
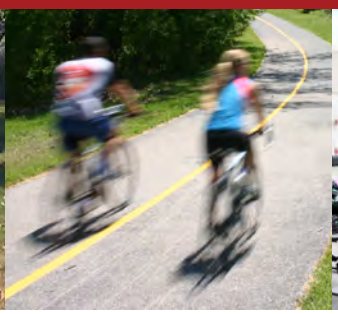


Carbondale
BICYCLE MASTER PLAN

Carbondale
BIKE PLAN

May 2016

SIMPO
SOUTHERN ILLINOIS
Metropolitan Planning Organization

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Cover Image Source: www.bikepedimages.org/Adam Darin

Acknowledgments

SIMPO Policy Committee

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Brad Robinson; Mayor, City of Carterville
(Alternate) Michele Edwards; City Clerk, City of Carterville
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John Rendleman; County Board Chairman, Jackson County
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Jim Marlo; County Board Chairman, Williamson County
(Alternate) Greg Smothers; County Engineer, Williamson County
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Sgt. Corey Kemp; Carbondale Police
Julie Klamm; IDOT District 9
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Les O’Dell; Executive Director, Carbondale Chamber of Commerce
Shelby Orr; SIU Student
Kathy Renfro; Executive Director, Carbondale Parks District
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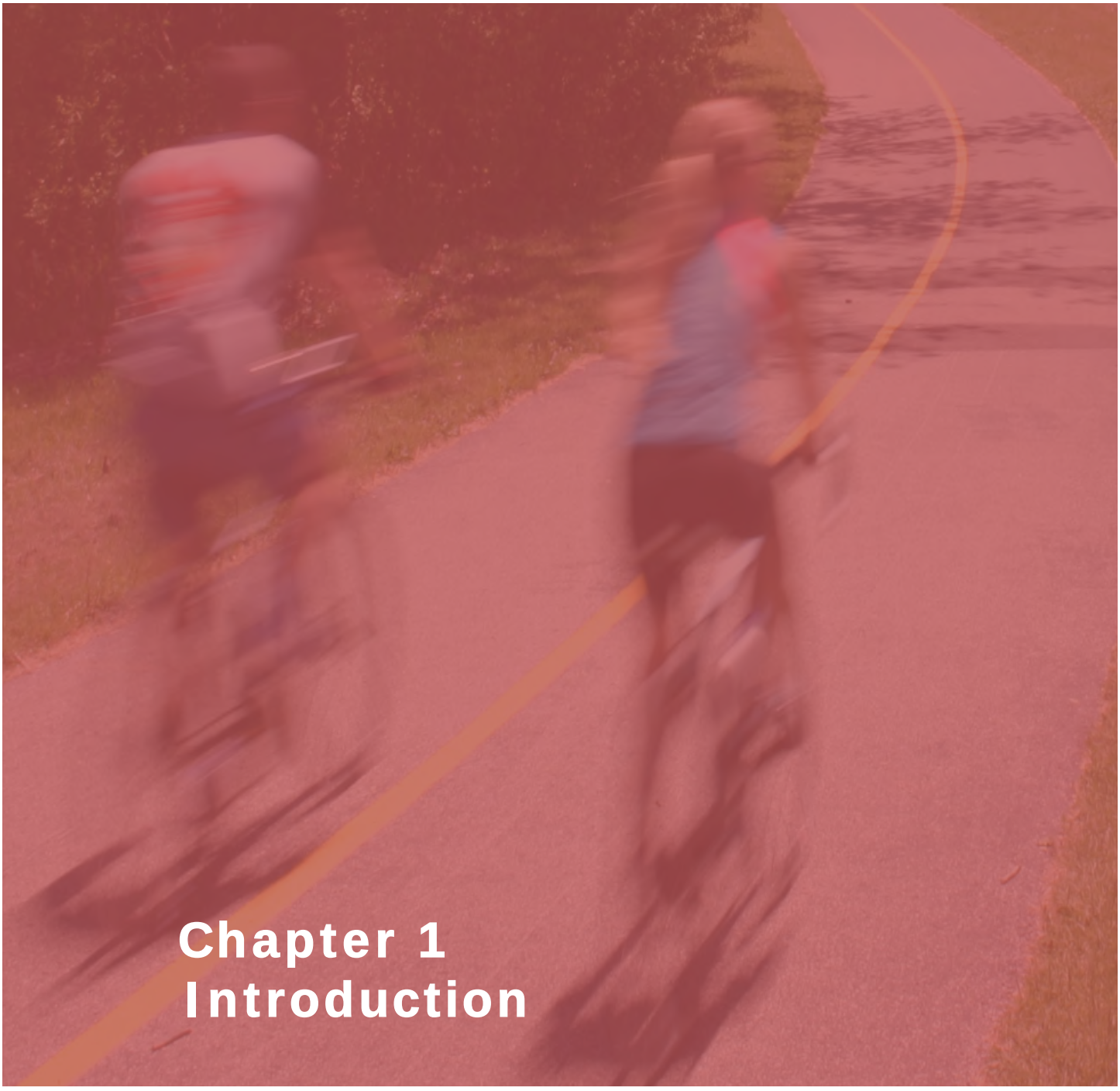


Chapter 1
Introduction

Executive Summary

OVERVIEW

There is a high desire and demand for bicycling in the city of Carbondale. The purpose of the Carbondale Bicycle Master Plan is to be a guide for the City, SIMPO, IDOT, SIU, and other partners to improve bicycling in Carbondale through additional facilities, education, encouragement, enforcement, and evaluation. The Bicycle Master Plan builds upon the existing positive momentum of improving bicycling in Carbondale.

Bicycling is an important quality of life component. Businesses and residents often choose to reside in a city with a high quality of life. A survey found 53 percent of Southern Illinois University alumni reported that they primarily walked or rode a bike while attending SIU. A bicycle friendly community is key to attracting and keeping students, young professionals, and families within the community.

Carbondale is well on its way to becoming a Bike Friendly Community. However, patience is the key to long-term success. This plan recommends a variety of improvements, many of which are relatively inexpensive and can be accomplished in the short term. More extensive recommendations can be accomplished by being opportunistic. This master plan does not force the community and partners to fund new projects. Instead, it is a commitment to plan for the needs of bicyclists, especially when new streets are built or current streets are improved.

COMMUNITY ENGAGEMENT

A robust community engagement process informed the planning process and recommendations. Engagement included two public open houses, an online survey and mapping tool, a 17-person advisory committee, SIU outreach, and numerous stakeholder meetings.

TARGET AUDIENCE

There are many types of bicyclists. Some bicyclists are very confident and will ride in almost any condition. The vast majority of the public, however, are casual bicyclists. They are interested in bicycling more often, but are concerned about safety. The recommendations of this plan target the casual bicyclist.

"Carbondale is well on its way to becoming a Bike Friendly Community. However, patience is the key to long-term success."

FRAMEWORK OF RECOMMENDATIONS

This plan includes 26 recommendations to improve bicycling in Carbondale. The recommendations are structured into the following categories:

- Infrastructure
- Encouragement
- Education
- Evaluation
- Enforcement

BUILDING ON CURRENT SUCCESSES

Many recent and current efforts are already underway to improve bicycling in Carbondale. This plan builds upon these current efforts:

- New bike lanes on Route 13 and Highway 51
- New multi-use trail along Route 13
- Multi-Use trail downtown, east of the railroad tracks
- City of Carbondale Complete Streets Policy
- City of Carbondale Bicycle Parking Ordinance

FUTURE PLANNING

This plan provides a guide to developing the overall bicycle network. Several aspects to the future bicycle network will require additional analysis and planning. Next steps for planning include:

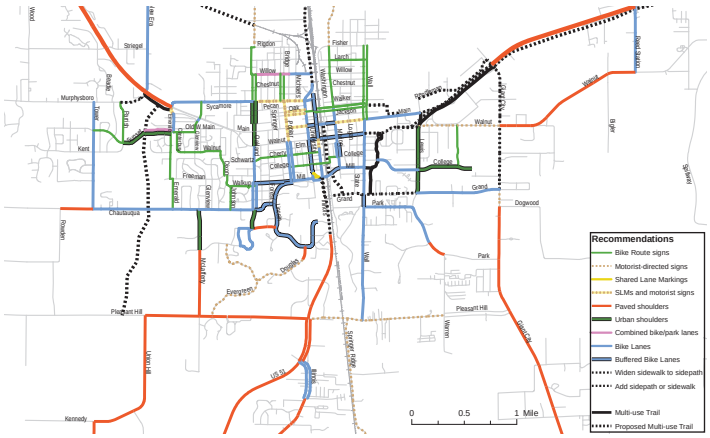
- Traffic analysis for Mill Street, Walnut Street, and Wall Street to confirm road diet potential.
- Citywide wayfinding plan.
- Preliminary design for Little Crab Orchard Creek Greenway.

ENSURING IMPLEMENTATION

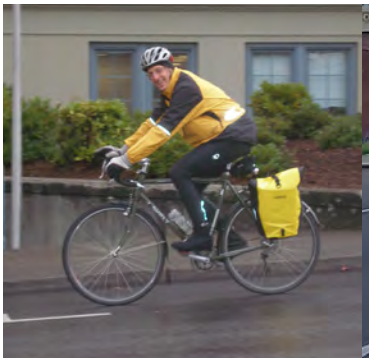
No plan should ever be static. While patience will be required for completion of all plan recommendations, it will be important to incrementally work toward the plan's completion. This plan recommends the continuation of the Bicycle Advisory Committee to meet on a quarterly basis to ensure that the plan is implemented. The Bicycle Advisory Committee should also continue to include a diverse representation of stakeholders including the City of Carbondale, Carbondale Park District, IDOT, SIU, and other civic partners.

High Priority Recommendations

- Fill in critical gaps in the bicycle network by providing bicycle facilities on key streets and improving key intersections, especially in connecting to SIU.
- Elevate the culture of biking through events such as Bike to Work Day and Bike to School Day.
- Increase bicycle education by expanding the existing children's helmet program to include educational activities such as bicycle rodeos for kids.
- Develop sidepath design standard to eliminate confusion over sidewalks versus sidepaths (multi-use trails) in the City.
- Develop a city-wide bicycle wayfinding system with custom branded Carbondale signs.



Recommended Bicycle Network. See 'Recommendations' and 'Detail of Route' Chapters for overview and explanation of the bicycle network.



Vision for Bicycling in Carbondale

Carbondale will be one of the most bike friendly communities in the Midwest, where bicyclists of all ages and abilities will ride safely and comfortably throughout the City for work, school, recreation, fitness, and fun.

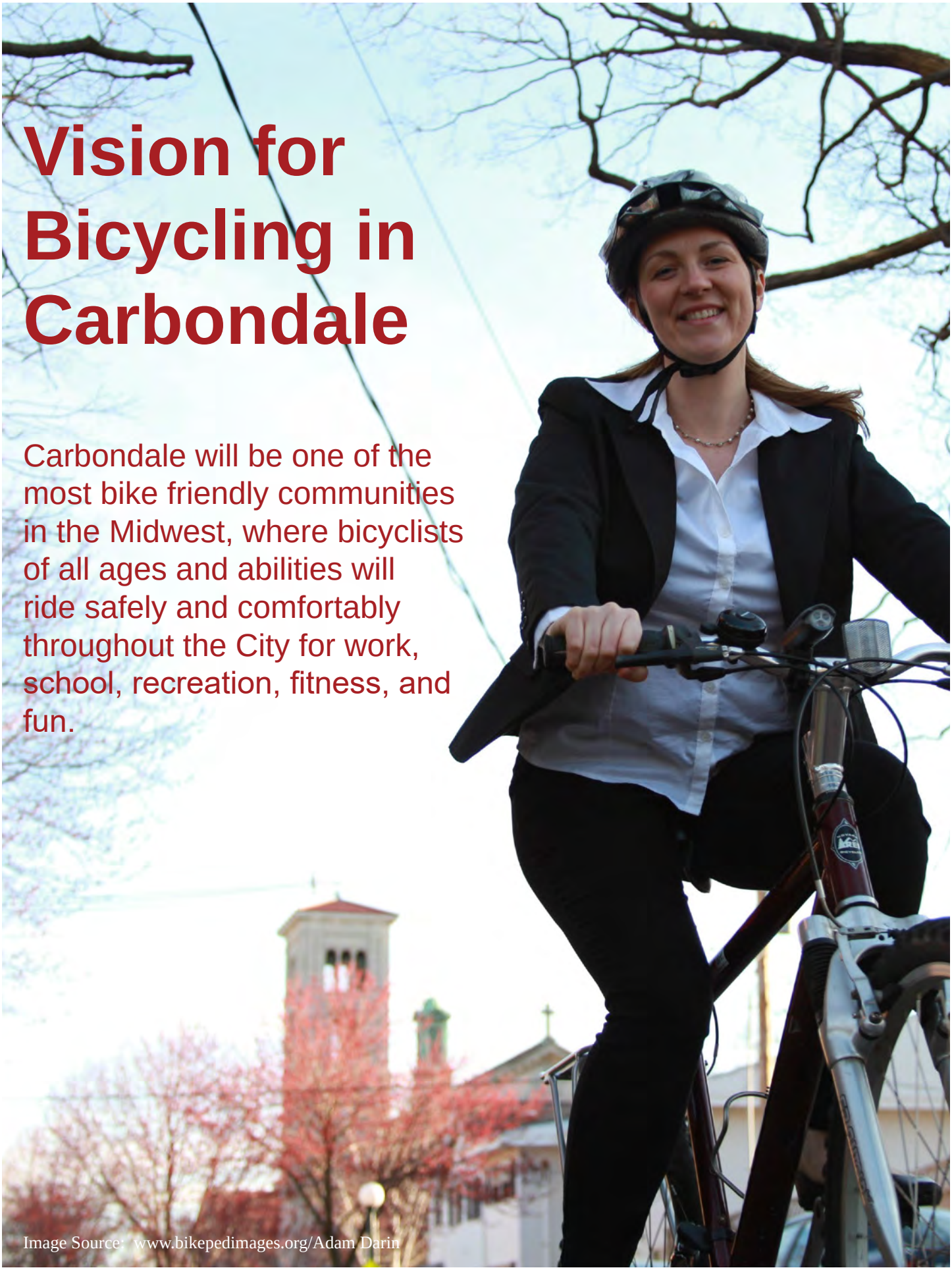
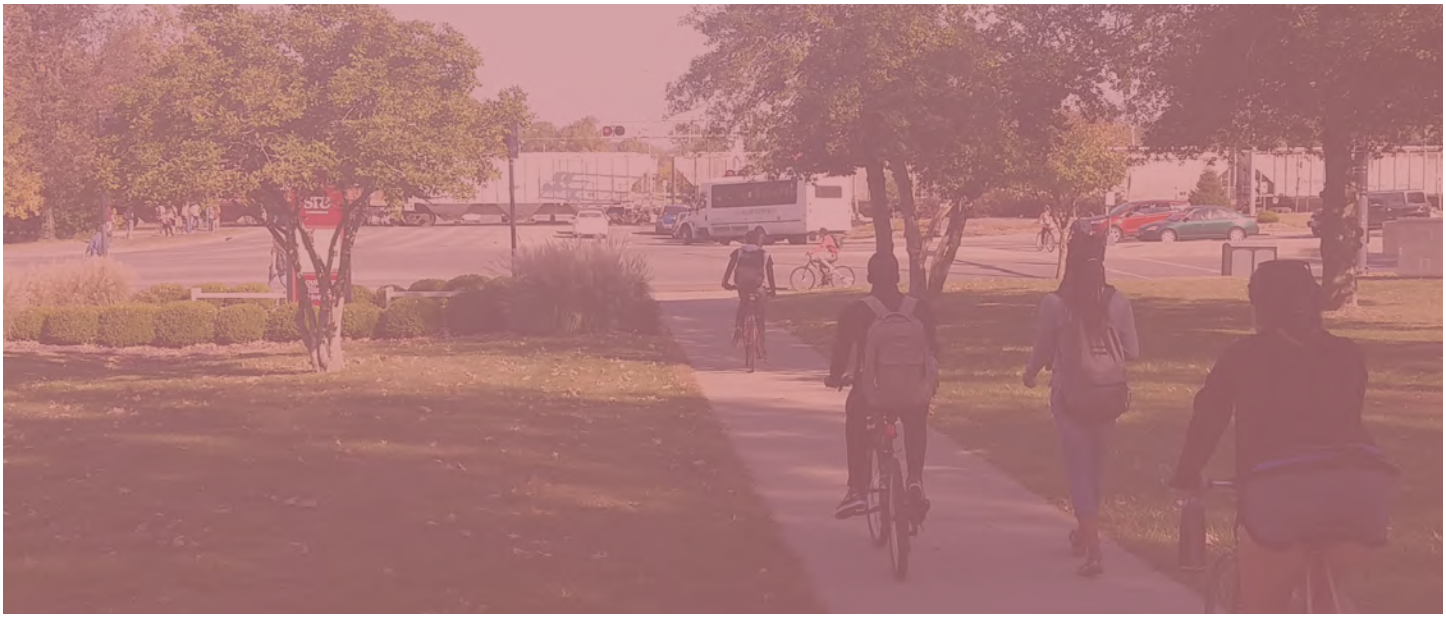


