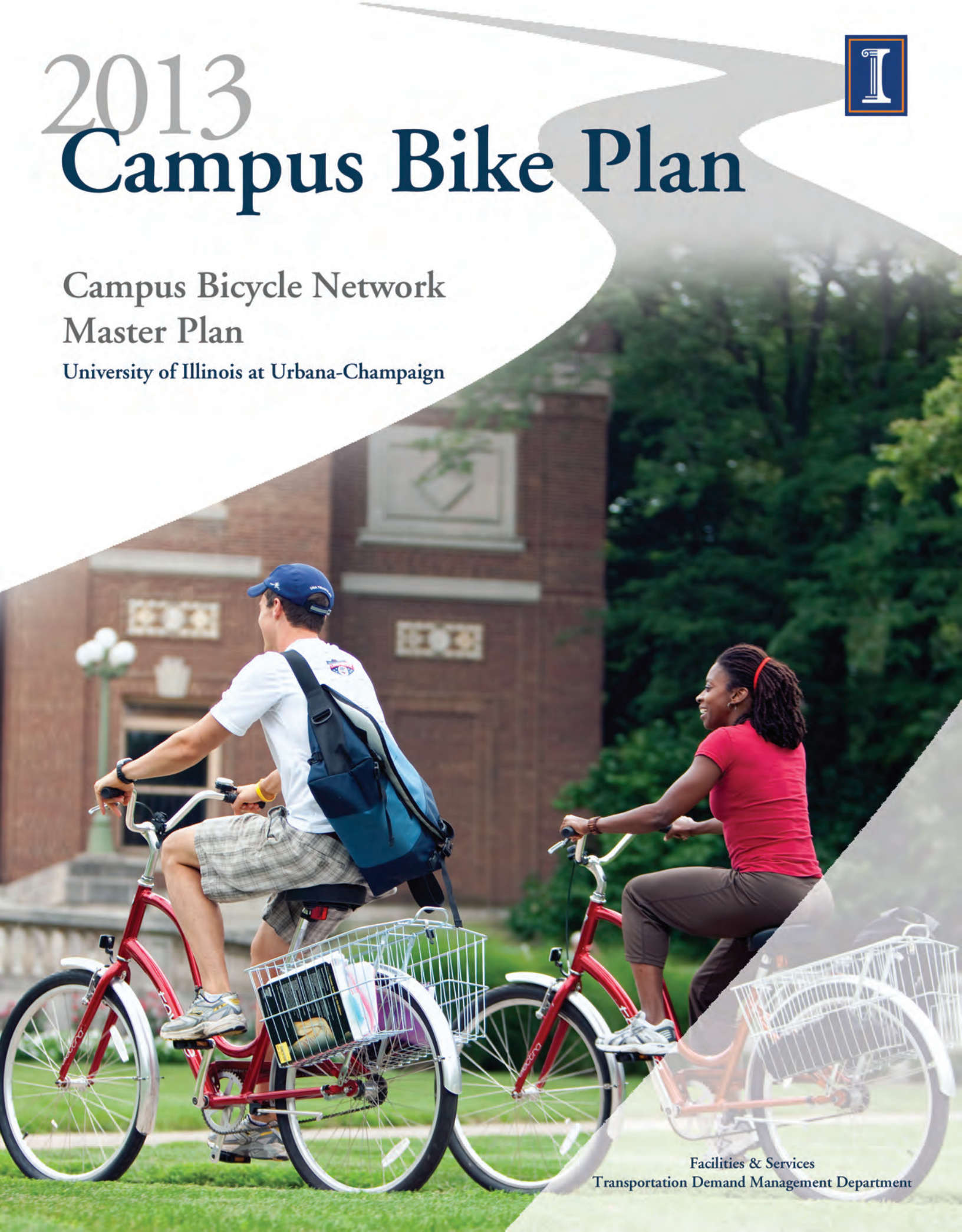
2013 Campus Bike Plan

Campus Bicycle Network Master Plan

University of Illinois at Urbana-Champaign



Facilities & Services
Transportation Demand Management Department

2013 Campus Bike Plan

Campus Bicycle Network Master Plan for the University of Illinois at Urbana-Champaign

March 2013 Draft

Prepared by Facilities & Services Transportation Demand Management

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Terms & Acronyms

AASHTO – American Association of State Highway and Transportation Officials
ACES – The College of Agricultural, Consumer, and Environmental Sciences
ACUPCC – American College and University Presidents' Climate Commitment
ADT – Average Daily Traffic
APBP – Association of Pedestrian and Bicycle Professionals
BFU – Bicycle Friendly University
BIF – Business Instructional Facility
BPAC – Urbana's Bicycle and Pedestrian Advisory Commission
CATS – Campus Area Transportation Study
CCB – Champaign County Bikes
CCRPC – Champaign County Regional Planning Commission
CSE – The Center for a Sustainable Environment
CUUATS – Champaign-Urbana Urbanized Area Transportation Study
FAR – Florida Avenue Residence Hall
F&S – Facilities & Services
iCAP – Illinois Climate Action Plan
IDOT – Illinois Department of Transportation
KCH – Department of Kinesiology and Community Health
LAB – League of American Bicyclists
LCI – League Cycling Instructor
LEED – Leadership in Energy and Environmental Design
LIB – League of Illinois Bicyclists
LINC – Learning in Community
miPLAN – Mobility Implementation Plan
MTD – Champaign-Urbana Mass Transit District
MUTCD – Manual on Uniform Traffic Control Devices
NTA – Notice to Appear
PDO – Property Damage Only
RSO – Registered Student Organization
SECS – Students for Environmental ConcernS
SRTS – Safe Routes to School
SSC – Student Sustainability Committee
TDM – Transportation Demand Management
UI – University of Illinois at Urbana-Champaign
UDTCS – University District Traffic Circulation Study
UIPD – University of Illinois Police Department
VMT – Vehicle Miles Traveled

Definitions

For the purposes of this plan, the following terms have been defined to coincide with definitions provided by the Illinois Department of Transportation,[1] and the American Association of State Highway and Transportation Officials (AASHTO). Each recommended facility type is described in further detail in Chapter 5.

Bikeway – a generic term for any road, street, path or way, which is somehow designated for bicycle travel, regardless of whether designated for exclusive use of bicycles or shared with other transportation modes

Bike Lane – on vehicular streets, a striped lane intended for exclusive bicycle use

Bike Route – a street or road noted for higher bicycle volumes, to be shared by vehicles and bicycles, which provide connections to the overall bicycle system

Shared Use Side Path – parallel to but physically separated from a street, a wide path intended to be shared by pedestrians, bicycles, and other non-motorized transportation (e.g. wheelchairs). Where possible, this plan has attempted to minimize the number of shared use side paths due to safety concerns and conflicts with pedestrians.

Dedicated Bike Side Path – parallel to but physically separated from a street, a path intended for the exclusive use of bicycles. While the existing network contains several dedicated bike side paths, these are extremely limited in the Campus Bike Plan recommendations, due to their unsafe nature.

Off-Road Shared Use Path – completely separate from a street, a path intended to be shared by pedestrians, bicycles, and other non-motorized transportation

Off-Road Dedicated Bike Path –separate from a street or sidewalk, a path intended for exclusive bicycle use

Off-Road Trail – unpaved trail to be shared by cyclists, walkers, joggers, and other non-motorized transportation

[1] http://www.dot.il.gov/desenv/bde%20manual/bde/pdf/chapter%2017%20bicycle%20and%20pedestrian.pdf

Executive Summary

March 4, 2013

The benefits of a bicycle friendly campus are many. As a mode of transportation, bicycles provide solutions in the areas of safety, sustainability, cost savings, mobility, health and wellbeing. The University of Illinois at Urbana-Champaign was one of the first campuses in the nation to adopt a bikeway network when the first bike paths were constructed here in the 1950s. Since that time, funding cutbacks have led to degraded and disconnected pathways, outdated and insufficient bicycle parking, and limited support for bicycle services and programs. Despite these setbacks, bicycle ridership has grown at the University of Illinois in the last decade, and is expected to continue to grow in the future, creating a great need for reemphasis on engineering, education, enforcement, encouragement, and evaluation for bicycle-friendly improvements.

The 2013 Campus Bike Plan outlines the various ways in which the University should improve for bicycles in the coming years. The goals of the Campus Bike Plan are five-fold:

1) Increase safety for all campus users, including pedestrians, bicyclists, transit riders, and motorists
2) Increase sustainability of campus transportation
3) Improve mobility and accessibility for cyclists on campus
4) Fund the ongoing and future improvement of campus bicycle facilities, services, and programming
5) Renew the University's standing as a national leader in bicycle friendliness

The primary focus of this plan is on infrastructure improvements to the University's network of bikeways. Wherever possible, this plan recommends removing existing off-road side paths for bicycles and replacing them with on-street bicycle lanes or routes. These recommendations are based on the best available research on bicycle safety, which have shown significant safety improvements through on-street facilities compared to separated facilities. As ongoing research in the field continues to evaluate best practices, all future infrastructure plans and improvements on campus should continue to reflect the best available research at the time. Chapter 6 details the specific recommendations for each segment of the bikeway network. The majority of infrastructure improvements included in this plan include rough cost estimates, totaling nearly $4 million in 2013 dollars. While the focus of this plan is primarily on the infrastructure improvements, Chapter 7 of the plan makes a number of additional recommendations on other key topics for bicycles such as improved education, encouragement, and enforcement.

This draft will be available for public comment through the end of March, 2013. Comments received will be considered as the draft is finalized in late spring 2013, and will be summarized in an appendix in the final plan. Transportation Demand Management will seek approval for the final plan in the summer of 2013. ***Please submit your feedback about the Campus Bike Plan online at http://go.illinois.edu/bikefeedback.***

Chapter I. Introduction

In 2011, the University of Illinois at Urbana-Champaign was recognized as a bronze-level Bicycle Friendly University by the League of American Bicyclists. As an institution committed to the safety of its students, employees, and visitors and to the sustainability of its campus, the University continues to strive for excellence in promoting and improving active transportation options. University policies currently prioritize walking, bicycling, and transit over automobiles in the core campus area, and as a result, bicycling is a primary form of transportation on campus. Providing improved bicycle facilities for the University's 42,605 students and 10,838 full time employees[3] is critical to improving public safety and reducing injuries and fatalities resulting from crashes, ensuring efficiency and ease of movement, improving livability and quality of life, improving energy efficiency and meeting sustainability targets, and promoting active lifestyles. Research shows that in the cost-benefit analysis of bicycle infrastructure, "the benefits of increased cycling are worth approximately four to five times the cost of investing in new cycling infrastructure."[4]

The updated 2013 Campus Bicycle Plan was developed to provide a concrete plan of action for the University to become more bicycle friendly and to achieve the necessary goals of improved safety, sustainability, and health. The previous draft of this plan, written in 2009, introduced the proposed network to improve connectivity and accessibility in the University District. This updated document provides an implementation plan to follow through on those recommendations, including updates where new information or guidelines are available, as well as specific, measurable goals. The primary focus of this plan is on improving the infrastructure of the campus bikeway network, though additional recommendations are made in the areas of education, enforcement, encouragement and evaluation and planning for bicycle transportation.

Much of the campus bikeway network has existed for many decades. However, it has not been consistently maintained and upgraded as the campus has grown and changed around it. The result is a discontinuous, outdated, substandard series of bikeway segments.[5] This plan intends to bring the University's bikeways back up to standard, and generate a well-connected bikeway network across campus. These bikeways will improve the campus in three major areas: safety of bicycling through better visibility and predictability; reduction of conflict with other transportation modes; and increased accessibility for the cyclists.

[3] http://illinois.edu/about/overview/facts/facts.html
[4] Reynolds, et al.
[5] Multi-Modal Study, page 13

STREET JURISDICTION MAP

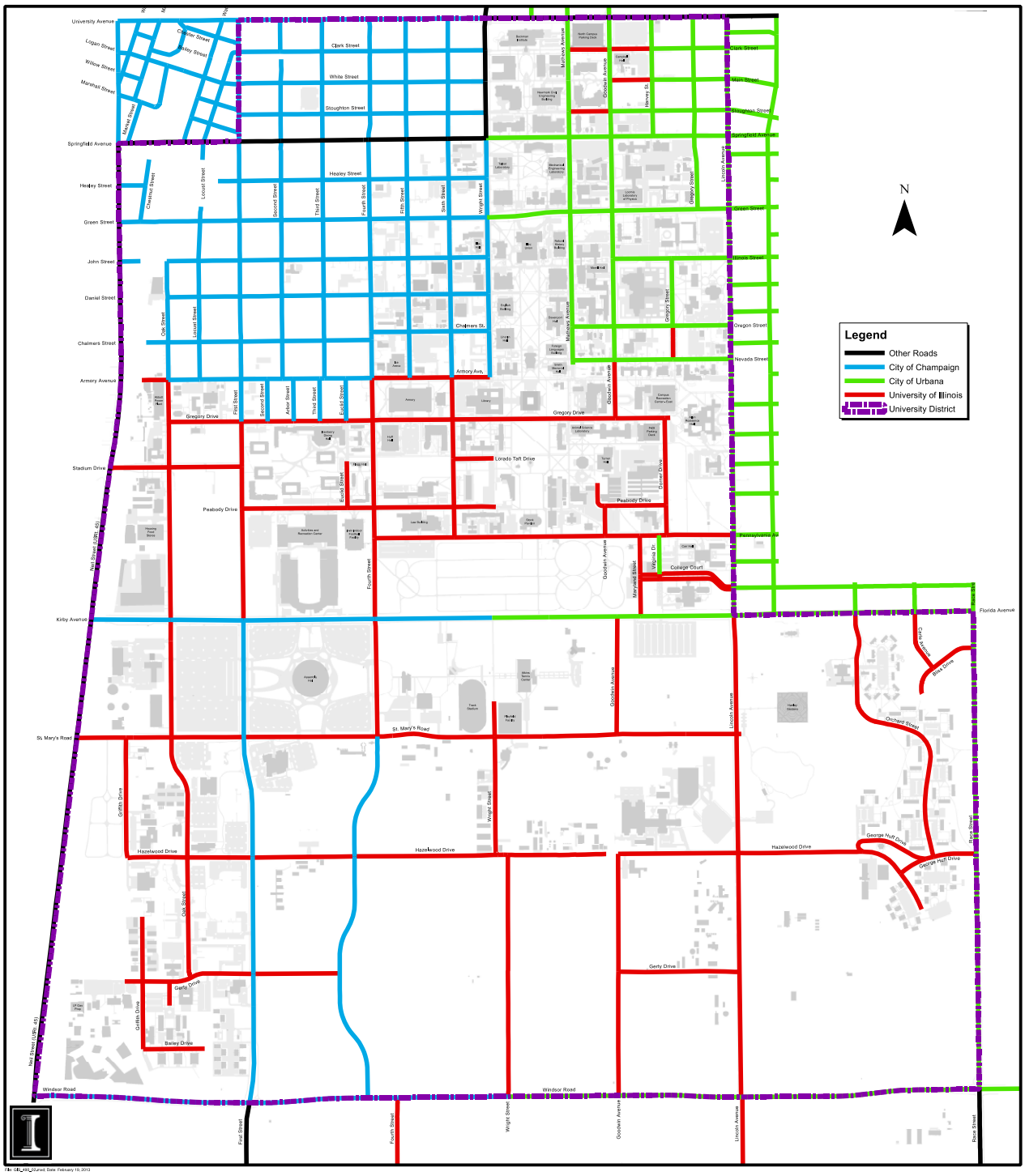

Figure 1: Street Jurisdiction Map, University District

Background & Context

Stakeholders

Governmental Agencies

University property is nestled between two cities, with the east side of campus in the City of Urbana and the west side in the City of Champaign. As shown in Figure 1 the streets within the University District are under the jurisdiction of various agencies, including the University, Urbana, Champaign, and the Illinois Department of Transportation (IDOT). Comprehensive transportation planning for the greater urbanized area is coordinated by the Champaign-Urbana Urbanized Area Transportation Study (CUUATS). CUUATS is the transportation arm of the Champaign County Regional Planning Commission (CCRPC), which is the Metropolitan Planning Organization responsible for administering the federally mandated transportation planning process for the Champaign-Urbana Urbanized Area.

The Campus Area Transportation Study (CATS), coordinated by CUUATS staff, is a planning initiative focused on transportation issues in the University District.[12] The four CATS member agencies are Urbana, Champaign, the Champaign-Urbana Mass Transit District (MTD), and the University. CCRPC/CUUATS received grant funding from the Illinois Department of Transportation (IDOT) in 2011 to conduct a traffic circulation study for the University of Illinois at Urbana-Champaign's University District. The CATS Technical Advisory Committee is the study steering committee. The University District Traffic Circulation Study (UDTCS) is still in progress at the time of this writing, although preliminary results from the study has been used to inform the prioritization of the recommendations in this plan.

Each of the four CATS agencies have their own programs and plans to guide bicycle-related transportation decisions within their jurisdictions:

- **University of Illinois:** The Transportation Demand Management (TDM) department in Facilities & Services (F&S) at the University is responsible for coordinating the overall transportation networks for all modes of travel on campus, including walking, bicycling, transit and vehicles. TDM is the author of this plan and is responsible for encouraging bicycle use in a number of ways, such as exploring bicycle sharing options for campus, supporting the Campus Bicycle Shop, installing and maintaining bike parking and storage, and promoting and arranging bicycle education opportunities. TDM also works with the Campus Transportation Committee, the Division of Public Safety, and other key campus stakeholders to make improvement recommendations to campus leadership.

- **City of Urbana:** Planning and Public Works staff from the City of Urbana are responsible for developing and implementing the *Urbana Bicycle Master Plan*, which was originally adopted

[12] http://www.ccrpc.org/CATS/index.php

in 2008. Urbana's Bicycle and Pedestrian Advisory Commission (BPAC) was established in 2006 with the primary purpose of advising City Council on how to make bicycling and walking more viable modes of transportation in Urbana.[13]

- **City of Champaign:** Champaign also created a transportation plan called *Champaign Moving Forward*, which includes the bicycle vision "to provide for a seamless, comprehensive network to encourage bicycling." In October 2012, Champaign hosted a public meeting regarding the Champaign Bike Implementation Plan, which should be adopted in 2013.

- **Champaign-Urbana Mass Transit District (MTD):** As the provider of public transportation in the greater Champaign-Urbana area, MTD strives to improve mobility and promote excellence in transportation. MTD coordinated the Mobility Implementation Plan (miPLAN) to find out what mobility options Champaign, Urbana and Savoy want as a community, both now and in the future, and is now developing a plan to bring those options to fruition. The first phase of miPLAN was an extensive public input period and market analysis done by asking students, employees, and residents what mobility options they want now and in the future.[15] A student survey conducted in 2007 as part of the miPLAN Phase One research helped inform the Campus Bike Plan.

There are also plans, studies, and programs in the greater region that facilitate bicycling. The Champaign County Greenways and Trails Plan is an effort led by CCRPC in coordination with local agencies to develop the county's greenways and trails system. The plan identifies goals and objectives developed by the Greenways and Trails Steering Committee that will help to evolve the existing system over the next 20 years. The public was included throughout the Greenways and Trails planning process via workshops, resident surveys, comment cards, and focus groups.[17] The Greenways and Trails Design Guidelines have been adopted by many jurisdictions in Champaign County as the common standard for pedestrian and bicycle facilities in both urban and rural areas.

The IDOT Office of Planning and Programming houses all non-motorized transportation plans for the State of Illinois. IDOT is currently in the process of developing a State Bikeway Plan with the support of an outside vendor. The plan will become a component of IDOT's Long Range State Transportation Plan, which is also currently underway.[18] All of the plans described above were reviewed and considered during development of the Campus Bike Plan.

University Entities

In addition to the Transportation Demand Management team under F&S, a number of University entities play a role in improving bicycling on campus:

[13] http://urbanaillinois.us/BPAC
[15] http://ihavemiplan.com/shared/pdfs/student_report_spring07.pdf
[17] http://www.ccrpc.org/greenways
[18] http://www2.illinois.gov/gov/green/Pages/AgencyBicyclingInitiatives.aspx

Campus Transportation Committee

The Campus Transportation Committee advises TDM regarding campus transportation policies and other major decisions on behalf of the University. The committee covers all aspects of surface transportation on campus, including pedestrian safety, bicycle facilities, transit agreements, automobile traffic, and the interaction of all modes of travel on campus. Members of the Campus Transportation Committee include staff from F&S, the University of Illinois Police Department (UIPD), the Wellness Center, and the Parking Department, as well as student, staff, and faculty representatives.

Parking Department

The Parking Department in F&S is responsible for coordinating automobile parking in University-owned facilities. The Parking Department sells employee parking permits, student permits, temporary passes, and cash keys. This department formerly handled bicycle registration, until it was moved to an online system in 2012 under TDM. Parking staff is responsible for impounding bicycles that are creating safety hazards during the school year. Parking also manages the annual collection of abandoned bicycles left on campus each summer. They donate the abandoned bikes to The Bike Project of Urbana-Champaign, to be reused locally, donated to other organizations internationally, or recycled.

University of Illinois Police Department

The UIPD in the Division of Public Safety coordinates pedestrian, bicycle, motorcycle, and vehicle public safety. This includes coordination of the Public Safety Advisory Committee, the Campus Lighting Committee, Safe Walks, and Public Safety Day. Officers participate in various bicycle related events, such as Light the Night and C-U Bike to Work Day. UIPD officers enforce transportation laws, including ticketing pedestrians and bicyclists when appropriate. The assistant Chief of Police is a member of the Campus Transportation Committee and the Police Captain is a member of CATS. UIPD participates in discussions about infrastructure safety improvements and is involved in updating the Campus Bicycle Code, in partnership with TDM.

UI Wellness Center

The UI Wellness Center encourages active living for students, employees, and visitors on campus. The UI Wellness Center supports bicycling initiatives on campus and is a strong advocate for active transportation.

The Center for a Sustainable Environment

The Center for a Sustainable Environment (CSE) supports sustainable transportation and the reduction of greenhouse gas emissions. They coordinate various sustainability programs and

projects throughout campus, including some related to transportation. Additionally, during major campus sustainability events, the CSE promotes related transportation initiatives.

Senate of the Urbana-Champaign Campus

The Senate on the Urbana-Champaign Campus is a legislative body comprised of 200 faculty, 50 students, and eight other academic staff members. The Senate Committee on Operations works with F&S to provide guidance on facilities and infrastructure. TDM provides annual updates to the Committee on Operations regarding bicycles. The Illinois Student Senate (ISS) president meets with TDM staff as needed to provide support from the ISS, and the ISS Environmental Committee.

Student Sustainability Committee

The Student Sustainability Committee (SSC) is a student-led organization charged with the distribution of two student fees – the Sustainable Campus Environment Fee and the Clean Energy Technologies Fee. With the ultimate goal of making the University of Illinois at Urbana-Champaign a leader in campus sustainability, SSC reviews, recommends, and funds projects that increase environmental stewardship, inspire change, and impact students. SSC has provided financial support for a number of bicycle programs and projects, such as bike parking upgrades, installation of bicycle fix-it stations, and the Campus Bicycle Shop.

Engineering 315: Learning in Community (LINC)

The LINC class includes a section titled *UI Bikes*, for which TDM acts as the project partner to engage students in a number of bike-related efforts on campus. LINC students in the UI Bikes section have helped conduct market research on the feasibility of bike sharing, developed social media platforms through which to share bike safety educational information, and helped compile information for this document.

Registered Student Organizations

There are a number of Registered Student Organizations (RSOs) at the University that are engaged in cycling or bicycle advocacy. The cycling team, Illini Cycling, aims "to introduce and assist students into the sport of bicycle racing."[19] Illini 4000 organizes cross-country bicycle rides to raise money and awareness for cancer support programs.[20] There are two organizations that focus on bicycle repair: Urbana Cycles at UIUC[21] and The Bike Project RSO.[22] Beyond Oil, a new student group affiliated with the Sierra Club's Campuses Beyond Oil Campaign, aims to help reduce the use of oil at the University of Illinois by supporting active transportation, particularly bikes.[23] Members from

[19] https://illinois.collegiatelink.net/organization/illinicycling
[20] https://illinois.collegiatelink.net/organization/illini4000/about
[21] https://illinois.collegiatelink.net/organization/urbanacycles
[22] https://illinois.collegiatelink.net/organization/thebikeproject
[23] https://illinois.collegiatelink.net/organization/beyondoil

the Beyond Oil Campaign have reached out to TDM staff and have voiced strong support for any improvements to the bicycling infrastructure and culture on campus.

Nonprofit Bicycle Organizations

There are a number of nongovernmental organizations that advocate for bikes and work to improve bicycling in the Urbana-Champaign area and beyond. Locally, Champaign County Bikes (CCB) works to make Champaign County the most bicycle friendly county in the Midwest through advocacy and education. The CCB Steering Committee has representatives from most bicycling groups in the area, including The Bike Project, Prairie Cycle Club, the League of Illinois Bicycles, Illini Cycling, and the CATS agencies, among others. CCB provides an active email listserv discussing various bicycling topics. Additionally, The Bike Project of Urbana-Champaign is a volunteer-run organization that offers community members a space, tools, and community to repair bikes, share knowledge, hold classes, and advocate for bikes in Urbana-Champaign. Since 2010, the University has collaborated with The Bike Project to run the Campus Bicycle Shop, an on-campus location using the same model of hands-on bicycle repair and maintenance education.

At the state and national scale, the League of Illinois Bicyclists (LIB) and the League of American Bicyclists (LAB) are strong advocates for bicycling. LIB is a not-for-profit organization dedicated to improving bicycling conditions in the State of Illinois, promoting bicycle access, education, and safety. Among many other resources, the LIB website offers a wealth of information for communities about creating, funding, and implementing bicycle plans.[24] Similarly, the mission of LAB is "to promote bicycling for fun, fitness and transportation and work through advocacy and education for a bicycle-friendly America."[25] Indeed, the Bicycle Friendly University status granted to the University by LAB is a motivating factor to becoming a more bicycle friendly campus, and LAB's guidance on how to improve the University's standing helped influence this plan and related efforts to become more bicycle friendly.

Ridership Data

The actual number of bicycles or bicycle riders on campus at any given time is unknown. Over the last fifteen years, various methods have been used to estimate the total volume. Although the resulting calculations varied greatly, it is clear from personal observation that there are many cyclists on campus and the number is on an upward trend.

- Between 1987 and 2012, there were 20,517 bicycles registered on campus through the Parking Department's in-person registration system, averaging 789 registrations per year during the 26-year period. Due to changes in the registration process and enforcement, actual annual bicycle registration has fluctuated from 2,500-3,500 registrations per year in the 1990's, 600-700 per year in the early 2000's, and only 300-

[24] http://www.bikelib.org/bike-planning/municipal-bikeped-planning-guide/
[25] http://www.bikeleague.org/about/

400 per year in the late 2000's. The new online bike registration system had 190 registrations during the 2012 fall semester. Because bicycle registration is not currently enforced, nor has it been strongly promoted to the campus, the number of bicycles currently registered is not representative of the number of bikes on campus. However, with improved promotion and enforcement going forward, bicycle registration may be used to estimate the number of bicycles on campus in the future.

- In 1999, the CATS Phase 1 report estimated 12,500 bicycles on campus, or roughly 21 percent of the total campus employee and student population of 59,000.[26]

- In 2007, the Mobility Implementation Plan (miPlan) survey included questions about bicycle ridership. About half of the students had access to a bike, and 42 percent reported using a bicycle at least once a week. Additionally, four percent of employees reported using a bicycle as their primary mode of transportation, while 70 percent owned a bike. At the time of the survey, there were 41,495 students and 11,676 employees on campus which implies there were 17,428 student bicyclists and 467 employee bicycle commuters. [27]

- From 2000 to 2008, there were over 140 bicycle counts at specific sites in the University District. For example, a bicycle count conducted in 2008 showed an average of 250 bicycles per hour per location at peak travel times. In September 2009, the University participated in the National Bicycle and Pedestrian Documentation Project sponsored by the Institute of Transportation Engineers Pedestrian and Bicycle Council.[28]

Estimated bicycle ridership levels for existing bikeway segments on campus were used to develop the prioritization of facility improvements recommended in Chapter 6. While the exact number of bicycles on campus is not currently known, there are methods available for future counts to better understand the level of ridership going forward, which will help for continued evaluation and planning for bicycle facilities. See Chapter 7 for recommendations on conducting regular counts and participating in nation-wide bicycle and pedestrian counting efforts. Increased use of the University's bicycle registration system will also help to track ridership levels on campus.

