CHAMPAIGN-URBANA COMPLETE STREETS AUDIT PROJECT

Evaluating 16 Recent Champaign-Urbana Area Road Projects for Bicyclist and Pedestrian Accommodation and Safety

September 2011

League of Illinois Bicyclists

ACKNOWLEDGMENTS

The League of Illinois Bicyclists thanks its 1300 members and 35 contributing bicycle clubs, whose support enabled this work. LIB intern Holly Nelson was the lead author on this report and individual audits, and staff Gin Kilgore and Ed Barsotti contributed to this project. LIB also thanks the members of Champaign County Bikes who assisted with taking photos and reviewing project documents. Finally, LIB appreciates review comments from the relevant road-building agencies.

Photo above by Gary Cziko
Photo below by Holly Nelson

TABLE OF CONTENTS

OVERVIEW

Complete Streets is a growing movement in transportation planning in the US.[1] It is a framework for designing roadways that meet the needs of all the people who travel along and across them—whether they are driving a vehicle, taking transit, riding a bike, walking, using a wheelchair or pushing a stroller. For example, a busy street that efficiently moves cars but provides no safe and convenient crossing for school children is incomplete.

Photo by Holly Nelson

The League of Illinois Bicyclists (LIB) has been conducting Complete Streets Audits since 2007. The audits rate individual roads on a 100-point scale of how well they accommodate bicyclists and pedestrians, taking into account each road's particular context. A quiet farm roadway or residential cul-de-sac might be fine for bicycling and walking as-is, but a major suburban arterial needs additional features such as sidewalks, intersection treatments, and bicycle lanes or a sidepath.

LIB's methodology (see appendix) includes objective tools such as the Federal Highway Administration's (FHWA's) sidewalk installation guidelines,[2] Bicycle Level of Service,[3] and LIB's Sidepath Suitability Score.[4] While the focus is on cyclists and pedestrians, the needs of transit riders are also discussed (a transit trip usually involves walking, and sometimes cycling).

During the summer of 2011, LIB conducted a "Complete Streets Audit" of 16 roads in the Champaign-Urbana area that were modified since 2001, and the results are very encouraging.

Summary of LIB's Complete Streets Audit Methodology

Pedestrian Accommodations Along the Road (40)

- *Do the number of sidewalks meet national guidance from FHWA?*
- *Well-designed sidewalks and intersections?*

Bicycle Accommodations Along the Road (35)

- *Is the roadway comfortable for cycling?*
- *Are there bike lanes or sidepaths?*
- *Pavement markings or signs?*

Crossing Accommodations (15)

- *Are there crosswalks and pedestrian refuges, if needed?*
- *Pedestrian signals? Cyclist actuation?*

Context Factors (10)

- *Do non-motorized accommodations match the level of need?*
- *Are there nearby alternative routes?*

Average Score Summary

Pedestrian Accommodations	*27.7 out of 40*
Bicycle Accommodations	*26.8 out of 35*
Crossing Accommodations	*8.3 out of 15*
Context Score	*7.6 out of 10*
AVERAGE TOTAL SCORE	***70.4 out of 100***

Conditions for cyclists and pedestrians in the Champaign-Urbana area are improving significantly, in large part due to recent changes to policy and movement towards design best practices. The average total score was 70.4 out of 100, with eight audits scoring over 75 points and only three audits scoring under 50 points. Most roads with high expected levels of pedestrian and bicycle activity had some form of accommodation. Ten roads met the minimum FHWA recommended pedestrian accommodation. Nine roads met or exceeded best practice recommendations for bicycle facilities, a testament to the dramatic improvement in area cycling conditions over the past decade. Prior to 2001, little to no on-road accommodations for cyclists existed; today bicycle lanes can be found on many area roads, such as Randolph, State and First Streets in Champaign, and Goodwin Avenue and Philo Road in Urbana.

Photo by Holly Nelson

Area roads are improving but our streets are not yet complete. No roads scored above 90 percent; each road has room for improvement, and some have major deficiencies. Five of the six lowest scoring projects had lopsided scores, where walking or cycling was accommodated but not both. For example, Kirby and Bradley have sidewalks but no bicycle facilities. Roads more on the developing fringe, like High Cross and Curtis, tend to lack pedestrian accommodations, but provide room for on-road cycling. It's better to install sidewalks proactively than to rely on parcel by parcel development.

In general, crossing accommodations need improvement. Some intersections are intimidating, due to road widenings, high speeds, large turning radii and/or turning lanes. Additional safety features – even beyond common design practice—are often needed to limit conflicts between motorized and non-motorized users of the roadway. The audits note multiple locations

where new or improved crossing treatments are needed. The southern part of Goodwin Avenue in Urbana is a great local model of successful crossing design, and won awards (American Public Works Association and FHWA) for its design and implementation. Bump-outs increase pedestrian visibility at crossing locations and color-contrasting tactile indicators help people with visual impairments locate the edges of the street.

Another issue is that many sidewalks are not the FHWA recommended five feet in width, which aids with accessibility. Sidewalks should be widened as they are replaced. Finally, continued coordination between agencies is necessary to ensure that bicycle and pedestrian networks are continuous and meet demand.

Funding agencies for the road projects included the City of Champaign, City of Urbana, Village of Savoy, University of Illinois, Champaign County, and IDOT. The roads were selected to reflect a diversity of type, agency and location. Some of the projects were completed before the adoption of Complete Streets related policies; it is clear that improved policies are leading to improved roadways. The top five scoring projects were all completed within the last five years while 3 of the 4 lowest scoring projects were completed in 2005 or before. Although at different times and in different ways, all agencies involved in the audited projects have taken steps towards better planning for non-motorized transportation.

Photo by Holly Nelson

RESULTS

From the sixteen local audits conducted by LIB, the average score was 70.4 out of 100 (see Table 1 for all audit scores by category). The Champaign-Urbana area had a higher average score than the Chicago area audit conducted in 2009, which had an average of 52.1 percent. Eight audits had good to excellent accommodations and received 75 or more points. Five audits had basic accommodations and scored 50 to 75 points. The remaining three audits need major improvements and scored lower than 50 points. No roads scored below 25 points. Figure 1 shows a map with the audit scores, and Figure 2 shows the distribution of scores by category.

Table 1: Champaign-Urbana Area Complete Streets Audit Results

Street Name	Location	Year	Funding Agenc(ies)	Pedestrian Score	Bicycle Score	Crossing Score	Context Score	Total Score
First Street (Champaign)	University Ave to Gregory Dr	2008	City of Champaign	36	35	10	9	**90**
Randolph Street	Bradley Ave to Hessel Blvd	2010	City of Champaign	35	35	10	9	**89**
Goodwin Avenue	Bradley Ave to Gregory Dr	2005-2010	City of Urbana, University of Illinois	37	31	11	9	**88**
Philo Road	Florida Ave to Windsor Rd	2006-2010	City of Urbana	36	35	8	9	**88**
Main Street	Grove St to Vine St	2010	City of Urbana	32	33	11	8	**84**
Lierman Avenue	Main St to Washington St	2006	City of Urbana	36	30	5	8	**79**
Windsor Road	Wright St to High Cross Rd	2007-2010	City of Urbana, Champaign County	28	31	10	8	**77**
Stone Creek Boulevard	Castlerock Dr to High Cross Rd	2005	City of Urbana	35	30	4	8	**77**
Green Street	Fourth St to Wright St	2002	City of Champaign	39	12	14	6	**71**
Florida Avenue	W of Kinch St to E of Abercorn St	2001	City of Urbana	35	19	6	7	**67**
Bradley Avenue	Mattis Ave to Duncan Rd	2008	City of Champaign	37	6	13	6	**62**
Curtis Road	Staley Rd to Wesley Ave	2008-2010	City of Champaign, Village of Savoy, Champaign Co., IDOT	9	32	6	7	**54**
Prospect Avenue	Meijer Dr to Interstate Dr	2005	City of Champaign	37	0	9	6	**52**
Kirby Avenue	E of Prospect Ave to Mattis Ave	2010	City of Champaign	34	0	9	5	**48**
High Cross Road	University Ave to Washington St	2005	IDOT	9	24	4	5	**42**
First Street (Savoy)	Curtis Rd to Old Church Rd	2001	Village of Savoy	9	12	8	7	**36**
Average				**27.7**	**26.8**	**8.3**	**7.6**	**70.4**
Maximum				**40**	**35**	**15**	**10**	**100**