Image Source: www.bikepedimages.org/Adam Darin

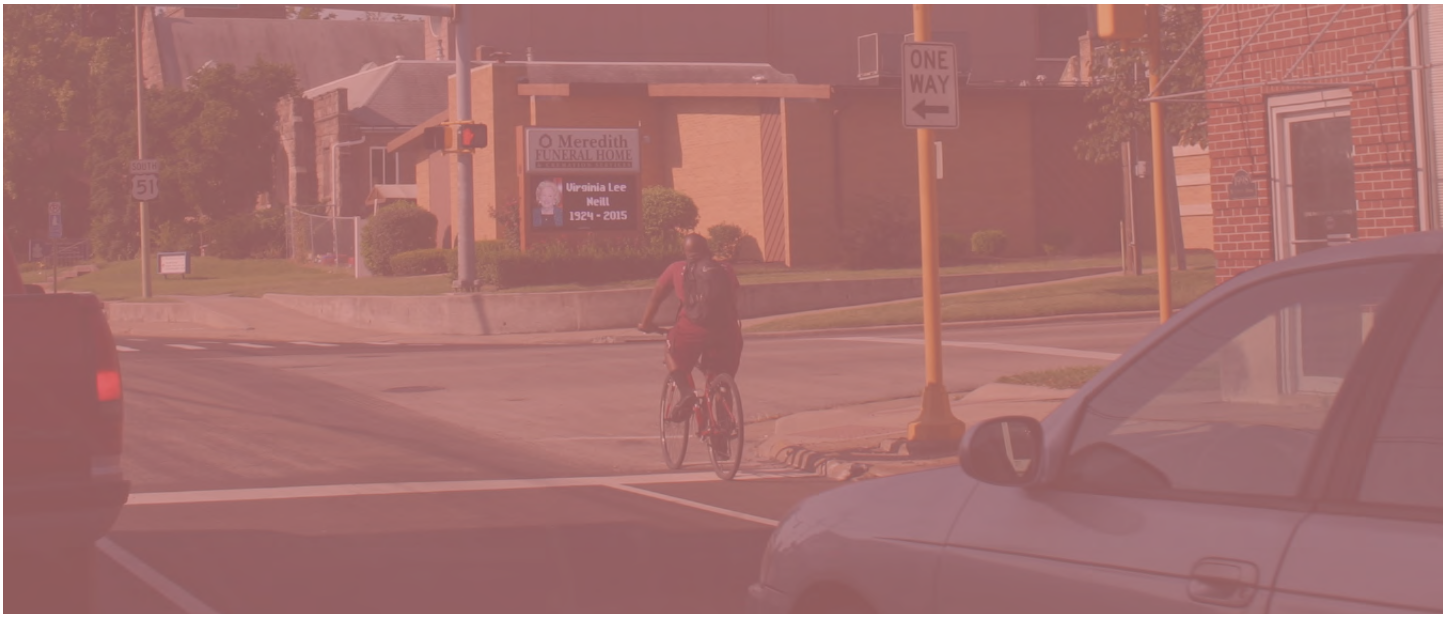
Core Values of the Bicycle Master Plan

- *Elevate the culture* and visibility of bicycling in Carbondale.
- Become a *Bicycle Friendly Community* and *Bicycle Friendly University*.
- *Increase* the number of residents and students bicycling while *reducing* the number of accidents.
- Strive for a *continuous bicycle network* throughout the City with a high comfort and safety level.
- *Connect SIU students* to the rest of the community.
- *Engage the casual adult cyclist* (who is interested but concerned). At the same time, address the needs of those who are more advanced and those who are less traffic-tolerant, including children.



Core Values of the Bicycle Master Plan

- *Be patient* toward long-term infrastructure improvements. Be opportunistic to incorporate bicycle improvements as part of other projects and development, not as stand-alone projects.
- Implement spot improvements, short links, and other small projects that *make a big impact*.
- *Educate and encourage* the next generation of bicyclists and motorists.
- *Positively reinforce* the rules of the road for bicyclists and motorists.



Purpose of the Plan

The Bicycle Master Plan will be a guide for the City, SIMPO, IDOT, SIU, and other partners to improve bicycling in Carbondale through additional facilities, education, encouragement, enforcement, and evaluation. A master plan does not force a community to fund new projects. Instead, it is a commitment to plan for the needs of bicyclists, especially when new streets are built or current streets are improved. If new bicycle facilities are a priority for the community, the master plan helps to prioritize projects and leverage support and funding options.

The benefits of the plan include having an inventory of the existing bicycle network, the analysis and evaluation of connections between routes in the existing network, analysis and evaluation of existing roadways that could accommodate bicycle facilities, recommendations of policy changes to assist in short and long term bicycle improvements, action items to move Carbondale toward being recognized as a 'Bicycle Friendly Community', and a shared consensus on priorities through public engagement including stakeholder meetings, public meetings, and outreach.

Planning Process

The planning process began in the fall of 2015 and concluded in the spring of 2016. Below is an overview of the planning schedule. Community engagement throughout the planning process provided opportunities for residents and key stakeholders to shape the plan's vision, goals, and recommendations.

Aug / Sept / Oct

Existing Conditions, Community Input, Guiding Principles

- Review existing plans and field data collection.
- Meetings with community stakeholders and organizations.
- Develop guiding principles and plan goals.
- Online community survey (late Sept. to Oct. 30)
- **Open House #1** - Wednesday, October 21
  6:00 - 8:00pm, Carbondale Civic Center

Nov / Dec / Jan

Development of Bicycle Network Recommendations

- Draft bicycle network recommendations.
- Review draft network with Technical and Advisory Committees.
- Draft master plan components.

Feb / Mar / Apr

Finalize Bicycle Network and Draft Master Plan

- **Open House #2**
- Review of draft bicycle network and draft master plan.
- Finalize bicycle network recommendations.
- Revise and finalize master plan.

May / June

Adoption of Final Bicycle Master Plan

- Adoption of Bicycle Master Plan

Types of Bicyclists (Who Rides and Who Doesn't)

Bicyclists can be categorized into one of four categories.

Types of Bicyclists	Percentage of Population
Strong and Fearless Rides in all types of traffic, regardless of whether there are bike facilities.	1-2%
Enthused and Confident Comfortable riding in traffic, but prefer facilities like bike lanes.	7-10%
Interested but Concerned Enjoys bicycling, but are nervous about riding in traffic.	50-60%
No Way, No How No desire to bicycle at all.	25-30%

It is important to note that categorizing bicyclists is not an exact science. The above information came from research that the City of Portland conducted in assessing the city's bicycle network. However, it is a good generalization of the different types of bicyclists.

The target audience for this plan is the "casual bicyclist" (interested but concerned). These riders want to ride more, but need facilities such as bike lanes to feel comfortable riding on-street with traffic.

Why People Ride
People bicycle for a variety of reasons and usually not just one specific reason. Common reasons for bicycling include:

- Commuting to work or school
- Recreation
- Fitness
- Running errands
- Socializing with family or friends
- Relaxation

It is important to note that some residents ride because they do not have other transportation options.

Importance of a Bicycle Plan and Bicycle Investment

Guidance for Implementation
A large portion of bicycle improvements can be done with little additional cost if it is done as part of a larger roadway project such as resurfacing or reconstruction. This master plan allows the City and other partners to be opportunistic in implementing the bicycle network in conjunction with other street improvements.

Shared Vision
This master plan is a shared community vision for bicycling improvements in the City. While improvements will not happen overnight, the plan can help ensure residents that the City and other partners are taking measurable steps toward improving bicycling. Evaluation on a yearly basis will help to ensure that the plan will continue towards full implementation.

Economic Development
Bicycling is an important quality of life component. Businesses and residents often choose to locate in a city with a high quality of life. A survey found 53 percent of Southern Illinois University alumni reported that they primarily walked or rode a bike while attending SIU. A bicycle friendly community is key to attracting and keeping students, young professionals, and families.

Health
Increased bicycling and other active living activities have shown positive influences in individual and community health.

Safety
Increasing the number of bicycle facilities will increase the safety for bicyclists. In addition, bicycle improvements can also improve safety for other users such as motorists and pedestrians. Bicycle improvements, such as bike lanes and other striping, act as a traffic calming device by reducing lane widths and slowing down traffic. Traffic calming helps to reduce the rate and severity of accidents.

It is important to note that the overall number of bicycle accidents may increase as more people bicycle, however, the rate of accidents decrease.

Increased Ridership
Investment in bicycle facilities will lead to increased ridership. In addition to infrastructure improvements, it is important to also implement strategies for education, encouragement, and enforcement to help overcome perceived hurdles to bicycling.

Chapter 2
Existing Conditions

Chapter 2
Existing Conditions

Existing Bicycle Network

EXISTING NETWORK: ON-STREET FACILITIES

Figure 2.1 shows the existing bicycle network in Carbondale. The City has several existing bicycle facilities, especially with the addition of recent bike lanes on University Avenue, Illinois Avenue, Main Street and multi-use trail segments along Route 13 near the Mall and Murdale Shopping Center.

There are several gaps in the existing network. The existing network has several streets that have striping but do not meet the definition of a "bike lane". Two of these existing streets are Sycamore Street and Lewis Lane. At times, these streets have been designated as having "bike lanes", however, this is not a proper definition. On roads with no on-street parking and no curb-and-gutter, bike lane width must be at least 4' to the center of the bike lane stripe. On roads without parking but having curb-and-gutter, the minimum width must be 5' (with some exceptions). Wherever possible, 4' of usable bike lane width is recommended from gutter joint to bike lane stripe center.

Existing BLOS

The Bicycle Level Of Service (BLOS) measure quantifies the "bike-friendliness" of a roadway, helping to remove a wide range of subjectivity on this issue. The measure indicates adult bicyclist comfort level for specific roadway geometries and traffic conditions. Roadways with a better (lower) score are more attractive – and usually safer – for cyclists. BLOS has been used in IDOT's bicycle maps for years, and it has been added to the Highway Capacity Manual. More information and an online calculator is at rideillinois.org/blos/blosform.htm. BLOS is used in the Carbondale Bicycle Plan to measure existing and future conditions, to set standards for the bikeway network, and to justify recommendations. A BLOS of "C" is considered acceptable for experienced cyclists, as is B for casual adult cyclists – the minimum target of this plan.

Figure 2.2 shows existing BLOS in Carbondale. Several streets in the City have a BLOS of "D" which is well below the minimum target BLOS of "B" of this plan.

Existing Street Conditions

Several factors were analyzed to assist in determining appropriate bicycle facilities for each street. Existing conditions that were analyzed included:

- Existing Parking Occupancy (Figure 2.3)
- Existing Average Daily Traffic Volume (Figure 2.4)
- Existing Lane Width (Figure 2.5)
- Pedestrian and Bicyclist Crash Locations (Figure 2.6)

EXISTING NETWORK: OFF-ROAD FACILITIES

Greenway Bikeway

The Greenway Bikeway is an asphalt trail that links Grand Avenue to Walnut. The trail is adjacent to the Piles Fork Creek. A spur of the trail connects to Mill Street at Wall Street. The trail is an important link in the heart of Carbondale. Several aspects of the trail, however, need to be upgraded. Asphalt is deteriorating in some areas and the width of the trail is below minimal standards in some segments. Existing bridges along the trail do not meet current handrail standards. The trail is not very visible when the trail meets existing street crossings.

Route 13 Multi-Use Trail

In 2015, an 8' width multi-use trail was constructed on the south side of Route 13 between Lewis Lane and Giant City Road. The trail provides a key connection adjacent to the Mall.

In 2015, construction started on a multi-use trail on the south side of Route 13 between New Era Road and Emerald Lane. The trail is expected to be completed in 2016.

Existing bike lanes on University Avenue.