Crash Analysis

As part of the University District Traffic Circulation Study (UDTCS), the Champaign County Regional Planning Commission has conducted extensive analysis of pedestrian, bicycle, and motor vehicle crashes within the University District from 2006-2010. The crash data, obtained from the IDOT Division of Traffic Safety, were analyzed for trends over time and accounting for changes in traffic volume, to identify safety issues related to existing infrastructure.

[26] http://www.ccrpc.org/CATS/pdf/CATSIFinalReport.pdf
[27] http://ihavemiplan.com/shared/pdfs/student_report_spring07.pdf Page 54.
[28] http://bikepeddocumentation.org/

According to the September 2012 draft UDTCS report, there were 162 crashes involving either a pedestrian or bicycle in the University District between 2006 and 2010, and "bicycle crashes exceeded the number of pedestrian crashes each year."[31] Figure 2 shows the trend in number of crashes per year, broken down by pedestrian and bicycle, while Table 1 shows the breakdown of crash severity for all bicycle and pedestrian crashes by year. The levels of severity range from fatal crashes, injury crashes ranked from most severe (A-Injury) to least severe (C-Injury), and Property Damage Only (PDO) crashes.

The map in Figure 33 shows the locations of bicycle crashes from 2006 to 2010, organized by crash severity. According to the study, "out of the 162 (bicycle and pedestrian) crashes, 108 crashes occurred at intersections along the Green Street, Springfield Avenue, Sixth Street, Lincoln Avenue and Fourth Street corridors, which is not surprising given the high pedestrian and bicycle crossing volumes at those intersections."[32] This data and the analysis included in the 2012 draft UDTCS report were considered heavily when assigning priority to infrastructure improvement recommendations included in Chapter 6.

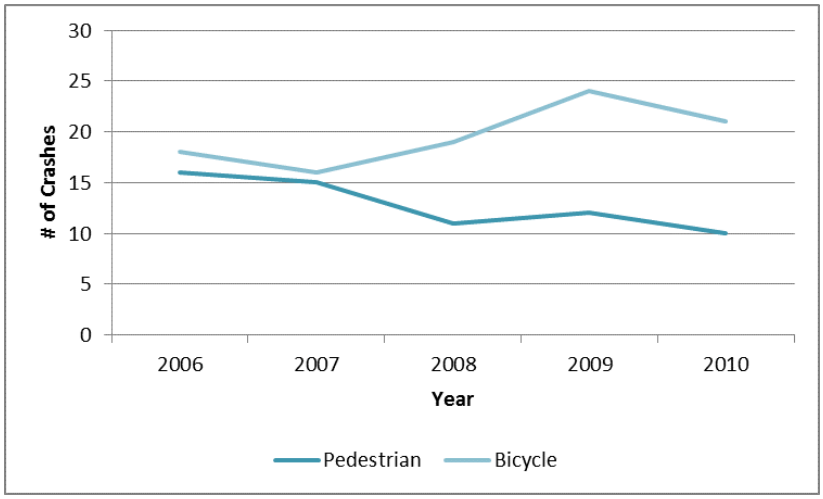

Figure 2 Pedestrian and Bicycle Crash Trends. Source: UDTCS Draft 9/14/12, page 71

Year	Crashes				Fatalities	Total Injuries
	Total	A-Injury	B-Injury	C-Injury		
2006	34	8	18	8	0	36
2007	31	4	17	9	0	32
2008	30	6	15	6	0	27
2009	36	8	17	9	1	34
2010	31	5	16	9	0	30
Total	**162**	**31**	**83**	**41**	**1**	**159**

Table 1 Pedestrian and Bicycle Crash Severity. Source: UDTCS Draft 9/14/12, page 68

[31] UDTCS, 68
[32] UDTCS, 72

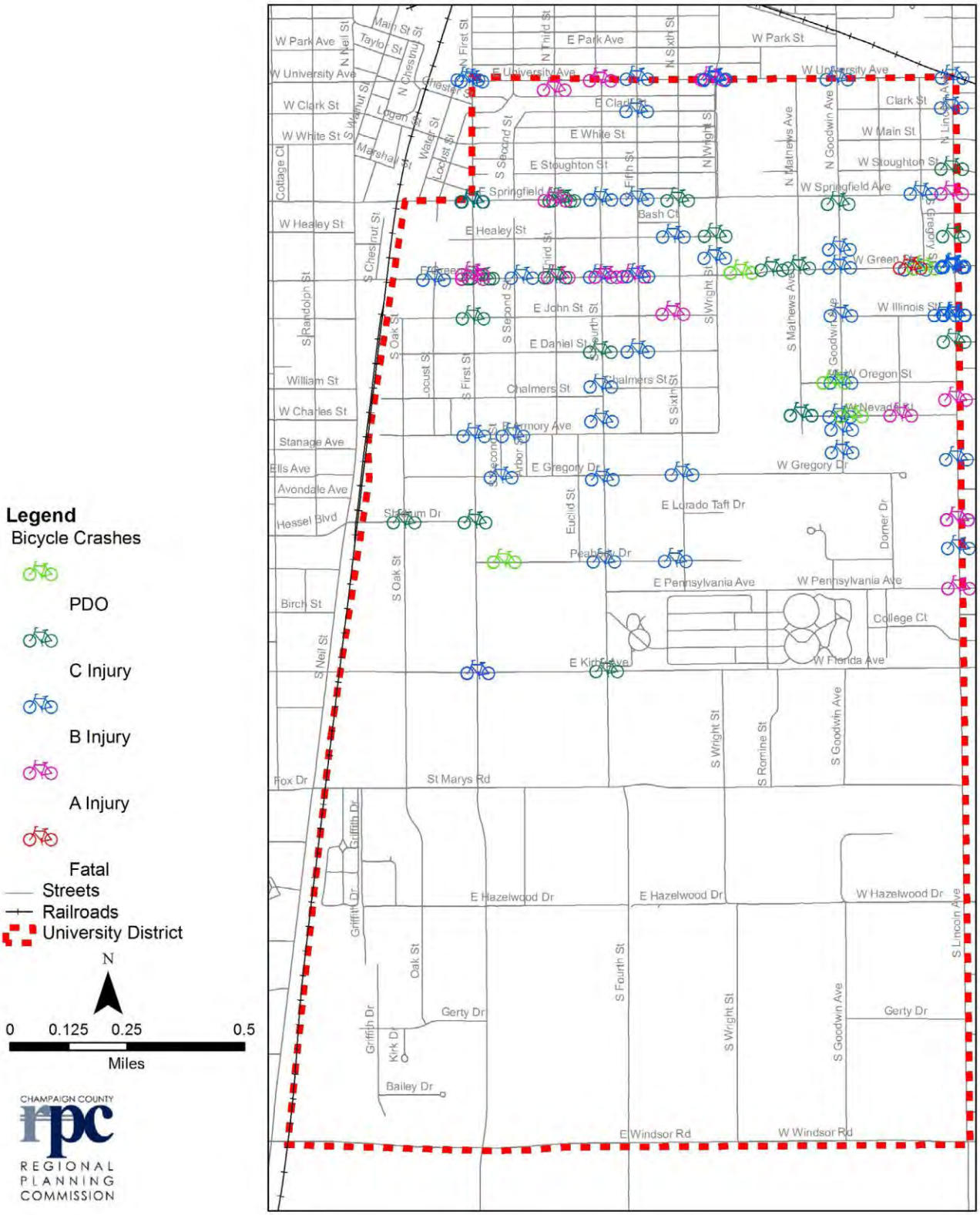

Figure 3 Bicycle Crashes in the University District between 2006-2010. Source: UDTCS Draft 9/14/12, page 74

Chapter II. Planning Process

There was a five-step planning process for this document.

1. It began with the preliminary existing conditions report of the 2007 Multi-Modal Study. That study identified a number of issues about the campus bike paths, and held 2 public input sessions.
2. A draft plan was developed in 2009 by TDM which incorporated the related plans from both cities and the principles laid out in the Multi Modal Study.
3. The CATS technical committee created a CATS Bike Plan working group to finalize the Bicycle Master Plan Network for the University District. There was a public input session in October 2010 during Sustainability Week.
4. During FY12, a number of items were addressed concurrently: the map was refined to include conceptual layouts for University-owned segments, T.Y. Lin was hired by MTD to evaluate bus-bike safety needs, and CUUATS began the University District Traffic Circulation Study.
5. This document incorporates the results of the previous four steps as the 2013 Campus Bike Plan.

Scope

While there are many issues to address to make this campus more bicycle friendly, the primary focus of this plan is on bikeway infrastructure. This plan recommends specific improvements for each unique segment of the campus bikeway network, as well as implementation considerations and cost estimates for those changes. The segments have been prioritized based on safety and volume data, as well as cost and feasibility of implementation, or "shovel readiness". Many important bikeways in the University District are located on streets that do not belong to the University. Those bikeways, although in need of improvements, are not included in this plan because the University does not have jurisdiction (see Figure 1). The bikeway segments included in this plan only cover streets and bikeways under University jurisdiction, rather than every segment in the full University District.

Additional topics beyond bikeway infrastructure, such as bike parking, bicycling encouragement and incentives, educational programs, and enforcement needs, are each covered briefly in Chapter 7. Recognizing that infrastructure improvements alone will not solve every issue faced by campus cyclists, these non-infrastructure recommendations should be addressed concurrently with the implementation of this plan. Every effort has been made to build a comprehensive list of the issues and considerations needing to be addressed, although future updates to this plan may identify new issues, or shift the plan's emphasis to other, more pressing needs at that time.

Related Plans & Studies

The following is a list of all University of Illinois plans, studies, recommendations and achievements that relate to bicycles in the last five years. These resources have all been instrumental in the development of this plan, and every effort has been made to ensure consistency between the 2013 Campus Bike Plan and the resources listed below. For a complete list of the additional off-campus studies and plans that influenced this plan, see the Literature Review (Chapter 1) of the 2012 Draft University District Traffic Circulation Study.[33]

2007 Campus Master Plan

The 2007 Campus Master Plan provides a framework for fitting the expansion program, a long-term guide for campus growth, into the fabric of the Urbana-Champaign campus in a way that builds upon existing patterns of land use, circulation, infrastructure, and open space, while making wise use of limited land resources. These visionary development guidelines allow administrators to make informed, coordinated, and cost-effective decisions.[34] The Campus Master Plan includes a recommendation to "de-emphasize automobile traffic … giving the highest priority to transportation strategies that emphasize pedestrian, bicycle, & transit movement."[35] The plan also recommends that the University adopt the Campus Area Transportation Study (CATS) mission statement "to better accommodate pedestrian, bicycle, transit, and vehicle movements in a more user-friendly environment" as a basic planning objective to be applied to all campus transportation planning and design efforts.[36]

2007 Multi-Modal Transportation Study

The 2007 Multi-Modal Transportation Study for the University addressed pedestrian safety and general mobility issues for campus. The study presented a number of recommendations related to parking, transit, streets, bicycling, walkability, and transportation demand management. The Multi-Modal Study was adopted by campus in 2007 to be implemented by the TDM department.

This document addresses four specific bicycle recommendations from the Multi-Modal Study:

- *Recommendation 3.18:* Commission a comprehensive campus bicycle plan to plan for upgrading existing facilities and developing new facilities.
- *Recommendation 3.19:* Implement bike lanes on campus streets as part of "complete streets" program. Bike paths should supplement street system in areas inaccessible by street and in areas used for recreational purposes.

[33] UDTCS September 2012 Draft, page 2
[34] http://www.uocpres.uillinois.edu/resources/uiucplan
[35] 2007 Campus Master Plan Recommendation B.3. page 4
[36] 2007 Campus Master Plan page 43

- *Recommendation 3.22:* Implement a comprehensive bicycle education and promotion program.

- *Recommendation 3.23:* Provide other amenities to accommodate existing bicyclists and attract new ones.[37]

2008 Parking System Review Committee Recommendation

In 2008, Chancellor Richard Herman charged the Parking System Review Committee (PSRC) with recommending "comprehensive parking policies that address the following:

- salary-based rate concerns;
- price differentiated parking options; safety enhancements that support current efforts to reduce vehicular traffic on campus;
- optimize existing parking space;
- promote green transportation; and
- give consideration to expanded parking services such as
    - satellite parking with high frequency shuttle access,
    - access to occasional parking for those who choose not to park on campus on a regular basis (e.g., transit riders, cyclists and car/van pool users),
    - access to multiple parking facilities, and
    - demand related pricing for high demand parking areas."[38]

The PSRC's final report recommended the formation of a bicycle committee to resolve issues related to bicycle paths, parking, and services and identify a revenue stream to fund and maintain bicycle facilities. The committee would be charged with identifying a revenue stream and resolving issues for bicycle paths, parking, and services, such as a bike shop, bike sharing on campus, and educational programs. This bike plan modifies that recommendation to propose a Bicycle Coordinator who will work with the Campus Transportation Committee for review of programs.

This bike plan recommends bike lanes on certain streets that will only accommodate bike lanes if some or all of the on-street parking spaces are removed. The table in Appendix C lists transportation segments that will impact parking spaces when implemented. This table also makes recommendations for alternative parking options for each of these segments. There are a total of 234 University parking spaces that will be removed from streets through the implementation of new bike lanes recommended in this plan.

[37] 2007 Multi-Modal Transportation Study, Final Report page 18, 20

[38] Parking System Review Committee Recommendations, Appendix I: Charge Letter http://www.senate.illinois.edu/co_psrc.pdf

2009 University District Bikeway Network and Draft Campus Bike Plan

In 2009, the University released a map of the University District Bikeway Network, accompanied by the 2009 draft Campus Bike Plan, which was the basis of this document. The University District Bikeway Network is a map delineating the proposed type of bikeway facility for each segment within the University District. The CATS Bike Plan Working Group discussed the individual segments as they relate to their jurisdiction's proposed network and its relationship to the rest of the CATS agency plans. This collaborative process was a vital step in creating this final document.

2010 iCAP: A Climate Action Plan

In February 2008, the University committed to becoming carbon neutral by 2050 when it signed the American College and University Presidents' Climate Commitment (ACUPCC). To reach this ambitious goal of net-zero greenhouse gas emissions, the University developed a plan called "iCAP: a Climate Action Plan" (iCAP), which outlines the strategies and interim targets that the campus should achieve along the way to carbon neutrality. A major target set by the iCAP is to reduce transportation emissions by 50 percent of 2008 levels by 2025. Transportation emissions, including those from commuter, air travel, and fleet emissions, accounted for roughly ten percent of the University's total greenhouse gas emissions when the iCAP was written. As part of the efforts to reduce these transportation emissions, the iCAP clearly states "the University will implement the campus bicycling master plan."[39] This document fulfills the iCAP commitment to develop such a plan, and will help reduce commuter-based greenhouse gas emissions by enabling higher rates of bicycle use on campus and encouraging the existing trend in mode shift away from single-occupancy vehicles.

In 2012, Facilities & Services partnered with the Center for a Sustainable Environment and the Office for Mathematics, Science, and Technology Education (MSTE) to launch the iCAP Portal.[40] The iCAP Portal is an online resource to track and share information about sustainability-related efforts on the campus. The iCAP Portal will be instrumental in informing the campus community about bicycle initiatives on campus and seeking feedback from the public.

2011 University District Bike/Transit Safety Study

T.Y. Lin International was hired by MTD to conduct the 2011 University District Bike/Transit Safety Study to offer guidance on bike facilities in the University District, specifically as related to safety near bus routes. The study reviewed a number of specific areas within the University District, as well as the various local plans, policies, and design guidelines for pedestrian and bicycle facilities existing at the time, including the 2009 Draft Campus Bike Plan. As part of the study, the facility designs recommended in the Campus Bike Plan were vetted by the professional bicycle design team of T. Y. Lin International. Their final report was completed in August 2011, and is available online.

[39] http://sustainability.illinois.edu/pdfs/Climate%20Action%20Plan.Final.pdf Page 15.
[40] http://icap.sustainability.illinois.edu/

2011 Bicycle Friendly University

In 2011, this campus was awarded bronze-level recognition as a Bicycle Friendly University (BFU). The BFU program is organized by the League of American Bicyclists (LAB) to recognize institutions of higher education for promoting and providing a more bicycle-friendly campus for students, employees and visitors. In response to BFU applications, LAB also provides a detailed roadmap and technical assistance to further improve campuses for bicycle friendliness. According to the feedback provided to this campus by LAB, among the top "most significant measures the University of Illinois Urbana-Champaign should take to improve cycling on campus" includes ensuring that "new and existing bicycle facilities conform to current best practices and guidelines – such as the NACTO Urban Bikeway Design Guide, AASHTO Guide for the Development of Bicycle Facilities and your DOT's own guidelines."[41] The LAB's recommendations have been incorporated into this updated plan, both in the areas of bikeway infrastructure and as it relates to bike parking, education, enforcement, and more. BFU status is renewed every four years, and the University hopes to achieve silver-level or higher status the next time we are evaluated.

2012 CATS Complete Streets Commitment

In February 2012, the CATS Policy Committee approved "A resolution setting forth CATS's commitment to Complete Streets."[43] The University's Facility Standards require that "streets on campus shall be developed as Complete Streets, which are designed to enable safe access for all users. Pedestrians, bicyclists, buses, and motor vehicles can all safely cross and move along a complete street."[44] A successful campus street will accommodate multiple traffic modes in a safe and efficient manner, utilize landscaping and other design treatments to enhance the streetscape and campus character, give low priority to cars and highest priority to pedestrians, and create a memorable sense of place. This document incorporates the complete streets philosophy and strives to accommodate multiple traffic modes on campus road and pathways. As a result, some of the recommended designs included in this plan include facilities such as curb bump outs and pedestrian-only sidewalks, despite the fact that these facilities may not directly serve bicyclists.

Public Input

Prior to 2013

The University has a rich history of public engagement since its founding in 1867, and this bike plan was developed in the same tradition. From the 1999 Campus Area Transportation Study to the ongoing University District Traffic Circulation Study, there have been many public input

[41] League of American Bicyclists, Feedback- Bicycle Friendly University Status- University of Illinois at Urbana-Champaign, Fall 2011. https://icap.sustainability.illinois.edu/project/bicycle-friendly-university-status
[43] https://icap.sustainability.illinois.edu/files/project/49/CATS_Complete_Streets.pdf
[44] U of I Facilities Standards: Streets Sidewalks Page 1

opportunities which have all helped guide the University's decision making related to bicycle infrastructure and programs.

In 1999, the CATS Phase I report recorded numerous issues with the bike infrastructure on campus.[45] That study included regular input from a Citizens Advisory Committee, and public input options throughout the study, including town meetings, surveys, workshops and focus groups, a web page with email input, and newsletters/project bulletins. The 2005 CATS Phase II report included two public input sessions during 2001. CATS Phase III is in progress, and staff of CCRPC/CUUATS along with CATS member agencies are organizing a public workshop for the University District Traffic Circulation Study. All CATS committee meetings follow the Open Meetings Act and allow public input during each meeting.

The bicycle plans and studies from other agencies in this community have collected numerous comments related to the University District. Through the collaborative planning approach under CATS, TDM staff have kept informed about the comments related to campus bikeways that were collected from other studies, including Greenways and Trails and related city plans.

As part of the 2007 Multi-Modal Study, a campus open house was held in November 2006 to solicit input from the campus community about transportation recommendations. Nearly 200 students, staff, faculty, and visitors attended the open house, and written comments are included in that final report.[46] Also, the Parking System Review Committee held multiple focus group meetings with various campus representatives, such as students, academic professionals, civil service, and community cyclists.

The 2009 University District Bikeway Network and Campus Bike Plan Draft were posted online and reviewed at a public workshop during Sustainability Week 2010. The network was also reviewed by the Campus Transportation Committee, the Urbana Bicycle and Pedestrian Advisory Commission, and the local cycling community via meetings with Champaign County Bikes.

The 2010 iCAP was created through an open dialog with campus and the public at large. The transportation section was developed in cooperation with local cycling advocates from the CATS agencies and non-profit organizations. The 2011 University District Bike/Transit Safety Study consisted of a workshop and guided bicycle tour of existing infrastructure in the University District, as well as a survey of MTD bus operators.[47]

2013 and beyond

In December 2012, TDM released a Campus Bicycle Feedback Form, to help inform this Campus Bike Plan as well as to continually guide future efforts to improve and enhance bicycle facilities and programs. Eighty-six responses were received within the first two weeks of the form's release date,

[45] http://www.ccrpc.org/CATS/pdf/CATSIFinalReport.pdf
[46] Multi-Modal Study, page 2
[47] University District Bike/Transit Safety Study, page 6

and the form remains online to receive ongoing input. Initial feedback submitted via this online form was used to help determine the order in which recommendations should be prioritized for implementation, as well as to gain insights into the problems and potential solutions that the Campus Bike Plan must address.

In addition to this feedback and the feedback collected through the number of historical documents, studies, and reports listed above, there was a four-week public comment period for this plan in March 2013, during which anyone could review and submit feedback on the plan through the online form, or in person at a number of hosted events during the four-week period. The draft was posted online to the iCAP Portal and announced through a number of communications channels. The draft was also specifically shared with a number of student groups, University entities, local governmental agencies, and local bicycle groups and organizations.

Chapter III. Goals and Objectives

The following goals and objectives are meant to direct planning efforts, independently of time frame and individual projects. A goal is defined as an end state that will be brought about by implementing the Campus Bike Plan. Objectives are sub-goals that help organize the implementation of the plan into measurable and manageable parts. Implementation measures are specific activities that must be completed in order to achieve goals. Transportation Demand Management worked with the CATS Campus Bike Plan Working Group to develop five principal goals for the Campus Bike Plan. These goals were created based on public input and a variety of planning efforts. Below each goal, objectives, implementation measures, and benchmarks for completion are listed that will guide our efforts in the implementation process.

Campus Bike Plan Goals:

1) Increase safety for all campus users, including pedestrians, bicyclists, transit riders, and motorists
2) Increase sustainability of campus transportation
3) Improve mobility and accessibility for cyclists on campus
4) Fund the ongoing and future improvement of bicycle facilities, services, and programming on campus
5) Renew the University's standing as a national leader in bicycle friendliness

1) Increase safety for all campus users, including pedestrians, bicyclists, transit riders, and motorists

a) Plan and implement a safe, contiguous network of bikeways throughout campus that adhere to campus facility standards and bikeway design guidelines included in Appendix A.

i) 50% of proposed network installed and up to standard by fiscal year 2020.

ii) 100% of proposed network installed and up to standard by fiscal year 2030.

b) Develop a plan and identify funding for the ongoing maintenance of the bikeway network.

i) Funding allocated to repainting and repairing one-third of all bikeways each year.

c) Educate cyclists, pedestrians, motorists, and transit riders about rules of the road and promote safe cycling behavior.

i) Double the number of bicycle safety classes available by 2015.

ii) 75% of incoming students will be exposed to bicycle safety information by fiscal year 2015.

d) Update and enforce the university's Bicycle Code, in addition to enforcing state and local traffic laws to ensure safe and legal behavior of cyclists.

i) Adopt updated code by start of fall 2013 semester.

e) Encourage proper maintenance of bicycles by supporting the Campus Bicycle Shop, mechanics courses, and campus fix-it stations.

i) Secure continual funding for the Campus Bicycle Shop by fiscal year 2014.

ii) Increase Campus Bicycle Shop memberships by 20% per year.

2) Increase sustainability of campus transportation

a) Reduce motor vehicle trips in the community and associated emissions by increasing mode shift toward bicycles.

i) Reduce ADT in University District by 20% by fiscal year 2020.

b) Increase the share of trips taken by bicycle.

i) Increase the percentage of journey-to-work trips made by bicycle to 30% by the 2020 census, compared to 2011 survey responses.

ii) Double the percentage of faculty and staff using bicycling as their primary mode of transportation on campus from the 2011 survey to the 2015 survey.

iii) Increase the percentage of students using bicycling as their primary mode of transportation on campus by 20% from the 2011 survey to the 2015 survey.

c) Increase incentives and services that encourage bicycle commuting.

i) Provide information packets about occasional parking permits to employees by 2015.

ii) Implement a Guaranteed Ride Home program on campus for users that do not rent an annual parking permit by 2015.

d) Improve and increase the quality and quantity of bicycle parking on campus, including long-term parking & storage for bikes to increase security from theft and inclement weather, and thus encourage bicycle ownership on campus.

i) 100% of facilities will have bike parking available within 300 feet by 2020.

ii) 100% of short-term bike parking will be up to current facilities standards by 2025.

iii) Implement long-term bike parking at key locations by 2020.

iv) Implement seasonal storage for students living in Housing facilities by 2020.

e) Build lifelong sustainable habits by influencing the behavior of students and others even after they graduate or leave the university.

   i) Develop method for gathering data from admitted, current, and graduated students.

3) Improve mobility and accessibility for cyclists on campus

a) Establish a bikeway network that is convenient and accessible for a range of ridership skill levels, by providing an integrated mix of facility types.

   i) 50% of existing bikeway facilities up to standard by 2020.

   ii) 100% of existing bikeway facilities up to standard by 2030.

b) Increase user friendliness of the campus bikeway network with improved signage and markings on all bikeway segments.

   i) 50% of existing bikeway facilities have proper signage and markings by 2015.

   ii) 100% of existing bikeway facilities have proper signage and markings by 2020.

c) Improve connectivity within and beyond the University District by working with the Cities of Champaign and Urbana and the Village of Savoy to implement bicycle facilities that connect the campus with the greater community.

   i) 100% of connection points will be safe crossings by 2020.

   ii) Continued collaborative planning through CATS, CUUATS and other opportunities as they occur.

4) Fund the ongoing and future improvement of bicycle facilities, services, and programming on campus

a) Secure funding for ongoing bicycle improvements and programming.

   i) Include bicycle facility needs in the Facilities & Services Strategic Plan in FY15 and future years.

   ii) Include bicycle programming needs in future iCAP funding.

b) Establish an on-going source of funding for continued maintenance and upkeep of the bikeway network and other bicycle infrastructure and programs.

   i) Develop a budget for continued annual maintenance of bicycle infrastructure.

c) Hire a bicycle coordinator for the university to oversee continual improvements, evaluation, and future planning.

   i) Hire full time bicycle coordinator by Fall 2014.

5) Renew the University's standing as a national leader in bicycle friendliness

a) Achieve silver-level status the next time the Urbana campus applies for Bicycle Friendly University recognition from the League of American Bicyclists.

   i) Apply for and achieve silver-level status in 2015.

b) Update the Campus Bike Plan once every four years to reflect best practices and existing opportunities.

   i) Publish next updated Campus Bike Plan in summer 2017.

c) Foster a culture supportive of bicycles, and improve relations and perceptions between bicyclists and other transportation modes.

   i) Hold, at minimum, five bike-related events per academic year.

d) Increase bicycle registration on campus as a means to track changes in ridership, and to better allow the University to communicate with campus cyclists. Coordinate with local city governments to streamline bicycle registration for residents.

   i) Develop sticker system and synchronized process with Champaign and Urbana by 2014.

   ii) Register at least 500 new bicycles per semester by 2015.

   iii) Have at least 50% of estimated bikes on campus registered by 2020.

e) Implement a bicycle sharing program on campus to provide bicycles for short-term visitors and to make bicycling more accessible to all campus users.

   i) Offer departmental bike sharing by Fall 2013.

   ii) Increase the number of departmental bike sharing bicycles to 20 by 2015 and 50 by 2020.

   iii) Offer bike rentals by fall 2014.

   iv) Support a public bike sharing program, in partnership with local governments and/or organizations, by 2017.

Chapter IV. Existing Conditions

The existing bicycle infrastructure on campus includes a mixture of dedicated and shared use side paths, a select number of off-road dedicated and shared use paths, as well as some newer on-street bike lanes. Many low volume campus streets are not specifically marked for bicycle traffic, but the Illinois Vehicle Code allows cyclists to ride on any street, whether or not that street contains designated bike lanes or bike route signage.[48] There is no clear corridor to direct cyclists clearly across campus running north-south or east-west.