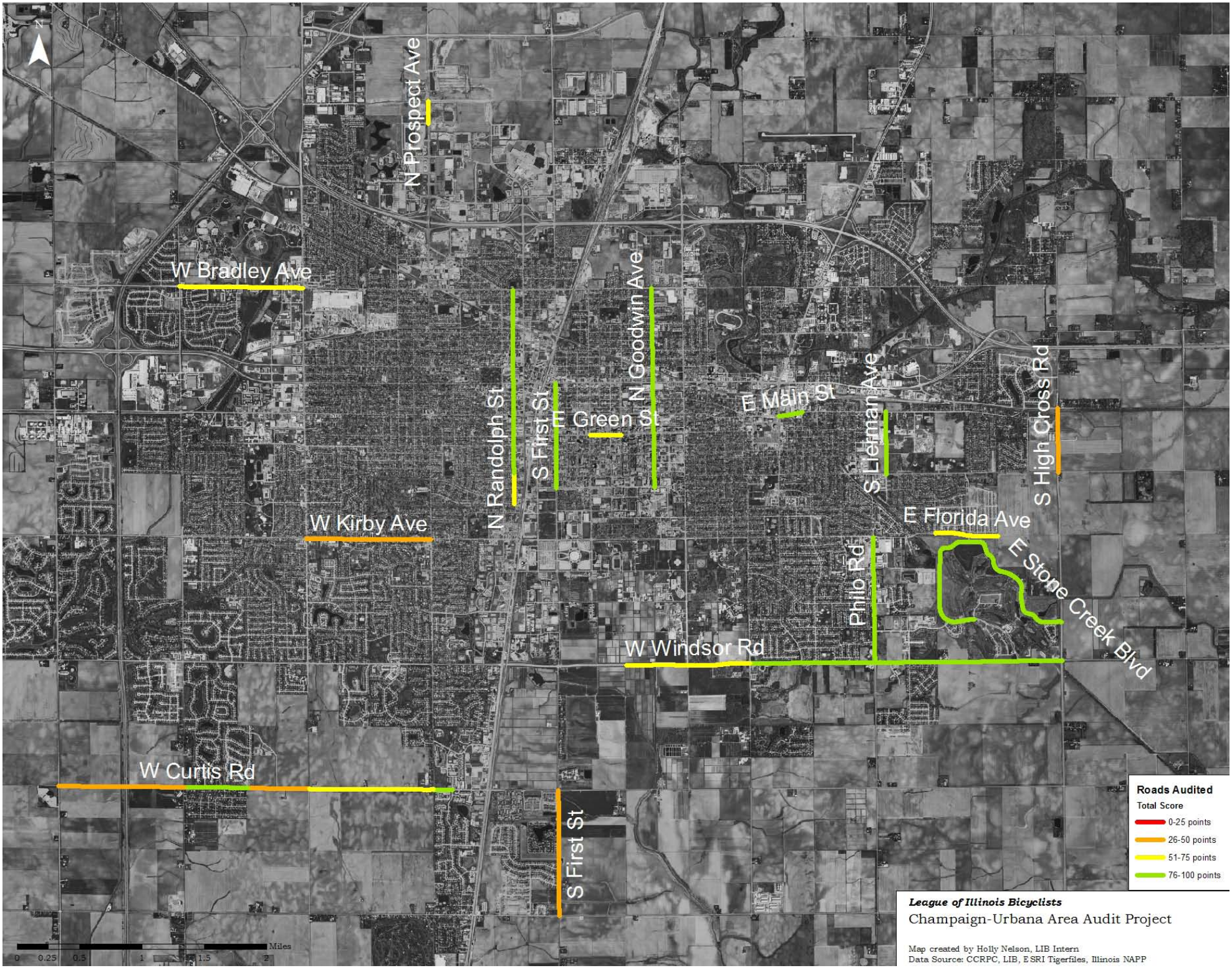
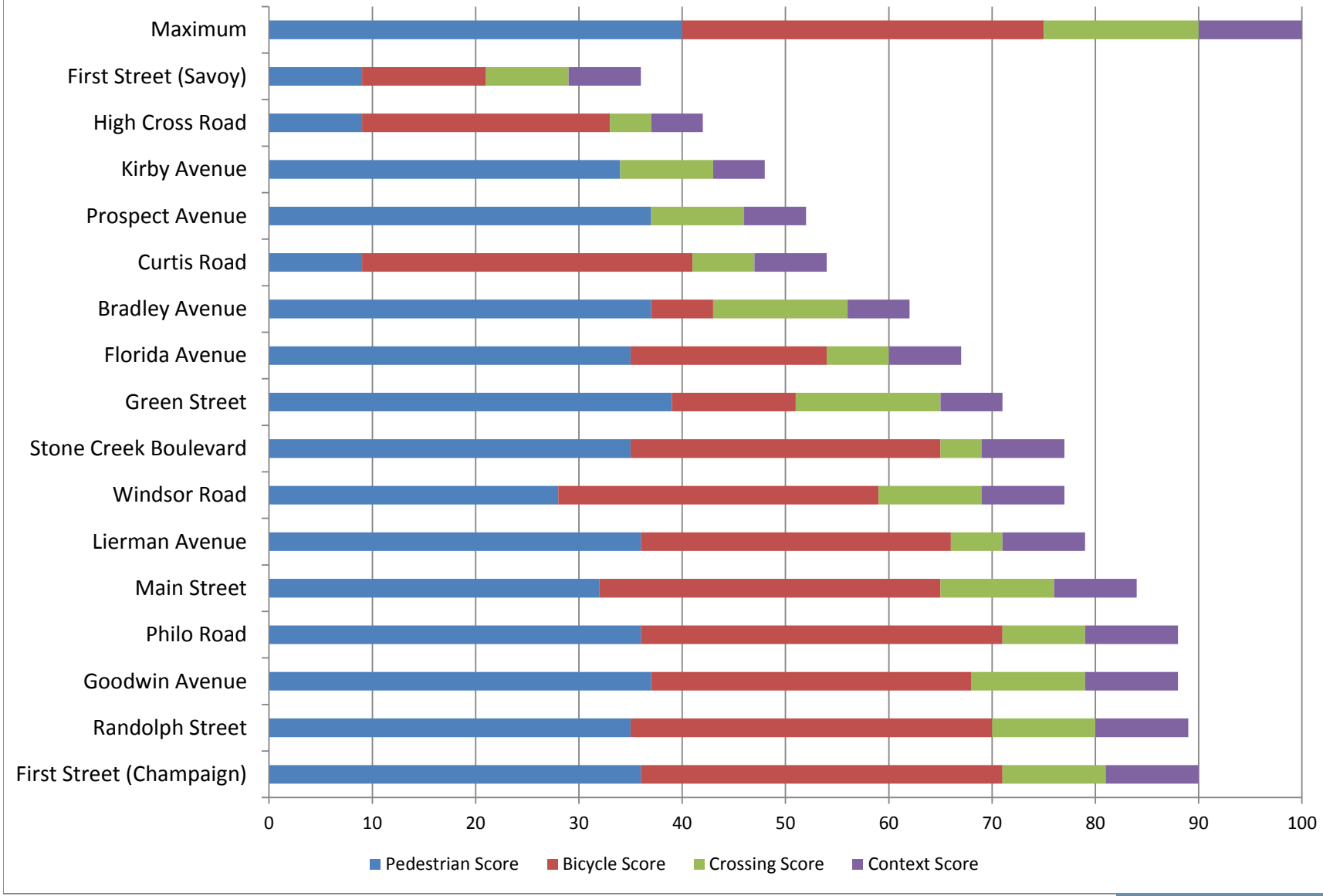
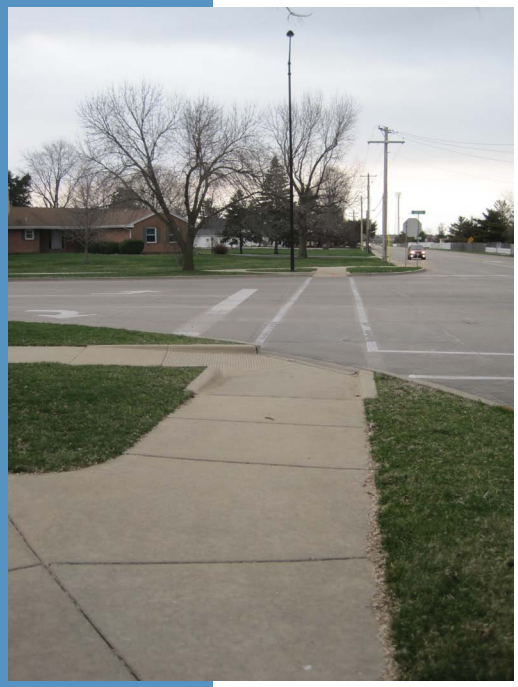