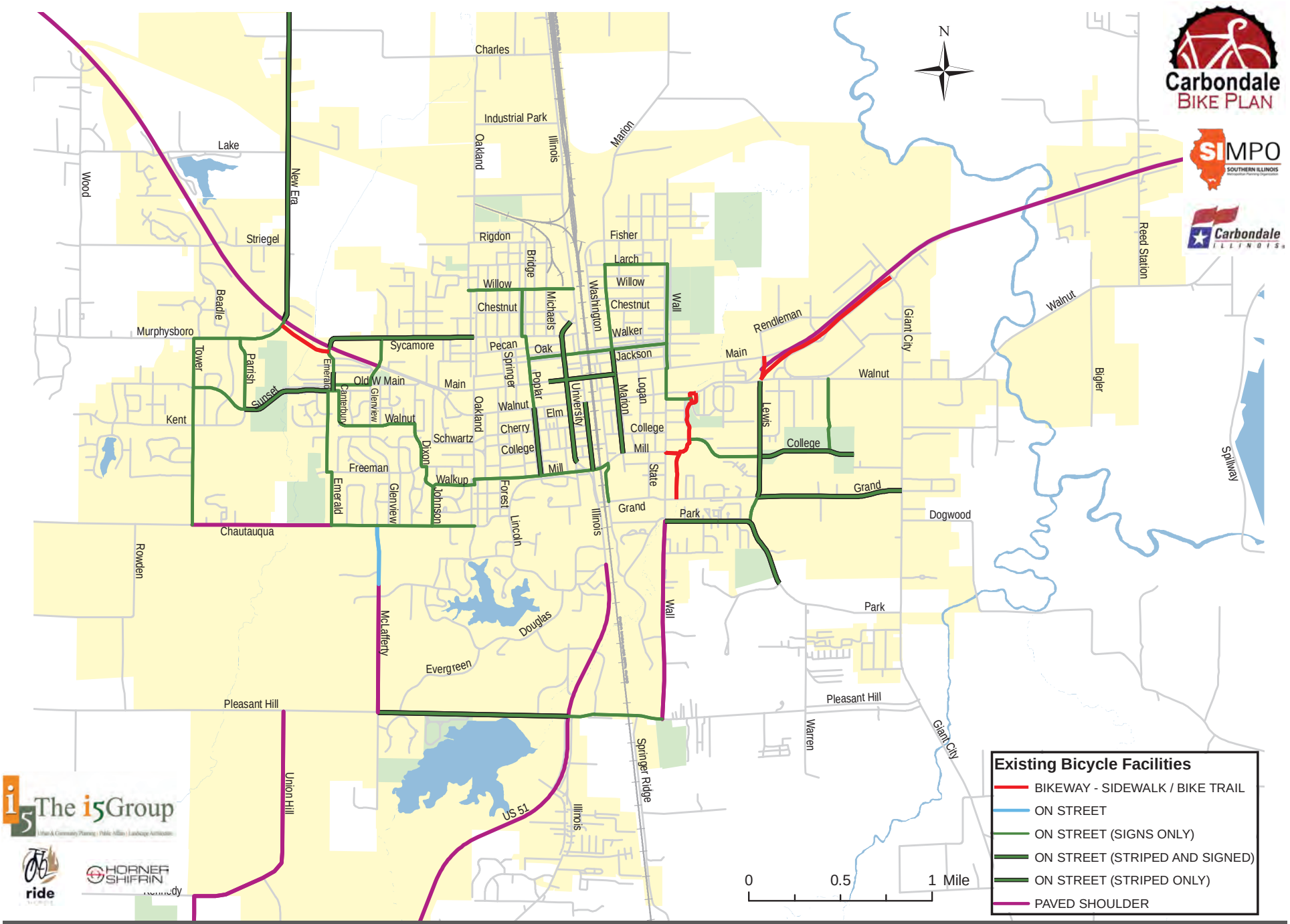


FIGURE 2.1: Existing Bicycle Facilities

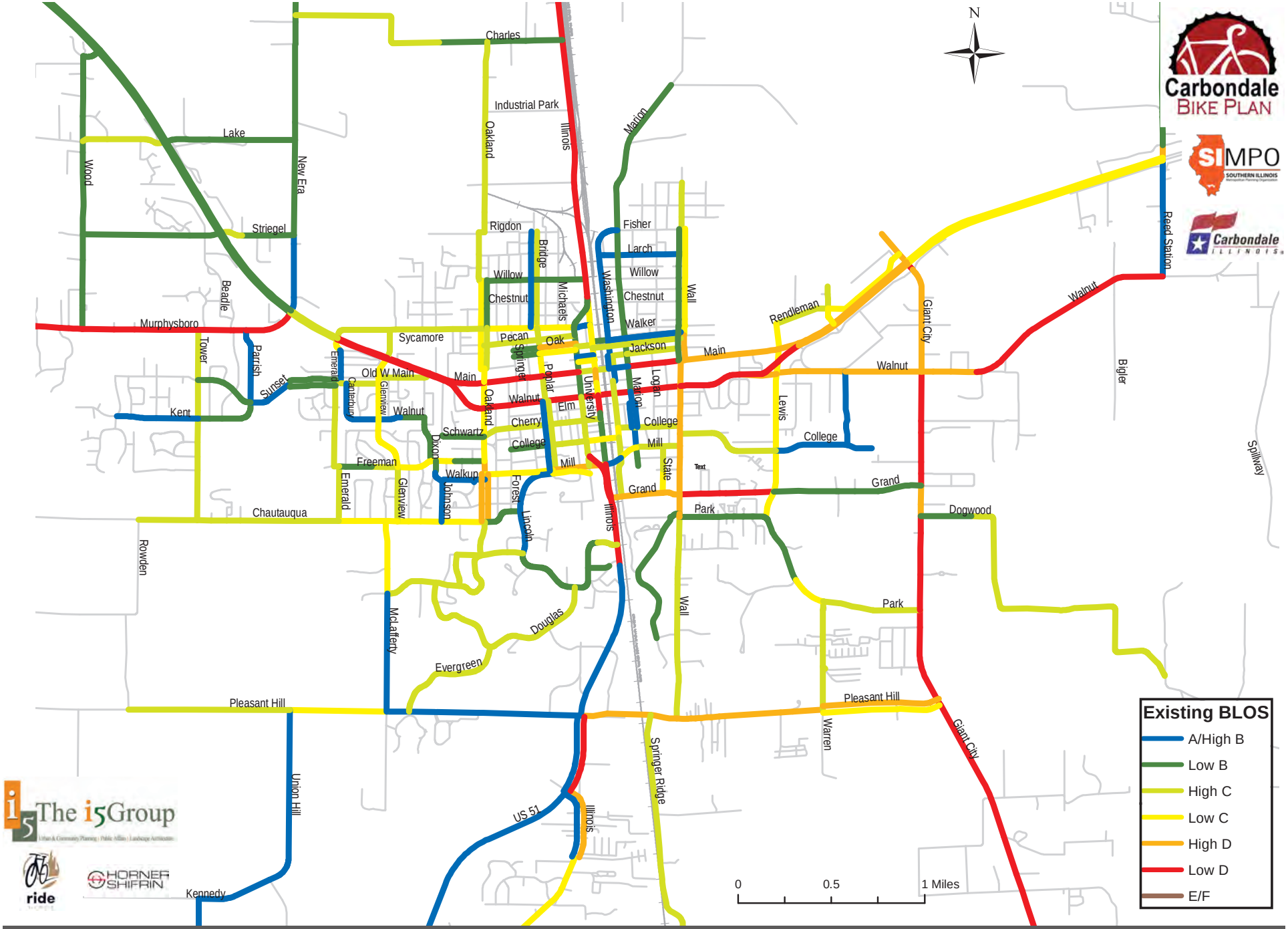


FIGURE 2.2: Existing Bicycle Level of Service (BLOS)

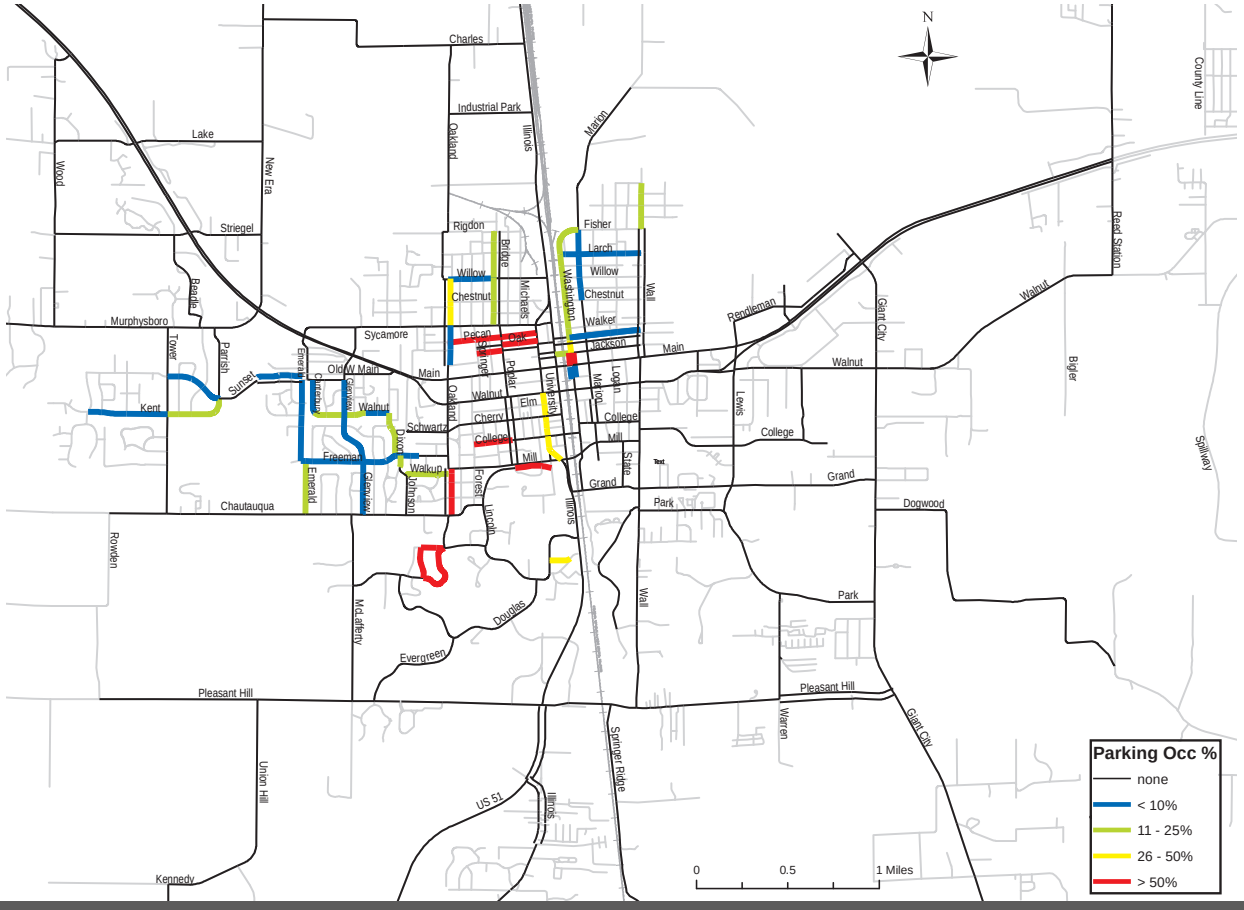


FIGURE 2.3: Existing Parking Occupancy

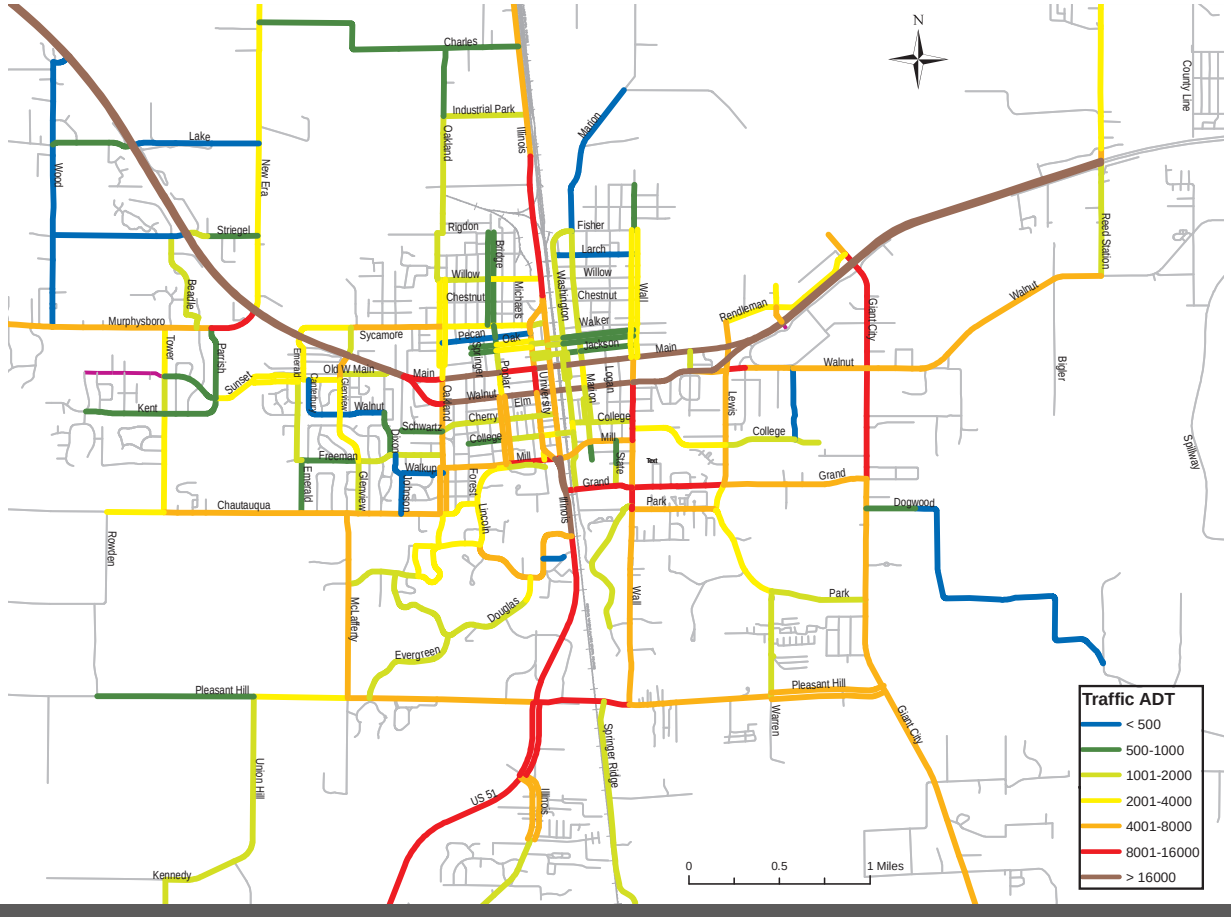


FIGURE 2.4: Existing Average Daily Traffic Volume (ADT)