The majority of bikeways on campus were constructed between 30-50 years ago and have not been consistently maintained or repaired in well over a decade, due to funding cutbacks. As a result, the campus contains many degraded and interrupted bicycle paths in need of improvement. Piecemeal changes over time have resulted in disconnection and unclear directions for travel. The 2007 Multi-Modal Transportation Study identified a number of specific issues with the current bicycle system, listed here:

- The bike paths are most problematic at intersections. Typically, the paths end before they reach the intersection, leaving bicyclists to mix with pedestrians at street corners.
- Since the bike path system is often segregated from the roadway, bicyclists cannot operate as vehicles in most intersections, causing unpredictability and introducing conflicts with pedestrians and vehicles.
- The bike paths are poorly marked and difficult to distinguish in many areas from the sidewalk since there is no physical separation.
- Most paths are of sub-standard width for two-way paths. The Guide for the Development of Bicycle Facilities [AASHTO, 2012] recommends a width of 10 feet for two-way shared-use paths. Many of the paths on campus are 8 feet, and some are as narrow as 6 feet.
- Many paths are partially blocked with potentially hazardous obstructions.
- Poor geometric design at some locations makes turning precarious.[49]

[48] 625 ILCS 5/Ch. 11 Art. XV

[48] http://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=062500050HCh%2E+11+Art%2E+XV&ActID=1815&ChapterID=49&Se qStart=125200000&SeqEnd=127100000

[49] 2007 Multi-Modal Transportation Study, Final Report, page 13

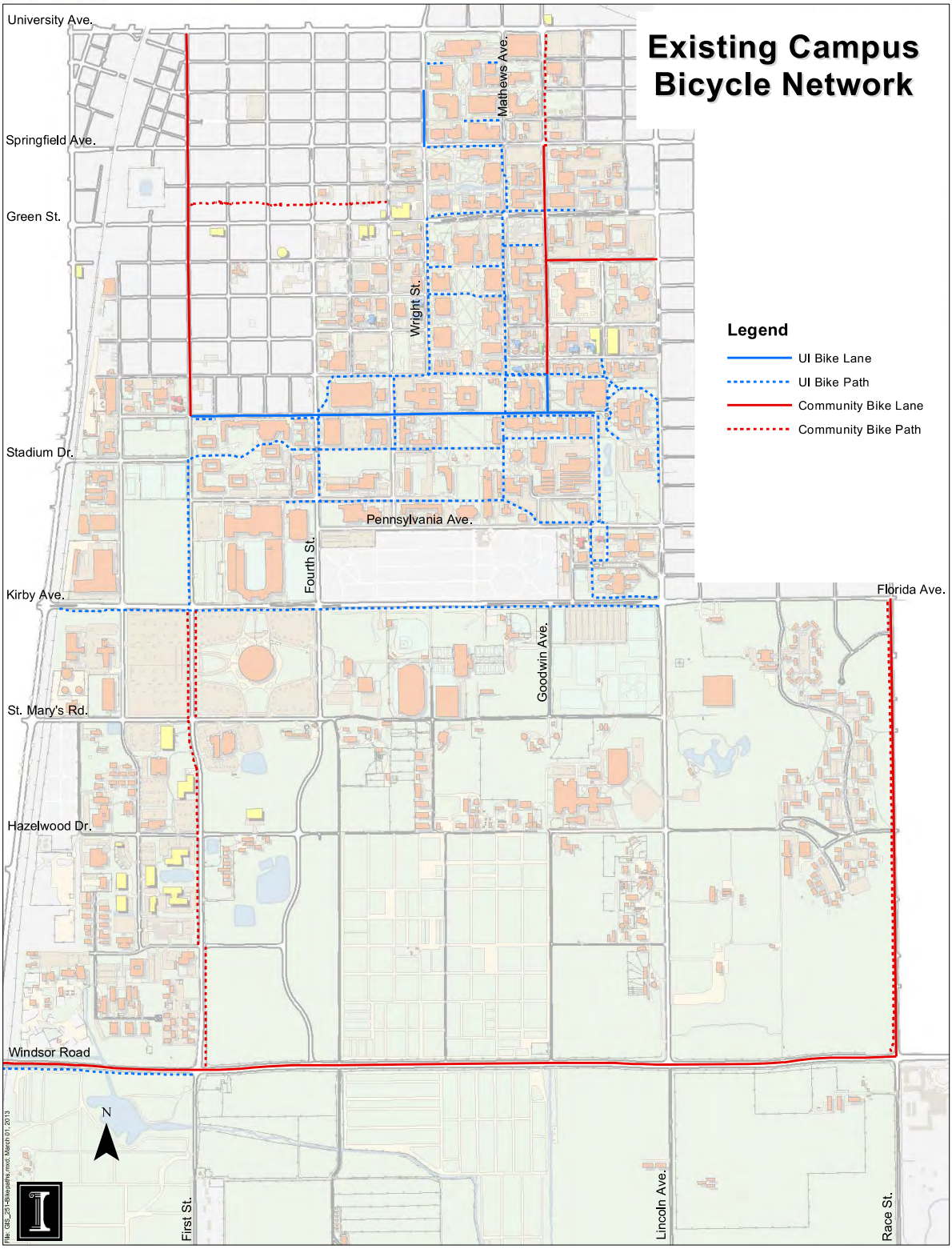

Figure 4 Existing Bike Lanes and Paths, University District

Summary of Problems

1. Safety

The safety of bicyclists, as well as that of nearby pedestrians, motorists, and transit users, is a top priority for the University. The poorly marked, inconsistent and unpredictable bikeways pose difficulties for cyclists trying to navigate campus. This commonly leads to unpredictable riding behavior, which not only puts cyclists at risk, but also adversely affects other users of paths and roadways. Even when a cyclist is trying to follow the traffic laws, there are many locations where a campus path ends without forewarning and without any indication of where the cyclist is expected to go next. The cyclist is then forced to make a sudden decision while in motion, which can be very dangerous for the rider and surrounding passersby.

Many existing bikeways on campus are intermixed with pedestrian walkways, with little or no distinction between a path intended for pedestrian use and one intended for bicycle use. The paint has worn off from most dedicated bike paths, making them undistinguishable from pedestrian-only paths, as well as from old bike paths where the paint was intentionally removed. The previous facility standards for bike paths required a darker pavement, but over time the darkness fades and is no longer distinguishable from sidewalk concrete. Due to faded or degraded markings, there is little to indicate whether the pavement on these paths is intended for cyclists or pedestrians, which causes pedestrians to frequently walk on the bike paths, unaware. This in turn pushes cyclists to use any available route, resulting in frequent conflicts between bicyclists and pedestrians across campus, both on and off bikeways. The majority of comments submitted by bicyclists via the Campus Bicycle Feedback Form pointed to the bicycle/pedestrians conflicts that result from poorly maintained bike paths.

Figure 5 Deteriorated bike path near Burnsides Research Laboratory north of Pennsylvania Avenue. Photo by Geoff Merritt

The high number of existing bi-directional side paths intended for bicycles poses a danger as well, due to the low visibility that motorists have of bikes on these paths when approaching intersections to turn. According to AASHTO's Guide to Bicycle Facilities, "In general it is undesirable for bicycles to ride on sidewalks. There is significantly higher incidence of bicyclist-motor vehicle crashes with bicyclists riding on the sidewalk than with bicyclists operating on the roadway. The issue with sidewalk bicycle riding is compounded by bicyclists riding against the flow of adjacent

traffic, as motorists crossing or turning left or right at driveways and intersections usually to not look for bicyclists traveling on the sidewalk."[56]

The original design of most outdated paths also poses a danger to cyclists, with sharp turns, narrow widths, and curb edges. Among the few dedicated bike paths being kept under the updated bike plan, the majority will need to be widened or resurfaced to meet safety standards. Nearly all of the bi-directional dedicated bike paths are only six feet wide, rather than eight feet, while some one-way dedicated paths are as narrow as two feet wide.

2. Poor Maintenance

As mentioned previously, many existing bikeways on campus have fallen into disrepair as a result of funding cuts and budget limitations. Without regular upkeep over the years, many of the dedicated bike paths have fallen subject to degraded concrete, faded paint, and edge drop offs. Broken and crumbling concrete poses a danger to cyclists, particularly on poorly lit pathways where the rugged terrain may not be visible at night. Yellow painted dash marks are often the only indication of whether an off-road path is designated for bikes or pedestrians. Where these painted markings have faded, conflicts regularly arise because pedestrians walk on dedicated bike paths and cyclists ride on pedestrian pathways. In many instances, painted "yield" signs intended to indicate the beginning or end of dedicated bike paths have faded to only vaguely show the original triangle outline. To newcomers and visitors, these remaining triangles look like directional arrows, incorrectly telling cyclists to ride on the left side of the path.

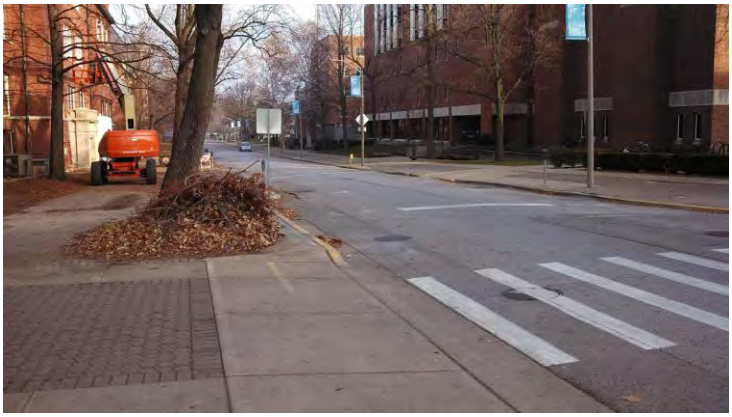

Figure 6 Leaf and debris pile up on Mathews Avenue side path. Photo by Geoff Merritt

3. Disconnection

As the original bikeway system has slowly been changed and moved over time, it has evolved from a cohesive network to a disconnected series of bikeway segments. The lack of connectivity makes it difficult to travel across campus by bicycle in an efficient, lawful manner, because it encourages cyclists to take dangerous and illegal alternatives such as bicycling on pedestrian-only sidewalks or traveling the wrong direction on one-way streets.

[56] AASHTO Guide to Bicycle Facilities, 4th Edition. 3-9.

Figure 7 Former dedicated bike path along Gregory Drive that has not been removed since new bike lanes were installed on the street. Photo by Geoff Merritt

Just as there are connectivity issues within the campus bicycle system, existing connections between the campus bikeways and the community bikeways are rare and hard to find. The University is nestled within the city limits of Urbana and Champaign and the bikeways on campus must connect with city-owned streets and bikeways to offer true connectivity. While the Multi-Modal Study recommends "the campus bicycle plan should be closely coordinated with bike planning for Champaign and Urbana to enhance regional connectivity and promote uniformity within the University District," [59] most of the actual connections between campus bike paths and community bike paths have yet to be built. The city plans are shown on pages 35 and 36, and street jurisdictions are mapped on page 10.

Because the University only owns roughly a third of the streets in the University District, many of the improvements needed to upgrade the overall University District bicycle network fall under the jurisdiction of Champaign or Urbana, rather than the University. While this plan does not specifically call out solutions for the city-owned bikeways, TDM has worked closely with those planning and implementing the city-owned bikeways to coordinate efforts and ensure that a well-connected network is put into place. In several instances, coordination is particularly needed where the University owns the sidewalks and off-road bike paths, but not the adjacent street where an on-street bike lane or bike route is recommended. Examples of this include Green Street from Wright Street to east of Goodwin Avenue, and the entirety of Mathews Avenue south of Springfield.

Figure 8 Crisscrossing bike and pedestrian paths at the intersection of Mathews Avenue and the existing Armory Avenue Path. Photo by Geoff Merritt

4. Lack of User-friendliness

Each of the aforementioned problems results in a lack of user-friendliness among the existing bikeways. Poorly maintained and disconnected routes are unsafe, and are often confusing and discouraging for new and potential riders. In order to attract campus residents and visitors to bicycling as a mode of transportation, the University must provide a logical, predictable, and efficient network of bikeways on which to travel.

[59] Multi-Modal Study, page 16

CAMPUS BIKE PLAN

CHAPTER 6: BICYCLE VISION

FIGURE 19: BICYCLE VISION PLAN

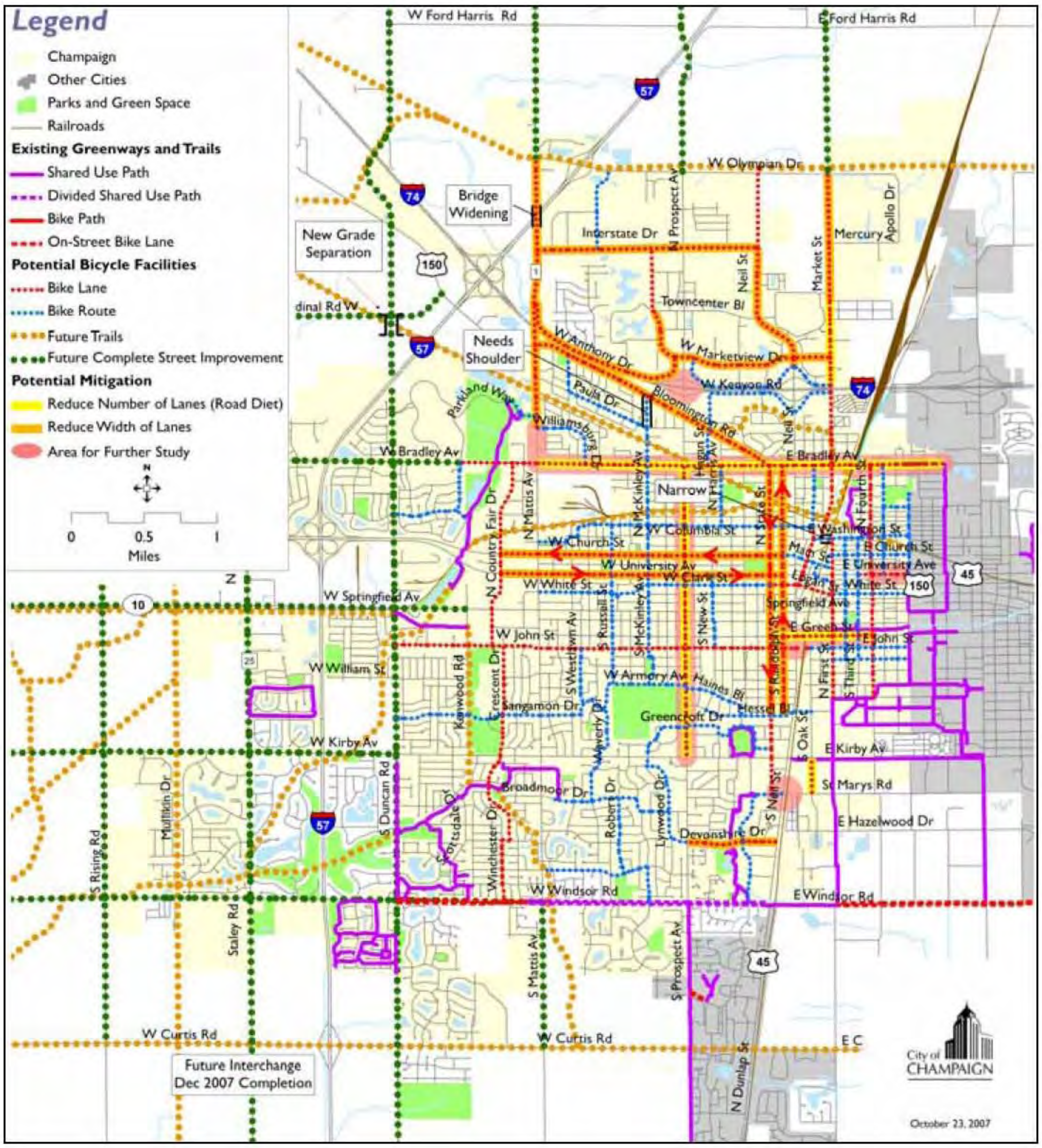

Figure 9 2007 Bicycle Vision Plan, City of Champaign

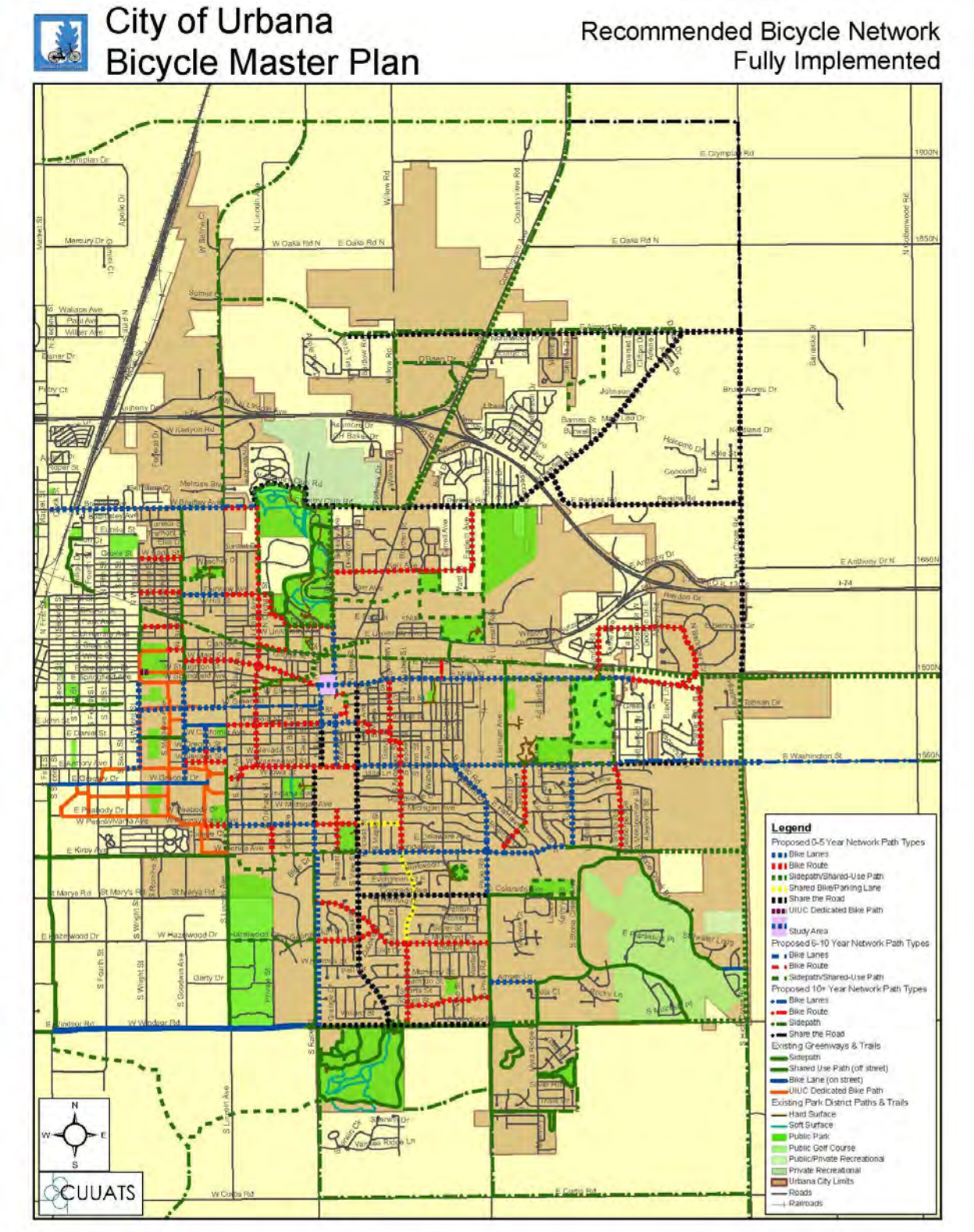

Figure 10 2008 Bicycle Master Plan, City of Urbana

Chapter V. Network Recommendations

Summary of Solutions

The recommendations provided in this plan attempt to solve the four major problems described above, by implementing the following general changes to the campus bikeway network.

1. Improve Safety

A 2009 literature review of the impact of transportation infrastructure on bicycling injuries and crashes found that "purpose-built bicycle-specific facilities reduce crashes and injuries among cyclists."[60] To reduce the number of dangerous interactions between bicyclists, motorists, and pedestrians, the Campus Bike Plan generally recommends replacing most existing side paths with on-street bike lanes or designated on-street bicycle routes. Bike lanes are safer for cyclists because they are more visible and predictable when following the Rules of the Road.[62] In the absence of the dedicated bike lanes, clearly marked designated bike routes provide additional safety measures for on-street cycling.[63] As noted in the Urbana Bike Plan, "Using the road often improves safety by increasing cyclist visibility, particularly at intersections, where most crashes occur. On-road bikeways are especially appropriate on moderate to lower speed roads with more than a few intersections, driveways, and entrances."[64]

2. Improved, Regular Maintenance

While the initial bikeway improvements recommended in this plan are critical to ensuring the safety of cyclists and others, continuing to maintain the new and improved network is essential to the ongoing success of the plan. Because many existing side paths will be replaced by on-street bike lanes, the maintenance of these new bikeways will vary from historical needs of the old off-street paths. Although the plan effectively reduces the number of dedicated bike paths requiring upkeep, on-street bike lanes may have an increased need for maintenance due to the added wear caused by vehicle traffic crossing over painted bike lanes. This will be particularly apparent where bike lanes are along bus routes and buses must cross through the bike lane to pull into bus stops. Most significantly, on-street bike lanes will mean that the maintenance of bike lanes will be paired with the maintenance of streets. Pavement upgrades for the street will mean pavement upgrades for the bike lane, and funding limitations for road maintenance will adversely affect bike lanes and routes.

For off-road shared use and dedicated bike paths, occasional motor traffic from service vehicles, as well as normal wear from daily use and inclement weather will continue to result in faded paint and degraded pavement over time. To prevent the future network from falling into the same state of disrepair that is found on campus today, a regular maintenance plan will be needed to follow the

[60] Reynolds, et al.
[62] http://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=1815&ChapterID=49
[63] Brady, et al.
[64] Urbana Bicycle Master Plan – Bikeway Types, Page 6.1 (http://www.ccrpc.org/bike/pdf/6BikewayTypes.pdf)

initial implementation of this bike plan. Potential funding sources for this ongoing need for maintenance of bikeways are listed below.

- Increase the annual F&S budget to support bikeway network repairs
- Create UI Foundation fund for bike-related projects and programming, including ongoing maintenance of the bikeway network
- Create a campus "Adopt a Path" program that would allow departments, student groups, or local businesses to provide funding to sponsor the ongoing upkeep of specific segments of the bikeway network
- Create a student fee specifically for bicycle maintenance and programs

Additional needs for all bikeways include ongoing regular maintenance such as sweeping of leaves and landscaping debris and snow removal.

3. Improved Connectivity

Although this plan does not attempt to advise the neighboring cities on specific bikeways to implement or change, it does recognize the need for the University to continue to work closely with the cities to ensure that campus bikeways are aligned with the greater area's bicycle network. This plan intends to connect and coordinate the campus bikeway network with facilities constructed and planned in the municipal jurisdictions of Champaign, Urbana, and Savoy. Every effort has been made to ensure that the recommendations included in this plan provide connectivity with non-University-owned bikeways.

4. User-friendliness

To make the bikeway network not only more safe but also more appealing and user-friendly for experienced and novice cyclists alike, this plan includes recommendations for improved signage and markings that would guide cyclists through campus. More consistent bikeways that are well maintained and clearly marked will help cyclists navigate campus by bicycle. This will also encourage more predictable riding behavior for the benefit and safety of all transportation modes.

Recommended Bike Facility Types

This plan identifies the campus streets that should include bike lanes or be designated as bike routes, shared-use paths that should be maintained or developed, and locations selected for enhanced dedicated bike paths. Design standards for each type of bikeway are included in Appendix A, with images of recommended markings and signage.

Bike Lanes

Increasing the number of bike lanes on campus roads will change the overall transportation network so that pedestrians have safer walkways with more predictable behavior from other users, while

bicyclists will share the road with motor vehicles. Bikes are legally designated as vehicles by the State of Illinois, and they have the same rights and responsibilities as motor vehicles when using roadways. When a bike lane is present on a street, bicyclists are not limited to riding in the bike lane according the State of Illinois' Vehicle Code.

Bike Routes

In some locations, rather than painting designated bike lanes, campus streets will simply be marked as a Bike Route using wayfinding signs. Campus Bike Routes will be implemented on streets that have lower traffic volumes, are too narrow for bike lanes, or connect with streets that have been designated by Urbana or Champaign as a Bike Route. Bike Routes are helpful pieces of the full bicycle network because they provide continuity when the street is not suitable for engineered bike lanes. The Bike Route wayfinding sign is meant to encourage bicyclists to use these streets and to remind motorists to share the road and watch for bikes. Painted shared lane markings, or "sharrows" are also recommended on certain Bike Routes. Sharrows are recommended to "be used to guide bicyclists to a safe position within the lane, alert motorists to the potential presence of bicyclists, encourage safe passing by motorists, and reduce the incidence of wrong-way bicycling."[65]

Shared Use Side Paths

A shared use side path is a wide sidewalk parallel to a street designed to accommodate bicycle use along with pedestrians. There are certain locations in Urbana and Champaign where bicyclists are not allowed to ride on sidewalks, but in all other locations bicycles are permitted, though not encouraged, on sidewalks.[66] There will be a limited number of shared use side paths implemented as part of this plan, where on-street bike lanes or routes are not feasible, and off-road paths are not available to offer alternative routes. The design guidelines for shared use paths include a sign that reminds cyclists to yield to pedestrians, but there are normally no pavement markings.

AASHTO notes that shared use side paths should be used rarely due to potential conflicts, such as motor vehicles crossing at intersections or entering driveways, and backwards signage for contra-flow riders.[67] The AASHTO guide recommends that "although paths in independent rights-of-way are preferred, side paths may be considered" in a number of cases, such as when the adjacent roadway has relatively high-speed and high-volume motor vehicle traffic and where few roadway and driveway crossing exist.[68] This coincides with the Urbana Bicycle Master Plan, which notes that side paths "may be better choices than on-road bikeways for faster, busier roads with few access points and with well-designed intersections."[69]

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[65] Brady, et al. page 33

[66] Urbana Municipal Code:
http://library.municode.com/HTML/11645/level3/COOR_CH23LOTRCO_ARTXIREBI.html#COOR_CH23LOTRCO_ARTXIREBI_S23-144RISI
Champaign Municipal Code:
http://library.municode.com/HTML/10520/level3/MUCO_CH33TRMOVE_ARTIIDRRE.html#MUCO_CH33TRMOVE_ARTIIDRRE_S33-26TRDOPEMA

[67] AASHTO 2012 Guide, pages 5-8 and 5-9

[68] AASHTO 2012 Guide, page 5-10

[69] Urbana Bicycle Master Plan, page 6-15

Dedicated Bike Side Paths

In very few instances dedicated bike side paths are recommended on campus. The adjacent street must have very low traffic frequency and speed, and on-street bike facilities must have been considered unfeasible in order for dedicated bike side paths to be acceptable. An example of such a path is the path along Peabody Drive.

Off-Road Shared Use Paths

As the University has grown, some streets have been closed to traffic. Because bike paths should supplement the street system in areas inaccessible by street, there will continue to be some off-road bike paths through pedestrian areas of campus. Off-road paths supplement the on-street facilities when on-street facilities are more than 1,000 feet apart. In some instances, a single shared-use path wide enough to accommodate bicyclists, pedestrians, and other non-motorized transportation will be the most appropriate facility type. The minimum paved width for a bi-directional shared use path is 10 feet, while paths with higher volume or a wide variety of user groups should range from 10-14 feet in width.[70]

Off-Road Dedicated Bike Paths

The off-road dedicated bike paths will improve safety for pedestrians and bicyclists through clear delineation as exclusive bikeway facilities. They will be designed using the AASHTO recommendations for bike lane designs on streets with no curb and gutter, with a minimum of four feet in width for each directional travel lane. The bike lane markings on the bike paths will indicate the proper use of the paths and minimize the number of pedestrians walking on the bike path. The potential for conflicts at pedestrian and street crossings will be also be minimized through appropriate design, markings, and signage for all users.

Off-Road Trails

The off-road trails are unpaved paths to be shared by cyclists, walkers, joggers, and other non-motorized transportation users.