N
N Prospect Ave
W Bradley Ave
N Randolph St
S First St
E Green St
N Goodwin Ave
E Main St
S Lieman Ave
S High Cross Rd
W Kirby Ave
E Florida Ave
E Stone Creek Blvd
Philo Rd
W Windsor Rd
W Curtis Rd
S First St
Miles
0 0.25 0.5 1 1.5 2
Roads Audited
Total Score
0-25 points
26-50 points
51-75 points
76-100 points
League of Illinois Bicyclists
Champaign-Urbana Area Audit Project
Map created by Holly Nelson, LIB Intern
Data Source: CCRPC, LIB, ESRI Tigerfiles, Illinois NAPP

Figure 2: Champaign-Urbana Area Complete Streets Audit Results



ANALYSIS & RECOMMENDATIONS

PEDESTRIAN ACCOMMODATIONS ALONG THE ROAD



Sidewalks are the most basic and recognized accommodation for non-motorized roadway users. They are especially important for less agile members of society, including children, the physically impaired, and the elderly. Some very low density residential streets may not need sidewalks due to low traffic levels, but in general sidewalks are a key feature for safety and access. Additionally, care should be taken to properly design crossings along a roadway to minimize conflicts between vehicles and pedestrians and to provide information to pedestrians in multiple formats so that users of varying mental and physical abilities can cross safely.

The Complete Streets Audit scores reflect the extent to which sidewalk coverage (one or both sides) meet Federal Highway Administration (FHWA) guidance.[5] All audited road projects are within the urbanized planning area. Thus, all will have existing or latent demand over the planned life cycle of the road project. This includes those audited roads presently on the urban fringe. Ten of the roads met the highest level of FHWA suggestions. The other seven met a lower recommendation or did not meet the recommendation for part of the length. All the roads had sidewalks for at least a portion of the study area, although the sidewalk on High Cross Road in Urbana is isolated and disconnected.

Photos by Holly Nelson

A portion of the pedestrian score (ten points) is awarded for design and maintenance details, such as buffer width, crosswalk location and visibility, raised corner and median refuge islands at intersections (where needed), provision of trees, pedestrian signals, accessible curb ramps, provision of amenities such as benches or bus shelters, and visual delineation of sidewalks at driveways. Sidewalks along Green Street in Champaign are an excellent example of pedestrian design, and neighboring buildings are built at a pedestrian-friendly scale as well. Kirby, which has narrow sidewalks abutting privacy fences, provides a less comfortable walking experience.

Recommended Actions

- *Adopt the Federal Highway Administration's "New Sidewalk Installation Guidelines"[6] as policy for all roadway projects. This specifies sidewalks on one or both sides as a function of road classification and land use.*
- *Adopt policies to prevent sidewalk gaps at undeveloped parcels.*
- *Where sidewalks cross wide, multi-lane intersections, use raised corner islands and/or median islands. This improves safety by:*
  - *breaking the crossing into segments, each with fewer traffic conflicts and turning movements; and*
  - *enabling crosswalks and stoplines to be closer to the parallel road, so that traffic is more likely to stop at the stopline instead of in the crosswalk.*
- *Adopt as standards other sidewalk design and maintenance details listed in the methodology, AASHTO's Guide for the Planning, Design, and Operation of Pedestrian Facilities,[7] and materials from the National Complete Streets Coalition.[8]*
- *As sidewalks are repaired or added, they should be built to the FHWA recommended width of five feet or more.*
- *Continue to improve accessibility of pedestrian facilities; the FHWA publication Designing Sidewalks and Trails for Access, Part II: Best Practices Design Guide is a good reference.[9]*

CU COMPLETE STREETS 11

League of Illinois Bicyclists

Average: 27.7 out of 40*

Photo by Holly Nelson
** Averages are weighted based on the lengths of the roads (a longer road carries more weight).*

BICYCLE ACCOMMODATIONS ALONG THE ROAD

Cyclists of differing abilities have different needs as they travel a roadway. For all but the slowest riders, cycling on sidewalks or sidepaths (off-road trails adjacent to roads) means the possibility of more conflicts with motorized traffic at every intersection, driveway, and entrance. Additionally, off-road facilities are generally not maintained as well as roads, including resurfacing, cleaning, and snow-plowing. On roads with lower speed limits and many such crossings, it is a nationally-recommended practice[10] to plan for on-road bicycling, often with special "bike lane" markings and signage. Surprising to many, doing so is actually safer, as most car-bicycle crashes on this type of road are due to lack of visibility at intersections – not from bikes being hit from behind. Off-road bicycle accommodations are more appropriate along higher-speed, higher-traffic roads with few crossings.

The Complete Streets Audit methodology rates any and all on-road or off-road accommodations that may exist for cyclists, awarding the highest score received from the most suitable option.

Bicycle accommodations on most of the audited projects have improved over the past ten years. While some of the older projects did not provide bicycle facilities or provided facilities that could be improved, many of the most recently completed projects reflect current best practices in planning for bicycles. Randolph Street and First Street in Champaign and Philo Road in Urbana received the maximum credit for bicycle accommodations. Five foot bicycle lanes with signs to alert motorists provide a comfortable and direct route for cyclists, and dashed lines at intersections indicate turning locations for cars.

