the benefits of active transportation and informational materials on transportation planning and implementation. Illustrate the potential for raised property values due to Complete Streets policies.	High	High	IDOT - Communications	LIB, other advocacy groups, IL Department of Human Resources; IL Department of Commerce and Economic Opportunity	All
		Communicate return on investment from Complete Streets Projects including impact relevant to multiple types of stakeholders.	High	High	IDOT—Communications	EPA, IL Department of Commerce and Economic Opportunity, Universities	CM, C, EC
4.8	**Provide modern, innovative means of collecting information, sharing information and mapping on regional trails through Internet, smartphone, etc**	Enhance state tourism website and Dept. of Commerce website to include information about quality-of-life measures (such as access to transit, greenways, etc.)			Department of Tourism, Department of Commerce and Economic Opportunity	IDOT	C, EC

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Provide bikeways information in easily accessible digital and physical formats to encourage reproduction and incorporation into third party apps. One example would be to submit all available State bicycle data for inclusion in Google Maps.	High	High	IDOT – Communications, OP&P		All
		Develop a statewide online and/or smartphone app for bicycling that includes information on preferred routes and real-time information on roadway conditions such as maintenance and weather.			IDOT – Communications, OP&P		All
		Promote the regional bicycling system through online and offline mapping and wayfinding, and coordinated outreach efforts with assistance from partner agencies.	High	High	IDOT – Communications, OP&P	LIB, Trails for Illinois, Department of Tourism, Department of Commerce and Economic Opportunity	All
4.9	**Work with partner agencies to track economic impact of Complete Streets**	Pursue studies that look into how Complete Streets relates to real estate values, jobs created, tourism dollars, business relocation due to quality of life, retail success along Complete Streets, etc.			IDOT – Communications, OP&P, Highways; Department of Commerce and Economic Opportunity; CNU		C, EC
4.10	**Coordinate with IDNR, MPO's and other agencies on Complete Streets, trails and other building efforts**	Continue ISBTP Advisory Group to work with IDOT and IDNR on implementation of this Plan.	High	High	IDOT – OP&P	Advisory Group partner organizations	All
		Coordinate on connectivity to trails and trails access.	High	High	IDOT – OP&P, IDNR	Trails for Illinois, LIB	C, A+C, S
		Coordinate on ROW easement for trails/trailheads.	High	High	IDOT – OP&P, Highways; IDNR	Trails for Illinois, LIB	C, A+C, S
		Continue utilizing prioritization criteria for bike/ped projects that are a part of a regional trail or connect to a regional trail.	High	High	IDOT, IDNR	Trails for Illinois, LIB	A+C
		Work with INDR to plan and develop an interconnected state network of greenway trails.			IDOT – OP&P, IDNR		A+C, H, EC
		Tollway projects that affect other roads should be held accountable for Complete Streets as well.	High	High	IDOT – OP&P, Highways, BDE, BLR, Tollways		A+C

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
4.11	**Incorporate environmental stewardship principles in Complete Streets projects and outreach**	Incorporate environmental stewardship issues, educational and encouragement campaigns.			IDOT – All, IDNR, Governor's Office for Sustainability, Illinois EPA		C, E
		Engage and collaborate with State organizations and environmental nonprofits to see where environmental considerations best fit within Complete Streets goals.			IDOT – Communications, OP&P, Highways, BDE, BLR	IDNR, Governor's Office for Sustainability, Illinois EPA, environmental non-profits (http://www.eco-usa.net/orgs/il.shtml)	C, E
4.12	**Expand available information, information sharing and training on Complete Streets**	Expand Department approved, online resources for Complete Streets planning and design.			IDOT – Communications, OP&P, Highways		C
		Utilize innovative tools in training and planning such as Streetmix (www.streetmix.net).			IDOT – Communications, OP&P, Highways, BDE, BLR		C
		Create an internal, online forum for sharing Complete Streets information and resources among districts.			IDOT – Communications, OP&P, Highways		C
4.13	**Work with partner agencies and communities to develop additional bicycling events such as races, long-distance tours, etc**	Partner agencies are already engaged in these types of events. IDOT can play a key role in supporting these activities and encouraging new initiatives in line with other Plan goals.	High	High	IDOT – Communications	LIB, Office of Tourism, local governments and businesses	EC, C