Overview of changes

The resulting campus bicycle network will be very different from the disjointed collection of old bike paths currently in place. Figure 11 shows the proposed full network of campus bikeways. Almost all two-way bike paths along the side of the road will be removed, the majority of which will be replaced with bike lanes on streets. In some cases, they will be changed to shared use paths, and in other cases they will be discontinued.

[70] AASHTO 2012 Guide, page 5-3.

Campus Bicycle Network Master Plan

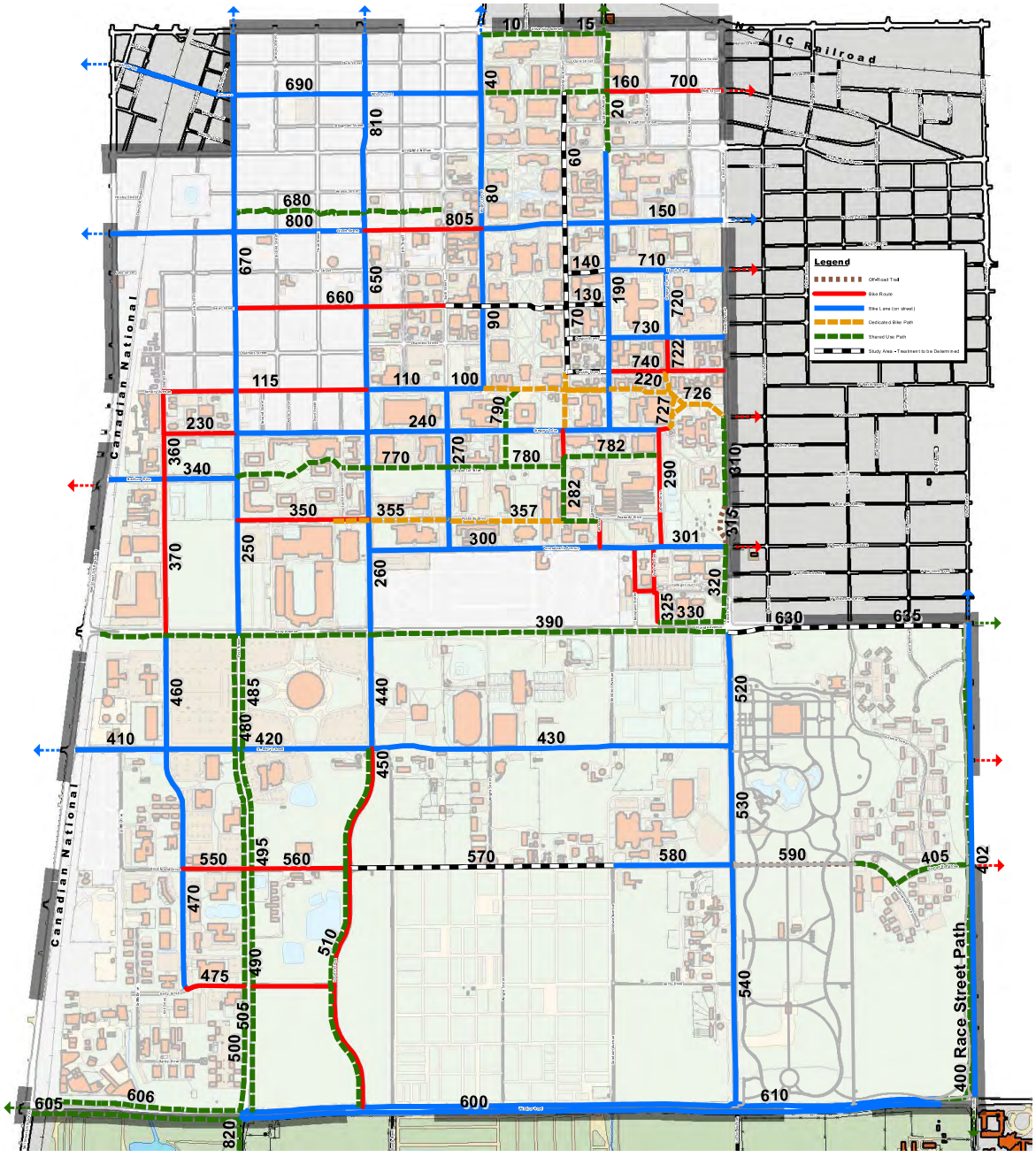


Figure 11 2013 Bicycle Master Plan, University of Illinois at Urbana-Champaign

Chapter VI. Implementation

Cost Estimates

The total construction cost of implementing the following recommendations is estimated to be roughly **$4 million** in 2013 dollars, excluding any areas that are still under study or have not yet been estimated. Each facility will need an engineering design completed before a construction estimate can be calculated accurately. Thus, only a very rough estimate for each segment can be included in this plan. These estimates are based on the installation of bike lanes on existing pavement, new concrete for the off-road paths, and an average cost per installed sign, using the following per-item cost estimates:

Item	Unit of Measure	Unit Cost
Sign	Sign	$125.00
Off-Road Pavement	Square foot of new pavement	$7.50
Pavement Removed	Square foot of pavement removed	$3.00
Landscaping Added	Square foot of new landscaping	$4.14
Bike Lane Striping	Foot of bike lane striping	$5.00
Bike Lane Marking	Marking	$55.00
Shared Lane Marking (Sharrow)	Marking	$60.00

In the following estimates, a 30% overhead has been added to account for additional costs such as staff time, contractor services, and so on. The full implementation table with a breakdown of the length, number of length of changes, as well as costs per segment is included in Appendix B. There are usually going to be additional needs with added costs, when the bikeway engineering is complete. For example, when Goodwin Avenue from Gregory Drive to Springfield Avenue was reconstructed in 2010, the original estimate for striping bike lanes along this 3,094 foot corridor was $15,469. However, the actual project included curb bump outs, new street lights, updates to sidewalk ramps and crosswalks, enhanced bus shelters, new pavement, and all the required design and oversight. Thus, the total project cost was close to $2 million. In many remaining projects similar to this one, the bikeway signage and markings are only a small part of the full project.

Funding

While the actual cost to the University for each of these recommended bikeways will depend on many variables, including engineering details, grant opportunities, and partnership with other

jurisdictions, the following recommendations will help ensure that this plan can be implemented in a timely manner.

- To implement these projects in the next few years, the University should allocate $1 million per year for four years for immediate improvements and engineering designs.
- To address these projects as funding permits, the University should increase the F&S budget by $200,000 per year for bike network improvements and ongoing maintenance.
- The University should place a high priority on funding capital projects that assist with implementation of this plan. This includes support for complete street facilities when upgrading street pavement. This also includes provided additional funding to building projects, so the adjacent bikeway can be upgraded with the building upgrades.

There is currently no funding on campus dedicated to maintenance of the bicycle network. The TDM department has funding for traffic sign upkeep and crosswalk and street painting maintenance, but not for bikeways, parking, or programs. The University should fully support the implementation of the Campus Bike Plan, including the initial construction, ongoing maintenance, and support for related programs.

One potential source for funding is to work with the University of Illinois Foundation to develop and promote a *Campus Bikes* designated fund.[71] This is an unusual approach to funding system-wide campus infrastructure and services, but it has the potential to bring in funding to support cycling initiatives on campus. The Foundation has met with staff from the Center for a Sustainable Environment in the past, seeking opportunities to offer a sustainability-related designated fund, and the Campus Bike Plan was selected as a valid and reasonable choice.

Another potential source for funding is to apply for bicycle infrastructure grants. The known grant programs are highly competitive with very limited funding availability, so it is not a guaranteed source of funding. However, there are many possibilities that can be sought as listed on the CUUATS website.[72] The grant applications will require additional staff time, which will be handled by the proposed Bicycle Coordinator.

While the source of funding is still unclear for the implementation of this plan, the need for such funding is vivid. The minor changes that have occurred on campus property in recent years were supported from one-time allocations by the campus budget officer, occasional allocations from the Student Sustainability Committee, and in combination with other capital projects such as Utility's Chilled Water Projects and Housing's Ikenberry Commons upgrades. Funding needs to be identified and provided to make these changes, and meet the implementation goals.

[71] http://www.uif.uillinois.edu/storydetail.aspx?id=29
[72] http://www.ccrpc.org/greenways/pdf/CCGT_Funding_List_10-21-08.pdf

Prioritization Process and Timeline

The projects making up this plan are ranked in order of priority, and each project has been broken into one or more phases. Projects were prioritized using a number of criteria:

- **Safety needs** using data of bicycle crashes from 2006-2011
- **Current volume** using traffic rates recorded from 2000-2012
- **Feasibility** of completion by the University, by considering jurisdiction of the segments included in and/or connecting to the project.

Projects that fall entirely under the jurisdiction of the University have received priority over projects that need assistance or cooperation from another local governmental agency, or where connectivity relies heavily on additional upgrades by neighboring jurisdictions. There will be a number of stakeholders and responsible parties involved in each project, even for projects that are entirely under University jurisdiction.

Using the above criteria, projects were ranked in high, medium and low priority levels. A fourth category, Study Areas, includes projects that do not yet have recommended designs. The implementation of some high-priority projects will begin as early as summer 2013, with additional projects planned for summer 2014 and anticipated for summer 2015.

Note: Existing associated schematic drawings for all projects are available at http://go.illinois.edu/bikeplan.

Full Implementation List

High Priority Projects

- Existing bikeway striping and new signage
- Small Starts Grant Proposal Projects
- Fourth Street
- First Street
- Armory Avenue Path
- Sixth Street

Medium Priority Projects

- Gregory Drive
- Peabody Drive
- Lorado Taft Path
- Stadium Drive
- St. Mary's Road
- Lincoln Avenue
- Main Street

Low Priority Projects

- Oak Street
- Florida/Kirby Avenue Path
- Race Street Path
- Pennsylvania Avenue
- University Avenue Path
- Goodwin Avenue Path
- Dorner Drive
- Mathews Avenue Path
- FAR Path
- Gregory Street

Study Areas

- Quad Path
- Illinois Street Path
- Mathews Avenue
- Research Park
- Hazelwood Drive

High Priority

Existing bikeway striping and new signage

Because many of the projects listed below will not be completed for a number of years, Facilities & Services is taking an interim step to make some initial improvements during spring and summer 2013. This work includes repainting several existing dedicated bike off-road and side paths, and adding stop signs for bicycle traffic at key intersections on existing paths. This step does not bring the existing bikeways up to acceptable safety standards, yet they will reduce bicyclist / pedestrian conflicts.

Small Starts Grant Proposal Projects

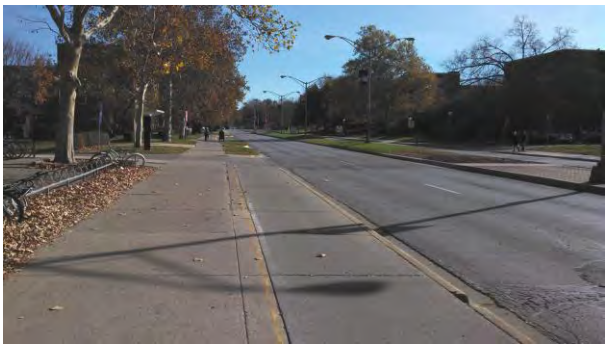
Small Starts is a federal grant program administered by the Federal Transit Administration for eligible transportation projects that cost less than $250 million total.[74] A Small Starts grant proposal is being spearheaded by MTD for a segment of high-traffic streets in the center of campus, which would require a cost-sharing component by all the CATS member agencies. Within the University District, this grant proposal includes bike lanes on White Street, Wright Street, Green Street from Wright Street to Lincoln Avenue, and Armory Avenue from Wright Street to Fourth Street. Within the Small Starts proposed improvements, the University has jurisdiction over Armory Avenue from Wright Street to Fourth Street, the Wright Street existing bike path to the east of the roadway from Armory Avenue to Green Street, and the Green Street existing bike path to the north of the curb from Wright Street to east of Goodwin Avenue.

The Green Street bike path removal should occur when the City of Urbana installs bike lanes on Green Street. The Wright Street bike path removal will need to happen in conjunction with the installation of bike lanes on Wright Street, which is under City of Champaign jurisdiction. The bike lanes on Armory Avenue should occur when the Wright Street and Armory Avenue intersection is reconfigured. That reconfiguration will include shifting the street and sidewalk southern edges farther to the south, so it will be primarily under the jurisdiction of the University. However, this work will require careful coordination with the City of Champaign, and the intersection should be done in conjunction with the bike lane installation on Wright Street.

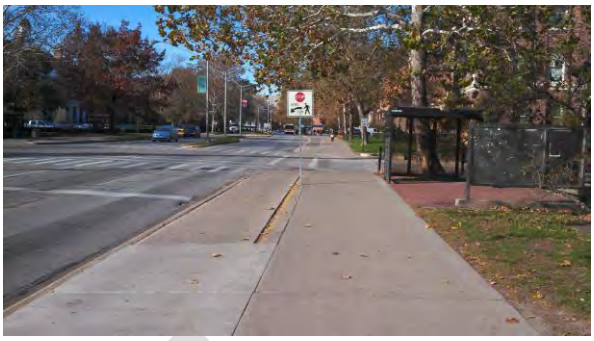
The projects in this grant proposal are the top priority safety concerns for the University and the other CATS agencies. Every effort should be made to assist MTD with obtaining this grant to address these safety issues. Additionally, because the Small Start Grant will require some matching funds from the member agencies of CATS, the University should be diligent in helping to meet the required match.

Segment Number	Description	Estimated Cost
#150	Remove side path on Green Street from Wright Street to east of Goodwin Avenue	Unknown
#90	Remove side path on Wright Street from Armory Avenue to Green Street	Unknown
#100	Bus/bike lanes on Armory Avenue from Sixth Street to Wright Street	Unknown
#110	Bike lanes on Armory Avenue from Fourth Street to Sixth Street	Unknown
	Total Cost:	Unknown

[74] http://www.fta.dot.gov/12304_222.html



Green Street east of Goodwin Avenue, where existing side path ends mid-block. (#150) Photo by Geoff Merritt

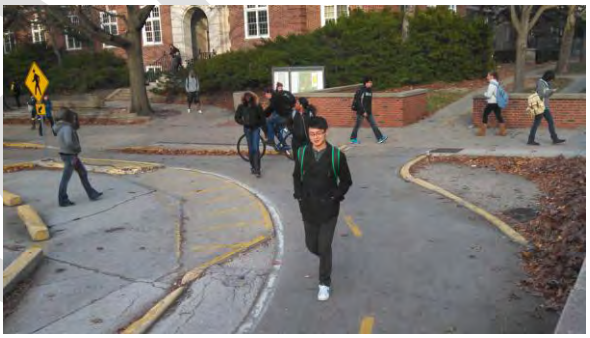


Green Street at Mathews Avenue, where existing side path goes through a bus stop. (#150) Photo by Geoff Merritt

West end of Green Street Side Path (#150) Photo by Geoff Merritt

Intersection and Wright Street and Green Street (#90 and #150) Photo by Geoff Merritt

Inconsistent markings on Wright Street side path (#90) Photo by Geoff Merritt



Pedestrian conflicts at existing intersection of Wright Street and Armory Avenue (#90 and #100) Photo by Geoff Merritt

End of side path along Armory Avenue (#100) Photo by Geoff Merritt

Armory Avenue (#110) Photo by Holly Nelson

Fourth Street

The University has jurisdiction over Fourth Street from Armory Avenue to St. Mary's Road. To the north of Armory Avenue, Fourth Street is the jurisdiction of the City of Champaign. Bike lanes are currently installed on Fourth Street, north of Armory Avenue, with a parking lane along the west edge. South of St. Mary's Road, Fourth Street is again the jurisdiction of the City of Champaign. At St. Mary's Road the on-street bike lanes will transition to a shared use side path along the west side of the street. There is also the potential for the City of Champaign to install sharrows on Fourth Street from St. Mary's Road to Windsor Road.

The Fourth Street project involves three phases. The first phase, from Armory Avenue to Kirby Avenue, is scheduled for summer 2014. It will include bike lanes on the street which will connect to the bike lanes on Fourth Street to the north. This segment will also include pavement and signal improvements, which are not included in the cost estimates below. The second phase will be removal of the off-road bike path along the east edge of Fourth Street from Armory Avenue to Peabody Drive. The third phase, from Kirby Avenue to St. Mary's Road, includes a road diet, a roundabout, and bike lanes on the street. This segment will also require new pavement construction, coordination with the city of Champaign at the intersection with St. Mary's Road.

Additionally, the east edge of the street, from south of Parking Lot E24 at Pennsylvania Avenue to Kirby Avenue is an unincorporated area. This plan recognizes that a sidewalk is needed along that space to make this a fully complete street; however, discussions have not been initiated with the owner of the associated right-of-way, so a solution has not been finalized.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#260	Bike lanes on Fourth Street from Armory Avenue to Kirby Avenue	$237,178.71
Phase 2		
#260	Remove side path on Fourth Street from Gregory Drive to Peabody Drive	*Included in Phase 1 cost estimate*
Phase 3		
#440	Bike lanes on Fourth Street from Kirby Avenue to St. Mary's Road	$19,747.13
	Total Cost:	**$256,925.84**

Existing Dedicated Bike Side Path along Fourth Street (#260), which will be removed as part of Phase Two. Photo by Holly Nelson

Existing Bike Lanes on Fourth Street north of Gregory Drive (#650) Photo by Holly Nelson

Pedestrian Crossing at Kirby Avenue (#390) and Fourth Street (#260/440) Photo by Holly Nelson

First Street

The University has jurisdiction over First Street from Gregory Drive to Kirby Avenue. To the north of Gregory Drive, First Street is the jurisdiction of the City of Champaign. Bike lanes are currently installed on First Street to the north of Gregory Drive. To the south of Kirby Avenue, First Street is the jurisdiction of the City of Champaign.

The First Street project involves a single phase, with three key components: bike lanes, a new sidewalk, and larger infrastructure work. The bike lanes will be installed from Gregory Drive to Kirby Avenue. A sidewalk is needed along the east edge of the street from Peabody Drive to Kirby Avenue, and a connecting sidewalk is needed along Peabody Drive to provide pedestrian access to the Activities Recreation Center. The larger infrastructure improvements are pavement reconstruction of First Street from Gregory Drive to Peabody Drive and stormwater facilities for Ikenberry Commons, which will run under a portion of First Street. Additionally, the traffic control along this street segment should be reviewed during this project, to assess the traffic flow as it relates to the corresponding CATS Zone.

This project should be scheduled to occur in conjunction with the construction of the new Ikenberry Residence Hall #3 at the southeast corner of First Street and Gregory Drive, which is scheduled to begin construction in fall 2014.

Additionally, when the temporary service drive to the east of First Street at Stadium Drive is removed during the future build-out of Ikenberry Commons, an accessible crosswalk ramp will need to be installed at the northeast corner of First Street and Stadium Drive.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#250	Bike lanes and new sidewalks on First Street from Gregory Drive to Kirby Avenue	$113,629.75
	Total Cost:	**$113,629.75**

Intersection of First Street (#250) and Gregory Drive (#230) Photo by Holly Nelson

Existing Bike Lanes on First Street north of Gregory Drive (#670) Photo by Holly Nelson

Shared Use Side Path along First street south of Kirby Avenue (#480) Photo by Holly Nelson

Armory Avenue Path

The Armory Avenue Path is an off-road dedicated bike path aligned with the bikeway facilities on Armory Avenue. It continues the east-west route from where Armory Avenue ends at Wright Street, to the east edge of the University District at Lincoln Avenue. At the west end of the Armory Avenue Path, the University has jurisdiction of Armory Avenue heading to the west and the city of Champaign has jurisdiction of Wright Street heading to the north. Both Armory Avenue and Wright Street are included in the Small Starts grant application, which would install bike lanes on both of those roadways. The east end of the Armory Avenue Path is at Lincoln Avenue, which is the jurisdiction of the City of Urbana. Also included in the eastern-most stretch of this path is the north-south segment from Allen Hall to Gregory Street, which will be a designated bike route. This dedicated off-road path is bounded by Nevada Street to the north, which is the City of Urbana's jurisdiction. The City of Urbana plans to sign Nevada Street as a bike route in the future. To the south, this path is bounded by the Allen Hall circle drive, at the corner of Gregory Drive and Dorner Drive.

This path also crosses the Mathews Avenue Path, Goodwin Avenue, and the Gregory Street Path, all of which are the jurisdiction of the University at these points. Phase One of the Armory Avenue Path includes the east-west segment from Illinois to Goodwin, and the north-south segment from Nevada to the Allen Hall circle drive. This project includes reconstruction for widening of the existing off-road bike path for the entire length. The north-south segment of this path that runs between the Armory Avenue Path and Nevada Street will require some grading work for the realignment needed. This regrading work is not included in the current estimate.

Phase Two should consider intersection safety improvements for pedestrians and cyclists at the off-road intersection of the Armory Avenue Path and the Mathews Avenue Path. It would be beneficial to implement phase two after the proposed Bevier Hall modifications are complete. Phase Three should take into consideration the Small Starts project proposed changes to the intersection of Wright Street and Armory Avenue. Phase Three should also include signs on the north-south shared use paths connecting the Armory Avenue Path with the Lorado Taft Path to the south.

Phase Three will replace one of the oldest bike paths on campus. The existing bikeway is made up of two parallel 30-inch strips of pavement with mature trees between them. The proposed bikeway will be eight feet wide, and to the south of the tree line, adjacent to and north of the broadwalk. There is one section of the current path that is six feet wide, near Foellinger Auditorium. This segment of the path should remain where it is, but be replaced with an eight-foot wide path. The reason to keep it slightly to the north is to provide a buffer between the pedestrians and the cyclists, where possible. It also creates a natural speed reduction for cyclists when they approach the high-pedestrian crossings entering the Quad. When addressing this pathway, campus should also consider possible improvements for ADA access to Smith Music Hall from the parking on Mathews Avenue.

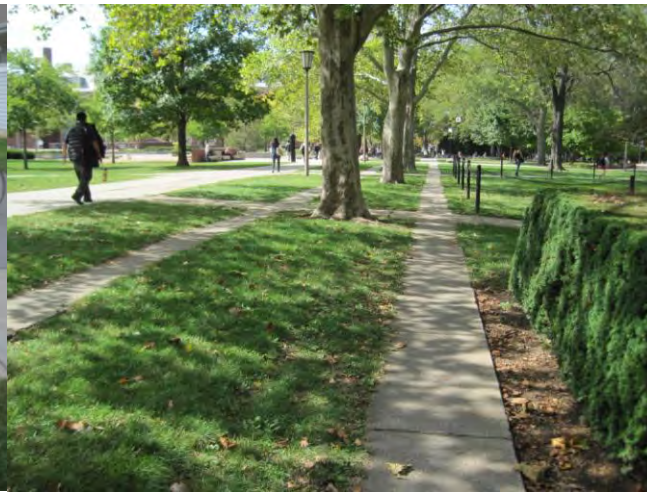
Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#220	Off-road bike path from Lincoln Avenue to Goodwin Avenue	$69,017.00
#725	Dedicated bike path from Nevada Street to Armory Avenue Path	$24,947.00
#726	Dedicated use path from Nevada Street to Gregory Drive	$73,231.60
#727	Dedicated use path from Armory Avenue Path to Gregory Drive	$39,059.80
Phase 2		
#210	Off-road bike path from Goodwin Avenue to Mathews Avenue	$97,022.64
Phase 3		
#200	Off-road bike path from Mathews Avenue to Wright Street	$94,196.70
#790	Shared use path by Undergraduate Library from Lorado Taft Path to Armory Path	$325.00
	Total Cost:	**$397,799.74**

Armory Avenue Path where it currently connects to Lincoln Ave (#726) Photo by Holly Nelson

Armory Avenue Path crossing Goodwin Avenue (#220/#210) Photo by Holly Nelson

Armory Avenue Path, currently two single-direction paths, between Goodwin Avenue and Mathews Ave (#210) Photo by Holly Nelson



Armory Avenue Path, currently two single-direction paths, south of the Quad (#200) Photo by Holly Nelson

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Sixth Street

The University has jurisdiction over Sixth Street from Armory Avenue to Pennsylvania Avenue. To the north of Armory Avenue, Sixth Street is the jurisdiction of the City of Champaign, and is one-way southbound. The City of Champaign does not have plans to add bicycle facilities on Sixth Street to the north of Armory Avenue. This project will connect bike lanes on Armory Avenue to bike lanes on Pennsylvania Avenue. The south boundary of this project is Pennsylvania Avenue, which is University jurisdiction and will have on-street bike lanes in the future. (See the Pennsylvania Avenue project).

This project will be done in three phases: bike lanes from Armory Avenue to Gregory Drive, removal of the off-road bike path from Armory Avenue to Gregory Drive, then bike lanes from Gregory Drive to Pennsylvania Avenue and removal of the off-road bike path from Gregory Drive to Lorado Taft Drive. Phase One is scheduled for construction in summer 2013, with removal of parking on the east side of the road, on street bike lanes, and new traffic signals at the both intersections. Phases Two and Three are not currently scheduled.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#270	Bike lanes on Sixth Street from Armory Avenue to Gregory Drive	$124,102.40
Phase 2		
#270	Removal of off-road bike path from Armory Avenue to Gregory Drive	*Included in Phase 1 Estimate*
Phase 3		
#270	Bike lanes from Gregory Drive to Pennsylvania Avenue and removal of off-road bike path from Gregory Drive to Lorado Taft Drive	*Included in Phase 1 Estimate*
	Total Cost:	**$124,102.40**

Sixth Street (#270) Photo by Holly Nelson

Medium Priority

Gregory Drive

Gregory Drive is an east-west roadway that is University jurisdiction from end to end and is bordered by University land in every direction. There are existing bike lanes on Gregory Drive from First Street to Dorner Drive, which were installed in 2007 along with the removal of on-street parking.

This project includes three phases: a bike route from Oak Street to First Street, removal of the off-road bike path along the south side of the road from First Street to Sixth Street, and removal of the off-road bike path along the south side of the road from the Mathews Avenue Path to Dorner Drive. Finally, to complete the project, bike lane signs should be added along Gregory where bike lanes already exist. Re-striping of the existing bikes lanes is scheduled to occur in 2014, and will likely need to reoccur ever 3-4 years.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#230	Bike route on Gregory Drive from Oak Street to First Street	$949.00
Phase 2		
#240	Removal of the off-road bike path from First Street to Sixth Street *(Bike Lanes already exist on Gregory Drive from First Street to Dorner Drive)*	$1,950.00
Phase 3		
#240	Removal of the off-road bike path from the Mathews Avenue Path to Dorner Drive *(Bike Lanes already exist on Gregory Drive from First Street to Dorner Drive)*	*Included in phase 2 cost estimate*
	Total Cost:	**$2,899.00**

Existing Bike Lane on Gregory Drive near Ikenberry Commons (#240) Photo by Holly Nelson

Existing Bike Lanes on Gregory Drive at Goodwin Avenue (#240). Note former side path along curb is still visible, to be fully removed as part of Phase 3. Photo by Holly Nelson

Peabody Drive and Peabody Drive Path

Peabody Drive is University jurisdiction from First Street to Sixth Street. The proposed bike facilities for this roadway include three phases: a bike route with sharrows from First Street to Fourth Street, and a dedicated bike side path on the south side of the curb from the bike parking area west of Fourth Street to Sixth Street, then continuing east to the intersection of Pennsylvania Avenue and Goodwin Avenue. The dedicated path will be referred to as the Peabody Drive Path, and it will provide a connection to the south end of the Mathews Avenue Path.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#350	Bike route with sharrows on Peabody Drive from First Street to Fourth Street	$1,989.00
Phase 2		
#355	Dedicated bike side path along Peabody Drive from west of Fourth Street to Sixth Street	$139,982.70
Phase 3		
#357	Dedicated bike side path along Peabody Drive from Sixth Street to Goodwin Avenue	$139,982.70
	Total Cost:	**$281,954.40**

Existing Dedicated Bike Side Path along Peabody Drive (#357) Photo by Holly Nelson

Existing Dedicated Bike Side Path along Peabody Drive (#357) Photo by Holly Nelson

Lorado Taft Path

The Lorado Taft Path begins where Stadium Drive ends at First Street. It continues across the University District to Dorner Drive. This project is separated into three phases, which can be implemented concurrently or as individual construction projects. Phase One is an off-road shared use path through Ikenberry Commons, from First Street to Fourth Street. Phase Two is an off-road dedicated bike path from Fourth Street to Sixth Street, on the north edge of the Military Axis. Phase Three is a shared use path from Sixth Street to Dorner Drive.