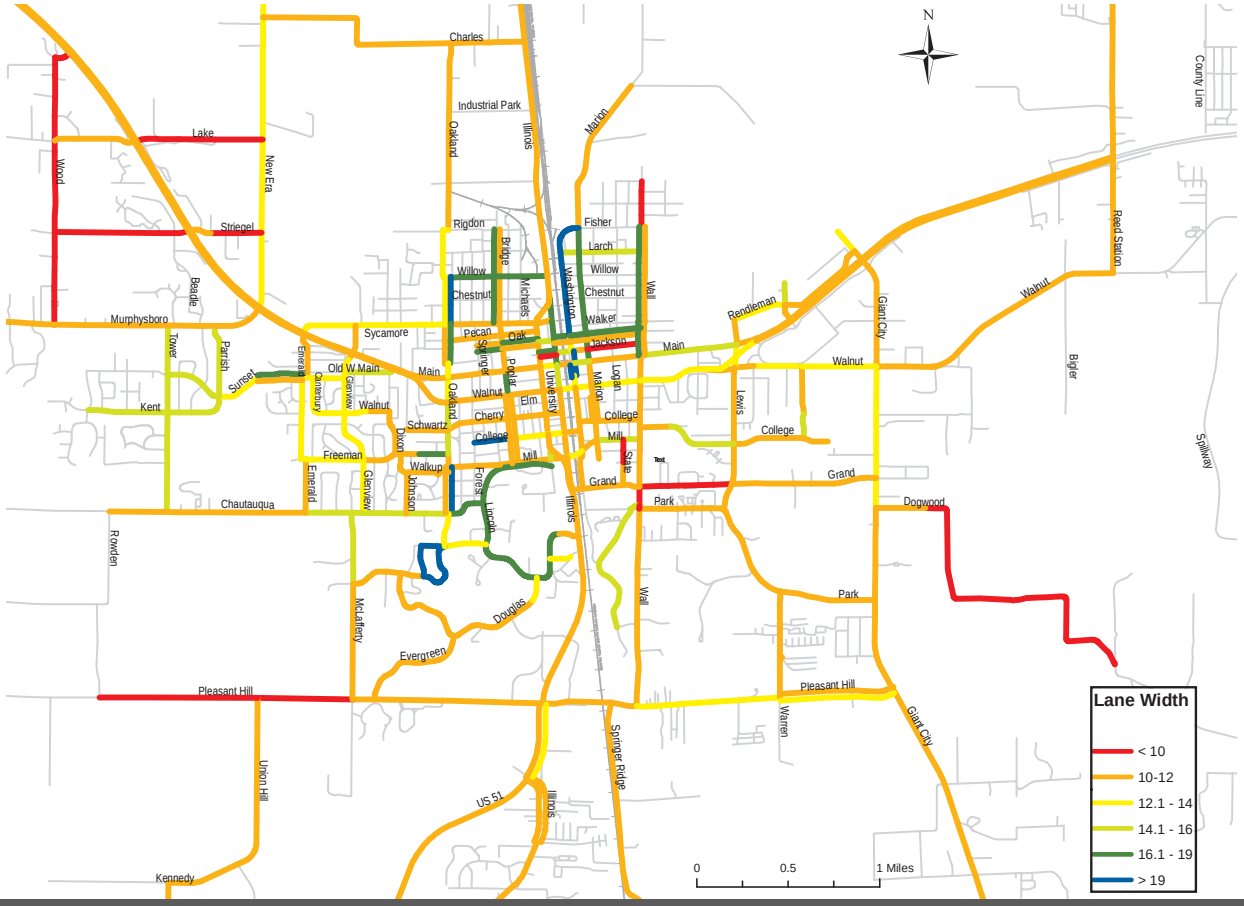
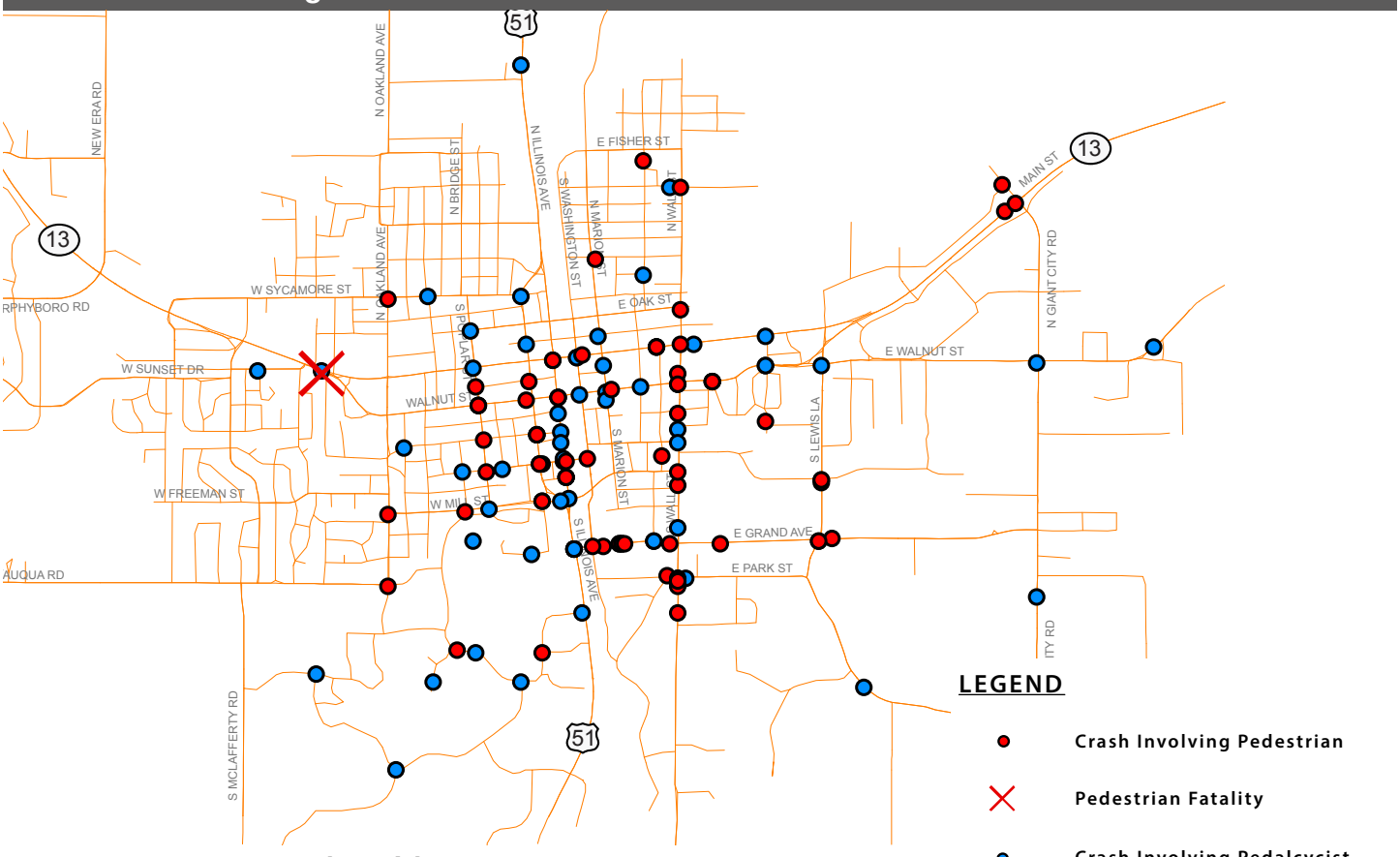


FIGURE 2.5: Existing Lane Widths



Map Source: SIMPO 2014 Multi-modal Transportation System Assessment

FIGURE 2.6: Pedestrian and Bicyclist Crashes (2008-2012)

EXISTING BICYCLE PROGRAMS AND POLICIES

Children Helmet Program
The Carbondale Park District, Rotary, Police Department, and other partners sponsor a regular children's helmet program. Approximately 60-80 children receive bicycle helmets on a regular basis through the program.

Regular Bicycle Rides / Clubs
Several organizations in Carbondale organize regular bicycle rides and events. Some of the events and organizations include:

- Chamber of Commerce Annual Southern Fun Ride
- Bike to Work Day
- Carbondale Bicycle Club
- 51 on 51 Bike Ride

SIU Campus
Southern Illinois University has a strong culture of bicycling. Existing ridership among students is high and is increasing. The University has expanded bicycle parking in multiple areas of campus to meet increasing demand.

There are currently several organizations and initiatives to promote cycling.

Saluki Spokes
Located in the Student Center Craft Shop, Saluki Spokes coordinates several activities to promote bicycling on campus. Saluki Spokes has a series of bicycle fix-it stations across campus. To help with on-site repairs, the group has a bicycle ambassador program and conducts bicycle repair workshops. Saluki Spokes also coordinates Bike Watch, a program to help students, with a lost or stolen bike, get the word out to help recover their bike.

Bicycle Friendly University Designation
An application is being prepared to designate the University as a Bicycle Friendly University through the League of American Bicyclists. The Bicycle Friendly University program recognizes institutions of higher education for promoting and providing a more bikeable campus for students, staff and visitors.

Below: Saluki Spokes fixing bikes outside of the SIU student center. Saluki Spokes coordinates several activities to promote bicycling on campus including bicycle fix-it stations, bicycle ambassador program, and bicycle repair workshops.

Complete Streets Policy
In 2015, the city of Carbondale adopted a Complete Streets Policy. The City joins over 850 communities, counties, states, and other agencies in having a Complete Streets policy that helps to ensure that all modes of transportation and users are considered for streets in Carbondale.

Key elements of Carbondale's Complete Streets policy include:

- The goal to create a comprehensive, integrated and connected network of transportation options for all modes of conveyance, designed and operated to enable appropriate and safe access for all users.
- The policy to be applied to all projects involving roadway improvements and the movement of people when feasible.
- Incorporating Complete Streets into budgeting and work plans.
- Exceptions to the policy include no feasible way to accommodate improvements within the project's scope and/or budget.
- Projects limited to maintenance activities.
- The cost would be disproportionate to future demand or need or users.

PAST PLANS

Recent and current plans regarding bicycling in the City of Carbondale include:

- 2010 Carbondale Comprehensive Plan
- 2014 SIMPO Multi-modal Transportation System Assessment
- 2015 SIMPO Long Range Transportation Plan
- 2016 Carbondale Downtown Master Plan

In addition to recent plans by the City and regional agencies, faculty and students at SIU have undertaken planning and research efforts regarding bicycle facilities on campus and within the City. Recent work has included mapping and analysis of bicycle parking on campus.

PLANNED BICYCLE FACILITIES

A number of bicycle facilities are currently being constructed or are being planned within the City. These bicycle facilities include:

Route 13 Multi-Use Trail Between New Era Road and Emerald Lane
A multi-use trail on the south side of Route 13 is expected to be finished in 2016. The trail will be an important connection between New Era Road and Emerald Lane and will include a pedestrian bridge over Little Crab Orchard Creek.

Downtown Multi-Use Trail
A multi-use trail, proposed on the east side of the railroad tracks, will connect Mill Street to Main Street. The trail will be let for construction in 2016. The second phase of the project will extend the trail from Mill Street to Grand Avenue. The schedule for the second phase is not confirmed, but is expected to be implemented by 2018.

Route 13 Multi-Use Trail - Giant City Road to Reed Station Road
A multi-use trail is planned for the south side of Route 13 that will provide an important connection from the City to John A. Logan College. IDOT has included the trail as part of their plan for Route 13. However, the schedule of the project in unknown as funding has not been allocated for the project.

Oakland Avenue Improvements
Oakland Avenue is scheduled for reconstruction in the next few years. The improvements to Oakland Avenue will be an opportunity to implement the recommendations of this master plan.

Chapter 3
Community Engagement

Chapter 3
Community Engagement

Process

The Carbondale Bicycle Master Plan included a robust community engagement process utilizing a variety of engagement techniques. The community engagement process included individual meetings, open houses, online tools, and marketing materials.

ADVISORY COMMITTEE

An advisory committee for the bicycle master plan met four times during the planning process. The advisory committee included representatives from SIMPO, the City of Carbondale, SIUC, the Carbondale Park District, Carbondale Chamber of Commerce, IDOT, bicycle shop owners, and other business and civic groups in the City.

The advisory committee met on the following dates:
September 9, 2015
November 5, 2015
February 10, 2016
April 6, 2016

Advisory committee members included:
Joe Zdankiewicz; Director of Transportation Planning, Southern Illinois Metropolitan Planning Organization
Chris Wallace; Development Services Director, City of Carbondale
Jacob Cook; Business Owner
Brad Dillard; Associate Director of Facilities, SIU
Ron Dunkel; Coordinator SIU Student Center Craft Shop / SIU Saluki Spokes
Sean Henry; Public Works Director, City of Carbondale
Shelby Orr; SIU Student
Sgt. Corey Kemp; Carbondale Police
Julie Klamm;Illinois Department of Transportation
Geory Kurtzhals; SIU Sustainability Coordinator
Doug McDermott; Owner, Phoenix Cycles
Shannon Sanders McDonald; Assistant Professor, SIU
Michelle McLernon; Jackson County Health Department, Director of Health Education
Les O'Dell; Executive Director of Carbondale Chamber of Commerce
Kathy Renfro; Carbondale Parks District
Jessica Sergeev; Planner, City of Carbondale
Gary Williams; Interim City Manager, City of Carbondale

The purpose of the advisory committee was to provide feedback and direction during the planning process and to act as the committee to oversee implementation of the plan.

STAKEHOLDER MEETINGS

The planning team conducted a series of individual and small group stakeholder meetings September 30 and October 1, 2015. A total of 13 stakeholder meetings were held. The purpose of the stakeholder meetings was to find out key issues related to bicycling in Carbondale such as key routes, barriers to biking, and general perceptions on bicycling in Carbondale. The stakeholder meetings also established networks of communication to share information about the planning process, open houses, and the survey with stakeholder networks.

The list of stakeholder meetings included:
- Carbondale Park District
- SIU Parking
- SIU PSO
- SIU Vice-Chancellor for Student Affairs
- SIU Students at Student Center
- Carbondale Mayor
- Carbondale Tourism
- Carbondale Main Street, Green Earth
- Bike Shop Owners
- IDOT
- Carbondale Chamber of Commerce
- Jackson County Health
- Carbondale Middle School

SIU STUDENTS

As part of the stakeholder meetings, the planning team, in conjunction with Saluki Spokes, set up a table at the SIU Student Union on September 30, 2015. The planning team talked with students and had students take the online survey for the bicycle master plan. Over 30 students talked with the planning team and took the online survey.

SIU students take the Carbondale Bicycle Master Plan survey on September 30, 2015 at the SIU Student Union.

OPEN HOUSES

Two public open houses were held during the planning process. Both open houses were held at the Carbondale Civic Center. The dates of the open houses were:

Open House #1
6:00 – 8:00 pm October 20, 2015 at the Carbondale Civic Center

Open House #2
5:00 – 8:00 pm February 17, 2016 at the Carbondale Civic Center

Open House #1

Open House #1 consisted of a presentation by the planning team that included an overview of the planning process, a review of various bicycle facilities that would be appropriate for the City of Carbondale, a review of the planning principles in selecting the type of bicycle facility. The Open House also included small group breakout sessions where attendees discussed the best streets and routes for bicycle facilities, ideas for education, and ideas for encouraging the growth of bicycling. Each small group presented their ideas back to the larger group.