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
4.14	**Expand public education, outreach and enforcement on bicycling**	Develop and implement programs that educate all types of roadway users on the rules of the road and safety for non-motorized users.	High	High	IDOT – Communications, DTS; Governor's Office; Board of Education; Secretary of State; LIB		S
		Incorporate bicycling into driver's education/ driver's test. This could include having questions on bicycling or incorporating bicycling skills/safety into High School driver's education programs. Support LIB in their pursuit of this goal.	High	High	Secretary of State, LIB	Communications, DTS	S
		Increase enforcement of bicycle traffic violations. LIB's bike safety quiz is being used in ticket diversion programs Champaign, Urbana, and Highland Park.			Law Enforcement Training & Standards Board, Law Enforcement Agencies, LIB	Communications, DTS	S
		Conduct outreach to public officials, transportation professionals and residents at large about the benefits of bicycling and reasons to accommodate it.			IDOT – Communications, DTS; Governor's Office	MPO's/RPO's, local governments, Illinois Municipal League	
		Institutionalize elementary school education for bicyclists. LIB's bike safety quiz is beginning to get $4^{th}/5^{th}$ grade usage, but assistance by relevant state agencies is needed to institutionalize it for routine acceptance and use.			IDOT – Communications, DTS, SRTS; Governor's Office; Board of Education; Secretary of State; LIB	Elementary Schools	

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
		Conduct outreach to encourage "family biking" and encourage safe riding with children.			IDOT—Communications, SE	LIB and other advocacy groups	
		Partner with agencies such as the Department of Tourism in developing community development type programs such as the Kentucky or Pennsylvania "Trail Towns" programs.	High	High	Illinois Department of Tourism	IDOT, LIB and other advocacy groups	
		Work with non-traditional organizations, e.g. Equip for Equality, NAACP, AARP, to identify the most effective and appropriate messages to encourage increased active transportation among low-income, people of color, youth, older adults, people with disabilities.			IDOT – Communications, DTS	Governor's Office for Sustainability, non-traditional organizations, LIB	C, EJ
		Develop a focused outreach approach to increase bicycling among women and girls.			IDOT - Communications, DTS	Illinois National Organization for Women, American Association of University Women, Girl Scouts, Illinois Healthy Women, other women/girl advancement organizations.	C, EJ
4.15	**Support efforts to better integrate land use considerations into the transportation planning process**	Continue to provide departmental education and discussions on the relationship between land use and multimodal transportation.			IDOT – OP&P, Highways	CNU	C, EC, H, E

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No.	Objective/Recommendation	Action Item	Priority	Anticipated Impact	Lead Agency(ies)	Partner Agency(ies)	Project Goals
4.16	**Promote the institutionalization of health professionals/advocates into transportation planning processes**	Reach out to local health directors and boards of health to communicate the importance of participation in local/regional transportation planning.			IDOT – Communications, OP&P; DPH; Illinois Department of Public Health, MPO's	Health Systems, Illinois Health Care Association, other health advocacy networks	C, H
		Identify and implement incentives for local health officials to collaborate on transportation planning efforts. Incorporate health professionals into the planning and project scoping process.	High	High	IDOT – Communications, OP&P; DPH; Illinois Department of Public Health	Health Systems, Illinois Health Care Association, other health advocacy networks	C, H
		Engage network of possible non-profit partners in Illinois, many of which support healthy living initiatives.			IDOT – Communications, OP&P; DPH; Illinois Department of Public Health	Governor's Office, Health advocacy networks, Illinois Healthy Women, Action for Healthy Kids, Illinois Fresh Food Fund	C, H
4.17	**Establish networks to educate non-traditional groups about transportation issues**	Conduct targeted social media, advertisements, marketing campaigns and/or other promotional efforts to increase active transportation.			IDOT – Communications, DTS	Governor's Office for Sustainability, non-traditional organizations, LIB	C, EJ
4.18	**Continue to develop and expand educational resources for residents**	Utilize LIB safety resources, such as videos, pamphlets and the Bike Safety Quiz on State websites (IDOT and Secretary of State) and in State outreach efforts.	High	High	IDOT – DTS, Communications, LIB	Secretary of State, Governor's Office	S
		Promote walking and bicycling as an amenity by continuing to feature exemplary facilities/projects from around the State.	High	High	IDOT – DTS, Communications	LIB	C