Phase One is the portion of this path that travels through Ikenberry Commons, between First Street and Fourth Street. The University Housing Division is responsible for this phase of the path, and because this area is a student residential space, this bikeway is not intended for cross-campus travelers, though it will be highly utilized by Housing residents. Cross-campus travelers are encouraged to use Gregory Drive to the north of Stadium Drive and Peabody Drive or Kirby Avenue to the south. Portions of this pathway are in place, and portions will be installed or modified as the Ikenberry Commons build-out continues.

Phase Two of the Lorado Taft Path is along the north edge of the Military Axis from Fourth Street to Sixth Street. This path needs to be coordinated with the planned Law School building site installation, and the proposed Illinois Path natural landscape proposed for the Military Axis.Phase Three includes removal of an existing off-road bike path on the north side of Lorado Taft Drive, and on the northern portion of the east edge of parking lot E-2. This phase also includes the addition of signs along the extent of the shared use path.

Phases & Costs:

Segment Number	Description	Estimated Cost
	Phase 1	
#775	Shared use path from First Street to Fourth Street	$975.00
	Phase 2	
#770	Shared use path from Fourth Street to Sixth Street	$112,498.10
	Phase 3	
#780	Shared use path from Sixth Street to Mathews Avenue Path	$78,605.07
#782	Shared use path from Mathews Avenue Path to Dorner Drive	$650
	Total Cost:	**$192,728.17**

Existing Dedicated Bike Path Lorado Taft Path (#780) Photo by Holly Nelson

Existing Dedicated Bike Path Lorado Taft Path (#780) Photo by Holly Nelson

Stadium Drive

Stadium Drive starts at Neil Street in Champaign and ends at First Street, where it will connect to the proposed bike lanes on First Street. Stadium Drive provides a key connection to campus bicycle commuters between the City of Champaign and the University District, with a railroad viaduct and a traffic signal for crossing US Route 45 / Neil Street. The pavement under the railroad viaduct is scheduled to be replaced in summer 2013, which will bring the full extent of the pavement on this roadway up to good condition.

This project is a single phase that will install bike lanes, remove metered parking on the north side, and install a south sidewalk from Oak Street to First Street. In order for this project to proceed, the Parking Department will need to be contacted, and the current permit holders will need to be permanently relocated. This project should be discussed with the Parking Department to begin that process after the First Street complete street project is implemented.

The City of Champaign plans to install a bike route with sharrows on Hessel Boulevard, which is aligned with Stadium Drive on the west side of Neil Street. The bike lanes on Stadium Drive should not wait for the implementation of bicycle facilities on Hessel Boulevard.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#240	Bike lanes on Stadium Drive from Neil Street to First Street, removal of south parking lane, and new sidewalk from Oak Street to First Street	$67,133.82
	Total Cost:	**$67,133.82**

Stadium Drive (#340) Photo by Holly Nelson

St. Mary's Road

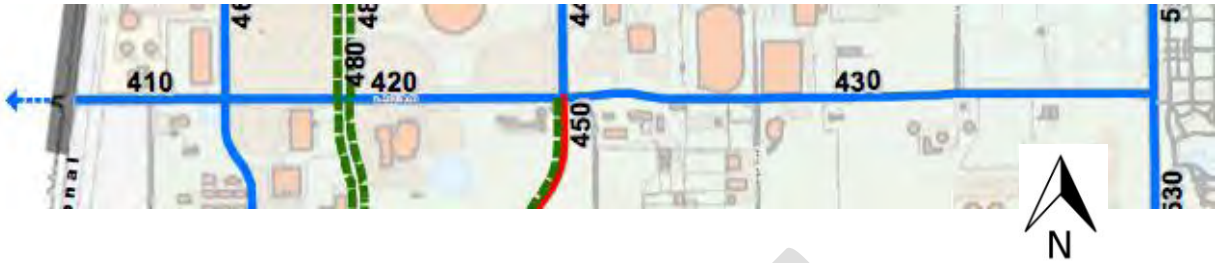
In 2008 the University of Illinois Research Park commissioned a St. Mary's Road Corridor Study to evaluate current and future traffic conditions on St. Mary's Road and nearby roadways over the coming decades, as the Research Park grows. The study was completed by CUUATS, and it identified recommended treatments for St. Mary's Road and the adjacent streets, in near, medium, and long-term timeframes.

This project has three phases: Neil Street to Oak Street, Oak Street to Fourth Street, and Fourth Street to Lincoln Avenue. Phase One, from Neil Street to Oak Street, includes a road diet, on-street bike lanes, and a new sidewalk from the Waste Transfer Station access drive to Neil Street. Phase Two, from Oak Street to Fourth Street, includes a road diet, on-street bike lanes, and new sidewalks. Phase Three, from Fourth Street to Lincoln Avenue, includes reconstruction from a rural cross section to an urban cross section with bike lanes, sidewalks, street lights, and a traffic signal at Lincoln Avenue.

For Phase Two, some sidewalks should be coordinated with the City of Champaign and the UI Research Park. For Phase Three, it should be noted that the Champaign County First coalition brought this segment to state legislators as a top priority in 2010-2011, with an estimated cost of $6.5 million. The state was unable to provide funding, so the University proceeded with a temporary solution in 2012. The temporary solution is expected to last no more than ten years.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#410	Bike lanes, road diet, and sidewalk on St. Mary's Road from Neil Street to Oak Street	$50,175.84
Phase 2		
#420	Bike lanes, road diet, and sidewalk on St. Mary's Road from Oak Street to Fourth Street	$237,701.75
Phase 3		
#430	Bike lanes, road diet, and sidewalk on St. Mary's Road from Fourth Street to Lincoln Avenue	$501,512.57
	Total Cost:	**$789,390.16**



St. Mary's Road (#420) Photo by Holly Nelson

Lincoln Avenue

Lincoln Avenue is the City of Urbana's jurisdiction from the north end of the University District to Florida Avenue. From Florida Avenue to Windsor Road, Lincoln Avenue is University jurisdiction. This project will provide an off-road connection from the Armory Avenue Path to Florida Avenue and on-street bike lanes from Florida Avenue to Windsor Road.

There are five phases of this project. Phases One, Two, and Three are the off-road connections for cyclists traveling north or south along Lincoln Avenue. Phase One is simply adding signs to the existing off-road shared use path from Ohio Street to Michigan Avenue. While the street here is Urbana's responsibility, the side path is the responsibility of the University. Phase Two is the replacement of an existing sidewalk with a wide shared use path from Pennsylvania Avenue to Florida Avenue. Phase Three is an off-road trail through the Illini Grove to allow cyclists to safely move from Michigan Avenue to Pennsylvania Avenue along Lincoln Avenue. Phase Four is a road diet, bike lanes, and a sidewalk along the east edge from Hazelwood Drive to Windsor Road.

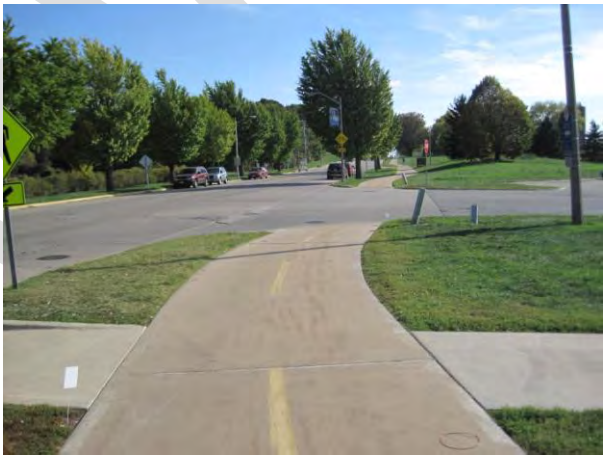
Phase Five is bike lanes and a sidewalk along the east edge from Florida Avenue to Hazelwood Drive. These bike lanes will require removal of one parking lane, so discussions with the Parking Department should be initiated when this segment is ready to move forward. With the reduction in parking permit sales throughout the University District, it is anticipated that the on-street parking spaces can be shifted to an off-street parking lot, as recommended by the Parking System Review Committee.

Existing Side Path along Lincoln Avenue (#310) Photo by Holly Nelson

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#310	Shared use path on Lincoln Avenue from Armory Avenue Path to Michigan Avenue	$325.00
Phase 2		
#320	Shared use path on Lincoln Avenue from Pennsylvania Avenue to Florida Avenue	$87,934.60
Phase 3		
#315	Off-road trail on Lincoln Avenue from Michigan Avenue to Pennsylvania Avenue	$19,743.26
Phase 4		
#540	Bike lanes on Lincoln Avenue from Hazelwood Road to Windsor Drive	$39,939.64
Phase 5		
#520	Bike lanes on Lincoln Avenue from Florida Avenue to St. Mary's Road	$19,553.88
#530	Bike lanes on Lincoln Avenue from St. Mary's Road to Hazelwood Road	$25,682.64
	Total Cost:	**$193,179.09**

Existing Shared Use Path on Lincoln Avenue (#530) Photo by Holly Nelson



Existing Shared Use Path on Lincoln Avenue (#520) Photo by Holly Nelson

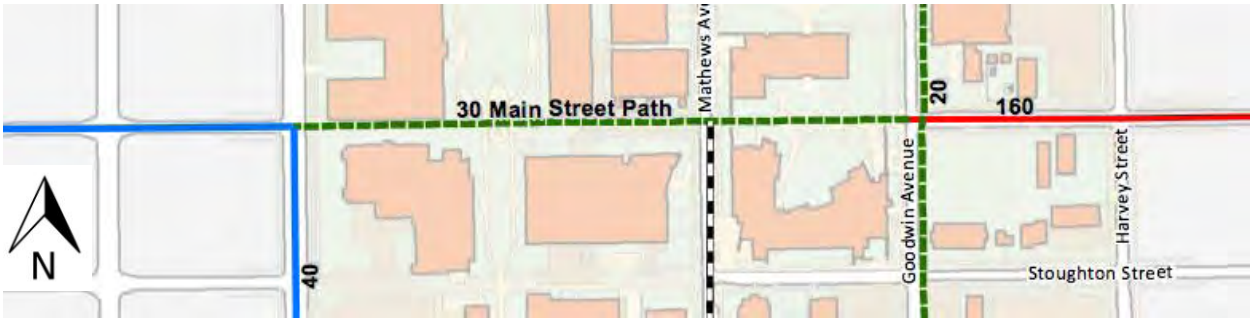
Main Street Path

The Main Street Path is the primary connection for cross-town bicycle commuters through the north side of the University District. Main Street from Goodwin Avenue to Harvey Street has been purchased by the University, but it remains under the maintenance of Urbana until all properties belong to the University or the foundation. This path connects the White Street bicycle facilities in the City of Champaign to the Main Street bicycle facilities in the City of Urbana. It crosses the Engineering Quadrangle and runs through the art sculpture water feature at the Oval Allee. This project has two phases: path enhancements from Wright Street to Goodwin Avenue, and a bike route on Main Street between Goodwin Avenue and Harvey Street.

Phase One includes changes to curb cuts along the path, including at Wright Street, Mathews Avenue, and Goodwin Avenue. Phase Two should be completed after the maintenance of Main Street has changed to the University jurisdiction, if the City of Urbana has not previously installed the bike route on that block.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#30	Shared use path from Wright Street to Goodwin Avenue	$42,570.37
Phase 2		
#160	Bike route on Main Street from Goodwin Avenue to Harvey Street	$325.00
	Total Cost:	**$42,895.37**



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Low Priority

Oak Street

The Oak Street project runs from Armory Avenue on the north to Gerty Drive on the south. The entire length of this street is University jurisdiction. To the north of this segment Oak Street changes to City of Champaign jurisdiction. This project has five phases.

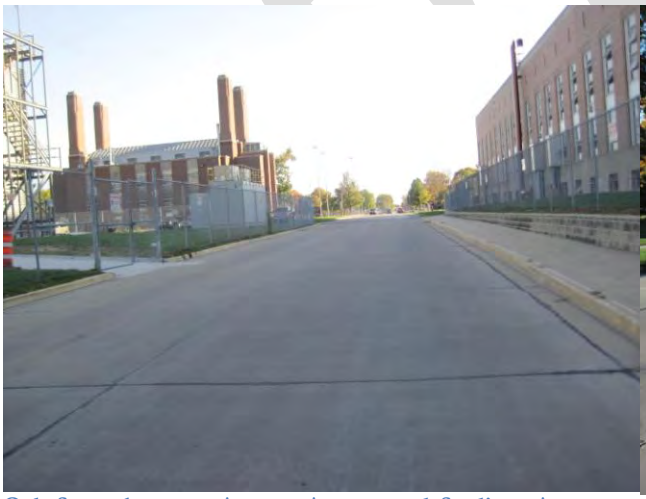
Phase One is bike lanes from Kirby Avenue to St. Mary's Road which will also include a road diet for this segment. The road diet was recommended in the 2008 St. Mary's Road Corridor Study, and it also will reduce some of the safety concerns for pedestrians crossing mid-block to access the E-14 Parking Lot by slowing traffic. The striping on this street is very faded, to the point where it is nearly invisible, so the new striping is a high priority. The east side of this roadway is lacking a sidewalk, which will need to be installed as Phase Two of this project, to complete the street. It also will need a sidewalk access point from the new sidewalk to the parking area.

Phase Three is a bike route from Stadium Drive to Kirby Avenue. Parking lot E-22 along both sides of this street is not expected to be removed for the bicycle facilities. The cyclist volume is relatively low in this street segment, so a marked bike route with sharrows is proposed. Additionally, a sidewalk along the east side of the street will be needed for this to be a Complete Street. The sidewalk will need to accommodate the existing trees, and potentially shift the existing post and chain fence. Phase Four continues this bike route and sidewalk from Armory Avenue to Stadium Drive.

Phase Five is the addition of bike lanes from St. Mary's Road to Gerty Drive, as well as completion of a number of missing sidewalks. The portion of Oak Street between Hazelwood Drive and Gerty Drive is funded for bike lanes and a portion of the missing sidewalk. The schedule for this work is currently being developed.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#460	Bike lanes and road diet on Oak Street from Kirby Avenue to St. Mary's Road	$92,770.28
Phase 2		
#460	Sidewalk along Oak Street from Kirby Avenue to St. Mary's Road	*Included in Phase 1 Cost Estimate*
Phase 3		
#370	Bike route with sharrows on Oak Street from Stadium Avenue to Kirby Avenue	$103,432.88
Phase 4		
#360	Bike route on Oak Street from Armory Avenue to Stadium Avenue	$53,404.00
Phase 5		
#470	Bike lanes and sidewalks on Oak Street from St. Mary's Road to Gerty Drive	$356,674.50
	Total Cost:	**$606,281.64**



Oak Street between Armory Avenue and Stadium Avenue (#360) Photo by Holly Nelson

Oak Street between Stadium Avenue and Kirby Avenue (#370) Photo by Holly Nelson

Florida/Kirby Avenue Path

One of the higher traffic streets in the University District is called Kirby Avenue in Champaign, west of Wright Street, and Florida Avenue in Urbana, east of Wright Street. The University owns and maintains a side path that currently runs from Neil Street in Champaign to Lincoln Avenue in Urbana across the entire University District. This path provides a convenient cross-campus path for bicycle commuters on the south side of the University District. To the east of Lincoln Avenue, the University owns property along the south of Florida Avenue, but there is not currently any sidewalk or bike infrastructure in this area. This path is divided into four phases. Phases One and Two are adding signs to the existing side path along Kirby Avenue and Florida Avenue, from Neil Street to Lincoln Avenue. Phase Three is an undetermined portion on Florida Avenue between Lincoln Avenue and Orchard Street. This segment passes The University President's House and there is a highly manicured front lawn area for that building. The solution for this connection is undetermined. Phase Four will connect Orchard Street and Race Street on Florida Avenue with a shared use side path.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#380	Adding signs along the existing shared use side path along Kirby Avenue from Neil Street to Wright Street	$1,300.00
Phase 2		
#390	Adding signs along the existing shared use side path along Florida Avenue from Wright Street to Lincoln Avenue	$975.00
Phase 3		
#630	Study Area on Florida Avenue from Lincoln Avenue to Orchard Street	unknown
Phase 4		
#635	Shared use side path along Florida Avenue from Orchard Street to Race Street	unknown
	Total Cost:	**$2,275.00**

Existing Shared Use Side Path along Florida Avenue (#390) Photo by Holly Nelson

Race Street Path

Race Street belongs to the City of Urbana, and the City maintains the shared use path along the west side of the street from Florida Avenue to Windsor Road. This road also currently includes bike lanes on the street, which connect to the existing bike lanes on Windsor Road to the west of the street. The shared use path is on University property, and the signs will be installed and maintained by campus. This project includes a single phase to install 6 new signs.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#400	Adding signs along the existing shared use path on Race Street from Florida Avenue to Windsor Avenue	$975.00
	Total Cost:	**$975.00**

Pennsylvania Avenue

Pennsylvania Avenue starts at Fourth Street on the west and extends east to the edge of the University District at Lincoln Avenue. This project should be completed in two phases.

Phase One is the installation of bike lanes with removal of on-street parking from Fourth Street to Goodwin Avenue. Phase Two should include safety modifications to the intersection of Pennsylvania Avenue and Dorner Drive, potentially including also Virginia Drive. Phase Two will also install bike lanes from Goodwin Avenue to Lincoln Avenue, remove the off-road bike path from Goodwin Avenue to Dorner Drive, and add a sidewalk on the south side from Maryland Drive to Dorner Drive. The addition of this sidewalk will require an agreement with the property owners between Maryland Drive and Dorner Drive.

Although there is no sidewalk along the south side of this roadway from west of Sixth Street to Maryland Drive, it is an unincorporated area that the University has no jurisdiction over. If an opportunity arises to add a southern sidewalk from Sixth Street to Maryland Drive, and make this road a complete street, then it should be pursued.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#300	Bike lanes on Pennsylvania Avenue from Fourth Street to Goodwin Avenue and removal of parking on north side of street	$73,231.42
Phase 2		
#301	Bike lanes on Pennsylvania Avenue from Goodwin Avenue to Lincoln Avenue, removal of off-road bike path, intersection improvements at Dorner Drive, and removal of parking on north side of street	$20,202.00
	Total Cost:	**$93,433.42**

Pennsylvania Avenue (#300) Photo by Holly Nelson

Pennsylvania Avenue (#301) Photo by Holly Nelson

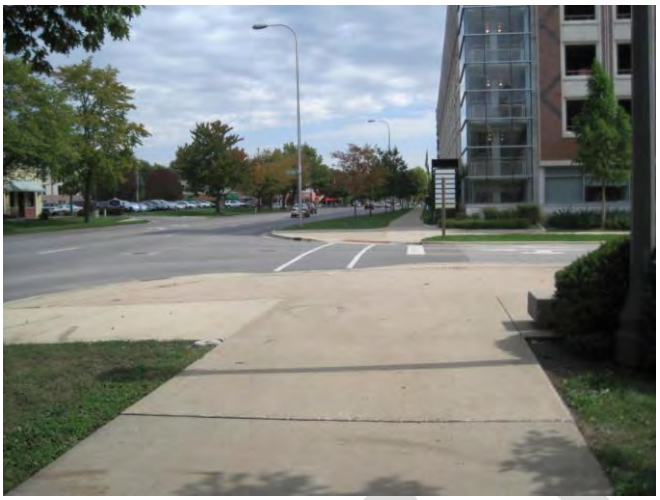
Pennsylvania Avenue (#300) Photo by Holly Nelson

University Avenue Path

The shared use path on the south side of University Avenue is in good condition from Wright Street to Mathews Avenue, and it needs to be widened from Mathews Avenue to Goodwin Avenue. This project should be completed in conjunction with the planned housing facility in the City of Urbana, north of University Avenue on Goodwin Avenue.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#10	Adding signs along the existing shared use side path along University Avenue from Wright Street to Mathews Avenue	$325.00
#15	Shared use side path along University Avenue from Mathews Avenue to Goodwin Avenue	$51,734.80
	Total Cost:	**$52,059.80**



Shared Use Side Path along University Avenue, looking east across Goodwin Avenue (#10 and #15) Photo by Holly Nelson

Existing Shared Use Side Path along University Avenue (#10) Photo by Holly Nelson

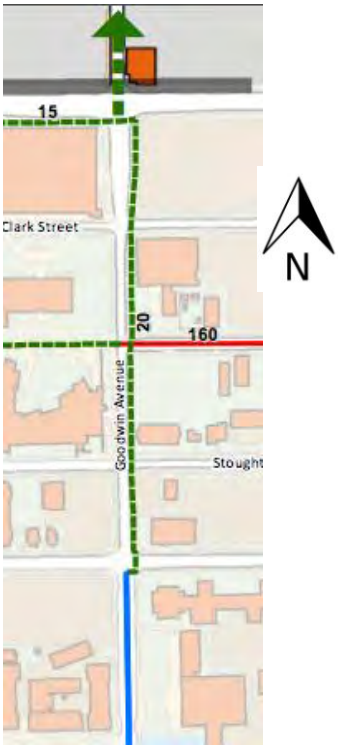
Existing Shared Use Side Path along University Avenue (#10) Photo by Holly Nelson

Goodwin Avenue Path

Goodwin Avenue between Springfield Avenue and University Avenue belongs to the City of Urbana, but the shared use path along the east side of the street is maintained by the university, except where there is private property. To the south, this shared use path connects to existing bike lanes on Goodwin Avenue south of Springfield Avenue, owned and maintained by the City of Urbana. To the north, it connects to the existing and planned shared use path along University Avenue, and it intersects with planned bikeways on Main Street. This project involves a single phase to install shared use path signs along the path.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#20	Adding signs along the existing shared use path on Goodwin Avenue from Springfield Avenue to University Avenue	$975.00
	Total Cost:	**$975.00**



Dorner Drive

Dorner Drive is the jurisdiction of the University, and it is bounded on both sides by University property, from Gregory Drive to Pennsylvania Avenue. The off-road bike path ends at a new enhanced MTD bus stop, and the path does not provide clear direction to cyclists trying to follow the appropriate rules of the road. This project is a single phase to install an on-street bike route with sharrows and remove the off-road bike path.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#290	Bike route on Dorner Drive from Gregory Drive to Pennsylvania Avenue	$78,645.60
	Total Cost:	**$78,645.60**

Existing Dedicated Bike Side Path along Dorner Drive (#290) Photo by Holly Nelson

Existing Dedicated Bike Side Path along Dorner Drive (#290) Photo by Holly Nelson

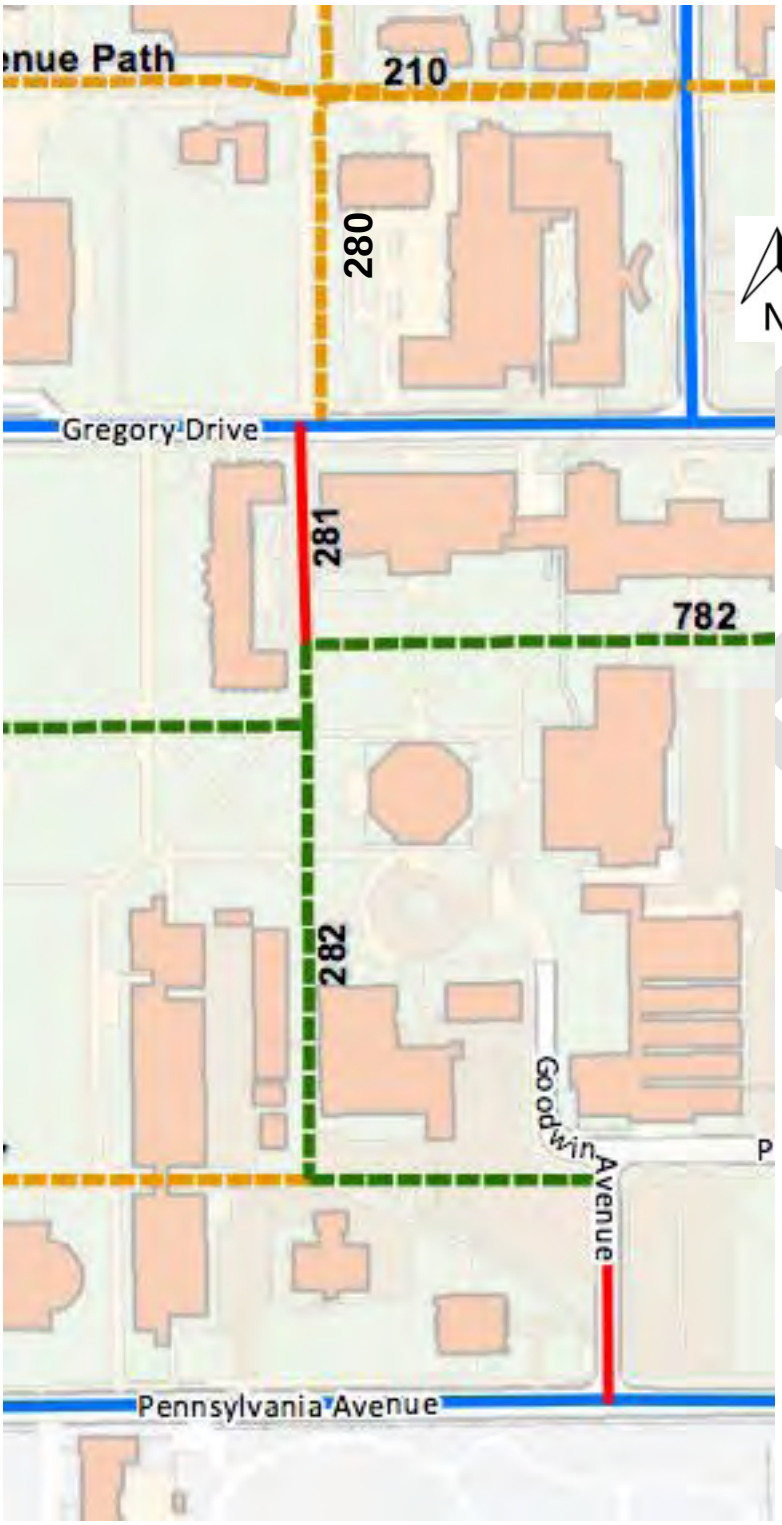
Mathews Avenue Path

The Mathews Avenue Path is a north-south connection from Nevada Street to Pennsylvania Avenue. This project is multi-phase to delineate a safe route for cyclists traveling north-south through this part of campus.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#280	Reconstruct off-road bike path from corner of Mathews Avenue and Nevada Street to Armory Avenue Path	$13,242.19
Phase 2		
#280	Off-road bike path from Armory Avenue Path to Gregory Drive	*Included in Phase 1 cost estimate*
Phase 3		
#281	Bike Route with sharrows from Gregory Drive to Lorado Taft Path (in parking area to the east of Mumford Hall)	$1,118.00
Phase 4		
#282	Shared use path from Lorado Taft Path to Peabody Drive Path	$82,259.74
	Total Cost:	**$96,619.93**

Existing Dedicated Bike Path extending south from Parking area east of Mumford Hall (#282 and #281) Photo by Holly Nelson

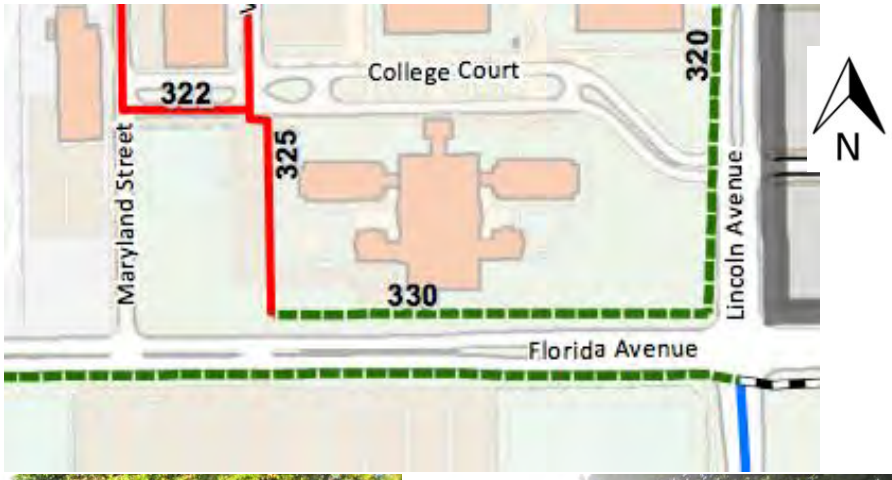

nue Path
210
280
N
Gregory Drive
281
782
282
Goodwin Avenue
Pennsylvania Avenue

FAR Path

The FAR Path is an existing shared use side path located to the south of the Florida Avenue Residence (FAR) Hall. This project is a single phase to install appropriate signage.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#330	Adding signs along the existing shared use path on the north side of Florida Avenue from Virginia Drive to Lincoln Avenue	$325.00
	Total Cost:	**$325.00**



Existing Shared Use Side Path along Florida Avenue near FAR (#330) Photo by Holly Nelson

Existing Shared Use Side Path along Florida Avenue near FAR (#330) Photo by Holly Nelson

Gregory Street

Gregory Street is university jurisdiction only from Nevada Street to Oregon Street. To the north, Gregory Street is City of Urbana jurisdiction. The City intends to install bike lanes on Gregory Street from Oregon Street to Illinois Street. This project is a single phase to install bike route signs and sharrows.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#722	Bike Route on Gregory Street from Oregon Street to Nevada Street	$650.00
	Total Cost:	**$650.00**

Gregory Street between Illinois Street and Oregon Street (#720) (City of Urbana jurisdiction) Photo by Holly Nelson

Gregory Street between Oregon Street and Nevada Street (#722) Photo by Holly Nelson

Study Areas

Quad Path

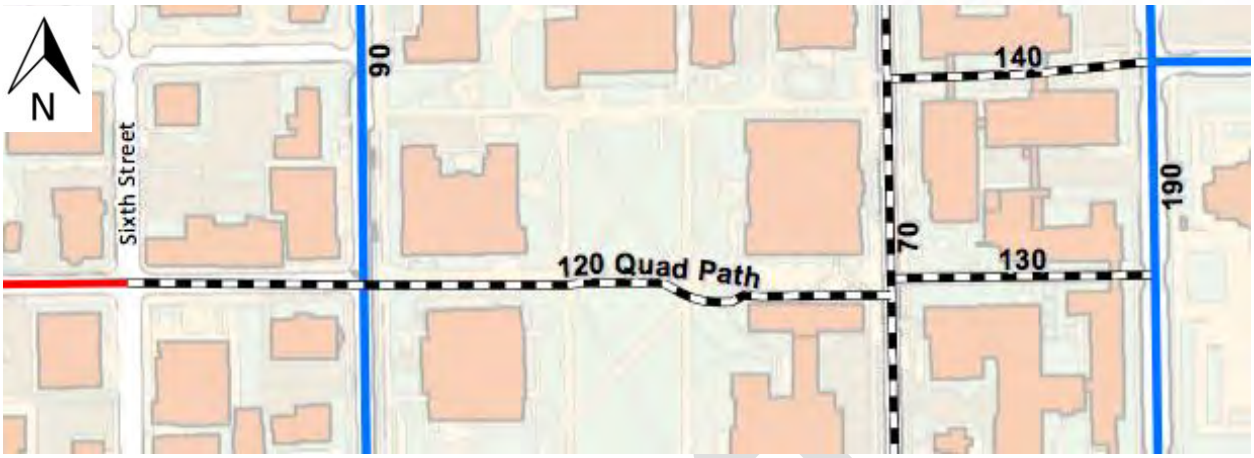
The Quad Path crosses the Main Quadrangle in line with Daniel Street in Champaign. It is bounded on the west by Wright Street, which is City of Champaign jurisdiction. On the east, the Quad Path is bounded by Goodwin Avenue, which is City of Urbana jurisdiction. This path also crosses Mathews Avenue, which is also City of Urbana jurisdiction.