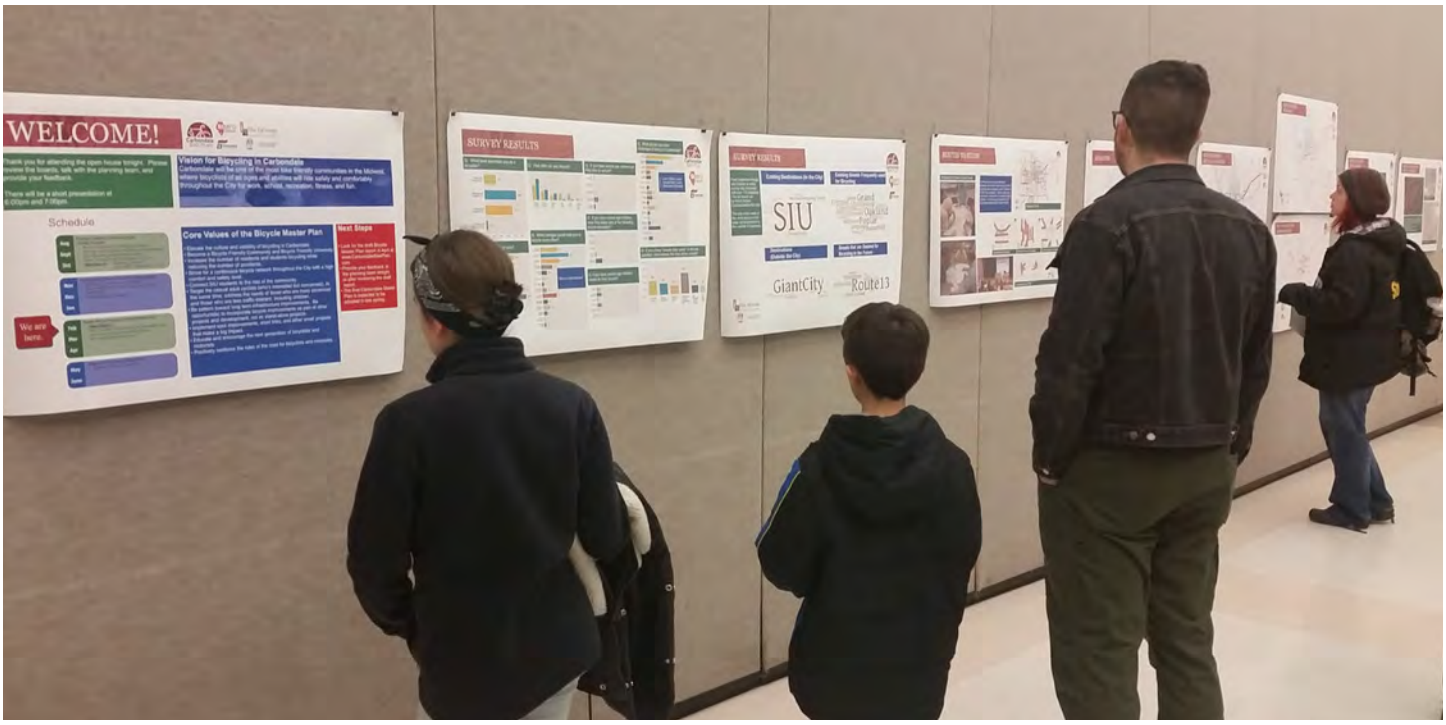
Open House #2

Open House #2 consisted of a presentation by the planning team that included an overview the project to date, the results of the online survey, and the draft recommendations of the plan. Thirteen boards displayed information including the results of the survey, analysis, and the draft plan recommendations. The public had an opportunity to talk with the planning team and fill out a questionnaire.

Attendees had the following responses to the questionnaire at Open House #2. 50 percent of the respondents strongly agreed with the high priority projects and remaining 50 percent agreed with the high priority projects. None of the respondents disagreed with the high priority projects. Over 80 percent of the respondents strongly agreed with the recommendations for education, encouragement, enforcement, and evaluation. Over 70 percent of the respondents strongly agreed with the vision statement and core values. None of the respondents disagreed.

For input on the priority of various parallel routes, 55 percent of the respondents felt that the higher priority for improvements should be Sycamore Street compared to using Pecan Street and Oak Street to connect to University Avenue and Illinois Avenue. 73 percent of the respondents felt having a widened shoulder on Old Hwy 13 east of Giant City Road should be a higher priority than a multi-use trail along Route 13 east of Giant City Road. 55 percent of the respondents felt that Mill Street should be a higher priority for improvements compared to College Street.

Multiple attendees commented that connecting to the future splash park is important.



WEBSITE

A project website was developed to be the hub of information regarding the plan. The website www.CarbondaleBikePlan.com provided documents for download including open house exhibits and presentations, survey results, and the draft and final plan report. The website included upcoming meeting dates, background on the planning process, and links to the online survey and online mapping tool.

ONLINE SURVEY

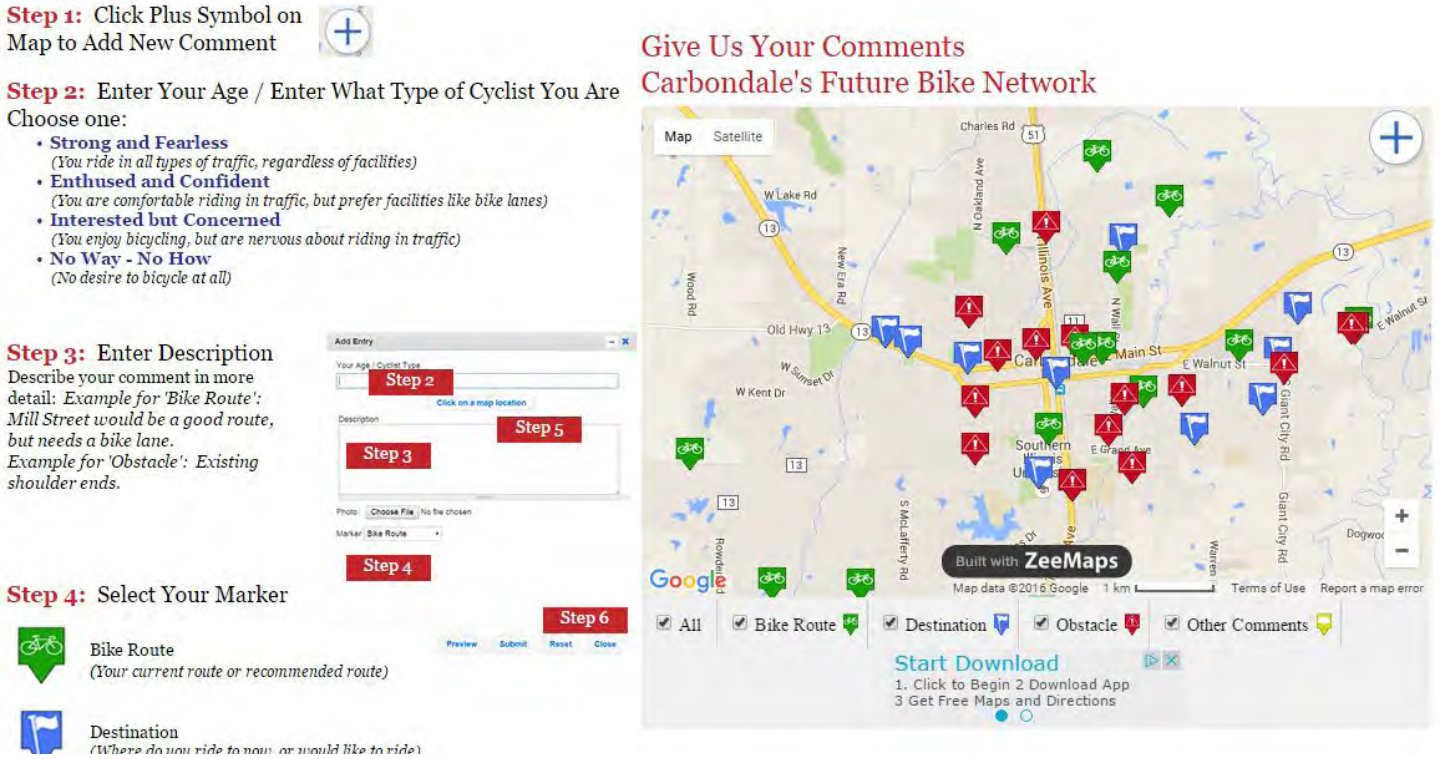
An online survey was conducted from mid-September to the end of October 2015. Over 170 responses were received through the survey. The survey results are included later in this chapter.

ONLINE MAPPING

An online mapping tool was developed that allowed the public to make comments on an online map regarding bicycling in Carbondale. Categories of comments included:

- Bike Route – Current or recommended routes.
- Destinations – Where individuals ride to now, or would like to ride.
- Barriers – Existing barriers to bicycling.
- Other Comments

Over 40 online mapping comments were made.



ENGAGEMENT MATERIALS

A postcard was developed to raise awareness of the bicycle master plan and promote the online survey and open house. A summary brochure was developed that provided an overview of the planning process, answered typical questions about the plan, and provided the overall schedule of the plan.

QUESTIONNAIRE AND PUBLIC COMMENTS TO DRAFT MASTER PLAN REPORT

A questionnaire was developed to gauge input on priority recommendations, vision, values, and parallel route alternatives. The questionnaire was used at Open House #2 and an online version of the questionnaire was used for public comment of the draft master plan report.

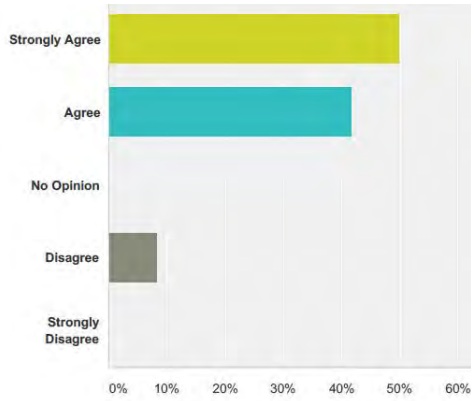
The draft report was reviewed by the technical and advisory committees in March 2016. The draft master plan report was made available for public review and comment from April 13, 2016 to May 6, 2016. Two comment surveys were received during the public review period.

Below are portions of comments received through both the open house and public review period. The complete set of comments can be found in the appendix.

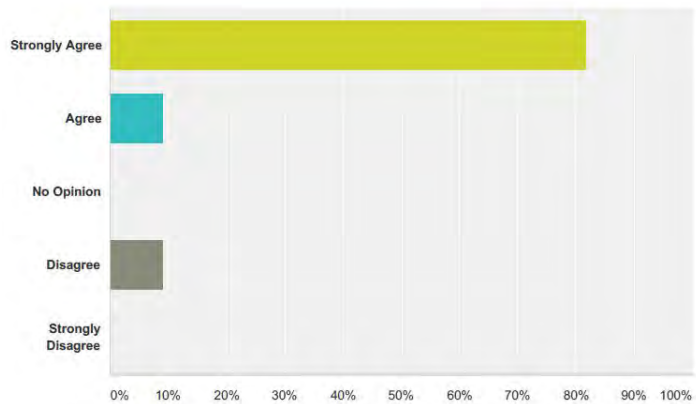
Above: Marketing postcard for the Carbondale Bicycle Master Plan.

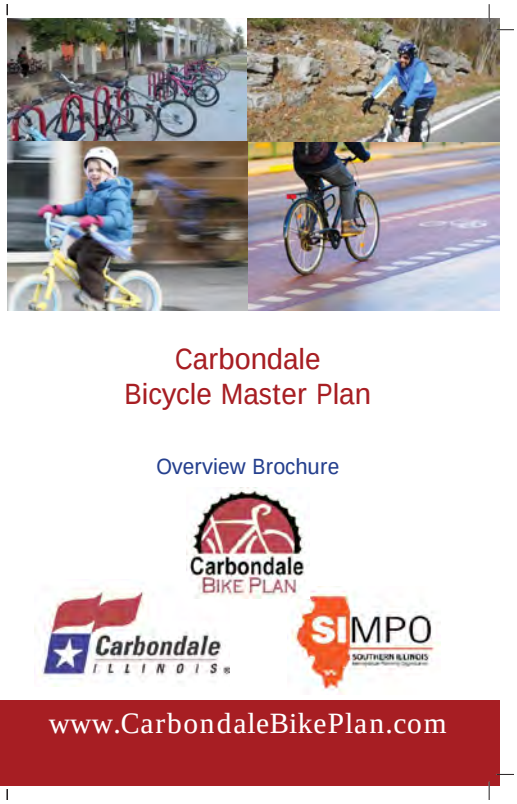
Below: Summary Brochure

Q: Do you agree with the high priority projects for the bicycle network?



Q: Do you agree with the recommendations for education, encouragement, enforcement, and evaluation?





Carbondale Bicycle Master Plan

Open House #2 Questionnaire

Q1: Several proposed recommendations for the bicycle network are streets/facilities that are parallel to each other. Which of the following parallel routes would you rank as a higher priority for improvements and to be part of the recommended bicycle network?

East of Oakland (Choose One)

☐ Using Sycamore to University/Illinois *or* ☐ Using Pecan and Oak to University/Illinois

East of Giant City Road (Choose One)

☐ Using a future multi-use trail along Route 13 *or* ☐ Using a widened shoulder along Old Hwy 13

Between Oakland and Wall (Choose One)

☐ Using Mill Street *or* ☐ Using College Street

Q2: Do you agree with the high priority projects for the bicycle network?

☐ Strongly Disagree ☐ Disagree ☐ No Opinion ☐ Agree ☐ Strongly Agree

Q3: Do you agree with the recommendations for education, encouragement, enforcement, and evaluation?

☐ Strongly Disagree ☐ Disagree ☐ No Opinion ☐ Agree ☐ Strongly Agree

Q4: Do you agree with vision statement and core values?

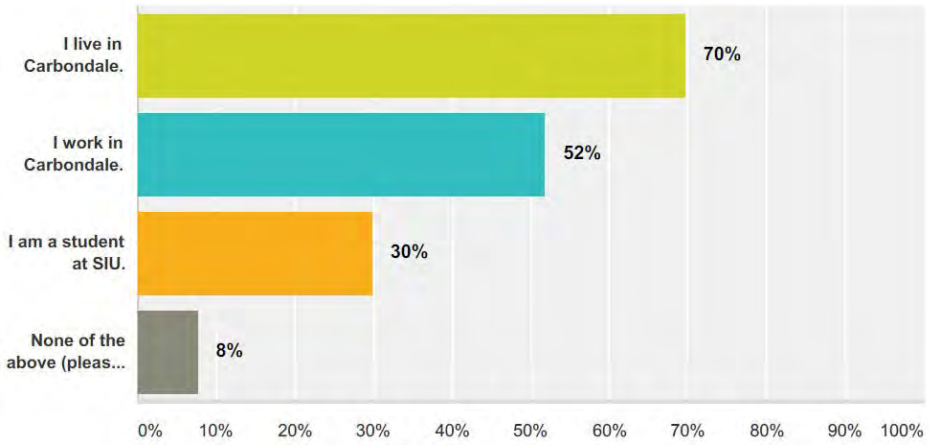
☐ Strongly Disagree ☐ Disagree ☐ No Opinion ☐ Agree ☐ Strongly Agree

Q5: What other comments or suggestions do you have regarding the draft components of the Carbondale Bicycle Master Plan?