Where a series of projects were completed over several years and by several different agencies, bicycle accommodations tended to oscillate between on-road and

Photo above by Holly Nelson
Photo below by Gary Cziko

off-road facilities, such as on Curtis Road in Champaign and Savoy, and Windsor Road in Urbana. In most cases, the facilities provided were appropriate for the context of each particular stretch of road, but the overall function of the road as a bikeway is choppy. Cyclists who are unfamiliar with the area may be confused by switches back and forth between sidepaths and lanes. Long-range coordination and planning is needed to produce continuous bikeways with good flow.

In addition to the provision of adequate bicycle facilities, signage both for cyclists and as an alert to motorists is an important part of the success of a cycling network. Some roads had signs indicating the presence of bicycle lanes but others did not. Way-finding signs would be helpful, especially since there is a constant influx of people new to the community via the University who may have difficulty learning to navigate the local bicycle network. Markings for on-road cyclist actuation at demand-actuated signals would also help cyclists to cross major roads in the absence of other traffic. Finally, implementing agencies should continue to keep abreast of evolving best practices.

Recommended Actions

- *Adopt roadway design standards to accommodate bicycles where there is existing or latent need. "Chapter 6: Bicycle Vision" from the Champaign Moving Forward transportation plan is a good resource.*[11]
- *Adopt road standards with bicycle accommodation determined by traffic speed and counts, road classification, and number of crossings. Resources include the AASHTO's Guide for the Development of Bicycle Facilities*[12] *and planning tools such as Bicycle Level of Service, Sidepath Suitability Score, and the methodology used here.*[13]
- *For rural cross-section roads in urban areas, adopt a paved shoulder policy with width varying according to traffic counts (see LIB's audit methodology). Avoid rumble strips, but if they are included, use bicycle-friendly designs with at least 3-4 feet clear of rumbles, periodic longitudinal breaks, and occasional sweeping.*

League of Illinois Bicyclists

Average:
26.8 out of 35

Photo by Holly Nelson

CROSSING ACCOMMODATIONS

Roadways may function well for cyclists and pedestrians travelling along them, but they can also act as barriers if well-designed crossings are not available. Depending on the context and size of the road, different types of crossings are applicable. Smaller roads with lower traffic volumes and speeds may only require a crosswalk while corner or median refuge islands and pedestrian signals with countdown timers would be appropriate at large, multilane intersections.

In recent decades, intersections – especially multi-lane suburban arterial intersections – have become increasingly hazardous for pedestrians and bicycles. Efforts to increase traffic flow through intersections, including additional turn lanes, wider turning radii for trucks and faster throughput, and signalization for continuous turning movements, have all come at the expense of non-motorized roadway users' safety. To compound the problem, fewer motorists yield the right of way when required by law, partially because of the engineering changes.

Accessibility is also of great concern at intersections as crossings may be difficult for persons with visual, mental, or mobility impairments. Tactile indicators in the form of truncated domes and audible pedestrian crossing signals can aid the visually impaired with road crossings. Curb ramps and median refuges make crossings easier for people with mobility impairments, strollers, small children, or bicycle trailers. Attention to small details in the planning and construction of intersections can make a big difference for the people who pass through them each day.

Photo by Holly Nelson

Among the roads in this audit project, Goodwin Avenue and Green Street had the best crossing accommodations. Highly visible crosswalks and bump-outs along Goodwin help motorists pay attention to pedestrians. Green has exclusive signal phases for pedestrians at two intersections and a well-marked

crossing at an unsignalized intersection. Many other roads could be improved. Although Windsor Road received a fairly high overall score for crossings, a better crossing is needed near the Clark-Lindsey bus stop. Many elderly pedestrians could be expected to cross in that location, or at the nearby Race Street intersection, which has a four-lane, four-way stop and standard crosswalks. Although some area intersections have signals that can detect bicycles, none are labeled. This deficiency should be addressed in future planning, especially along recommended bicycle routes.

Recommended Actions

- *Adopt proactive intersection design policies including those discussed above, in the methodology, and in AASHTO's Guide for the Planning, Design, and Operation of Pedestrian Facilities.*[14]

- *Provide sensitive traffic loops to detect the presence of on-road bicycles (and motorcycles) at demand-actuated traffic signals. Tune and mark "trigger points" with MUTCD-approved markings.*[15]

- *Continue to improve accessibility of roadway crossings; the FHWA publication Designing Sidewalks and Trails for Access, Part II: Best Practices Design Guide is a good reference.*[16]

CU COMPLETE STREETS 15

League of Illinois Bicyclists

Average: 8.3 out of 15

Photo above by Holly Nelson
Photo below by Gary Cziko

CONTEXT SENSITIVE FACTORS

Context is key to designing a roadway. While walking and cycling can be expected along and across all roadways (expect where prohibited), their levels will vary based on land use. In the appendix, the methodology quotes IDOT's bicycle policy "warrants," which define factors that determine the importance of a road's non-motorized accommodations (see also IDOT trends section below). These include high latent demand areas, unique access to destinations, crossing of a "barrier," or transit accessibility.

Many of the roads where pedestrians and cyclists could be most expected had adequate accommodations, including Goodwin, Randolph, Philo, and First. In some lower density areas, such as Stone Creek in Urbana, need for accommodation may not be as high, but roads with high vehicle throughput are not necessarily unused by pedestrians or cyclists. Kirby and High Cross are roads where higher consideration should have been given to non-motorized users. Some people will walk or bike along these roadways if they have no alternative form of transportation.

Photos by Holly Nelson

Recommended Actions

- *Place more emphasis on non-motorized accommodation where context and need is greatest.*
- *Extra care should be taken in planning for pedestrians and cyclists on roads that are used for bus routes.*
- *Recognize that cyclists and pedestrians can be expected on all roadways, unless explicitly prohibited.*

CU COMPLETE STREETS 17

League of Illinois Bicyclists

Average: 7.6 out of 10

Photo by Gary Cziko

AGENCY TRENDS

All agencies mentioned in this report have expressed commitment to bicycle and pedestrian safety improvements. However, some of the audited projects were completed before the implementing agency had adopted Complete Streets related policies. This section describes each agency's progress towards routine accommodation of cyclists and pedestrians. They are listed in order of most to least projects included in the audit.

CITY OF URBANA

Photo by City of Urbana

Urbana's bicycle and pedestrian policies have evolved over the past ten years. Best practices have improved since the earliest completed project included in this audit, Florida Avenue (2001). The sidewalk and sidepath accommodate pedestrians but crossings are unmarked and cyclists would have been better accommodated in the roadway.

Urbana does not have a specific transportation plan but many objectives of the 2005 *Comprehensive Plan* promote bicycle, pedestrian, and transit opportunities.[17] Projects completed around that time included Goodwin (2005-2010), Philo (2006-2010), Lierman (2006) and Stone Creek (2005). All of those projects included some accommodation for bicycles. Philo and Goodwin are Urbana's highest scoring roads, earning over 85 points each because of the well-designed pedestrian, bicycle, and crossing facilities. Stone Creek has an unorthodox multiuse path located in a central median.

The City of Urbana contracted with the Champaign County Regional Planning Commission and the League of Illinois Bicyclists to produce the *Urbana Bicycle Master Plan*,[18] published in April of 2008. Windsor (2007-2010) and Main (2010) reflect Urbana's continued commitment to the provision of bicycle amenities. Specific future improvements on roads throughout the city over the upcoming fifteen years are outlined in the "Recommendations" and "Implementation" sections of the plan.