Section III- Moving Forward
Chapter 3- Performance Measures

Chapter 3- Performance Measures

The performance measures presented in this chapter provide a tool for tracking the progress of State bicycling and Complete Streets improvements and Plan implementation. Performance measures are directly tied to the Plan recommendations presented in the Process Review and Integration Matrix and throughout Sections II and III. Performance measures are especially pressing because they play a key role in MAP-21 implementation and other legislation's implementation. Although many MAP-21 performance measures were established with the Federal-aid highway program in mind, the policy seeks to provide the "most efficient investment of Federal transportation funds by refocusing on national transportation goals", among other goals related to the national transportation system (§ 1203; 23 USC 150(a))[1]. MAP-21 requires the DOT, in concert with other stakeholders such as State DOTs and MPOs, to accomplish performance measures within 18 months of MAP-21 enactment. Further performance targets "require States to set performance targets in support of those measures", which may be adjusted for the diverse settings found in their respective state (§1203; 23 USC 150 (d))[2]. States must also report on their progress throughout this progress. The performance measures proposed in this section will work with these federal guidelines to reduce traffic congestion, lower fatalities and serious injuries, improve bridge congestion, and reduce on-road mobile source emissions, in addition to those goals outlined in this Plan itself.

The performance measures exhibit continuity with the preceding sections, as each performance measure category corresponds to one of the seven overarching recommendation categories, with the exception of Policy/Legislation:

- Planning & Policies
- Design & Maintenance
- Funding
- Education & Promotion

Information regarding data collection accompanies each metric, giving IDOT the required tools to assess each performance measure. Some of these data points already exist. Sidewalk inventories exist at the district level as one assessment measure for Complete Streets construction. Mode share data for bicycle use is already collected at the statewide level. On the other hand, some metrics need new types of data in order to reliably assess their impact. For example, although IDOT districts inventory sidewalks, Complete Streets projects are not usually tracked. Collecting this data would provide an opportunity to assess many of the proposed performance measures. Performance measures are a good arena for advocacy organizations to lend their skills. LAB already uses a variety of data to assess their Bicycle Friendly State program (see Section I—Existing Conditions, especially Chapter 3—Illinois and Comparisons with Other States). The Chapter on Innovative Technology (Section I Chapter 8) describes opportunities for open source data collection. These and similar

[1] http://www.fhwa.dot.gov/map21/factsheets/pm.cfm
[2] http://www.fhwa.dot.gov/map21/factsheets/pm.cfm

measures can benefit from open source collection since this process expedites the data collection process.

Organizing the proposed performance measures into near and long-term goals allows IDOT staff members to divide far-reaching performance measures into manageable and implementable sections.