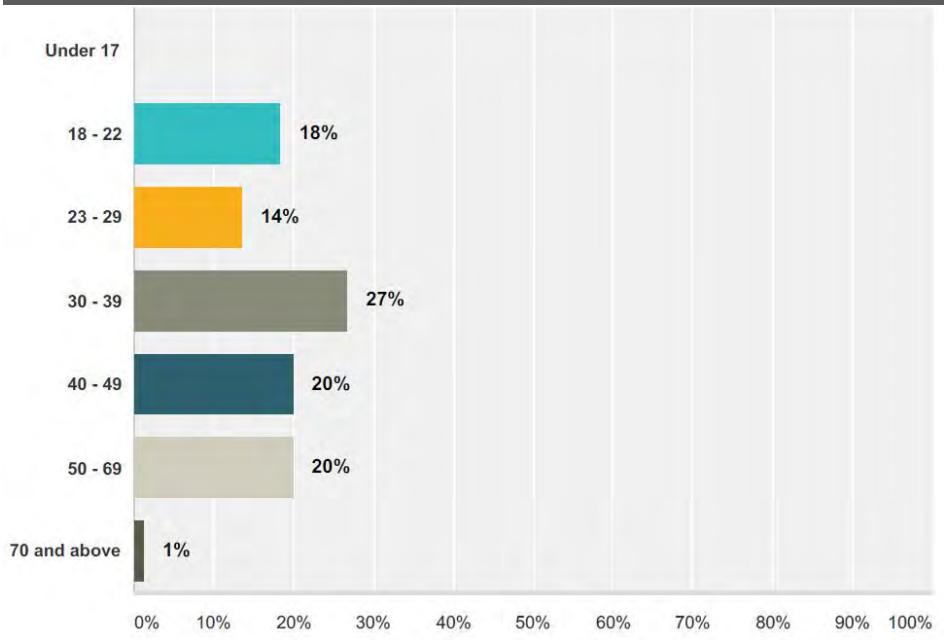
Thanks for attending the open house tonight and providing your feedback! Be sure to stay up to date about the plan at www.CarbondaleBikePlan.com. The boards from the meeting tonight will be available on the website. In April, the draft Carbondale Bicycle Master Plan report will be available for review.

Survey Results

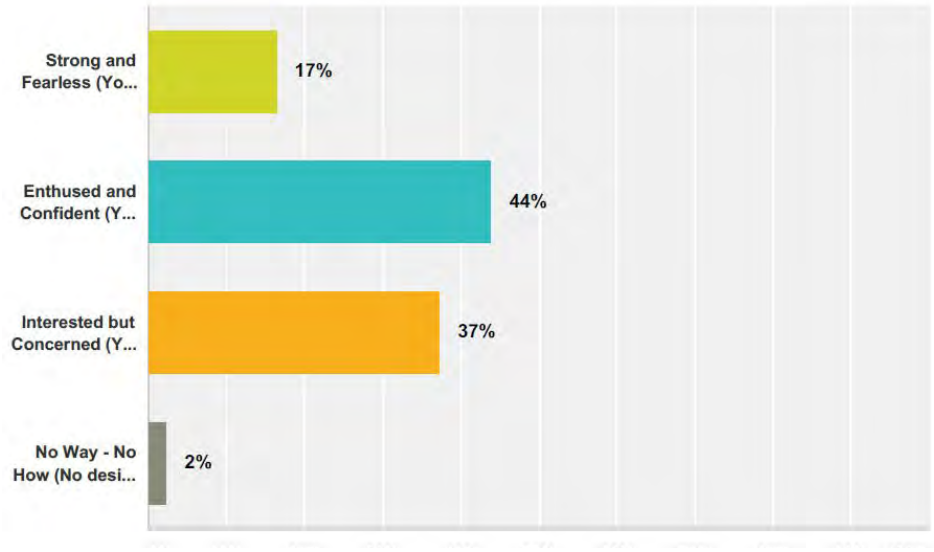
Q1: Choose all that describe you?



Q2: What is your age?



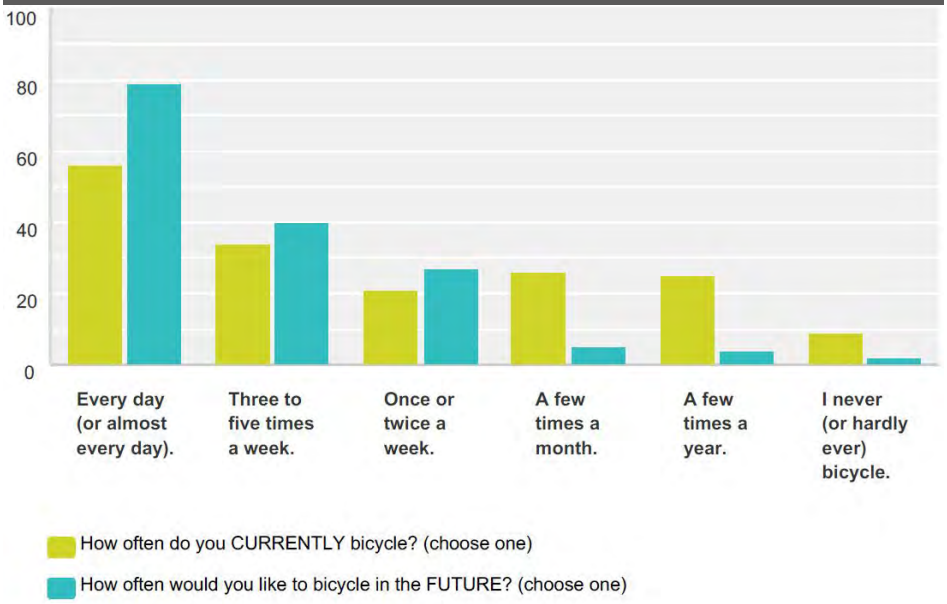
Q3: What best describes you as a bicyclist?



The categories of bicyclists include:

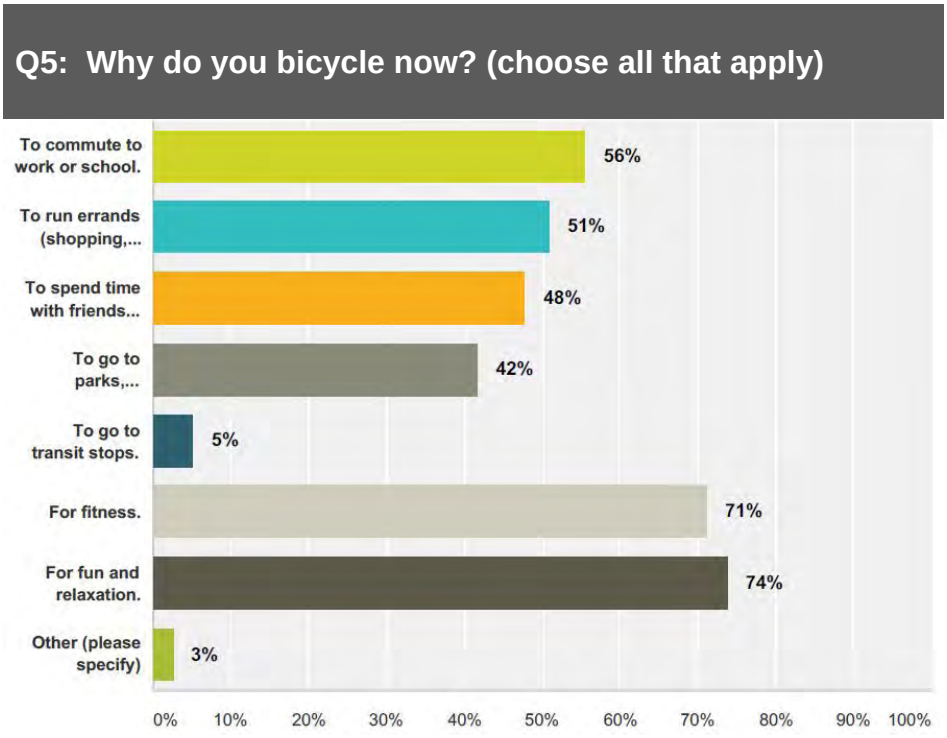
- Strong and Fearless (You ride in all types of traffic, regardless of whether there are bike facilities)
- Enthused and Confident (You are comfortable riding in traffic, but prefer facilities like bike lanes)
- Interested but Concerned (You enjoy bicycling, but are nervous about riding in traffic)
- No Way - No How (No desire to bicycle at all)

Q4: How often do you bicycle?



Respondents who identified as "Interested but Concerned" showed the greatest interest in riding more frequently, from a few times a month or year to almost every day or multiple times a week.

Bicycling for fun, relaxation, and fitness were the top responses for reasons for bicycling.



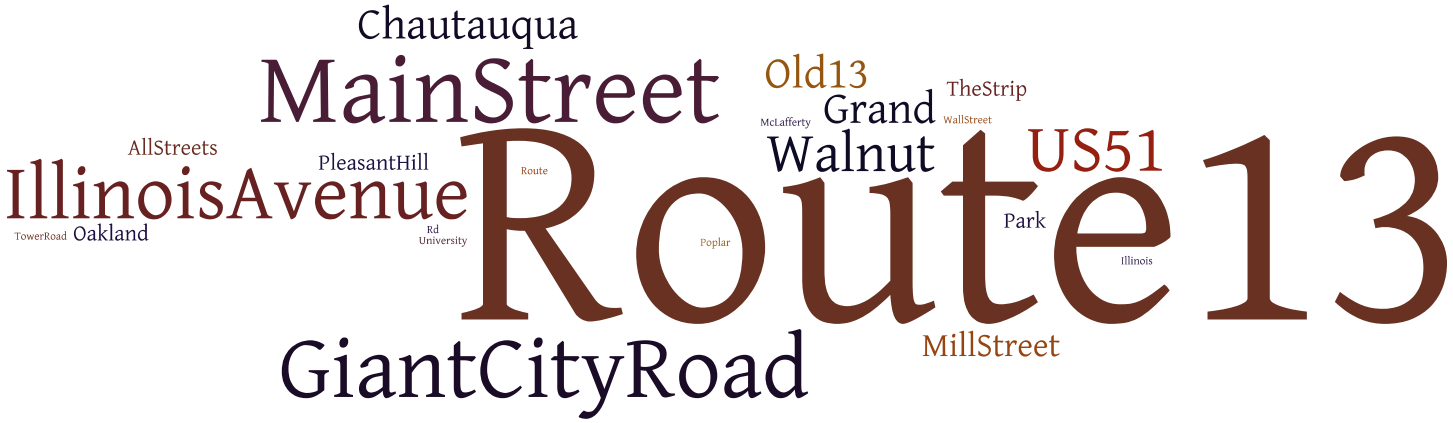
Q6: What is your top existing biking destinations within the City?

Q7: What are destinations outside of the City limits that you bike from the City (or would like to bike)?

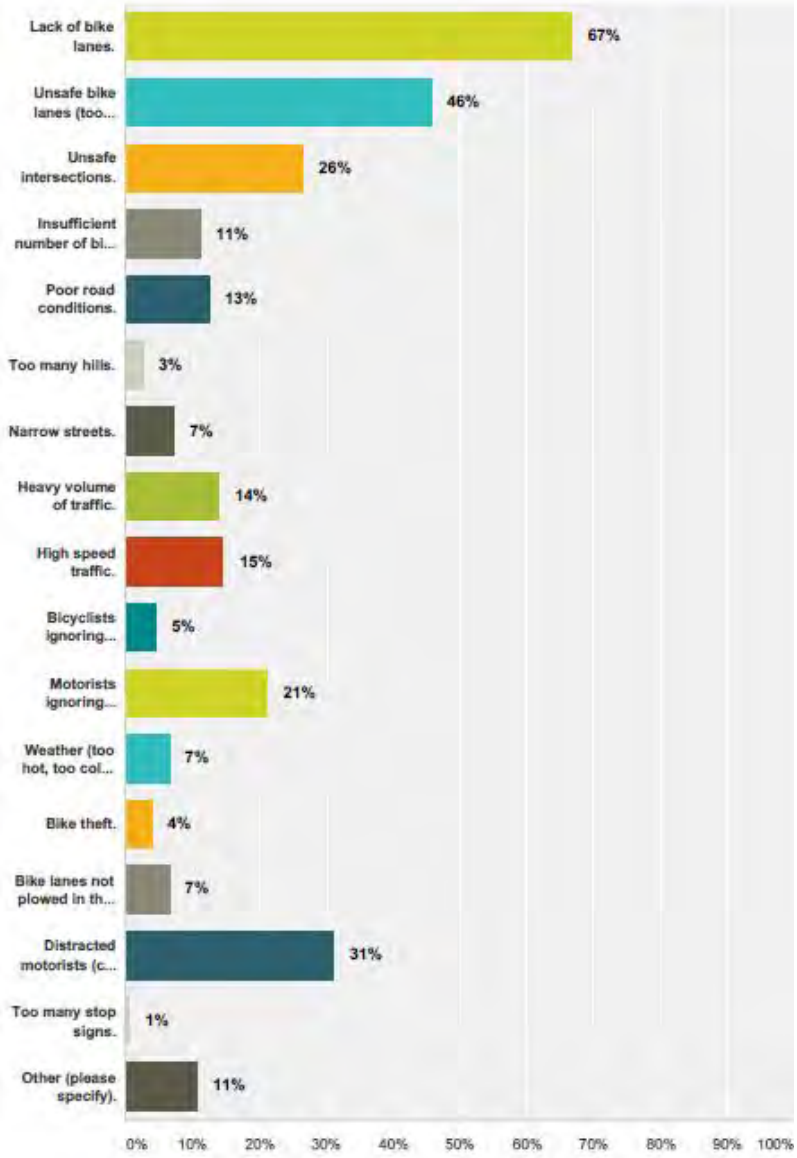
The word clouds on these two pages show proportionally the number of responses.

Q8: Currently, what streets do you frequently bicycle on?