Urbana's bicycle plan, as well as the active Bicycle and Pedestrian Advisory Committee, show that the city is engaged in improving the bicycle and pedestrian network. The plan also calls for re-evaluation of the bicycle network every five years to determine if the plan should be adjusted. One sign of Urbana's success is that it was honored as a Bicycle Friendly Community by the League of American Bicyclists in 2010.

Urbana is continuing to make progress. It is in the process of considering a Complete Streets policy that will help specify the types of pedestrian and bicycle facilities that should be provided on city roads. While bicycle facilities are well-outlined for existing roads, the current city ordinance does not indicate where or when bicycle facilities should be constructed for new roads. Urbana is also updating its ADA compliance plan and now requires five-foot sidewalks.

CITY OF CHAMPAIGN

The City of Champaign's bicycle and pedestrian policies have evolved significantly since the start of the study period. The City of Champaign Manual of Practice,[19] adopted in 2002, provided standards and guidelines for road and sidewalk construction until recently. Older projects, such as Green Street (2002) and Prospect Avenue (2005) reflect those older policies.

In February of 2008, the city adopted a new transportation master plan, *Champaign Moving Forward*,[20] which revised many of the old policies to fit the Complete Streets model. Under this plan, current best practices for bicycle and pedestrian facilities are required and exceptions must receive approval from higher authorities. Significantly, the plan requires five foot sidewalks rather than the four

Photos by Holly Nelson

Photos by Holly Nelson

foot minimum width previously required, inclusion of bicycle lanes rather than off-road sidepaths on four and five lane arterials, and construction of wide shoulders for bicycle use on outer suburban arterials. The 2011 *Champaign Trails Plan*,[21] completed by the City and the Champaign Park District, shows detailed opportunities and constraints for seventeen potential major pedestrian and bicycle trail corridors.

These changes, as well as the overall sentiment of *Champaign Moving Forward,* indicate that the City of Champaign is already working towards many of the improvements outlined in this report. Projects completed more recently, including First Street (2008), Randolph Street (2010), and Curtis Road, reflect many of the newer policies. However, Bradley Avenue (2008) and Kirby Avenue (2010) do not meet Complete Streets standards. These projects were lost opportunities to fill in gaps in the bicycle network, although they were likely designed before the passage of *Champaign Moving Forward*.

CHAMPAIGN COUNTY

Champaign County participated in the funding of two road projects in the Champaign-Urbana area since 2001, both of which were audited (Curtis Road and Windsor Road). Curtis (2008-2010) had adequate bicycle accommodations but needs better pedestrian and crossing facilities. Windsor (2007-2010) scored fairly well for all categories.

The Champaign-Urbana Urbanized Area Transportation Study (CUUATS) of the Champaign County Regional Planning Commission (CCRPC) is the MPO charged with completing the *Long Range Transportation Plan* (LRTP) for the Champaign-Urbana area.[22] The current LRTP, adopted in 2009, summarized many of the transportation improvements that individual agencies have made in the past and will make in the future. The LRTP emphasized improvements for pedestrians, cyclists, and public transit,

reflecting current best practices. The plan also calls for coordination between agencies to produce well-integrated transportation networks. One specific project advocated by CUUATS is the completion of a fringe road network around Champaign-Urbana, which would be built to Complete Streets standards to allow higher-speed and longer-distance commuting for all modes of travel.

The *Greenways and Trails of Champaign County Design Guidelines*,[23] completed in 2008 and amended in 2010, features up-to-date policies and design standards for sidewalks, bicycle lanes, shared lane markings, and shared-use trails.

The CCRPC appears to be on target with Complete Streets policies based on the sentiment of the LRTP and the design standards in the Greenways and Trails manual. The CCRPC should continue to coordinate with other agencies to ensure that policies are fulfilled and goals are met.

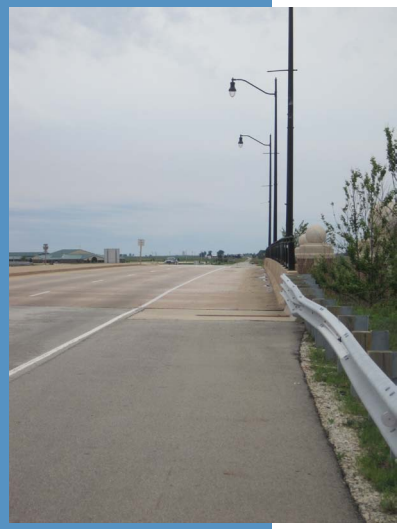
Specific LRTP objectives relating to Complete Streets include:

- *Increase the miles of dedicated bicycle facilities and signed bike routes in the metropolitan planning area by 15% by 2014.*
- *By 2014, ensure that 100% of new development within the municipal boundaries or land annexed into a municipality provides sidewalks along roadway frontages through construction or a reservation of land and funds for construction, unless an acceptable alternative pathway is provided. Sidewalk connectivity must be analyzed with each new development proposal.*
- *Provide transit service within a 1/4 mile for 90% of residential development (new or existing) within the CUMTD transit service area by 2014.*
- *Reduce the total number of crashes involving bicyclists and pedestrians in Champaign-Urbana by 15% by 2014.*
- *Construct a comparable amount of facilities for active modes of transportation during new roadway construction, major reconstruction or lane reconfigurations by 2014.*
- *Increase the percentage of persons aged 16 and older using transit in their journey to work from 6.5% to 9% of the urbanized area by 2014.*
- *To the greatest extent possible, improvements will be made to the existing roadway network to preserve or improve upon its current condition and to add pedestrian, bicycle and transit facilities where needed.*

Photo by Holly Nelson

ILLINOIS DEPARTMENT OF TRANSPORTATION

IDOT participated in only a few road projects in the Champaign-Urbana area, including the widening of High Cross (2005) and the construction of Curtis Road and the I-57 interchange from Staley to Duncan (2008). The bridge over I-57 has wide shoulders that assist cyclists and pedestrians to cross that major barrier. This is a significant improvement over other bridges that were installed in the past. High Cross includes shoulders which accommodate bicycle travel. However, neither project scored well for pedestrian or crossing accommodations. The reconstruction of several overpasses in the next decade provides an opportunity to dramatically increase bicycle and pedestrian access across I-57, ideally with both bicycle lanes and sidewalks.



Since these projects, changes have been made to IDOT's *Bureau of Design and Environment Manual*,[24] prompted by the 2007 passage of a Complete Streets law in Illinois. While intersections and FHWA sidewalk guidance were not addressed, the changes included substantial improvements in urbanized area bicycle accommodations and in local cost share rates for off-road facilities. These new policies, scheduled for review after two years, poise IDOT to make significant strides in the future.

IDOT Complete Streets Policy excerpts:

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

a. in pavement resurfacing projects that do not widen the existing traveled way or do not provide stabilized shoulders; or

b. where approved by the Secretary of Transportation based upon documented safety issues, excessive cost, or absence of need.

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."

Photo by Holly Nelson

VILLAGE OF SAVOY

Savoy's 2002 and 2009 *Comprehensive Plan Updates* called for increases in the provision of pedestrian and bicycle facilities.[25] The *Savoy Municipal Code*, last revised in 2010, requires the installation of sidewalks on both sides of all public streets.[26] Savoy demonstrated an increased commitment to cyclists by constructing wide shoulders and sidepaths along its section of Curtis Road in 2009. Pedestrian and crossing accommodations could be improved, however. South First Street, completed in 2001—before policy updates—has only a short section of sidewalk on one side of the street, but does have shoulders that a confident cyclist could use. Ideally, sidewalks are installed as part of a road project, instead of parcel by parcel when development occurs.