Performance Measures Matrix – Illinois Bike Transportation Plan

Performance Measures Matrix

No.	Performance Measure	Metric	Data Collection Need	Agency	Near-term Goal	Long-term Goal
1.0	Planning & Policies					
1.1	Complete Street-specific projects included in the Multi-year Program (projects where Complete Streets issues are the main reason for improvement).	Number or percentage of Complete Street-specific projects.	Tracking of Complete Streets projects (not existing)	IDOT –OP&P	10 projects per district, 20 projects for district one	Distribution of project types is in tandem with current bicycling/pedestrian levels and predicted demand/growth.
1.2	Quantity of Complete Streets projects added annually.	**Bike lanes** – miles added, annually **Sidepaths** – miles added, annually **Sidewalks** – miles added, annually **Paved shoulders** (3' or more) - miles added, annually **Complete Streets Intersection Improvements** (for example, pedestrian/bicycle signal timing, bicycle intersection markings, refuge islands, high-visibility crosswalks) **Complete Streets Mid-block Crossing Improvements** (includes improving existing or installation of new mid-block crossing) **Bridges with Complete Streets Improvements** These features should be evaluated by district.	Tracking of Complete Streets Improvements (not existing), Inventory of sidewalks (in progress by districts)	IDOT – OP&P and districts	Analyze existing growth rates and determine a visionary, yet achievable, goal.	Re-evaluate goals on a regular basis, preferably semi-annually.
1.3	Roadway segments with sidewalks 1) within incorporated areas, or 2) where Complete Streets are warranted.	Percentage of roadway segments. Should be evaluated by district. Alternate: miles of sidewalk backlog (within incorporated boundaries) (note	Inventory of sidewalks (in progress by districts), mapping of areas likely warranted for Complete Streets (not existing)	IDOT - districts	Analyze existing growth rates and determine a visionary, yet achievable, goal.	All warranted areas will have sidewalks

No.	Performance Measure	Metric	Data Collection Need	Agency	Near-term Goal	Long-term Goal
		both sides of road)				
1.4	Cities, businesses, and universities designed as Bicycle Friendly by LAB and the Highway Safety Research Center.	Total number in each category.	Bicycle Friendly Program results from the League of American Bicyclists (existing)	League of American Bicyclists, IDOT	Get 10 communities or colleges/universities who have not applied before to the program to apply through encouragement.	All medium and large cities and colleges/universities in the State will be at least a bronze ranking
1.5	Bicyclist and pedestrian serious injury and fatality rates.	Total number and crash rates compared with mode share split.	Statewide crash data (existing) and commute mode-share (existing)	IDOT -SE	Reduce rate of serious injuries and fatalities by 20%	Eliminate fatalities; reduce serious injuries by 50%
1.6	The number of jurisdictions with adopted bicycle, pedestrian or Complete Streets plans.	The number of jurisdictions that have submitted plans to the Bicycle Inventory System.	Bicycle Inventory System (in progress through this plan)	IDOT – OP&P or Communications	10 new incorporated places statewide adopt bicycle, pedestrian and/or Complete Streets plans	All incorporated places in the state will have local bicycle, pedestrian and/or Complete Streets plans
1.7	Statewide bicycle mode-share	- Census data - City of Chicago's counts (on-road, and Lakefront Trail) - Bike-to-Metra counts (every 5 years) - Metra's on-train bike counts - Others including trail counts, independent studies, etc. This should include an evaluation of woman, minority, children and senior ridership as an indicator of overall system comfort.	Existing data	IDOT – OP&P and partner agencies	Double walking and bicycling mode share rates from 2012 rates	Increase bicycling mode share to 5%, walking to 8%.
2.0	Design & Maintenance					
2.1	Bicycle Level of Service on State-jurisdiction roads	Bicycle Level of Service ratings on State-jurisdiction roadways (that warrant Complete Streets improvements). Metric should note BLOS ratings (A through E) (or equivalent quality index).	Bicycle Level of Service ratings (existing, but improvements recommended)	IDOT – Highways, districts	10% improvement/annually	All roadways where bicycling is warranted should be Bicycle Level of Service rating of B or better (or equivalent quality index)
2.2	The number of State-jurisdiction roadway projects with Complete Streets elements that are suitable for a wide range of bicycling ages and	Number of State-jurisdiction roadway projects where Complete Streets improvements improve Bicycle Level of Service to an A or B rating (or equivalent quality index). Should be evaluated by	Tracking of Complete Streets projects (not existing), Bicycle Level of Service ratings (existing, but improvements to BLOS recommended)	IDOT – Highways, districts	Every roadway project that is along a corridor viewed as an integral piece of a local bicycling network should be improved to BLOS A or B (or reasonable alternate route	Every roadway project that is along a corridor viewed as an integral piece of a local bicycling network should be improved to BLOS A or B (or reasonable alternate route