Q9: In the future, what streets would you like to bicycle on?
(Perhaps you don't bicycle on these streets now because you feel unsafe)



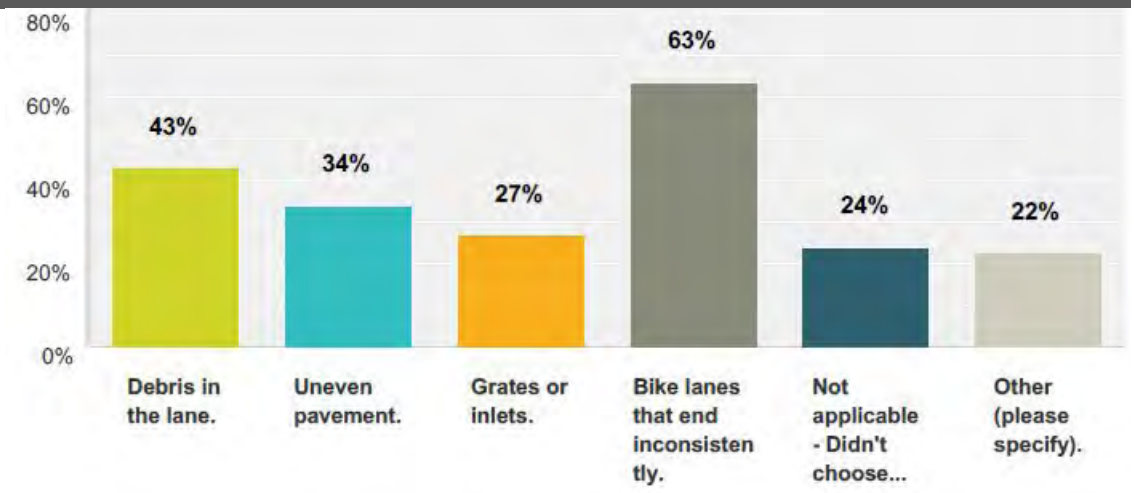
Q10: What are the top three challenges to biking in Carbondale? (Choose up to three)



The top challenges to biking in Carbondale are:

1. Lack of bike lanes.
2. Unsafe bike lanes.
3. Distracted motorists.
4. Unsafe intersections.
5. Motorists ignoring traffic rules.

Q11: If you chose "unsafe bike lanes" in the last question, what makes the bike lanes unsafe? (Choose all that apply)

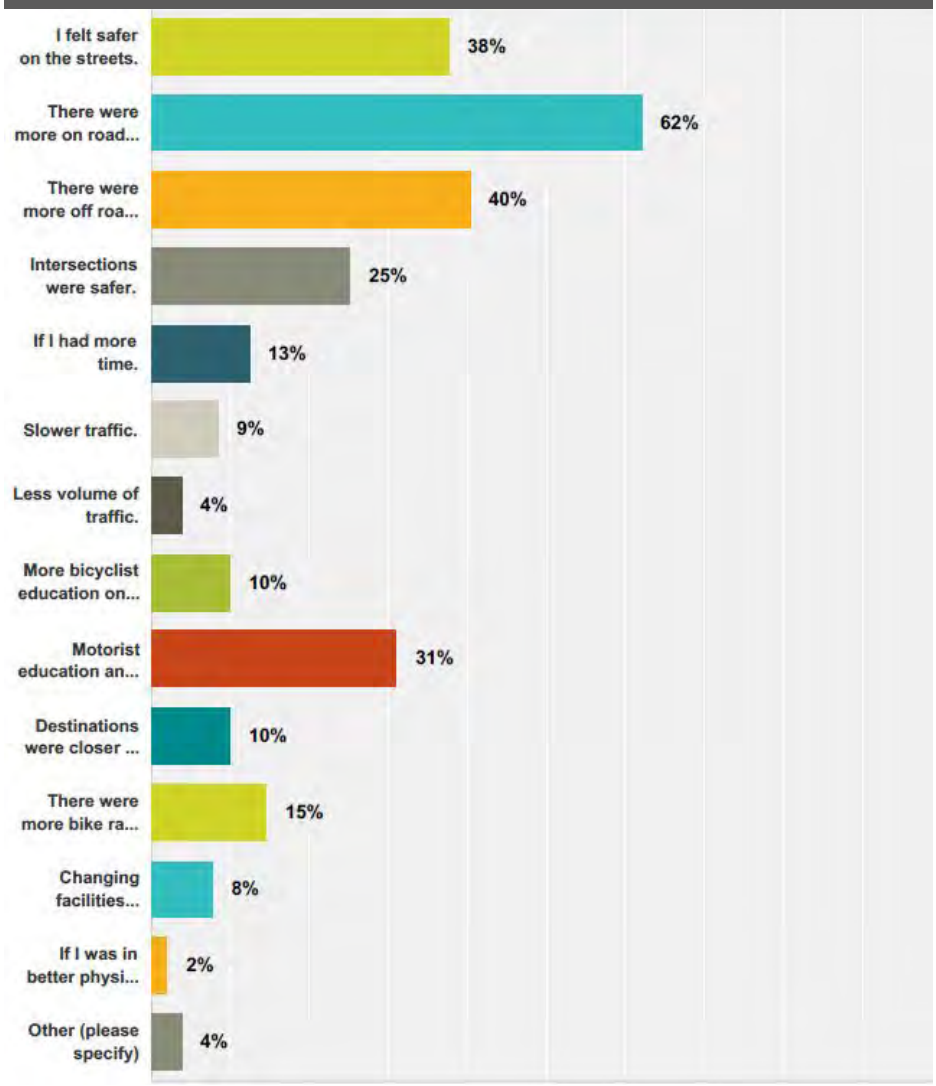


The top response for "Other" was existing bike lanes that are too narrow.

The top changes to help increase bicycling are:

1. There were more on-road bike facilities (bike lanes, shared lanes, etc).
2. More off-road trails.
2. Felt safer on the streets.
3. Motorist education and enforcement made streets safer for bicyclists.

Q12: What changes would help you to bicycle more often? (Choose up to three)

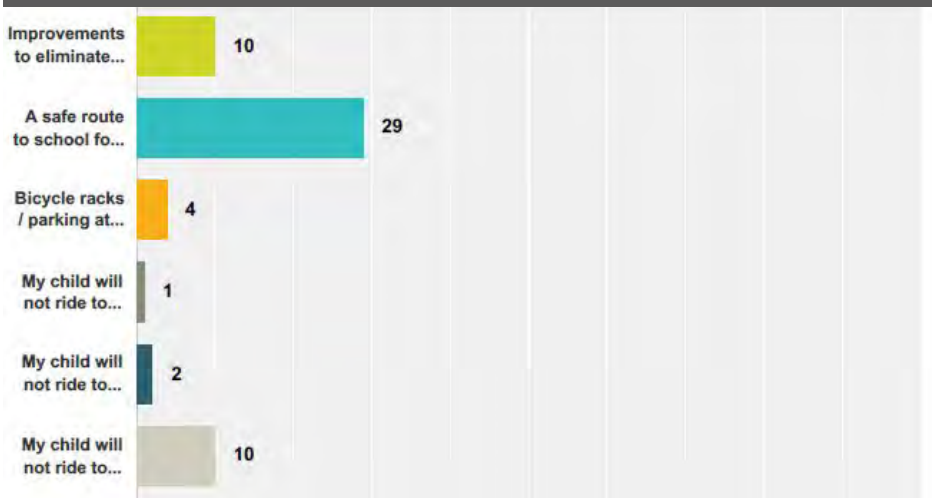


Q13: If you have school age children (grade school thru high school), do they bike to school?

60 percent of school age children of respondents have never ridden to school. Only 20 percent of children currently ride to school.

Although only a small percentage of respondents had school age children, there were strong trends of children not riding to school.

Q14: If your child doesn't ride or rides infrequently, what would help your child bike to school?



While almost one-third of the parents said their children would never ride to school because of lack of time or concerns about safety, two-thirds of parents said their children would potentially ride if there was a safe route to school or if one or two key barriers were eliminated.

Q15: If you have school age children, where do they bicycle? (Choose all that apply)

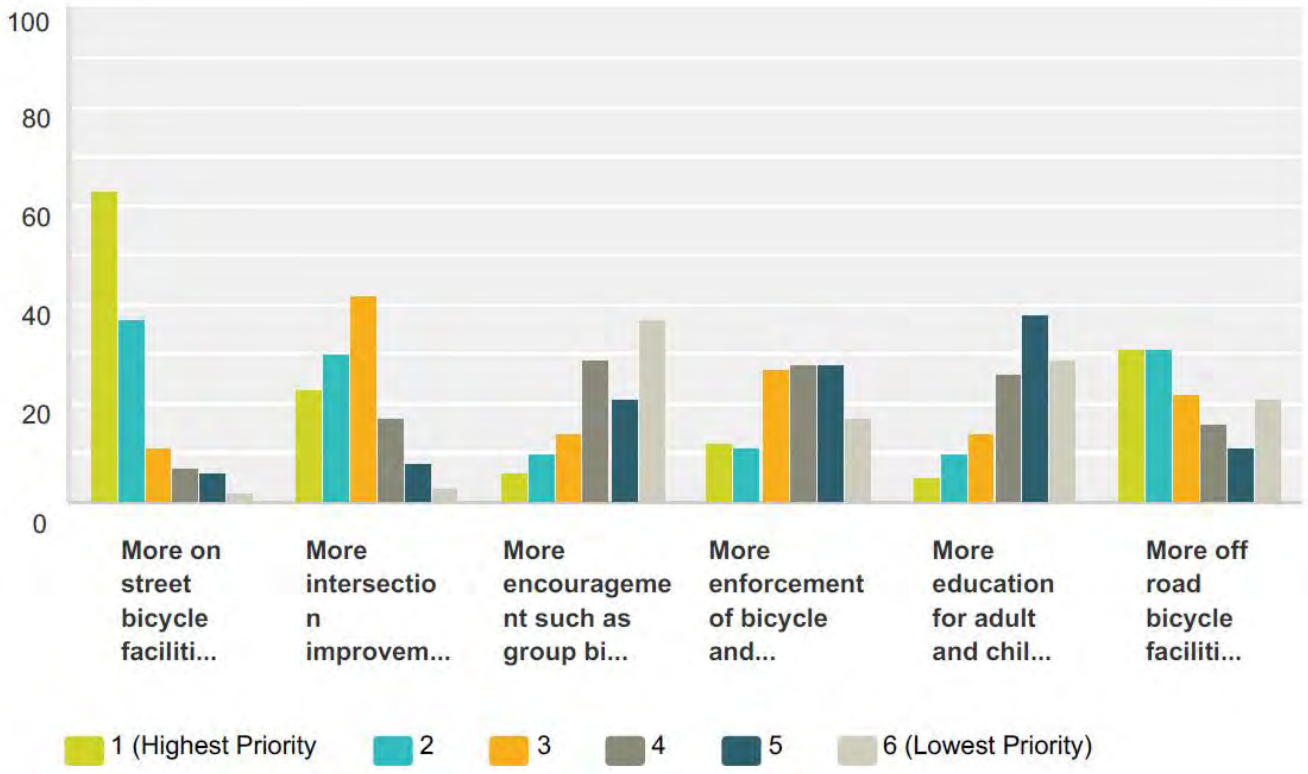
While school is not a major destination for children, children are riding their bikes to parks, within neighborhoods, and on family bike rides.

Over 85 percent of children are riding somewhere. Only 15 percent of children do not ride.

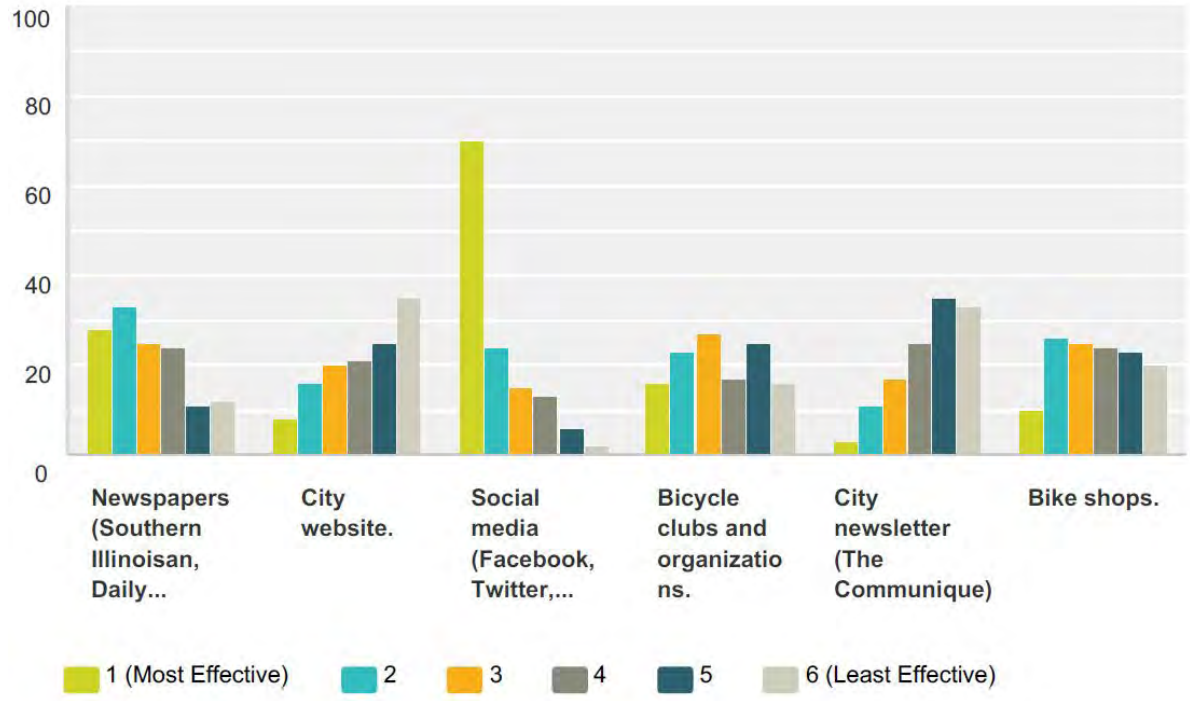
Q16: If you have school age children, have they taken any of the following bicycle education?

85 percent of children have not taken any bicycle education classes.

Q17: How would you rank the following ways to improve bicycling in Carbondale? (1 being the top priority, 6 being the lowest priority)



Q18: How would you rank the following ways to share information about bicycling (events, routes, resources, etc) in Carbondale? (1 being the most effective way, 6 being the least effective way)



Q: Other comments regarding the Carbondale Bicycle Master Plan.

The following is a sampling of other comments.

“There is no reason Carbondale should not be a bastion of cycling...”

“More off-street bike trails on more than one side of the community.”

“I really appreciate this movement and plan to take whatever action necessary to aid in the accomplishments of the outlined goals.”

“I think bringing more bicycle friendly options to Carbondale is wonderful for the community!”

“Need to revisit master plan to get input from pubic on effectiveness of plan in future years.”