The Village of Savoy should continue to strive to realize its goal of creating an atmosphere conducive to "leisurely strolls through the neighborhoods by its residents, hopefully leading to neighbors meeting neighbors," while also providing opportunities for alternative forms of transportation for functional purposes.

Photos by Holly Nelson

UNIVERSITY OF ILLINOIS

The University of Illinois (UIUC) has been actively updating its roadway design policies over the past ten years. UIUC campus bicycle facilities, built before bikeway standards were developed, are showing their age. They have "existed for decades with little improvement," as noted in the 2009 Draft *Campus Bike Plan*.[27] The 1999 *Campus Area Transportation Study* identified several pedestrian deficiencies as well, including narrow sidewalks and pathways, excessive queuing at intersections, and inconsistently defined crossings. Bicycle deficiencies included insufficient width of off-road paths, inappropriate use of off-road paths, point obstructions, mode conflicts, and poor connectivity.[28]

The University participated in the funding of several road projects since 2001, including Goodwin Avenue (2005-2010), which received one of the highest scores in this audit. The University-funded segment of Goodwin (2009) is an excellent example of Complete Streets implementation. The Campus Area Transportation Study was part of the planning effort for some city-funded road projects as well, including Green Street (2002), which has excellent pedestrian accommodations. The university was also involved in retrofitting Gregory Drive with bicycle lanes.

In terms of future planning and policy, the University should continue to phase out off-road bike paths where there are many vehicle and pedestrian conflicts. "Yield to Pedestrians" signage should be installed on sidepaths to reduce conflicts between pedestrians and cyclists. Further incentives to decrease motor vehicle traffic on campus would improve conditions for cyclists and pedestrians. The University should continue to work closely with local planning agencies to coordinate bikeways and provide a more continuous network.

Photos by Holly Nelson

CONCLUSION

In general, streets in the Champaign-Urbana area have become more complete over the past decade. While some early projects did not offer adequate facilities for pedestrians or cyclists, many of the more recent projects offer better accommodations. The central areas have seen some of the biggest changes, with new bicycle lanes and friendlier intersections. The area's road building agencies should be commended for their work in developing plans and policies that will improve conditions for all roadway users. As roads are constructed or reconstructed in the future, implementation of these strategies will continue to expand options for walking and cycling.

Even with the progress, more work remains. There are roads that make room for cyclists or pedestrians but not both. And, too often, roads act as barriers; travel along is still sometimes easier than travel across. Proactively emphasizing safe road crossings at intersections will improve conditions in locations with the highest potential for conflict. The stakes are high for the most vulnerable users of our roadways.

Local agencies should continue to stay aware of changing best practices in roadway design to ensure that streets stay up-to-date and use the best available technologies for safety. Continued coordination among area agencies is also key to the future success of bicycle and pedestrian facilities to avoid gaps and create efficient routes for alternative transportation.

Photo by Holly Nelson

Photo by Holly Nelson

REFERENCES

1. National Complete Streets Coalition.www.completestreets.org

2. FHWA."Priorities and Guidelines for Providing Places for Pedestrians to Walk Along Streets and Highways (Table 4-2, Guidelines for New Sidewalk Installation)." Federal Highway Administration, 1999. www.fhwa.dot.gov/environment/sidewalk2/sidewalks204.htm

3. *Bicycle Level of Service calculator.* League of Illinois Bicyclists. www.bikelib.org/roads/blos/losform.htm

4. *Sidepath Suitability calculator*. League of Illinois Bicyclists. www.bikelib.org/roads/blos/sidepathform.htm

5. Ibid. FHWA 1999

6. Ibid. FHWA 1999

7. AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. American Association of State Highway and Transportation Officials. Washington, DC, 2004.

8. National Complete Streets Coalition."Resources." http://www.completestreets.org/complete-streets-fundamentals/resources/

9. FHWA. *Designing Sidewalks and Trails for Access, Part II: Best Practices Design Guide*. Federal Highway Administration, 2001. http://www.fhwa.dot.gov/environment/sidewalk2/

10. AASHTO. *Guide for the Development of Bicycle Facilities*. American Association of State Highway and Transportation Officials. Washington, DC, 1999.

11. City of Champaign. *Champaign Moving Forward: City of Champaign Transportation Master Plan*. Adopted 2008. http://ci.champaign.il.us/departments/planning/long-range-planning/champaign-moving-forward-transportation-master-plan/

12. Ibid. AASHTO. 1999

13. See www.bikelib.org for more information on tools and the audit methodology.

14. Ibid. AASHTO 2004

15. FHWA. *Manual for Uniform Traffic Control Devices* (Chapter 9). Federal Highway Administration. mutcd.fhwa.dot.gov/HTM/2003/part9/part9-toc.htm

16. Ibid. FHWA 2001

17. City of Urbana. *2005 Comprehensive Plan*. Spring 2005. http://urbanaillinois.us/businesses/urbana-comprehensive-plan

18. City of Urbana and Champaign County Regional Planning Commission. *Urbana Bicycle Master Plan*. April 2008 http://www.ccrpc.org/bike/report.php

19. City of Champaign. *Manual of Practice*. Adopted March 2002. http://ci.champaign.il.us/departments/public-works/residents/subdivision-regulations-and-manual-of-practice/

20. Ibid. City of Champaign 2008

21. City of Champaign and Champaign Park District. *Champaign Trails Plan*. 2011. http://ci.champaign.il.us/cms/wp-content/uploads/2011/03/Champaign-Trails-Plan-2011.pdf

22. Champaign-Urbana Urbanized Area Transportation Study of the Champaign County Regional Planning Commission. *Long Range Transportation Plan*. December 2009. http://www.ccrpc.org/transportation/lrtp2/

23. Champaign County Regional Planning Commission. *Greenways and Trails of Champaign County: Design Guidelines, Logos and Signage*. April 2008, amended August 2010. http://www.ccrpc.org/greenways/index.php

24. Illinois Department of Transportation. *Bureau of Design and Environment Manual.* "Chapter Seventeen: Bicycle and Pedestrian Accommodations." September 2010.

25. Village of Savoy. *2009 Comprehensive Plan Update*. Winter 2009. http://www.village.savoy.il.us/vertical/Sites/%7BD0463038-CAC4-4485-B59A-9F55DCAB155B%7D/uploads/%7B871966B5-F8E9-41AB-937E-CB991F0726EB%7D.PDF

26. Village of Savoy. "Title 16: Subdivisions". *Municipal Code*. Last revised December 20, 2010. http://library.municode.com/index.aspx?clientID=16036&stateID=13&statename=Illinois

27. University of Illinois at Urbana-Champaign. *Campus Bike Plan: Draft for Review*. August 21, 2009 http://www.fs.uiuc.edu/pdfs/tdm/CampusBikePlan.pdf

28. University of Illinois. *Campus Area Transportation Study. Final Report*. June 1999. Prepared by Bucher, Willis & Ratliff Corporation.http://www.ccrpc.org/CATS/pdf/CATSIFinalReport.pdf

"COMPLETE STREETS" ROAD DESIGN AUDITS FOR BICYCLES AND PEDESTRIANS

By

Ed Barsotti, Executive Director
Stephen Hunt, Project Assistant
Christopher Trigg, Project Assistant
League of Illinois Bicyclists
2550 Cheshire Dr., Aurora, IL 60504
630-978-0583, ed@bikelib.org

INTRODUCTION

"Complete Streets" are designed to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders are able to safely move along and across a complete street. Across the country, road-building agencies are formally adopting complete streets policies, to provide safer conditions for those who bicycle or walk either by choice – or by economic (or other) *necessity*.