Phase One of this project extends from Wright Street to Mathews Avenue. On the west end, the Quad Path will intersect with the proposed Wright Street bike lanes. Additionally, the City of Champaign is investigating options for cyclists that want to continue west on Daniel Street, such as a contra flow bike lane, even though Daniel Street is currently one-way eastbound at that location. On the east end of Phase One, the Quad Path intersects with Mathews Avenue. The future design of bicycle facilities on Mathews Avenue is undetermined at this time, so the Quad Path Phase One will be designed to connect with the existing facilities on Mathews Avenue at the time of installation.

Phase Two of this project is a connection between Mathews Avenue and Goodwin Avenue. The Quad Path is a key connection for cyclists heading from the City of Champaign to the east end of the University District. This is the only bicycle facility across the Main Quadrangle, and it continues the bicycle access from Daniel Street to Mathews Avenue. However, once a cyclist reaches Mathews Avenue, they may need to continue eastbound to Goodwin Avenue. At this time, there are no specific bicycle facilities planned for cyclists heading from Mathews Avenue to Goodwin Avenue along the Quad Path.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#120	Off-road bike path from Wright Street to Mathews Avenue	unknown
Phase 2		
#130	Shared use path from Mathews Avenue to Goodwin Avenue	unknown
	Total Cost:	**Unknown**



Existing Path west of the Quad connecting to Daniel Street (#120). Photo by Holly Nelson

Existing Path east of the Quad connecting to Mathews Avenue (#130). Photo by Holly Nelson

West side of Quad Path (#120) Photo by Holly Nelson

Quad Path from the east (#120) Photo by Holly Nelson

Illinois Street Path

Illinois Street is the City of Urbana jurisdiction, and it has bike lanes installed from Goodwin Avenue to Lincoln Avenue. The connection for cyclists heading to the Main Quadrangle from the Illinois Street bike lanes is undetermined. There is an existing dedicated off-road bike path to the north of Burrill Hall. There is also a wide pedestrian path aligned with Illinois Street. This is a dangerous area to ride a bicycle because of the tight spacing between buildings and planter areas. However, there is no clear direction for cyclists heading to the Quad from the intersection of Goodwin Avenue and Illinois Street.

Phases & Costs:

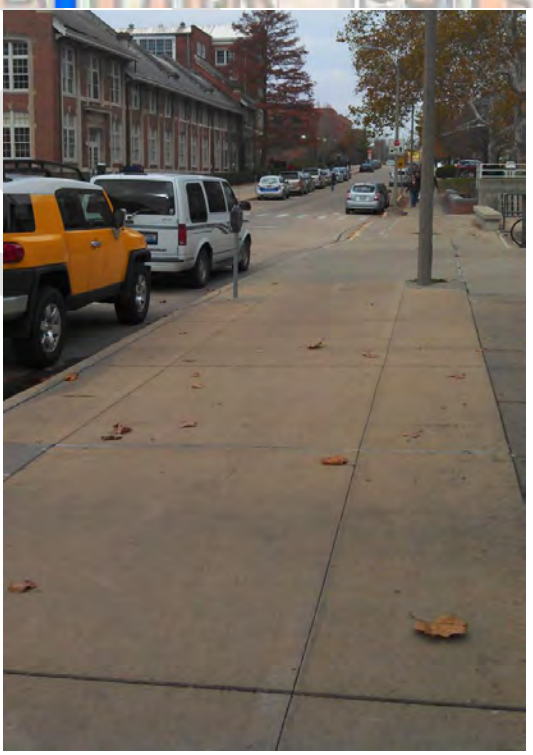
Segment Number	Description	Estimated Cost
Phase 1		
#140	Shared use path from Mathews Avenue to Goodwin Avenue	unknown
	Total Cost:	**Unknown**

Mathews Avenue

Mathews Avenue is a high volume street for pedestrians and bicyclists. This street, with its on-street parking, belongs to the city of Urbana, but the existing dedicated bike side path belongs to the University. The options for safe bicycle facilities along this street have not yet been determined.

Phases & Costs:

Segment Number	Description	Estimated Cost
#70	Study Area- treatment to be determined along Mathews Avenue from Nevada Street to Green Street	unknown
#60	Study Area- treatment to be determined along Mathews Avenue from Green Street to Main Street	unknown
	Total Cost:	**Unknown**



Mathews Avenue north of Green Street (#60) Photo by Geoff Merritt

Research Park Paths

The UI Research Park has an existing shared use path along First Street from St. Mary's Road to Windsor Road. The St. Mary's Road Corridor Study also recommended a shared use path on the east side of First Street for the same segment of roadway. The Fourth Street extension from St. Mary's Road to Windsor Road includes construction of Hazelwood Drive and Gerty Drive east of First Street, which should be designated bike routes. The implementation of off-road bicycle facilities in the Research Park should be coordinated with the UI Research Park and the City of Champaign as applicable.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#480	Shared use path on First Street from Kirby to St. Mary's Road	$98,459.66
	Total Cost:	**$98,459.66**

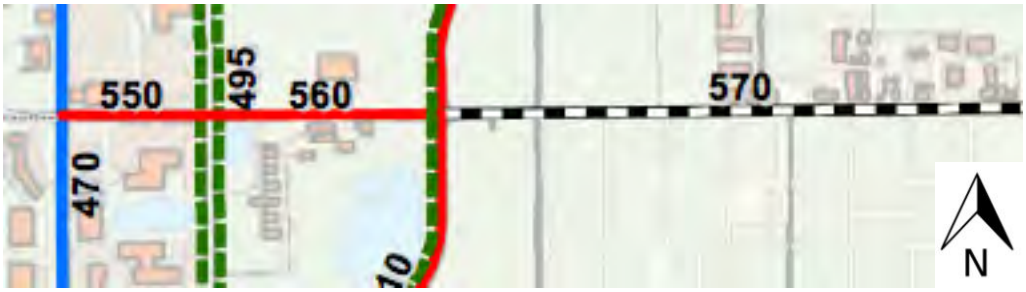

380 Florida/Kirby Ave Path
Kirby Avenue
First Street
N
480
485
420
St. Mary's Road
470
495
550
560
Drive

Hazelwood Drive and Path

Hazelwood Drive and the Hazelwood Drive Path run from Oak Street to Race Street. It is currently interrupted between Fourth Street and Goodwin Avenue Extended by an area controlled by the College of Agricultural, Consumer, and Environmental Sciences (ACES) for crop science research plots. This project is in six phases.

Phases & Costs:

Segment Number	Description	Estimated Cost
Phase 1		
#590	Off-road trail on Hazelwood Bike Path from Lincoln to George Huff Drive	$104,530.40
Phase 2		
#560	Bike route on Hazelwood Drive from First Street to Fourth Street	$325.00
Phase 3		
#550	Bike route on Hazelwood Drive from Oak Street to First Street	$637.00
Phase 4		
#580	Bike lanes on Hazelwood Drive from South Goodwin Avenue to Lincoln Avenue	$19,445.72
Phase 5		
#570	Off-road trail on Hazelwood Bike Path from Fourth Street to South Goodwin Avenue	unknown
Phase 6		
#405	Shared use side path on George Huff Drive from Hazelwood Drive to Race Street	$111,579.00
	Total Cost:	**$236,517.19**



Hazelwood Path crossing Lincoln Avenue (#580) Photo by Holly Nelson

Hazelwood Drive (#560) Photo by Holly Nelson

Chapter VII. Additional Considerations

While updating the bikeway network is a necessary and top-priority step for encouraging more bicycle trips and improving the safety and ease of use for campus cyclists, there are additional issues to be considered.

- Lack of appropriate bicycle parking and storage facilities, in terms of location, quantity, and type
- The need for systematic bicycle education for cyclists and other transportation modes, covering safe riding techniques, basic rules of the road, share the road concepts, and the benefits of bicycling
- Options for incentives and benefits for bicycle commuters, such as a bicycle commuter tax benefit, a guaranteed ride home program, occasional parking passes for cyclists, and shower facilities for cyclists
- Requests for special bicycle services, including bike sharing for employees and students.
- The need for ongoing coordination and collaboration between the University and the other CATS member agencies and local bicycling groups to provide year-round education, encouragement, and enforcement for safe cycling.

Engineering

While the entire preceding chapter outlines the various engineering improvements recommended for the bikeway network, additional engineering considerations exist for bicycle parking and storage. These recommendations are included below.

Bike Parking/Storage Facilities

The 2007 Multi-Modal Study highlighted the need for better bicycle parking facilities, and concerns about bike parking have been raised by various departments, facilities managers, campus committees, and bicyclists.

As of November 2012, there are an estimated 5,444 University-owned bicycle parking spaces in roughly 410 bike parking areas on campus. Of these areas, only 53% meet current standards for campus bicycle parking facilities. Some outdated bicycle parking areas on campus are being upgraded thanks to funding provided by the Student Sustainability Committee, and Facilities & Services intends to request additional funds in the coming years to upgrade the remaining locations. Additional locations for new bike parking should also be identified to ensure there is adequate parking available for campus cyclists. The provision of non-University owned bike parking is being addressed by the Cities of Champaign and Urbana through efforts to require bicycle parking at new developments and educational outreach to existing developments about the benefits of providing bike parking.

Going forward, the University should update the building standards so that bicycle parking is required for all new building construction on campus. Many recent construction projects have included bike parking and other bicycle facilities in pursuit of LEED certification, but a firm requirement should be formalized within the campus standards. In conjunction with the existing bike parking inventory, a bicycle parking construction policy should be developed. This policy should include minimum bicycle parking spaces per building, guidance on locations for new bicycle parking areas, and temporary solutions for bike parking areas closed by construction projects. Furthermore, all new and upgraded bicycle parking on campus should be required to adhere to the most current Bicycle Parking Guidelines set by the Association of Pedestrian and Bicycle Professionals (APBP).[76]

Indoor/Covered Bike Parking

In addition to outdoor bike parking, the University should provide sheltered bicycle parking throughout campus, and particularly near Residence Halls. Champaign-Urbana regularly experiences winter weather, and many cyclists continue to ride in inclement weather. Current campus policies prohibit bringing bicycles into University-owned buildings, including offices, academic buildings, and residence halls. This policy most negatively impacts students who live on campus and own bikes, because they are left with no option but to leave their bike outside in rain, snow, and ice that are damaging to bicycles. Additionally, some campus residents who own valuable, expensive bikes have requested more secure bike parking to help deter theft and vandalism.

First, policies preventing bicycles inside of buildings should be assessed to ensure they are necessary. Where possible, exceptions can be made to allow indoor bike parking. The Physical Plant Services Building, where Facilities & Services is primarily located, will be testing out some indoor bike parking to see how well it works for cyclists and other users of the building.

Where indoor bike parking is not an option or does not provide enough storage for the number of bikes seeking protection, sheltered bike parking should be provided. Bike lockers could also be installed in select locations on campus and rented to users each semester to cover the costs. The primary hurdles to sheltered bike parking and bike lockers are getting the designs approved by the Architecture Review Committee, to allow the structures to be built on campus property. Aesthetic concerns may pose a barrier to their approval, but the useful function of these campus enhancements would benefit many students, as well as faculty, staff, and visitors.

Seasonal Bike Storage

For students who live on campus and do not continue to use their bicycle during winter months or who leave for the summer and have nowhere to store their bicycle while away, there is a clear need for long-term, protected storage of bicycles. The University should identify a space where bicycles can be safely stored for several months in the summer and winter, and develop a system for students

[76] See http://www.apbp.org/?page=Publications

to utilize the storage program. This effort will also require solidifying the programmatic details including the process by which bicycles are dropped off and picked up; any fees associated to cover the cost of storage and staff time; and inventorying requirements to keep the program well organized. It is also important to recognize that many students rely on their bicycles for transportation year-round, and would not necessarily be willing to give up access during the entire winter. For these students, sheltered bike parking or bicycle lockers would most likely be the ideal solution, allowing them to protect their bikes from the elements and still have access to their bikes whenever desired.

Shower Facilities for Bicycle Commuters

To encourage bicycle commuting, the University should offer shower facilities to allow commuters to clean up for work or class after arriving by bike. Currently, 15-25 buildings on campus have showers, but few of these showers are accessible to most commuters. As part of its Platinum LEED Certification, many new and reconstructed buildings on campus, such as the Business Instructional Facility (BIF) and Lincoln Hall are constructed with shower facilities for cyclists, runners, and joggers. The showers are accessible only by swiping an i-card, and can be locked from the inside once in use. Campus Recreation has also considered offering shower-only memberships at their exercise facilities, and the TDM department should work with them to implement and promote the program. The University should continue to include shower facilities in new and reconstructed buildings, and also work to make the existing showers on campus more easily accessible to cyclists.

Education

The University should expand educational efforts to reach a broader audience concerning roadway rules, safe cycling behavior, and how cyclists, pedestrians, and motorists can most safely interact with one another on campus. With well over 7,000 new students each year, there is a consistent need to reinforce key messages on an ongoing basis, with particular focus at the beginning of each academic year in the fall, and again when ridership increases with warm weather in the spring. Educational efforts should take many forms and be pervasive in the daily lives of campus users. Because bicycle safety is not currently included in driver's education or high school curriculum in Illinois, many are unaware that the Illinois Vehicle Code applies to cyclists when riding in the street. Additionally, nineteen percent (19%) of the student body is from international origin, implying that bicycle education should be made available in several languages, and that a primary goal of bicycle education should be to inform those who are less familiar with national, state, and local traffic laws for all roadway users.[77]

Just as cyclists need to be made aware of their rights and responsibilities as lawful roadway users, there is a general lack of awareness among motorists and pedestrians about rules relating to cyclists. Due to lack of information, it is not uncommon to see vehicle drivers on campus passing too closely next to cyclists, or pedestrians walking in dedicated bike paths. As part of bicycle education, the

[77] http://illinois.edu/about/overview/facts/facts.html

University should continue to increase and improve traffic safety education for all transportation modes. While there have been many efforts toward improved bicycle education in Champaign-Urbana in recent years, the following outlines existing efforts and recommendations for future improvements to achieve greater awareness of the rights and responsibilities of cyclists.

Incoming Students

At the start of each academic year, UIPD officers speak at student orientation about campus safety including traffic safety for bicycles. Attendance to the orientation sessions is not required, and often the parents of incoming students, rather than the students themselves, attend these informational events. The University should assess the effectiveness of the current programming and look into ways to make bicycle safety information more accessible to incoming students. Potential alternatives include bicycle tours of campus for incoming students, info sessions at Residence Halls organized through Housing by Resident Advisors, or integrating the information into other well-attended events during Welcome Week, such as Quad Day and the Campus Rec Block Party. Educational materials can also be better incorporated into existing welcome packets given to accepted and incoming students, or general information could be included in walking tours for accepted students. Facilities & Services should work with Public Safety, the Office of the Dean of Students, Housing, and other campus entities to identify these and other opportunities to reach incoming students so that bicycle education is incorporated from the first time a student visits campus.

Educational Events

There are a number of events throughout each academic year at which the University provides and promotes bicycle safety education. Facilities & Services already hosts a table during Quad Day every year during Welcome Week in late August, but with planning and coordination, more can be done to improve the effectiveness of our presence at this event. Every September, the Division of Public Safety hosts Public Safety Day on the Quad. Public Safety Day occurs at the beginning of each fall semester, and features safety information related to all modes of transportation, particularly focusing on cycling and walking. Facilities & Services should continue to help promote and staff Public Safety Day, and perhaps incorporate more bicycle safety components, such as mechanics from the Campus Bicycle Shop and on-site bicycle registration.

Also in September is Light the Night, an annual bicycle light giveaway event coordinated by MTD in partnership with the CATS agencies and The Bike Project of Urbana-Champaign. Since 2008, Light the Night volunteers have installed 800 sets of bike lights on bicycles each year free of charge, primarily to educate riders that using a light on your bike at night is required by law in the State of Illinois. Volunteers also share information about the importance of following rules of the road when cycling, encourage cyclists to register their bikes, and provide additional resources for riders about safe cycling behavior. The success and popularity of this event is evidence that the event could be held more than once a year, or that more lights could be given out at each event. In addition to looking for ways to expand Light the Night, the University should explore ways to use the same

model for promoting the use of helmets, reflective gear, locks and other safety accessories for cyclists.

During Sustainability Week in the Fall and Earth Week in the Spring, the University normally sponsors a bicycle safety course to be offered for free to students. Attendance for these courses has been relatively low, and the organizers of these events should put more resources into promotion and advertising, or toward understanding how to make the courses more appealing to students.

Materials, Campaigns, & Multi-Media

In the past, the University and its partners have conducted public service announcements, promoted safe cycling concepts through campus newsletter and local newspaper articles, and produced a number of educational materials to promote cycling and raise awareness about the rights and responsibilities of cyclists. Key partners in the community include the CATS agencies, The Champaign-Urbana Safe Routes to School (SRTS) Project, The Bike Project of Urbana-Champaign, and Champaign County Bikes.

Champaign County Bikes (CCB) produces the C-U Area Bicycle Map, which contains a detailed map of recommended bike routes in the Champaign-Urbana area, as well as safety information for cyclists. The bike map is updated every two to three years, and the Office of the Dean of Students funds roughly 10,000 prints per year to distribute to students. The C-U Area Bicycle Map includes information on state traffic laws, rules of the road, safe cycling techniques, and tips such as how to use a bike lock and proper helmet fitting. As revisions of the map are produced, the University should continue to engage with CCB to ensure that it remains relevant and useful to students and employees.

Facilities & Services has also worked with CCB to produce a series of educational posters

Figure 12 Safety Education Posters produced by Champaign County Bikes in partnership with Facilities & Services

highlighting important bike safety messages. The posters were developed out of a larger design theme created by an outside firm which was hired to design a coordinated bicycle safety campaign. Although only the poster designs have been used to date, the University should pursue the

production of additional coordinating materials, such as billboards and external bus boards. The University should also further promote the existing posters by printing new runs each year and encouraging campus units to hang them in high traffic areas such as academic buildings, residence halls and dining halls, campus recreation facilities, and the Illini Union.

Outside of the University, a number of past and ongoing efforts have promoted bicycle and traffic safety in the community at large. In 2008, CCB volunteers organized a highly successful bicycle education program called "Share the Road." Through partnerships with governmental agencies, local and state bicycle groups, and various businesses, they created and distributed bicycle safety literature at over 50 public events during the campaign. CCB also raised funds to print a bus wrap advertising *share the road* principles, in cooperation with MTD, which provided the bus exterior. Through a number of SRTS grants over the years, SRTS has displayed educational information on some billboards, bus boards, and interior bus posters for motorists and cyclists on roadway safety and laws. In late 2012, MTD launched a new safety campaign titled 'The Bee Scene' targeting pedestrians, transit riders, cyclists, and drivers, emphasizing the importance of visibility and awareness. The University should take advantage of the existing efforts and work to maximize their impact by coordinating similar efforts targeting University students, employees, and campus visitors.

Figure 13 Image from MTD Bee Scene Campaign

Bicycle Courses

Currently, there are a limited number of bicycle safety classes offered annually on campus and in the community, taught by experienced instructors certified by national bicycle organizations including the League of American Bicyclists and Cycling Savvy. As of March 2013, the Champaign-Urbana area has five League Cycling Instructors (LCIs) who are certified by the League of American Bicyclists to teach their bicycle safety courses such as Traffic Skills 101. In addition to partnering with the existing LCIs in the community to offer safety courses on campus regularly, at least one staff member from Facilities & Services or Public Safety should also receive LCI certification to be able to offer courses by University staff. This will be particularly important as ticket-diversion programs are introduced in place of fines for cyclist traffic violation citations.

Additionally, bicycle education can be incorporated into introductory courses already offered through several of the University's colleges. Programs that have worked in the past need to be repeated and improved upon in the future, such as the *Share the Road* campaign, and distribution of materials at public events. Additional programs need to be developed, such as special presentations at residence halls and student life forums or guest lecturers at related academic courses.

In spring 2013, the Campus Bicycle Shop began offering its first bicycle mechanics classes. These should be expanded in future semesters to include one-off classes as well as weeks-long series,

focusing on a range of different bicycle repair and mechanics topics. This curriculum could also be incorporated into more general bike safety courses proposed above.

Social Media and Online Resources

In 2010, the cities partnered with support from other bicycling groups in the area, the University, and the League of Illinois Bicyclists to produce a video titled "C-U Sharing the Road." That video is now broadcasted through various media on a regular basis, and it is available online via YouTube.[78] In 2013, Facilities & Services is planning to produce a series of educational videos related to safe cycling and proper bicycle upkeep, in partnership with student groups and the Campus Bicycle Shop. In addition to airing education videos online and through local media, existing LCD screens throughout campus could regularly show short, silent videos throughout the year. The University should continually identify new opportunities to produce and air educational videos, particularly including educating the campus community about new bicycle infrastructure or programming available in the future.

Since 2012, Facilities & Services has worked with the LINC class to develop a social media presence under the branding *Illini Bikes*. Using Facebook, Twitter, Reddit, and YouTube, LINC students are helping to disseminate bike safety messages and promote bicycling to an audience of several hundred followers. In future semesters, F&S will continue to work with LINC students to build this audience base, and develop a coordinated messaging strategy to encourage responsible bike usage on campus.[79] There is a large number of additional social media accounts managed by University entities such as Facilities & Services and the Center for a Sustainable Environment, as well as student groups and local agencies and organizations, which can be utilized to leverage the educational content generated for the *Illini Bikes* social media accounts.

Figure 14 *Illini Bikes* Logo created for social media accounts by LINC Students in fall 2012

Additional Educational Tactics

In addition to merely expanding and improving the existing tactics described above, the University should also pursue new, engaging, and creative tactics such as residence hall challenges and safety pledges to reach students. Best practices by other colleges, universities, and communities around the country should continually be assessed and tracked for new ideas to be implemented on this campus. For these educational opportunities to be successful, the University must dedicate funds toward the development and execution of bicycle education. The initial investment to get many of these programs off the ground will be most significant for planning, design, and content strategy for the materials, events, programs, and resources proposed. Once developed, consistent funding toward

[78] http://www.youtube.com/watch?v=m3IsA8XZWko

[79] https://www.facebook.com/IlliniBikes and https://twitter.com/illinibikes

ongoing bicycle education would allow the university to continually inform the high turnover in student population.

Encouragement

As bicycle programs and services are implemented on campus, additional incentives and benefits for bicycling should be implemented to further increase cycling as a transportation mode.

Campus Bicycle Shop

The Campus Bicycle Shop—a collaboration between the University and The Bike Project of Urbana-Champaign—is dedicated to empowering individuals with knowledge about how to repair and maintain bicycles. The Campus Bicycle Shop (formerly known as the Campus Bike Project) was opened in May 2010 with support from the Student Sustainability Committee, Facilities & Services, the Office of Sustainability, the Prairie Research Institute, and The Bike Project of Urbana-Champaign. In fall 2012, the shop hired its first full-time Shop Manager and three part-time student employees using funds from the Student Sustainability Committee.

The Campus Bicycle Shop provides tools, parts, refurbished bikes for sale, educational classes, and knowledgeable employees and volunteers to help members and the larger community with their bicycle needs. This is a hands-on, educational space meant to provide knowledge and experience about fixing bicycles, not a "drop it off for repair" bike shop. The shop supports many bicycling events both on and off campus, and they host weekly bike rides from the shop every Friday at 5:30pm. These rides provide new and experienced cyclists the opportunity to meet other cyclists on campus, learn and follow rules of the road, and build a sense of community. In Spring 2013, the Shop Manager developed curriculum for and began offering a 6-week long introductory bike mechanics course at the shop. The Campus Bicycle Shop should continue to expand the number and type of courses provided, including single specialty courses and longer in-depth series of courses on a range of mechanical topics.

Long term, there are many other potential opportunities that should be explored for the Campus Bicycle Shop, such as greater involvement in bike sharing, bike safety education, and advocacy for campus cyclists. The Shop should increase the number of student employees in the coming years and, consider potentially transforming to a primarily student-run facility in the future, to better reflect the needs of the community it serves. The University should continue to support the Campus Bicycle Shop and explore new opportunities to improve and expand the services it provides for campus. Although some funding for the Shop will be generated annually from the shop's net income, the University should identify an ongoing funding source from campus to help fund the Campus Bicycle Shop sustainably into the future.