No.	Performance Measure	Metric	Data Collection Need	Agency	Near-term Goal	Long-term Goal
	abilities.	district.			should be established).	should be established).
2.3	Number of State-jurisdiction roads where Complete Streets are warranted that comply with ADA and PROWAG guidelines.	% of roadways warranted for walking with sidewalks or sidepaths, % of roadways with compliant curb-ramps, % of roadways with compliant crossings and signals. Should be evaluated by district.	Inventory of sidewalks (in progress by districts), Inventory of compliant curb ramps	IDOT – Highways, districts	Address high-priority walking and ADA issues (areas with highest volumes of pedestrian demand or need for accessible facilities) and include walking infrastructure in all warranted projects.	Address ADA issues on all roadways and include walking infrastructure in all warranted projects.
2.4	Bicycle-friendly rumble strips on roads with 4' or greater shoulders.	% of bicycle-friendly rumble strips on roads with 4' or greater shoulders (providing 3' of clear riding space outside of the rumble strip). This would include both IDOT roads, and local roads funded through HSIP. Should be evaluated by district.	Inventory of roads with bicycle friendly rumble strips (not existing)	IDOT - Highways, districts	Double the percentage of roads with bicycle-friendly rumble strips – focusing on significant bicycle routes identified in the BIS	All roadways with 4' or greater shoulders have bicycle-friendly rumble strips.
2.4	Maintenance/preservation/resurfacing projects that include bicycle improvements either within the project scope or as a scope add-on (Includes HSIP projects)	Percentage of all Maintenance/preservation/resurfacing projects that include bicycle improvements either within the project scope or as a scope add-on. Should be evaluated by district.	Maintenance/preservation/ resurfacing projects that include bicycle improvements (not existing)	IDOT – Highways, districts, SE	50% of projects include bikeway improvements where they are warranted and feasible.	100% of projects include bikeway improvements where they are warranted and feasible.
2.5	Bicycle-safe drainage grates on State-jurisdiction roadways.	Percentage of bicycle-safe drainage grates on State-jurisdiction roadways. Should be evaluated by district.	Inventory of drainage grate location and type (not existing)	IDOT – Highways, districts	All drainage grates in populated areas are bicycle-friendly	All drainage grates are bicycle-friendly
3.0	Funding					
3.1	Multi-year Program funding dedicated to Complete Streets improvements.	Percent of Multi-year Program funding dedicated to Complete Streets improvements.	Tracking of Complete Streets projects and funding (not existing)	IDOT – OP&P	Funding levels should be set to address the statewide anticipated need. Meet 25% of this overall need in the near-term.	The statewide anticipated Complete Streets infrastructure need should be met.
3.2	HSIP safety infrastructure dollars going to projects improving bicycling, annually.	Percent of HSIP safety infrastructure dollars going to projects improving bicycling, annually.	Tracking of HSIP funding (existing)	IDOT - SE	HSIP funding for pedestrians and bicyclists should be proportionate to the rate of bike/ped serious injuries vs. all serious injuries	HSIP funding for pedestrians and bicyclists should be proportionate to the rate of bike/ped serious injuries vs. all serious injuries.
3.3	Section 402 safety infrastructure dollars going to bicycle safety programs,	Percent of Section 402 safety infrastructure dollars going to bicycle	Tracking of 402 funding (existing)	IDOT - DTS	Funding or in-kind funding for bicycle and pedestrian programs should increase to	Funding or in-kind funding for bicycle and pedestrian programs should continue to