The League of Illinois Bicyclists (LIB), a statewide non-profit bicycle advocacy organization, has started a Complete Streets Audit program of road-building agencies. LIB has developed a new scoring methodology rating a road design on how well it accommodates bicyclists and pedestrians – taking into account what is needed for that road's particular context. A quiet farm roadway or residential cul-de-sac may not need anything extra for bikes or peds, but a major suburban arterial would. A high score indicates that non-motorized users have been appropriately accommodated for whatever the specific situation may be.

Overall accommodation and design details are rated for: pedestrian travel *along* the road, bicycle travel *along* the road, crossings of the road, and other context-sensitive factors. The methodology uses tools such as the Federal Highway Administration's sidewalk installation recommendations[1], Bicycle Level of Service[2,3], and LIB's Sidepath Suitability Score[4,5] to provide design guidance on topics ranging from bike accommodation type to right-in-right-out entrances.

The League plans to conduct Complete Street Audits of roadway projects in the state's urban areas, where both federal and state policies recognize there being the most existing and latent need. The goals of the program are to:

- Introduce the scoring methodology as a planning tool that can be used by agencies in a project's early stages and in the selection of accommodation type
- Work cooperatively with agencies on design details that make a big difference
- Give credit to agencies that build safer roads for pedestrians and bicyclists
- Urge other agencies to adopt Complete Streets policies and to view bike/ped accommodation as a necessary part of a project, not as an optional amenity

CU COMPLETE STREETS 27

APPENDIX A: COMPLETE STREETS METHODOLOGY

METHODOLOGY

The Complete Streets Audit scoring methodology is based on a 100-point scale, with the following gradations: A = 80-100, B = 60-79, C = 40-59, D = 20-39, F = 0-19. Sum the results from the sections below, including pedestrian accommodations along the road, bicycle accommodations along the road, road crossings, and other context-sensitive factors.

PEDESTRIAN ACCOMMODATIONS ALONG THE ROAD

A maximum of 40 points are possible for sidewalks *along* the road being audited. "Sidepaths", bike trails parallel to but off the road, are considered as sidewalks here.

The Federal Highway Administration (FHWA) has provided recommendations[1] for **sidewalk installation**, based on road classification, land use and density. These recommendations, which include suggested "required" and "preferred" conditions, are used in this section of the methodology, with the following weighting:

- 30 points if the maximum FHWA recommendation is met
- 22 points if only the "required" level is met when a "preferred" level is present
- 14 points if sidewalks are only on one side, when FHWA lists two sides as required
- 5 points if right-of-way has been preserved with flattened ground work, for future sidewalks

Deduct between 25% (minimum) and 100% of the above for incomplete sidewalks, depending on severity and/or frequency of the gaps.

Add up to 10 points for favorable **sidewalk design and maintenance details** *along* the road being audited, including:

- Sufficient sidewalk buffer strip width and/or ped-friendly features such as trees
- Placement of crossings and stop bars at intersections – closer to the road is better for visibility and for more realistic car stopping location and stopline adherence
- Right-turn island and/or median refuge islands at wider, busier intersections – breaking up the crossing into segments and isolating turning motions with which to contend
- Pedestrian signals and conveniently-located push-button activation
- Sufficiently visible crosswalks at signalized intersections, including continental, ladder or zebra-style where appropriate (Figure 1)
- Maintained crosswalks, as appropriate, at street intersections
- Visual delineation (e.g., painted or color-contrasted crosswalks) at crossings of commercial entrances – in recent years, this feature is regularly omitted

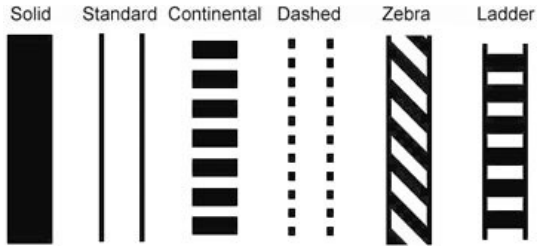


Figure 1 – Crosswalk styles.

- Use of right-in-right-out islands as a refuge island – allowing crossings/crosswalks and stoplines to be closer to the road (see Figure 2)

Figure 2 – Left: poor crossing and stop bar placement.
Right: good use of a right-in-right-out island

- American with Disabilities Act (ADA) ramp compliance at crossings
- Links to adjacent land uses – are roadside destinations accessible from the sidewalk?
- Other proactive design factors
- Deduction for poor sidewalk condition

BICYCLE ACCOMMODATIONS ALONG THE ROAD

A maximum of 35 points are possible for bicycle accommodation *along* the road being audited. The methodology compares a baseline score for the road with any dedicated on-road and/or off-road bikeway facility that may be present. The highest scoring accommodation is considered as the overall bicycle accommodation score.

Many minor roads may be fine for bicyclists "as is". For other roads, extra space may be warranted. Both off-road and on-road bikeway options are available, each appropriate in a range of cases. Scoring for four bikeway options below varies with the situation to reflect their ranges of suitability.

First, consider the road without any of these bikeway options. This will be its **minimum bike accommodation score**. Determine its Bicycle Level of Service[2] (BLOS), a measure of adult bicyclist comfort level as a function of roadway geometry and traffic conditions. Using an on-line BLOS calculator[3], enter the number of lanes, lane width, daily traffic volume count (ADT), speed limit, and on-road parking occupancy percentage. Consider the pavement width *without any bike lane or shoulder stripes* (paved shoulder/bike lane/parking width = 0), even if such striping exists on the road. If the resulting BLOS is a "B" or "C", calculate 15 * (3.5 – BLOS). Use 30 points for a BLOS of "A" and 0 points for a BLOS of "D" or worse. Then, add up to 5 points for any bicycle-related pavement markings and/or signage that may exist (Figure 3).

Figure 3 – Pavement Markings and Signage: "Sharrows" – indicates proper bike position in the presence of on-road parking; on-road traffic signal actuation for bicycles; Bike Route signage with wayfinding; Share the Road signage.

Next, consider any specific bikeway or other accommodation that may be part of the road design. If any of the four types below exist, find its score:

1) **Bike Lanes** (Figure 4) provide dedicated space for bikes. Each 5-6 foot bike lane should be one-way, on each side of two-way roads. Urban arterials (usually low to medium speed) and collectors are the most appropriate places for bike lanes. Results include higher bike usage and lower crash rates – even among car-car crashes.

Award 30 points for bike lanes designed per AASHTO[6] guidelines. Deduct up to 15 points if the lanes are poorly maintained or swept, or if they do not meet guidelines. Add up to 5 points for relevant pavement markings, such as those for signal actuation, proper striping at intersections[6], and lane positioning to avoid parked cars' doors.

Figure 4 – Bike Lanes.

2) **Paved Shoulders** provide space for bicycles, improve safety for cars, and reduce road maintenance needs. IDOT's bicycle policy[7] specifies 4-foot shoulders for daily ADT traffic count between 1000 and 2999, 4-6 feet over 3000 ADT – with 6-foot shoulders for 55 mph roads or 45 mph roads with high truck traffic. Bicycles can not ride on shoulder rumble strips. However, designs with periodic longitudinal breaks and at least four feet of (swept) space clear of rumble strips can be bike-friendly.

Award 30 points if paved shoulders on both sides of the road meet IDOT's bicycle policy. Award 15 points for paved shoulders of 3 or more feet but not meeting these standards. Deduct up to 50% if the shoulders are poorly maintained or full of debris. Deduct up to 100% for rumble strips, depending on their bicycle-friendliness. Add up to 5 points for bike-related pavement markings and/or signage, as shown in Figure 3.