Bike Sharing

In 2011, the Student Sustainability Committee funded a year-long study to assess the feasibility of a wide-scale bicycle sharing program at the University. The feasibility study was published in November 2012, and recommended that before the University pursues a public bike sharing system, the campus must first address its degraded infrastructure and the need for better bicycle safety education. The Campus Bike Plan aims to resolve these issues and begin to fulfill these prerequisites, and will play an important role in taking the steps necessary to prepare the campus for a wide-scale bike sharing. In the meantime, the final report the bicycle sharing feasibility study recommended the following three-tiered approach to answer the call for bicycle sharing in Urbana-Champaign.

I. Departmental Bike Sharing for Employees

Departmentally-owned bikes for employees will build on the existing departmental bicycle sharing program maintained by the Department of Kinesiology and Community Health (KCH). Using this model, interested departments will purchase a small number of bicycles, either new or used, and will be responsible for maintaining the bikes, either by contracting with a local bike shop or handling maintenance in-house, potentially with a membership at the Campus Bicycle Shop. The bikes will then be available for check-out free of charge to departmental employees during working hours. The KCH program began as a pilot for research purposes in 2008, and continues on today as a successful example of small-scale bike sharing on campus. This same model can be adopted by many departments in different locations around campus, and it would be available to all staff, faculty, and graduate employees of the respective participating departments. This system should be centrally coordinated by TDM to allow for streamlined purchasing and maintenance efforts, and to make marketing the system across departments more efficient.

II. Short Term Bike Rentals

While the campus is not yet prepared to handle a full-scale public bike sharing program, there is an unmet demand for the temporary use of shared bicycles at a low cost. To address this demand, the campus should explore the possibility of expanding the existing small-scale bike rental program that currently exists through Campus Recreation. With support from the Student Sustainability Committee and guidance from TDM, Campus Rec would first need to increase the number of bicycles available, identify space and staffing needs, and develop a business model to make the program financially self-sufficient. Once ready to launch, Campus Rec would need to partner with TDM and a number of other partners to market the program to visitors, conference attendees, faculty, staff, and students. If a bike rental solution cannot be met through Campus Recreation, alternative locations and partners for a bike rental facility on campus should be considered.

III. Bike Solutions for Students and the Public

Once the identified infrastructure issues have been largely resolved, the campus should renew consideration of several options for bike sharing, such as bicycle libraries, kiosk systems, or GPS-

enabled community bikes. This final stage of bicycle sharing will remain on hold until the majority of the Campus Bicycle Plan has been implemented, or is underway.

C-U Bike to Work Day

In May 2010, Champaign-Urbana hosted its first ever C-U Bike to Work Day, in conjunction with National Bike Month, coordinated by the League of American Bicyclists every May. The University has been involved in planning C-U Bike to Work Day each year since it started, including playing the lead role of organizing the event in 2012. Each year, Facilities & Services partners with other local agencies on the planning committee for Bike to Work Day in addition to hosting a station near Green & Wright Street, and additional support comes from a number of on-campus entities. Campus Recreation and the Campus Bicycle Shop have each hosted bike stations on Bike to Work Day; Housing has donated food and beverages to the three on-campus stations each year; In 2012, the Illinois Student Senate became the first Platinum level sponsor of Bike to Work Day with a $1,000 donation. Bike to Work Day is an important initiative to encourage new people to commute by bicycle, and the University should continue to engage employees and students in this effort. In 2013, the event is being expanded to an entire Bike Month and will include a series of events during the entire month of May. As the event grows to a larger scale and audience, the University should continue to participate and to encourage staff, faculty and students to take advantage of C-U Bike Month activities to learn about cycling and to build new habits by bicycling for transportation.

Sustainability and Earth Week

Each fall semester, the Center for a Sustainable Environment (CSE) hosts Sustainability Week on campus, featuring a series of events highlighting numerous sustainability efforts and concerns, both locally and globally. Similarly, the RSO Students for Environmental ConcernS (SECS) hosts Earth Week every spring, in partnership with CSE. Bicycle events at Sustainability and Earth Weeks have historically included free bike tune-ups on the Quad, an open house at the Campus Bicycle Shop, free Cycling Savvy courses taught by certified instructors, and guest speakers from bicycle organizations such as Working Bikes Cooperative in Chicago. These biannual events encourage new ridership and help foster a strong bicycling community. The University should continue to provide these resources during Sustainability and Earth Weeks, and should look for ways to expand these opportunities to larger audiences each year.

Bicycle Commuter Tax Benefit

IRS Tax Code Section 132(f) allows employers to offer a subsidy of $20.00 per month to their employees who ride their bicycles to work to pay for bicycle commuting costs.[80] Bicycle commuting costs include the cost of bicycles, bicycling equipment, accessories, and bicycle storage costs. The current version cannot be offered in conjunction with a transit or parking tax benefit, and because employees are able to ride MTD buses for free, this campus is not currently able to offer this

[80] http://www.nctr.usf.edu/programs/clearinghouse/commutebenefits/

benefit. However, the Association for Commuter Transportation is lobbying to remove this restriction. If that is accomplished, the bike tax benefit should be pursued for campus employees.

Seasonal and Occasional Parking Passes

The final report by the Parking System Review Committee states that "Campus should encourage people to use active transportation options by improving bike safety, facilitating carpooling and offering occasional parking passes. Alternatives to an annual parking permit will allow employees to choose active modes of transportation and decrease the demand for annual parking spaces. Updating the bicycle system on campus will boost ridership which will positively impact the health and safety of campus citizens as well as benefit the environment."[81]

There are seasonal parking permits available in non-waitlisted lots, which is actually the annual permit pro-rated for the winter months. Although this option is available to any employee, it is currently not well advertised, and could be more heavily promoted in combination with active transportation modes. Metered parking provides an additional alternative to the annual parking permit, and can be paid for with coins ($1.00 per hour), cash key, or through a day meter permits, which cost $11.00 per day.[82] Some University-owned meters also offer a credit card payment option through mobile phones. The Parking Department should expand and promote these temporary parking options through an occasional parking packet advertised to employees, which could potentially encourage employees to give up their parking permit for the summer.

The concept of a "sunk cost" applies to an employee's choice in commute modes. If a person owns a car, has paid for a full year of parking, and is accustomed to paying the standard automobile ownership costs like gasoline, insurance, and upkeep, then the immediate benefit to choosing a different transportation mode is not readily apparent. One method for breaking through this barrier is to provide an alternative to the annual parking permit, so there is a specific economic choice every time an employee drives to work. The TDM Department should work with the Parking Department to offer occasional parking passes to employees willing to give up their annual parking permit, as recommended by the PSRC.

Guaranteed Ride Home Program

The Guaranteed Ride Home Program would provide direct transportation home in the event of an emergency, inclement weather, or other unplanned events. With support from MTD, this program can be offered free of charge to campus employees who do not purchase an annual parking pass. The TDM Department should work with the Parking Department and MTD to implement this program.

[81] Page 8, PSRC Recommendation V: Active Transportation http://www.senate.illinois.edu/co_psrc.pdf
[82] http://www.parking.illinois.edu/visitorparkinginfo.htm

From the miPlan 2007 Student Survey report by MTD:

> "In other markets, the guaranteed ride home program is often found to be popular in surveys and, while rarely used, provides a sense of security for some people. Twenty nine percent (29%) said that the guaranteed ride home would convince them to use an alternative mode, or to use it more often than they now do. Another 29% said that the guaranteed ride home would address some of their concerns. These responses do not mean that these respondents would necessarily begin taking the bus or walking or bicycling because of the guaranteed ride home, but it does mean that the idea is appealing to them and can be one aspect of a program promoting the use of alternative modes."[83]

Enforcement

According to UIPD Deputy Chief of Police Skip Frost, the UIPD normally begins each academic year with "educational" enforcement, consisting primarily of warnings intended to inform and educate cyclists about their rights and responsibilities. Over the course of the year, as they work to establish a culture of safety, the UIPD graduates to a more strict enforcement approach through written citations for traffic violations, under the Illinois Vehicle Code.

University Bike Code

According to Article XV of the Illinois Vehicle Code, with only a few exceptions, bicycles upon roadways "shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle."[84] Citations written under the Illinois Vehicle Code are normally associated with fees ranging from $50-$200, owed to the State of Illinois. While these laws are effective for enforcing traffic laws for on-street bicyclists, they do not apply to cyclists riding outside the perimeters of a public roadway. Cyclists on University-owned paths or sidewalks are only subject to the 1989 University Bike Code, which does not currently have associated fees or penalties. As a result, the Bike Code effectively provides no enforcement options to penalize or discourage prohibited behavior on sidewalks, shared use paths, or dedicated bike paths on University property.

Facilities & Services is working with the UIPD to revise the 1989 University Bike Code to better reflect the ongoing enforcement needs for bicycles on campus. The updated Bike Code should provide a clear and consistent method of enforcement, such as warnings, citations, required safety classes, or other diversion tactics. The updated Bike Code should place primary emphasis on safety-related rules for cyclists on campus property, with additional attention on non-safety issues such as bicycle registration and proper bike parking. Once updated, the new University Bike Code should be well promoted throughout campus so that all students, employees, and campus visitors are made aware of it.

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[83] http://ihavemiplan.com/shared/pdfs/student_report_spring07.pdf

[84] http://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=062500050HCh%2E+11+Art%2E+XV&ActID=1815&ChapterID=49&SeqStart=125200000&SeqEnd=127100000

Diversion Alternatives

In early 2013, the Urbana Police Department began working to establish alternatives to traffic citations, through a Notice to Appear (NTA) diversion program. Under the NTA diversion program, cyclists would have the option to either pay the full citation fee, or pay a partial fee and attend a safe cycling course or series of courses offered through the city. This program should be adopted by the UIPD as well, and should be included in the University Bike Code. The University should partner with both Urbana and Champaign to coordinate consistent educational options for ticketed cyclists, and all three jurisdictions should offer the diversion program safety courses as part of regular, year-round bicycle enforcement. F&S should also continue to work with UIPD to identify additional solutions to ensure that campus cyclists follow the rules of the road and behave in a safe and predictable manner, whether on a street or path.

Bicycle Registration

The University manages a free, voluntary, online bicycle registration system for anyone who brings a bike to campus. Bicycle registration is important because it helps identify the owner of a bike that has been impounded, abandoned, lost, or recovered after theft. When the Parking Department collects abandoned bikes annually in the spring, or is asked to remove a bike improperly parked on railings, fences, or trees, the registration system is used to identify and contact the original owner of each bike. If the bike is not registered, the Parking Department has no way of knowing who the bike belongs to and there is very little chance of the owner recovering their bike. Similarly, when the UIPD investigates the report of a stolen bicycle, having the bike already in the registration system with its serial number and description recorded, it is much easier to identify the bike if it has been found or recovered.

Figure 15 *My Bike Registration* Poster, advertising the new online Bicycle Registration system

Bicycle Registration, when well used, also provides the University with a rough estimate of the number of bikes brought to campus each year. Finally, bicycle registration provides the University with contact information for the owners of all registered bikes on campus—which could be utilized in the future to announce important policy changes affecting cyclists, new bike safety education courses, or additions to bicycle-related infrastructure, programs, events, or resources. Although the contact information for registered bicycles has never been used for general communication with cyclists before, it does provide the University with an important opportunity to reach anyone who owns a bike.

In the summer of 2012, Transportation Demand Management staff developed an online bicycle registration form to replace the paper-based registration process previously managed by the Parking

Department.[85] While the online form is easier and more accessible to cyclists, the current program does not provide the registrant with any sticker of physical evidence to indicate that their bicycle has been registered. Facilities & Services should purchase asset stickers to mail to each new registrant to affix to their bicycle. By making the bicycle more easily recognized as registered, the sticker may deter theft, and will help UIPD or Facilities & Services staff more easily identify a registered bike if it is recovered.

Additionally, the University's bicycle registration system is not linked to those of the Cities of Champaign or Urbana. Therefore, if a bike is stolen, the bike owner must check with the police departments of all three jurisdictions, in case it is recovered by a different jurisdiction than where it was registered. All three registration systems are free, and so a bike owner in the area could certainly register their bike in all three jurisdictions, though this is inefficient for everyone involved. The University should work through the CATS agencies to streamline bicycle registration across the county and develop a single system or a way to connect the databases for the existing systems.

Finally, there is a significant need to better promote and incentivize bicycle registration. The program should remain free to use, and greater emphasis should be placed on the benefits of registering ones bicycle. The current registration system is underused by students, employees, and visitors. The University should encourage every incoming student and employee to register their bike at the beginning of each school year, and should continually promote bicycle registration to bike owners throughout the year through a number of communications channels, including events, newsletters, posters, and advertisements.

Bicycle Parking Enforcement

As long as the campus has a shortage of up-to-standard bicycle parking, cyclists on campus will continue to secure their bikes to other structures, such as lamp posts, signs, parking meters, hand railings, fences and trees. As the available bike parking is increased and improved, greater efforts should be made to encourage cyclists to only lock their bikes to proper bicycle racks. Improper bicycle parking is a visual nuisance, can pose physical danger when blocking railings, stairs, ramps, or doorways, and can also prevent staff from doing their work when blocking parking meters or building entrances.

Facilities & Services should consider a number of options to enforce proper bicycle parking, once up-to-standard parking facilities are available. The University could create a universal hang tag to notify owners of illegally parked bikes. These can be affixed to the bikes in violation by facility managers, volunteers, or the public safety student patrol. If a tagged bicycle is still in violation after a certain number of days, the Parking Department can impound the bicycle, and charge a small fee for the owner to retrieve it. The downsides of bicycle impoundment are that it takes time and effort for staff to cut the owner's lock and move the bike to a secured storage space, plus the cost of the storage space itself. They also must attempt to contact the owner, which can be impossible if the

[85] http://go.illinois.edu/mybike

bike is not registered. If the owner of the bike does not know their bike was impounded for improper parking, they may assume the bike was stolen, and so rather than being retrieved by its original owner, the bike will likely be abandoned.

An alternative to impounding bicycles is for facility managers to add an additional lock to the bicycle along with the universal hang tag, so that the owner must contact the building to unlock their bike. This saves time and storage space for facility managers, and also better ensures that the owner of the bike understands what happened to their bicycle and can retrieve it. The time required for the owner to get the additional lock removed from their bike along with the possibility of a small fee associated with the removal of the lock, will act as a deterrent for bike owners, and will likely change habits in bike parking fairly quickly. It should be emphasized that these tactics should not be enforced in an area where proper bicycle parking does not exist or does not meet current demand; instead the University should focus its efforts on providing adequate parking for bicycles.

Abandoned Bicycles

Every year, the Parking Department collects between 400-600 bicycles that have been abandoned on campus at the end of the school year. These bicycles are then stored in a warehouse on South Farms, where they are inventoried and checked for registration. If the bike is registered, a notification letter is sent to the registered owner so they can retrieve the bicycle. If the bike is not registered, there is no way for the Parking Department to know whom to contact. If the owner inquires and is able to give an accurate description of the bike and where it was last left, they will likely be able to retrieve the bicycle.

Abandoned bikes that have not been claimed within 60 days are donated to The Bike Project of Urbana-Champaign. Many of the donated bikes are then fixed up to be sold at the Campus Bicycle Shop, or disassembled for parts. Remaining bikes that are unwanted are normally donated to a third party nonprofit organization, Working Bikes Cooperative, which will fix up or convert the bicycles and send them overseas to communities in need. Although the abandoned bicycles on campus are ultimately used for sustainable and worthy causes, the process by which these bikes come to be donated is largely inefficient, and has led to a number of problems:

- Because the system of handling abandoned and impounded bicycles is not well known by students, most students would likely assume their bicycle was stolen rather than collected by the University, and they would not know how to retrieve their bicycle. If the bike is registered, the owner would be contacted, but if not, it is highly unlikely that the owner would ever find out what happened to their bike under the current system. In addition to encouraging more people to register their bikes, Facilities & Services should work with University Housing and other groups on campus to better communicate with students about how to retrieve impounded and abandoned bicycles so that they can reconnect with their bike.

- Currently, the pick-up of abandoned bicycles only happens once at the end of each academic year. As a result, many bike racks on campus contain unwanted, unused bikes for several months throughout the year, wasting valuable space for much-needed bike parking. If abandoned bikes could be identified and collected more quickly and more frequently, the demand for bike parking on campus would more easily be met. Facilities & Services should develop a system to identify and remove abandoned bicycles several times throughout the school year.

- The staff time and physical space required to collect and store up to 600 bicycles every year could be greatly reduced if people could more easily donate their unwanted bicycles directly to The Bike Project or organizations. A donation system would eliminate the need to check for registration and store bicycles for 60 days before they are usable, saving staff time and storage space. Facilities & Services should work through the Campus Bicycle Shop to develop such a donation system. The system could have highly advertised donation events at specific times throughout the year, and an ongoing, year-round drop-off option.

Evaluation and Planning

While every effort has been made to ensure this plan contains a comprehensive list of the current needs and issues concerning bicycling at the University of Illinois at Urbana-Champaign, continued evaluation and planning will be needed to ensure that the recommendations adapt to changing needs. With ongoing evaluation and planning of bicycle improvement efforts, the University will also be able to assess whether those efforts are actually achieving the stated goals and objectives of this plan. Additionally, the Campus Bike Plan should be updated once every four years to incorporate new national guidelines and best practices, as well as the evolving needs of the campus community. The following steps are important in continuing to understand the issues facing bikes on campus and help ensure that the progress toward planning a more bicycle friendly campus does not stop with this document.

Bicycle Counts

The University should conduct annual bicycle counts, both to maintain a better sense of the total number of cyclists on campus from year to year, and also to identify the intersections, streets, and areas of the campus with the highest regular bicycle traffic. Consistent bike counts conducted annually can help track the increase or decrease in bicycling on campus to help aid budget allocation and decision-making, as well as identify priority areas of the campus for infrastructure upgrades. Recommended intersections for regular bicycle counting include Fourth and Gregory, Goodwin and Illinois, and the Armory Avenue Bike Path at the intersection with the Mathews Avenue Bike Path.

Bike counts can be conducted in a number of different ways, but consistent methodologies should be used from year to year for more accurate data comparisons. Potential methods include enlisting volunteers or students to participate in a manual counting program, or using electronic bicycle counters. Currently, CUUATS owns two electronic counters and can be hired to conduct formal

counts for the University. Facilities & Services should also consider purchasing its own counters as well to allow for permanent, ongoing counts at intersections of interest.

The University should participate in a national annual bicycle count sponsored by Alta Planning and Design and the Institute of Transportation Engineers Pedestrian and Bicycle Council, called the National Bicycle and Pedestrian Documentation Project. The project includes four count dates per year, in January, May, July, and September, with the official count day taking place in mid-September. The organizers for this nationwide effort provide local agencies with materials and directions to conduct counts and surveys in a consistent manner, including standard dates and times for the counts, and then collects all the information centrally and makes it available to the public. Participating in this effort will allow the University to more easily track ridership trends, and manage the data to inform future bicycle improvement efforts.

Surveys and Feedback

Direct feedback from bicyclists and those who interact with cyclists is an important part of evaluation and planning for bicycles. Although there have been many surveys as part of various transportation studies in the past, there has not been a consistent effort to collect and compare similar data over time. Facilities & Services should conduct annual bicycle surveys to gauge the needs and concerns of campus cyclists, as well as to assess the success of efforts to educate and improve relations between cyclists and other transportation modes. This survey could be released each spring, and would ideally cover a broad range of topics, including bikeway and parking infrastructure, education, and rules of the road. By asking consistent questions year after year, survey administrators would be able to look for trends over time, and assess where progress is being made and what areas need greater efforts toward improvement. Surveys can also be given to graduating seniors and alumni to assess the long-term impact of bicycle education and encouragement efforts.

In December 2012, Facilities & Services released an online feedback form where anyone can submit specific campus-feedback about any bike-related topics. Initial feedback on the form has reinforced the recommendations in this plan, and the form was used to collect input specific to the plan during the four-week input period. Ongoing feedback collected in the future can be used to set priorities in the implementation of the plan, as well as to develop new ideas for infrastructure enhancements, bike safety programs, and bicycle services to make the campus more bicycle friendly.

Bicycle Coordinator Staff Position

For the University to accomplish the many recommendations made in this plan, as well as to stay apprised of the burgeoning needs of cyclists on campus and best practices across the country, the University should invest in a full-time Bicycle Coordinator position in Facilities & Services, under the TDM Coordinator. This position would oversee the implementation of this plan's recommendations, in addition to the development of new programs and services for bicycles. The Bicycle Coordinator should be expected to stay up to date on national research and current best

practices, and would be responsible for producing the update of the Campus Bike Plan every four years. In addition, the University should regularly provide training about accommodating bicyclists for other engineering and planning staff in Facilities & Services, as well as for UIPD law enforcement. By making a greater effort to understand the needs and concerns of cyclists, the University's staff will be better able to meet those needs and provide the campus with the services, programs, and infrastructure that will make us truly bicycle friendly.

Chapter VIII. Conclusion

The University of Illinois has a strong relationship with the surrounding community, working together for increased safety, sustainability, and wellness through promotion of active transportation modes. With support and encouragement from the Cities, Champaign County, the Champaign-Urbana Mass Transit District, and the Champaign-Urbana Urbanized Area Transportation Study, the University is poised to change the central heart of this area into a well-connected bicycle network that is safe and predictable for bicyclists, motorists, and pedestrians.

By providing appropriate infrastructure for bikes, along with additional bicycle programs and services, the University will encourage cycling as a means of transportation, for the betterment of both the individual cyclist and the general public. The additional considerations recommended in this plan will amplify the benefits of the infrastructure improvements, by increasing the level of awareness for the rights and responsibilities for cyclists, by improving relations and perceptions between cyclists and other transportation modes, and by promoting bicycling as an optimal form of transportation.

Bicycling has many benefits: increased activity and health improvements for cyclists; reductions in automobile pollution and greenhouse gas emissions; costs decrease for governmental agencies by reducing the need for road and parking lot maintenance, and for individuals by reducing the cost of commuting; and safety increases as cycling rate rise and vehicle congestion decreases on campus. The implementation of the 2013 Campus Bike Plan will help bring these and many other benefits to the University of Illinois at Urbana-Champaign, and renew the University's standing as a national leader in bicycle friendliness.

"Be visible and predictable at all times."

– League of American Bicyclists

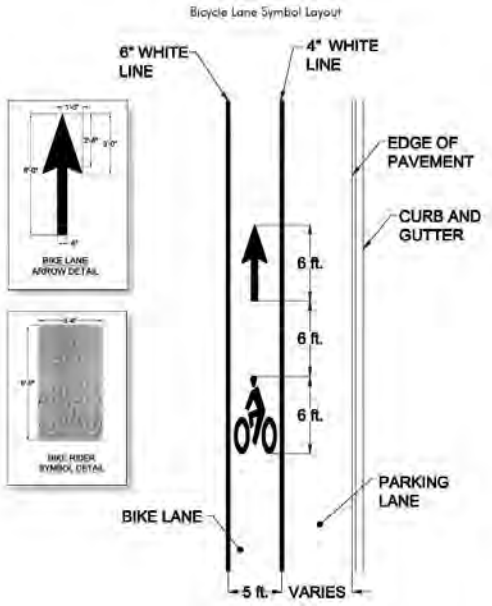
Appendices

Appendix A. Design Guidelines

The design of campus bicycle facilities should follow recommendations in the AASHTO Bike Guide, and signage should follow the standards established in the Manual on Uniform Traffic Control Devices (MUTCD). Additionally, the campus bikeways should fit into local standards established in the Urbana Bicycle Master Plan, Champaign Moving Forward, and the Champaign County Greenways and Trails Design Guidelines.

Bike Lane Striping

- On-street bike lanes should be a minimum of five feet wide. When adjacent to parking, bike lanes should be 5-7 feet wide.
- A six-inch solid white stripe should run between the bike lane and the motor vehicle lane.
- The white stripe should be dashed with two-foot-long stripes separated by six-foot-long breaks for the length of any bus stops along the bike lane.
- Bike lanes next to parking lanes should be separated with a four-inch solid white stripe.
- If there is a parking lane adjacent to a bike lane, the bike lane should be between the parking lane and the travel lane.



- If there is parallel parking next to the bike lane, the parking stalls should be marked with ticks that extend two feet into the bike lane to warn bicyclists to watch for opening doors. Where space allows, a striped buffer should be placed between the parking lane and the bike lane to move bicyclists away from parked cars.
- The minimum width of parallel parking lanes should be seven feet.
- Diagonal parking next to a bike lane shall be back-in parking only.

Bike Lane Symbol Markings

- The bike lane symbols shall be white.

- All bike lane markings will include the standard MUTCD riding cyclist, followed by the arrow in the direction of travel. The riding cyclist marking will be six feet long, followed by six feet of blank pavement, followed by an arrow six feet long.

- Bike lane markings should be used as frequently as necessary to clearly delineate the bike lane. Recommended placement includes at major driveways, at bus stops, and at least once mid-block.

Bike Lanes at Intersections

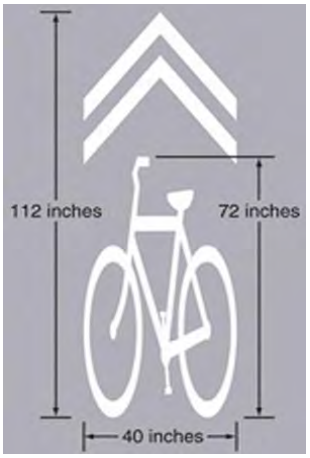
- A through bike lane may not be placed to the right of a right turn only lane.

- The white stripe should be dashed with two-foot-long stripes separated by six-foot-long breaks for approximately 50-200 feet before any street intersection with right turning motor vehicles. If there is a stop bar at the intersection, the first section of the dashed stripes closest to the stop bar should be the six foot break, with the solid white line beginning 54 feet from the stop bar. If there is no stop bar at the intersection, the first section closest to the intersection should be the two foot white stripe, with the solid white line beginning 48 feet from the intersection.

- Bike lane markings should not extend into an intersection.

- The bike lane symbol shall be placed immediately after an intersection.

- No markings should extend through a marked continental pedestrian crosswalk.



Bike Route Markings

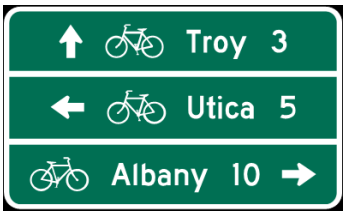
- The bike and chevron marking known as a "sharrow"

- When on-street parking is present, each marking should be at least 11 feet from the curb or edge of pavement. When on-street parking is not present, each marking should be placed at least 4 feet from the curb or edge of pavement.

- Sharrows should be preserved for roadways with a speed limit no greater than 35 miles per hour.

- Sharrows should be placed immediately after an intersection and spaced no more than 250 feet apart.

Bike Route Signs



- Bike route signs shall be placed according to MUTCD requirements along all street segments designated as a Bike Route.
- Way-finding signage is preferred in addition to "Bike Route" signs (MUTCD D11-1).

Shared Use Paths

- Shared use paths shall be a minimum of ten feet wide.

Shared Use Path Signs

- The "Bikes Yield to Peds" sign (MUTCD R9-6) should be placed mid block along each block of a shared use path within the University District.
- On shared use side paths, there should be two signs on one post, facing each direction along the shared use side path. The sign post shall be placed on the far side of the path, away from the street.
- Sign placement on shared use paths shall follow the MUTCD clearance requirements.
- Lateral sign clearance shall be a minimum of three feet and a maximum of six feet from the near edge of the sign to the near edge of the path.
- Mounting height for ground-mounted signs on shared-use paths shall be a minimum of four feet and a maximum of five feet, measured from the bottom edge of the sign to the near edge of the path surface.

Shared Use Path Markings

- No paint markings are required on shared use side paths. Existing paint markings on shared use paths should be removed.

Dedicated Bike Paths

- Dedicated bike paths will be designed to AASHTO standards for bike lanes on streets with no curb and gutter.
- Dedicated bike paths shall be a minimum of eight feet wide. This follows the AASHTO guidelines for a bike lane on a street with no curb or gutter.

Dedicated Bike Path Center Lines

- A four-inch wide yellow center line shall separate bicycles traveling in opposite directions.
- The center line should be dashed when passing is permitted. Dashes should be three feet long, followed by a nine-foot break.
- Center lines should be solid to indicate no passing within 20 feet of intersections.