No.	Performance Measure	Metric	Data Collection Need	Agency	Near-term Goal	Long-term Goal
	annually.	safety programs, annually.			cover the addition of new recommended programs in addition to existing programs	increase as additional recommended programs in are added.
3.4	Transportation Alternatives Program funds for projects to improve bicycling (a separate measure could be established for pedestrian improvements)	Percent of Transportation Alternatives Program funds for projects to improve bicycling (a separate measure could be established for pedestrian improvements).	Tracking TA funds (existing)	IDOT – OP&P	80% of funds for bicycling and pedestrian improvement projects	80% of funds for bicycling and pedestrian improvement projects
3.5	Obligation Rates for the ITEP program.	Rate of obligated funding	Tracking obligated funding (existing)	IDOT – OP&P	Double obligation rates	100% of funds obligated
3.6	Obligation Rates for the SRTS program.	Rate of obligated funding	Tracking obligated funding (existing)	IDOT - SE	Double obligation rates	100% of funds obligated
3.7	IDNR bikeway/trail capital expenditures, annually.	Break out into local grants (State Bike Path Grants) and IDNR's state and local trail work.	Tracking funding (existing)	IDNR, IDOT	Work with IDNR to determine goals	Work with IDNR to determine goals
4.0	Education & Promotion					
4.1	Number of bicycling webpage visits.	Increase in bicycling webpage visits vs. current	Site data (existing)	IDOT - Communications	Increase visits to the bicycling webpage by 50%	Continue an increase in website visits
4.2	Number of safety material downloads and materials distributed (includes Secretary of State and State Police websites).	Increase in content downloads and materials distributed	Tracking of downloads and distribution (existing)	IDOT - Communications	Increase material downloads by 50%	Continue an increase in material downloads
4.3	Safety program PSA's, social media updates, highway marquee messages, etc. about bicycle and/or pedestrian issues.	Percent of Safety program PSA's, social media updates, highway marquee messages, etc. about bicycle and/or pedestrian issues.	Tracking of campaigns about bicycle and/or pedestrian issues (not existing)	IDOT – DTS, Communications	Work with LIB to implement a radio PSA. 20% of all posts will have a bicycle or pedestrian focus	20% of all posts will have a bicycle or pedestrian focus
4.4	The number of engineers, planners and consultants who have attended IDOT-sponsored or endorsed training events for Complete Streets issues.	% of personnel who have completed programs or number of staff-hours spent in training programs in the last 12 months. Should be measured by district and division in addition to department-wide. Could include CEU credits.	Tracking personnel in bike/pedestrian training programs (not existing). Evaluation could be done in conjunction with staff performance evaluations.	IDOT – Highways, OP&P, districts	30% of engineers, planners and consultants will have received regular training on Complete Streets issues.	All engineers, planners and consultants will have received regular training on Complete Streets issues.
4.5	The number and quality of SRTS programs statewide.	The number of Safe Routes to School programs statewide and their score. IDOT should adopt a similar evaluation method for SRTS programs such as	Inventory of SRTS programs (existing) Evaluation of SRTS programs (not existing)	IDOT - SE	Encourage the establishment of 20 new SRTS programs statewide	All state schools serving incorporated communities should have SRTS programs.

No.	Performance Measure	Metric	Data Collection Need	Agency	Near-term Goal	Long-term Goal
		South Carolina's[3]				
4.6	The number of bicycle/pedestrian programs and events.	The number of IDOT-led efforts, IDOT supported efforts, and bicycling programs and events statewide - measured separately	Inventory of active IDOT programs pertaining to bicycling (not existing). Inventory of all programs throughout the State (not existing, rely on bicycling organizations to provide this data).	IDOT – SE, DTS	Establish or facilitate the establishment of 5 new recommended high-priority programs or events	Establish or facilitate the establishment of all recommended high-priority programs or events and begin implementing medium priority project opportunities

[3] http://www.scsaferoutes.org/partnership/become-a-partner