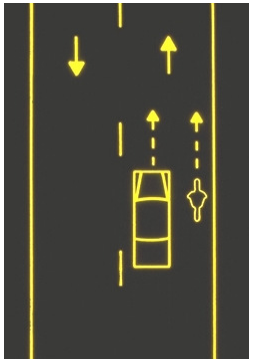


Figure 5 – Wide outside curb lanes.

3) **Wide Outside Curb Lanes** (Figure 5) allow cars to pass bikes within the same lane, with at least three feet clearance. These serve experienced cyclists on lower speed urban roads, but are less adequate for other users and on other roads.

Award 10 points for an outside curb lane width of 13 feet, 15 points for 14 feet, and 20 points for 15 feet or more. Deduct 25% of this for every 5 mph speed limit increment over 30 mph. Deduct another 1% for every 1000 in its daily traffic count (ADT). As an example, 14-foot lanes on a 30 mph road with 3000 ADT score 12 points, while the minimum of 0 points is given for the same road with 45 mph *or* 15000 ADT. Add up to 5 points for bike-related pavement markings and/or signage, as shown in Figure 3.

4) **Sidepaths** are bike trails adjacent to but off the road (Figure 6), basically widened sidewalks. Because of conflicts at intersections (illustrated in Figure 7), sidepaths are more appropriate along roads where there are fewer crossings. This commonly occurs on higher-speed and (often) busier roads with more access control. Despite advice from AASHTO, many towns use sidepaths in less appropriate places with numerous crossings. This often is *less* safe than riding on-road – a surprising result to many.

Figure 6 – Sidepath.

Start with 30 points for a sidepath – or a sidewalk, which is also considered here for its utility as a place to bike. Deduct 3 points for each foot of width under 8 feet, as this creates pedestrian conflicts. Deduct 4 points for every Sidepath Suitability Score[4,5] (SSS) over 6 points. The SSS is used to gauge appropriateness and design factors of the sidepath (or sidewalk).

Deduct 50-100% of what remains, for gaps of varying severity. If there are no gaps, deduct up to 50% if the sidepath (or sidepath) is poorly maintained and swept. Also, factor in the sidepath in the sidewalk design and maintenance detail score above.

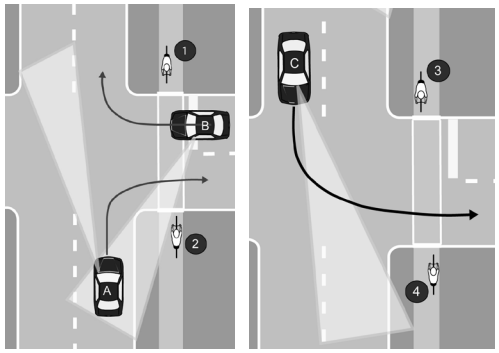


Figure 7 – Sidepath crossing problems. Sidepath users, especially contra-flow cyclists 1 and 3, are often not seen. On-road cyclists are within turning motorists' viewing areas.

Select the highest score among these four bikeway accommodation types above, or 0 if none of them exist. The result becomes the **bikeway facility accommodation score**.

The higher of (1) the minimum bike accommodation score (the baseline) and (2) the bikeway facility accommodation score becomes the **overall bike accommodation score**, to be added to the total.

ROAD CROSSING ACCOMMODATIONS

The pedestrian section considered travel *along* the rated road, including crossings of side streets, entrances, and driveways intersecting the road. But, how easy is it for bicyclists and pedestrians to *cross* the road being rated? As a road gets busier and wider, it can become more difficult, especially when certain design features are absent.

Score up to 15 **road crossing** points for well-designed crossings suitable for the particular road. Considerations may include factors mentioned earlier and more:

- Right-turn and/or median refuge islands at wider, busier intersections
- Median refuge islands, high-visibility crosswalks, warning signage, and other features at significant non-motorized mid-block crossings
- At signalized intersections, pedestrian signals with conveniently-placed actuation and highly visible crosswalks
- If appropriate, raised crosswalk crossings and bulb-outs that shorten crossing distance
- Signal actuation for on-road cyclists – either MUTCD-approved Bicycle Detector Pavement Markings on-road (preferred), or accessible off-road placement
- ADA ramp compliance at crossings
- Access to the off-road sidepath trail or sidewalk from road entrances on the other side (Figure 8)
- Other proactive design factors

Figure 8 – Access to far-side sidepath or sidewalk at T-intersection.

OTHER CONTEXT-SENSITIVE FACTORS

Certain roads have factors making adequate bike and pedestrian accommodation even more important. Access to destinations, adjacent land use, and availability of alternative routes all affect the *latent* demand of non-motorized use. Some of the following factors are adapted from IDOT's bicycle policy[7] in its design manual.

Start with 10 **other factors** points. Deduct points for *not meeting* any special context of the road's corridor, such as:

- Does this road provide the only access to significant destinations such as a park, recreational area, school, transit, shopping/commercial area, or employment center?
- Does the road provide unique access across a natural or man-made barrier (e.g., bridges over rivers or expressways)?

- Are there alternative, *nearby, useable* routes that also provide access to the destinations along the road being rated?
- Is the road in an area where many more non-motorized users would be expected, based on density, land uses, parking availability, economics, and other reasons?
- Does the road impact an independent trail or connectivity to a trail?

CONCLUSION

The goal of the Complete Streets Audit scoring methodology was to rate the effectiveness of bicycle and pedestrian accommodation in road designs, in a way that adapted to the particular situation. What is needed to walk or bike safely along or across a street varies dramatically over the wide range of roadways. Clearly, a "one-size-fits-all" bikeway or pedestrian accommodation approach does not work.

Early testing and use of the methodology has shown that it meets this goal adequately. Larger road projects and residential streets have been examined with the result much more dependent on proactive design principles than on traffic counts or the like. This allows measuring of the road-building agency's policies, not the road classification. Initial audits have ranged from an "F" through a high "B", the latter being a few details away from an "A". This correlated strongly to how the relevant agencies' policies view the meeting of non-motorized users' safety needs: an optional amenity or diversion – or an integral part of a road project.

REFERENCES

[1] "Priorities and Guidelines for Providing Places for Pedestrians to Walk Along Streets and Highways (Table 4-2, Guidelines for New Sidewalk Installation)". Federal Highway Administration (1999). www.fhwa.dot.gov/environment/sidewalk2/sidewalks204.htm

[2] Landis, Bruce, et al. "Real-Time Human Perceptions: Toward a Bicycle Level of Service". Transportation Research Record 1578 (1997).

[3] Bicycle Level of Service calculator. League of Illinois Bicyclists. www.bikelib.org/roads/blos/losform.htm

[4] Barsotti, Ed and Kilgore, Gin. "The Road Network is the Bicycle Network: Bicycle Suitability Measures for Roadways and Sidepaths". Transport Chicago Conference (2001).

[5] Sidepath Suitability calculator. League of Illinois Bicyclists. www.bikelib.org/roads/blos/sidepathform.htm

[6] Guide for the Development of Bicycle Facilities. AASHTO (1999).

[7] Bureau of Design and Environment Manual (Chapter 17). Illinois Department of Transportation. www.dot.state.il.us/desenv/BDE%20Manual/BDE/pdf/chap17.pdf

Photo credits: www.bicyclinginfo.org, Dan Burden, Chicagoland Bicycle Federation.

League of Illinois Bicyclists