Dedicated Bike Path Markings

- The dedicated bike paths will follow the marking recommendations for on-street bike lanes.
- The bike lane symbols shall be white.
- All bike lane markings will include the standard MUTCD riding cyclist, followed by the arrow in the direction of travel. The riding cyclist marking will be six feet long, followed by six feet of blank pavement, followed by an arrow six feet long.
- Bike lane markings should be used as frequently as necessary to clearly delineate the bikeway. Recommended placement includes at building entrances, at service drive crossings, and at least every 500 feet.

Dedicated Bike Paths at Street Crosswalks

- Bike Path street crossings should follow the University District Crosswalk Guidelines standards. These currently state "Use standard two white parallel lines with a bicycle stencil marked in the center of the section."
- A bike crossing will be indicated with two 12-inch white parallel lines, spaced eight feet apart.
- The bike lane symbol shall be placed in the center of the street intersection.
- At a mid-block bike crossing, without a marked pedestrian crosswalk adjacent, a bike warning sign with downward pointing arrow (MUTCD W11-1 and W16-7p) should be installed at the bike crossing.
- When a bike warning assembly is installed to indicate a mid-block bike crossing not adjacent to a marked pedestrian crosswalk, an advance warning sign should be installed approximately 25 feet prior to the bike crossing, with an "AHEAD" plaque (MUTCD W11-1 and W16-9p).

Dedicated Bike Paths at Minor Walkway Intersections

- At minor walkway intersections, the bike path shall have two white parallel lines four inches wide and eight feet apart, denoting the location of the path across the walkway.
- The yellow center line should continue through the minor walkway intersection with the same style as leading up to it.

Dedicated Bike Paths at Major Walkway Intersections

- At major walkway intersections, the bike crossing shall be indicated with white parallel lines, six inches wide and eight feet apart, denoting the location of the path across the walkway.
- The yellow center line should not be extended across major walkway intersections.
- The bike lane symbol shall be placed in key locations at major walkway intersections.

R5-1b

R9-3c

Other Signage considerations

- One-way streets should have "Bicycles Wrong Way" (MUCTD R5-1b) and "Ride with Traffic" (MUCTD R9-3c) signs discouraging contra-flow riders.
- Streets without bike lane or sharrow markings may include "Bicycles May Use Full Lane" (MUCTD R4-11) signs to inform drivers.

Appendix B Implementation Table

Segment #	Project Group Name	From	To	Proposed Path Type	Length (ft)	Street/Path Name	Total # of signs	new # of square feet off-road path pavement	# square feet pavement removed	# square feet landscaping added	new # of feet bike lane striping	approximate # of bike lane markings	approx. # sharrows	estimated cost per segment, including 30% overhead	**Total Estimated Cost Per Project**
150	Small Starts Grant	Wright Street	Lincoln Avenue	Bus/Bike Lanes	2,688	Green Sreet									
90	Small Starts Grant	Armory Avenue	Green Street	Bus/Bike Lanes	1,772	Wright Street									
100	Small Starts Grant	Sixth Street	Wright Street	Bus/Bike Lanes	444	Armory Avenue									
110	Small Starts Grant	Fourth Street	Sixth Street	Bike Lanes	884	Armory Avenue									**Pending**
260	Fourth Street	Armory Avenue	Kirby Avenue	Bike Lanes	2,718	Fourth Street	10	16,306	4,784	4,784	4,596	32	0	$237,178.71	
440	Fourth Street	Kirby Avenue	St. Mary's Road	Bike Lanes	1,261	Fourth Street	11	0	0	0	2,521	22	0	$19,747.13	**$256,925.84**
250	First Street	Gregory Drive	Kirby Avenue	Bike Lanes & Shared Use Path	2,248	First Street	10	8,341	0	0	4,500	20	0	$113,629.75	**$113,629.75**
220	Armory Avenue Path	Goodwin Avenue	Lincoln Avenue	Dedicated Bike Path	670	Armory Avenue Path	4	5,360	4,020	0	0	6	0	$69,017.00	
725	Armory Avenue Path	Nevada Street	Armory Avenue Path	Dedicated Bike Path	240	Gregory Street Path	2	1,920	1,440	0	0	4	0	$24,947.00	
726	Armory Avenue Path	Armory Avenue Path	Gregory Drive	Dedicated Bike Path	719	Armory Avenue Path	2	5,752	4,314	0	0	0	0	$73,231.60	
727	Armory Avenue Path	Armory Avenue Path	Gregory Drive	Dedicated Bike Path	382	Armory Avenue Path	2	3,056	2,292	0	0	0	0	$39,059.80	
210	Armory Avenue Path	Mathews Avenue	Goodwin Avenue	Dedicated Bike Path	948	Armory Avenue Path	4	7,581	5,686	0	0	4	0	$97,022.64	
200	Armory Avenue Path	Main Library	Mathews Avenue	Dedicated Bike Path	913	Armory Avenue Path	6	7,304	5,478	0	0	9	0	$94,196.70	
790	Armory Avenue Path	Lorado Taft Path	Armory Avenue Path	Shared Use Path	927	by Undergrad Library	2	0	0	0	0	0	0	$325.00	**$397,799.74**
270	Sixth Street	Armory Avenue	Pennsylvania Avenue	Bike Lanes	1,778	Sixth Street	7	0	10,666	10,666	3,555	12	0	$124,102.40	**$124,102.40**
230	Gregory Drive	Oak Street	First Street	Bike Route	809	Gregory Drive	2	0	0	0	0	0	8	$949.00	
240	Gregory Drive	First Street	Dorner Drive	Bike Lanes	4,686	Gregory Drive	12	0	0	0	0	0	0	$1,950.00	**$2,899.00**
350	Peabody Drive	First Street	Fourth Street	Bike Route	1,461	Peabody Drive	6	0	0	0	0		13	$1,989.00	
355	Peabody Drive	West of Fourth Street	Sixth Street	Dedicated Bike Path	1,283	Peabody Drive	6	10,264	7,698	0	1,283	8	0	$139,982.70	
357	Peabody Drive	Sixth Street	Goodwin Avenue	Dedicated Bike Path	1,283	Peabody Drive	6	10,264	7,698	0	1,283	8	0	$139,982.70	**$281,954.40**
775	Lorado Taft Path	First Street	Fourth Street	Shared Use Path	1,302	Lorado Taft Path	6	0	0	0	0	0	0	$975.00	
770	Lorado Taft Path	Fourth Street	Sixth Street	Shared Use Path	1,154	Lorado Taft Path	7	9,232	2,300	2,300	0	0	0	$112,498.10	
780	Lorado Taft Path	Sixth Street	Dorner Drive	Shared Use Path	1,391	Lorado Taft Path	7	0	8,346	8,346	0	0	0	$78,605.07	
782	Lorado Taft Path	Mathews Ave Path	Dorner Drive	Shared Use Path	1,065	Lorado Taft Path	4	0	0	0	0	0	0	$650.00	**$192,728.17**
340	Stadium Drive	Neil Street	First Street	Bike Lanes	1,426	Stadium Drive	8	4,756	0	0	2,851	13	0	$67,133.82	**$67,133.82**
410	St. Mary's Road	Neil Street	Oak Street	Bike Lanes	1,011	St. Mary's Road	7	3,593	0	0	2,023	12	0	$50,175.84	
420	St. Mary's Road	Oak Street	Fourth Street	Bike Lanes	2,284	St. Mary's Road	12	21,067	0	0	4,350	29	0	$237,701.75	
430	St. Mary's Road	Fourth Street	Lincoln Avenue	Bike Lanes	3,989	St. Mary's Road	15	45,641	0	0	7,978	31	0	$501,512.57	**$789,390.16**
310	Lincoln Avenue	Armory Avenue Path	Michigan Avenue	Shared Use Path	993	Lincoln Avenue	2	0	0	0	0	0	0	$325.00	
320	Lincoln Avenue	Pennsylvania Avenue	Florida Avenue	Shared Use Path	864	Lincoln Avenue	2	6,912	5,184	0	0	0	0	$87,934.60	

Segment #	Project Group Name	From	To	Proposed Path Type	Length (ft)	Street/Path Name	Total # of signs	new # of square feet off-road path pavement	# square feet pavement removed	# square feet landscaping added	new # of feet bike lane striping	approximate # of bike lane markings	approx. # sharrows	estimated cost per segment, including 30% overhead	**Total Estimated Cost Per Project**
315	Lincoln Avenue	Michigan Avenue	Pennsylvania Avenue	Off-Road Trail	451	Lincoln Avenue	2	0	0	3,608	0	0	0	$19,743.26	
540	Lincoln Avenue	Hazelwood Drive	Windsor Road	Bike Lanes and Shared Use Path	2,651	Lincoln Avenue	13	0	0	0	5,303	47	0	$39,939.64	
520	Lincoln Avenue	Florida Avenue	St. Mary's Road	Bike Lanes and Shared Use Path	1,265	Lincoln Avenue	9	0	0	0	2,530	23	0	$19,553.95	
530	Lincoln Avenue	St. Mary's Road	Hazelwood Drive	Bike Lanes and Shared Use Path	1,320	Lincoln Avenue	7	282	0	542	2,640	24	0	$25,682.64	**$193,179.09**
30	Main Street Path	Wright Street	Goodwin Avenue	Shared Use Path	1,384	Main Street Path	8	2,873	2,199	271	452	4	0	$42,570.37	
160	Main Street Path	Goodwin Avenue	Harvey Street	Bike Route	468	Main Street Path	2	0	0	0	0	0	0	$325.00	**$42,895.37**
460	Oak Street	Kirby Avenue	St. Mary's Road	Bike Lanes	1,262	Oak Street	6	7,571	0	0	2,524	22	0	$92,770.28	
370	Oak Street	Stadium Drive	Kirby Avenue	Bike Route	1,733	Oak Street	6	10,397	0	0	0		14	$103,432.88	
360	Oak Street	Armory Avenue	Stadium Drive	Bike Route	902	Oak Street	2	5,412	0	0	0		4	$53,404.00	
470	Oak Street	St. Mary's Road	Gerty Drive	Bike Lanes	2,704	Oak Street	20	32,446	0	0	5,408	27	0	$356,674.50	**$606,281.65**
380	Florida/Kirby Avenue Path	Neil Street	Wright Street	Shared Use Path	3,008	Kirby Avenue	8	0	0	0	0		0	$1,300.00	
390	Florida/Kirby Avenue Path	Lincoln Avenue	Wright Street	Shared Use Path	3,975	Florida Avenue	6	0	0	0	0		0	$975.00	
630	Florida/Kirby Avenue Path	Lincoln Avenue	Orchard Street	Undetermined	1,351	Florida Avenue								Unknown	
635	Florida/Kirby Avenue Path	Orchard Street	Race Street	Undetermined	1,272	Florida Avenue								Unknown	**$2,275.00**
400	Race Street	Florida Avenue	Windsor Road	Shared Use Path	5,223	Race Street	6	0	0	0	0		0	$975.00	**$975.00**
300	Pennsylvania Avenue	Fourth Street	Goodwin Avenue	Bike Lanes	2,535	Pennsylvania Avenue	20	0	3,752	3,749	5,070	31	0	$73,231.42	
301	Pennsylvania Avenue	Goodwin Avenue	Lincoln Avenue	Bike Lanes	1,424	Pennsylvania Avenue	6	0	0	0	2,848	10	0	$20,202.00	**$93,433.42**
10	University Avenue	Wright Street	Mathews Avenue	Shared Use Path	913	University Avenue	2	0	0	0	0	0	0	$325.00	
15	University Avenue	Mathews Avenue	Goodwin Avenue	Shared Use Path	507	University Avenue	2	4,056	3,042	0	0	0	0	$51,734.80	**$52,059.80**
20	Goodwin Avenue	Springfield Avenue	University Avenue	Shared Use Path	1,334	Goodwin Avenue	6	0	0	0	0	0	0	$975.00	**$975.00**
290	Dorner Drive	Gregory Drive	Pennsylvania Avenue	Bike Route	1,301	Dorner Drive	4	0	6,505	6,505	2,602	0	9	$78,645.60	**$78,645.60**
280	Mathews Avenue Path	Nevada Street	Gregory Drive	Dedicated Bike Path	639	Mathews Avenue Path	3	0	0	0	1,918	4	0	$13,242.19	
281	Mathews Avenue Path	Gregory Drive	Lorado Taft Path	Bike Route	292	Mathews Avenue Path	4	0	0	0	0	0	6	$1,118.00	
282	Mathews Avenue Path	Lorado Taft Path	Goodwin Avenue	Shared Use Path	608	Mathews Avenue Path	6	4,864	3,648	3,648	0	0	0	$82,259.74	**$96,619.93**
330	FAR path	Lincoln Avenue	Virginia Street	Shared Use Path	732	Florida Avenue	2	0	0	0	0	0	0	$325.00	**$325.00**
722	Gregory Street	Oregon Street	Nevada Street	Bike Route	379	Gregory Street	4	0	0	0	0	0	4	$650.00	**$650.00**
120	Quad Path	Wright Street	Mathews Avenue	Undetermined	1,355	Quad Bike Path								Unknown	
130	Quad Path	Mathews Avenue	Goodwin Avenue	Undetermined	466	Quad Bike Path								Unknown	**Unknown**
140	Illinois Street Path	Mathews Avenue	Goodwin Avenue	Undetermined	468	Illinois Bike Path								Unknown	**Unknown**
60	Mathews Avenue	Main Street	Green Street	Undetermined	1,455	Mathews Avenue								Unknown	

Appendix B Implementation Table

Segment #	Project Group Name	From	To	Proposed Path Type	Length (ft)	Street/Path Name	Total # of signs	new # of square feet off-road path pavement	# square feet pavement removed	# square feet landscaping added	new # of feet bike lane striping	approximate # of bike lane markings	approx. # sharrows	estimated cost per segment, including 30% overhead	**Total Estimated Cost Per Project**
70	Mathews Avenue	Green Street	Nevada Street	Undetermined	1,670	Mathews Avenue								Unknown	**Unknown**
480	Research Park	Kirby Avenue	St. Mary's Road	Undetermined	1,254	First Street - west side	4	10,032	0	0	0	0	0	$98,459.66	**$98,459.66**
590	Hazelwood	Lincoln Avenue	George Huff Drive	Dedicated Bike Path	1,332	Hazelwood Drive	4	10,654	0	0	0	0	0	$104,530.40	
560	Hazelwood	First Street	Fourth Street	Bike Route	1,168	Hazelwood Drive	2	0	0	0	0	0	0	$325.00	
550	Hazelwood	Oak Street	First Street	Bike Route	681	Hazelwood Drive	2	0	0	0	0	0	4	$637.00	
580	Hazelwood	Goodwin Avenue Extended	Lincoln Avenue	Bike Lanes	1,326	Hazelwood Drive	7	0	0	0	2,652	15	0	$19,445.79	
570	Hazelwood	Fourth Street	Goodwin Avenue Extended	Undetermined	2,929	Hazelwood Drive								Unknown	
405	Hazelwood	Hazelwood Drive	Race Street	Shared Use Path	1,418	George Huff Drive	6	11,344	0	0	0	0	0	$111,579.00	**$236,517.19**
													TOTAL:	$3,729,854.98	**$3,729,854.98**

Appendix C. Parking Spot Removal Table

Segment #	Street/Path Name	From	To	Street Width (feet)	Current Parking Configuration	# UI parking spots	# UI spaces removed	Recommendations for Alternative Parking options
270	Sixth Street	Armory	Pennsylvania	45	parallel parking on both sides, 81 permits	88	37	vehicles can park on west side only, as well as lots E19 off of Peabody and E21 off of Sixth
300	Pennsylvania Avenue	Fourth	Lincoln	40	parallel parking on both sides, 149 meters	149	75	vehicles can park on north side only
340	Stadium Drive	Neil	First	40	parallel parking on both sides, 18 E-8 permits, 41 meters	59	32	vehicles can park on south side only. 25 spaces on south = 18 permits + 7 meters
520	Lincoln Avenue	Florida	St. Mary's Road	43	parallel parking on both sides, 81 meters	81	41	change meters to be only on one side of road, from Florida to Hazelwood. Move permit spaces south of St. Mary's to other parking lots
530	Lincoln Avenue	St. Mary's Road	Hazelwood	43	parallel parking on both sides, 76 permit spaces - 49 student permits, 0 employee permits	76	38	move all these student permit spaces to other lots in Vet Med area. 21 to F32, 15 to F27, 10 to F25 - lose 4 or add them to F22 or F26
580	Hazelwood Drive	South Goodwin	Lincoln	40		12	12	
							234	

Appendix D. Sources

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Appendix E. Additional Studies on Bicycle Infrastructure

1. ***Bicycling Choice and Gender Case Study: The Ohio State University,*** Gulsah Akar PhD, Nicholas Fischerb & Mi Namgunga, International Journal of Sustainable Transportation, Volume 7, Issue 5, 2013. This article brings two emerging research areas together: gender differences in travel behavior and travel patterns on college campuses; with a focus on bicycling. Detailed analysis and choice model estimations present the significant effects of gender, travel times, and personal attitudes on the decision to bike. Although men and women experience similar environmental opportunities and constraints, their perceptions in terms of safety and feasibility of alternative transportation modes differ. The models indicate women are more sensitive to being close to bicycle trails and paths. Results reveal different policy and infrastructure changes may be required to encourage more women to bicycle. http://www.theatlanticcities.com/commute/2013/02/women-will-ride-bikes-when-its-safer-them-do-so/4730/

2. ***Walking and Bicycling in the United States The Who, What, Where, and Why***, J. Richard Kuzmyak and Jennifer Dill, TR NEWS 280 May–June 2012. The percentage of daily trips in the United States made by walking or bicycling is far lower than in Western European countries. The authors explore what makes the United States so different, examining the demographics and the frequency, distance, and purpose of pedestrian and bicycle travel; the influences of the natural and built environments; safety concerns; and research needs, including data and planning tools.
http://pubsindex.trb.org/view/2012/C/1143549

3. ***A Comparative Analysis of Bicycle Lanes Versus Wide Curb Lanes: Final Report***, William W. Hunter, J. Richard Stewart, Jane C. Stutts, Herman H. Huang, and Wayne E. Pein, PUBLICATION NO. FHWA-RD-99-034 December 1999. Both BL and WCL facilities can and should be used to improve riding conditions for bicyclists. Given the stated preferences of bicyclists for BLs in prior surveys (e.g., Rodale Press, 1992), along with increased comfort level on BLs found in developing the Bicycle Compatibility Index (Harkey et al., 1998), use of this facility is recommended where there is adequate width, in that BLs are more likely to increase the amount of bicycling than WCLs.
http://katana.hsrc.unc.edu/cms/downloads/BikeLanesVSWideCurbs_Final1.pdf

4. ***Evaluation of Shared Lane Markings,*** Publication Number: FHWA-HRT-10-041 December 2010. Results suggest that the sharrows provided some possible enhancement to the safety of bicyclists in several ways. Sharrow installation increased the percentage of bicyclists who rode on the roadway, sharrows enhanced recognition of riding space for bicyclists, motorists drove 7 inches farther from the curb overall after the sharrows, there was a decrease in the proportion of motorists driving within 50 inches of the curb in both, motorists passed bicyclists 3 inches closer on average in the after period and 7 inches closer in the downhill direction.
http://www.fhwa.dot.gov/publications/research/safety/pedbike/10041/005.cfm

5. ***The conspicuity of South Australian cyclists: implications for safety***, Centre for Automotive Safety Research, Raftery SJ, Grigo JAL, 2013. A total of 715 cyclists (78% male) were observed, the majority of whom (59%) were estimated to be aged 30-59 years. The general level of front and rear conspicuity amongst cyclists observed commuting to and from the Adelaide CBD is concerning: 38% of cyclists were observed to have high frontal conspicuity; a small minority (8%) of cyclists were observed wearing high visibility vests. High rear conspicuity was much less common with 18% of cyclists observed to have high rear conspicuity. http://casr.adelaide.edu.au/publications/list/?id=1347

6. ***Emerging Technologies: Webcams and Crowd-Sourcing to Identify Active Transportation***, American Journal of Preventive Medicine, Aaron Hipp, PhD, assistant professor of public health at the Brown School. Technology to effectively measure the use of built environments -- parks, greenways, trails and other man-made public areas -- as a means to improve public health http://bit.ly/YCu8TR

7. ***Route infrastructure and the risk of injuries to bicyclists: A case-crossover study***, American Journal of Public Health, 2012: http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2012.300762

   http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2012.300762?journalCode=ajph (abstract)

   http://cyclingincities.spph.ubc.ca/injuries/the-bice-study/ (overview)

8. ***Bicyclists' injuries and the cycling environment: Results of the "BICE" Study*, 2009**: http://cyclingincities-spph.sites.olt.ubc.ca/files/2012/10/BICEstudyBrochure.pdf

9. ***Personal and trip characteristics associated with safety equipment use by injured adult bicyclists: A cross-sectional study****, BMC Public Health, 2012:* http://www.biomedcentral.com/1471-2458/12/765/abstract

10. ***Bicycling: Health Risk or Benefit?***, UBC Medical Journal, 2012: http://www.ubcmj.com/pdf/ubcmj_3_2_2012_6-11.pdf

11. ***RC-1572 - Sharing the Road: Optimizing Pedestrian and Bicycle Safety and Vehicle Mobility Research Report***, Michigan Department of Transportation, 2012: http://www.michigan.gov/mdot/0,4616,7-151-9622_11045_24249-279311--,00.html

12. ***A GPS-based bicycle route choice model for San Francisco***, California, Transportation Letters: The International Journal of Transportation Research, 2011: http://trid.trb.org/view.aspx?id=1097265

13. ***Motivators and deterrents of bicycling: comparing influences on decisions to ride***, Transportation, 2011: http://www.springerlink.com/content/ex63304355024117/fulltext.pdf

14. ***Pedestrian and Bicycle Information Center Case Study Compendium***, (The PBIC Case Study Compendium contains a collection of all of the case studies developed by the Pedestrian and Bicycle Information Center and the Association of Pedestrian and Bicycle Professionals (APBP). The case studies, or success stories, cover pedestrian and bicycle projects and programs from across the US and abroad, including engineering, education, enforcement, encouragement, planning, health promotion, and comprehensive safety initiatives. This compendium is a dynamic document that is updated regularly, so please check this page periodically for the latest version.)
http://www.bicyclinginfo.org/case_studies/

15. ***The Dutch model for Making Walking and Cycling Safer,*** Australian College of Road Safety:
http://arsrpe.acrs.org.au/pdf/RS000001.pdf

16. ***Operational and Safety Implications of Three Experimental Bicycle Safety Devices 2 in Austin***, TX, TRB:

http://docs.trb.org/prp/11-0921.pdf

17. ***Cyclists injured while sharing the road with motor vehicles*:**
http://injuryprevention.bmj.com/content/13/3/202.full.pdf+html

18. ***Associations between Road Network Connectivity and Pedestrian-Bicyclist Accidents***
http://docs.trb.org/prp/12-0478.pdf

19. ***Risk of injury for bicycling on cycle tracks versus in the street***
http://injuryprevention.bmj.com/content/early/2011/02/02/ip.2010.028696.full

20. ***The impact of transportation infrastructure on bicycling injuries and crashes: A review of the literature***, by - Conor CO Reynolds, M Anne Harris, Kay Teschke, Peter A Cripton and
Meghan Winters, Environmental Health, 2009:

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21. ***Infrastructure and Cyclist Safety*** (UK), 2011 Reid
http://www.ctc.org.uk/resources/Campaigns/1111_TRL_PPR580-Cycle-infra-safety_rpt.pdf

22. ***Capacity Analysis of Pedestrian and Bicycle Facilities***, Federal Department of Transportation:
http://www.fhwa.dot.gov/publications/research/safety/pedbike/98108/index.cfm

23. ***Portland Blue Bicycle Lanes***:
http://www.bicyclinginfo.org/bikesafe/case_studies/casestudy.cfm?CS_NUM=306

24. ***D.C Separated Bike Lane 15th Street Pilot Study***: http://ddot.dc.gov/DC/DDOT/On+Your+Street/Bicycles+and+Pedestrians/Bicycles/15th+Street+NW+Separated+Bike+Lane+Pilot+Project+-+Interim+Results+and+Next+Steps

25. ***Portland State University Evaluation of Innovative Bicycle Facilities***: http://www.ibpi.usp.pdx.edu/media/PSU%20Cycle%20Track%20BBL%20Report%20FINAL.pdf

26. ***Bicycle Counts and Speeds after Installation of Bike Lanes – St. Petersburg, Florida*** http://katana.hsrc.unc.edu/cms/downloads/FDOT_BA784_ExaminationBicycleCountsSpeedsInstallationBikeLanesStPetersburgFlorida.pdf

27. ***Pedestrian and Bicycle Information Center FAQ – Bike Lane Safety***: http://www.bicyclinginfo.org/faqs/answer.cfm?id=971

28. ***San Francisco Cycletracks***: http://www.bicyclinginfo.org/library/details.cfm?id=4727

29. ***Australia study on impact of bicycle infrastructure on crash rates***: http://www.roadsafetytrust.org.au/c/rtt?a=sendfile&ft=p&fid=1330472150&sid=

30. ***Top cities in American for bicycle commuting***, Governing Magazine: http://www.governing.com/blogs/by-the-numbers/bicycle-commuter-data-for-american-cities.html

31. ***Evaluation of bike boxes at signalized intersections***, Portland, Oregon: http://otrec.us/project/227

32. ***Cycling in New York- Innovative Policies***: http://policy.rutgers.edu/faculty/pucher/cyclingny.pdf

33. ***Evaluation of Innovative Bicycle Facilities***, Portland, Oregon: http://bikeportland.org/wp-content/uploads/2011/02/PSUCycleTrackBBLReportFINAL.pdf

34. ***Revision to the AASHTO Guide for the Development of Bicycle Facilities***, Toole Design Group, prepared for the National Cooperative Highway Research Program, Transportation Research Board of the National Academies: http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP_15-37_FR.pdf

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35. ***Cycling Safety on Bikeways vs. Roads***, Pucher: http://policy.rutgers.edu/faculty/pucher/CyclingSafetyOnBikewaysVsRoads_TQ2000.pdf

36. ***Analysis of Bicyclists and Bicycle Characteristics***, Austin, Texas: http://www.ce.utexas.edu/prof/bhat/ABSTRACTS/sener_eluru_bhat_bicycle_rev_Jan18_TRBstyle.pdf

37. ***Evidence on Why Bicycle Friendly Communities are Safer for All Road Users***: http://files.meetup.com/1468133/Evidence%20on%20Why%20Bike-Friendly.pdf

38. ***Bicycling and Walking in the United States 2012 Benchmarking Report*****,** CDC: http://www.peoplepoweredmovement.org/site/index.php/site/memberservices/2012_benchmarking_report/

39. ***Effects of Shared Lane Markings on Bicyclist and Motorists Behavior***, Institute of Transportation Engineers Journal: http://www.ite.org/membersonly/itejournal/pdf/2011/JB11HA33.pdf

40. ***Explaining Gender Differences in Bicycling Behavior***: http://siliconvalleytrails.pbworks.com/f/Explaining%2BGender%2BDifference%2Bin%2BBicycling%2BBehavior.pdf

41. ***Shared Bike Lane Report*****,** San Francisco: http://www.sfmta.com/cms/uploadedfiles/dpt/bike/Bike_Plan/Shared%20Lane%20Marking%20Full%20Report-052404.pdf

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43. ***How to Get More Bicyclists on the Road, to boost urban bicycling, figure out what women want***, Scientific American: http://www.scientificamerican.com/article.cfm?id=getting-more-bicyclists-on-the-road

44. ***Do the Health Benefits of Cycling Outweigh the Risks?*** CDC http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info:doi/10.1289/ehp.0901747

45. ***Health Benefits of Bicycling, compilation of studies***: http://www.bikesbelong.org/resources/stats-and-research/statistics/health-statistics/

46. ***An Analysis of Bicyclists and Bicycling Characteristics: Who, Why, and How Much are they Bicycling?*** http://www.ce.utexas.edu/prof/bhat/ABSTRACTS/sener_eluru_bhat_bicycle2_13Nov08.doc

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49. ***Making Walking and Cycling Safer: Lessons from Europe***, Transportation Quarterly, 2000: http://www.ta.org.br/site/Banco/7manuais/VTPIpuchertq.pdf

50. ***Making Cycling Irresistible: Lesson from the Netherlands***, *Denmark and Germany*: http://policy.rutgers.edu/faculty/pucher/irresistible.pdf