“What are the plans to hold the “plan” accountable? Bicycles have been part of our master plan for years but who makes sure that the plans get done.”

“While planning, be mindful of the blending of rural and urban infrastructure/roadways and culture.”

“Impressed input is being considered.”

“Make safer bike lanes and encourage motorist and bicyclist alike to be respectful to each other when sharing the road.”

“I think this is a great idea and would cause me to get on my bicycle and ride much more often, rather than my daily exercise ride.”

“Many college and small towns have an emphasis on bicycling. this brings out the community, decreases traffic and is a welcoming site for people looking to move.”

“We should market Southern Illinois as an outdoor destination. Take notice of Chattanooga, Tennessee and what they are doing with their downtown.”

“Please, please, please make Carbondale a hub for bicyclists! This is something this community greatly needs. There is only one road that goes all the way across town. The community needs more ways to get across town.”

“The City has made great strides in improving bicycle facilities, keep the momentum going.”

“A large population considers Carbondale home, but they live outside of the city limits. Need safe ways to bike, walk and travel throughout Jackson County that make access to Carbondale easier.”

“Persuade people to believe that using bicycles can be a main transportation (not a hobby) for everyday life is achievable. As well as accommodate the appropriate bicycles routes that suitable to the users.”

“Education has to be coupled with safe, planned, and maintained riding routes for commuters, including shoppers, to destinations like Murdale and the Mall.”

“Making the city more bike friendly is overdue and will help enrich the community.”

What We Heard

Key issues that were heard from the community engagement process include:

"Outdated" Facilities
While the city of Carbondale has many strengths regarding bicycling including existing bike facilities, many of the facilities are outdated. For example, the striping on Sycamore Street and Lewis Lane has in the past been designated as "bike lanes". However, the lanes on Sycamore Street and Lewis Lane do not meet current standards for width to be designated as official bike lanes. The Greenway Bikeway along Piles Fork Creek is another example. The trail provides an important connection between Grand Avenue and Walnut Street. However, the trail does not meet current standards for width in some sections. In addition, the trail has outdated bridges, seating areas, and trailheads.

Crossing Key Intersections
There was concern by many bicyclists about crossing certain intersections, especially Route 13. There are real and perceived safety issues at many intersections. The plan should address making key intersections more comfortable for bicyclists to cross.

Confusion about Sidewalks and Sidepaths/Trails
There was great confusion about sidewalks versus sidepath/trails in the City and where bicyclists should ride. The confusion stems from multiple factors, which include:

Campus versus City Ordinances: On campus, bicyclists are allowed to share sidewalks and paths with pedestrians. However, within the City, adult bicyclists are prohibited from using the sidewalk. Thus students are accustomed to riding on sidewalks on campus, so are confused when they travel elsewhere in the City.

Improper Designation of Bikeways: Some sidewalks in the City are designated as bikeways that do not meet standards for width to be considered as a multi-use path. One example is the sidewalk on Grand Avenue east of Illinois Avenue. The sidewalk is only 5'- 6' in width and is labeled as a bikeway. This creates confusion by bicyclists on why other sidewalks in the City are prohibited.

Bicyclists tend to ride on sidewalks when they do not feel safe riding on the street. The plan should strive to provide on-street facilities that will allow bicyclists to feel safe and comfortable riding on the street.

Sidepaths and multi-use trails (which are wide enough for multi-use by bicyclists and pedestrians) will also need to be clearly differentiated from regular sidewalks.

Desire for Recreational Biking Opportunities within the City
Many bicyclists stated that there is a lack of recreational biking opportunities within the City. Bicyclists will often ride north of the City via New Era Road to ride the relatively flat and low traffic roads north of town. Many bicyclists, especially for longer family rides, will transport their bikes to other locations for recreational rides.

There is a desire to have more recreational biking opportunities, especially with off-road multi-use trails. A perimeter greenway system was a strong preference.

Opportunities to Improve School and Park Connections (Especially the New Recreation Complex)
Parks and open spaces owned by the Carbondale Park District and Green Earth provide a strong network of green space throughout the City. There was a strong preference to improve connections to the park and open space network, especially providing connections to the new water park at the Carbondale recreation complex.

Improving connections to schools was also another important consideration. Many parents said that their children would potentially ride their bicycle to school if there were safer routes to school. Intersection improvements, especially within a half mile radius, are an important tool to improve the likelihood of children biking to school.

Shoulder and Lane Maintenance
Debris and litter on shoulders and bike lanes was cited as one of the biggest problems with existing bicycle facilities. Street sweeping helps to keep shoulders and bike lanes free of debris, however, street sweeping has been reduced in past years for budgetary reason. The evaluation of increased street sweeping will be an important part of the plan and future implementation.

Opportunity to Leverage Carbondale as a Key Stop on TransAmerica Bike Trail
Carbondale is a key stop on the TransAmerica Bike Trail, which is a cross country bike route. Many respondents expressed a desire to see Carbondale leverage the TransAmerica Trail to increase tourism and raise the profile of the City.

Great Momentum on Campus
There is great momentum on the SIU campus toward improving bicycling. There is already great demand to ride. Many bicycle parking areas frequently reach capacity and the University has expanded many bicycle parking.

Staff and students are working toward applying for Bicycle Friendly University designation for SIU from the League of American Bicyclists. Other campus wide efforts include mapping existing bicycle parking, analysis of bicycle parking, and conducting a campus wide survey on bicycling.

Bicycle Parking
While bicycle parking is still needed in many areas of the City, good progress has been made to provide bicycle parking. The City adopted a bicycle parking ordinance in 2015 that requires any new development to provide bicycle parking. Multiple fix-it stations have been installed on campus and in the City. Carbondale Main Street is working with artists on custom bike racks for the downtown area. SIU has expanded bicycle parking in many areas on campus to meet demand.

Education
Multiple organizations are involved with providing bicycle education. The Carbondale Park District, Rotary, the City, and other partners conduct an annual kids helmet program.

However, there is a large opportunity to increase bicycle education. Key opportunities include:
- Educating SIU students, especially incoming freshman.
- Educating children. Only a limited number of parents said that their kids had any bicycle education. Most children have not had any formal bicycle education programs.
- Educating motorists.

Elevating the Culture of Bicycling
Elevating the culture of bicycling was a frequent comment during the community engagement. There are many ways to elevate the culture of bicycling such as expanding bicycle facilities, increased events, and more education.

Two short-term priorities for elevating the culture are bike parking and signage. Both parking and signage provide functional benefits and they are both highly visible examples of bicycling in the City. Branded, custom wayfinding signage will further raise the visibility of bicycling.

Chapter 4
Recommendations

Chapter 4
Recommendations

Recommendations

This chapter presents the recommendations of the Carbondale Bicycle Master Plan. The recommendations are categorized as infrastructure, encouragement, education, evaluation, and enforcement.

There are 26 recommendations in the five categories. Recommendations are prioritized in order to more easily focus on early momentum. For infrastructure, an overview of network improvements is included in this Chapter. For details of key corridors and a list of high priority projects, refer to Chapter 'Detail of Routes and High Priority Projects'.

Infrastructure (Facilities)

Encouragement

Education

Evaluation

Enforcement

Infrastructure (Facilities) Recommendations

Recommendation #1 – Fill in gaps in the existing on-street bicycle network to provide increased connectivity for safety and comfort with the goal of continuous, connected system of facilities spaced no more than ½ to 1 mile apart

Recommendation #2 – Improve key intersections to provide greater safety and comfort for bicyclist navigation.

Recommendation #3 – For existing non-conforming bicycle routes, modify streets to conform to current standards. For streets that cannot be modified, re-classify streets within the bicycle network.

Recommendation #4 – Improve connections to SIUC campus, especially at the Grand Avenue, Mill Street, and Pleasant Hill Road / Hwy 51.

Recommendation #5 - Increase the number of off-road bicycle facilities. Improve existing off-road bicycle facilities.

Recommendation #6 – Develop sidepath design standard to eliminate confusion over sidewalks versus sidepaths (multi-use trails) in the City.

Recommendation #7 – Increase frequency of street sweeping to help ensure bike lanes and shoulders are free of debris.

Recommendation #8 – Seek opportunities, including Safe Routes to Schools, to improve intersections and network recommendations within ½ mile of schools to for students riding to school.

Recommendation #9 – Further evaluate and develop preliminary plans for the following road diet candidates:

Recommendation #10 – Update the City's Complete Streets policy to include capital projects involving utility work in the evaluation of bicycle and pedestrian facilities.

Recommendation #1

Fill in gaps in the existing on-street bicycle network to provide increased connectivity for safety and comfort with the goal of continuous, connected system of facilities spaced no more than ½ to 1 mile apart.

OVERVIEW

The goal of the recommended bicycle network is to create a continuous, connected system of facilities spaced no more than ½ to 1 mile apart. The future bicycle network should also achieve a Bicycle Level of Service (BLOS) of B or higher.

Figure 4.1 shows the recommended bicycle network that creates a continuous, connected system of facilities. The recommended bicycle network map shows both existing and future bicycle facilities.

In creating the recommended network, the planning team examined corridors including:

- East-West Connections
- North-South Connections
- Connections to SIU
- Commuter Connections

EVALUATION

As the recommended bicycle network map shows, portions of Route 13 (Main Street and Walnut Street) and Giant City Road are not included as part of the recommended bicycle network.

Route 13 Evaluation

The public strongly desired bikeway improvements along the Route 13 corridor. Each segment of Route 13 was carefully examined for feasibility.

East of Lewis Lane are newly-constructed and planned sidepath sections. With current road widths, Main Street's bike lane – some of which can be buffered – could extend from Poplar Street to Lewis Lane with shared lane markings and motorist signage used for two gaps. A Walnut Street buffered bike lane could be added between University Avenue and Wall Street, with a sidewalk widened to sidepath width from Wall Street to Lewis Lane.

However, west of downtown, where an east-west route is much needed, the road widths of the Main Street-Walnut Street couplet do not allow for bike lanes and the land use is not easily suited for a sidepath. The same is mostly true west of the couplet to Emerald Lane, although sidewalk and crosswalk improvements are recommended for those biking there. West of Emerald Lane, wide paved shoulders are adequate currently, with sidepaths recommended during future development.

East of Emerald Lane, Sycamore Street and Oak Street are the recommended streets to provide the east-west connection through the City.

Giant City Evaluation

Giant City Road was another roadway of great interest. A slight widening of the paved shoulders, with rumble strip re-design, is recommended south of Dogwood Road. North of Dogwood Road, however, on-road width is inadequate for bike lanes and the recommendations focus on off-road improvements, including sidepaths.

ACTIONS

A core value of the plan is patience in implementation. Implementation should be opportunistic to incorporate bicycle improvements as part of other projects and development, not as stand-alone projects. However, some projects may only be achieved as stand-alone projects. These projects include wayfinding signs, sidepaths, multi-use trails, and some intersection projects. Some isolated high priority projects should also be considered to be done as stand-alone projects. See Figure 4.2 for high priority projects.

See Chapter 6 for details of the recommended bicycle network and high priority projects.

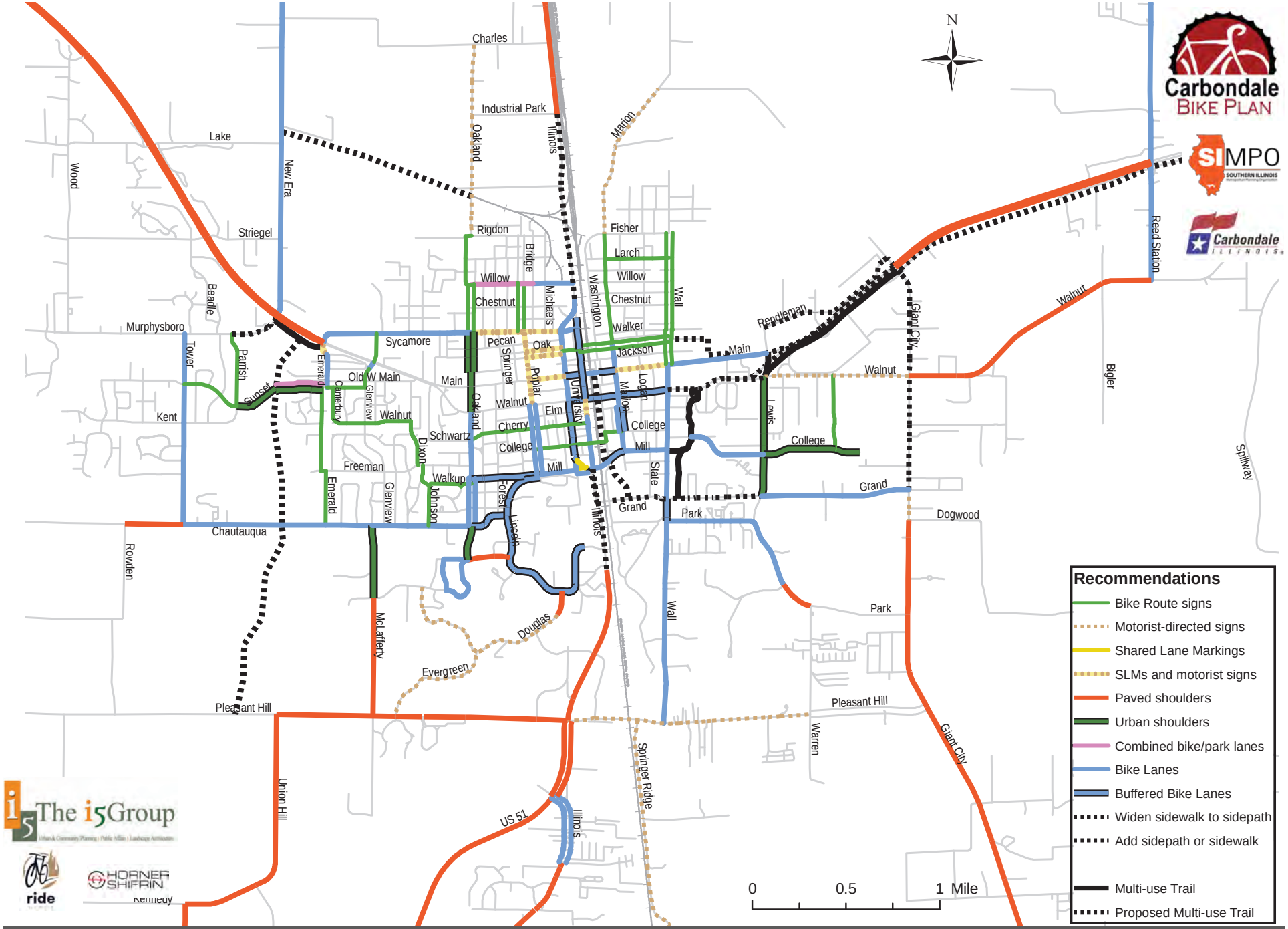


FIGURE 4.1: Recommended Bicycle Network

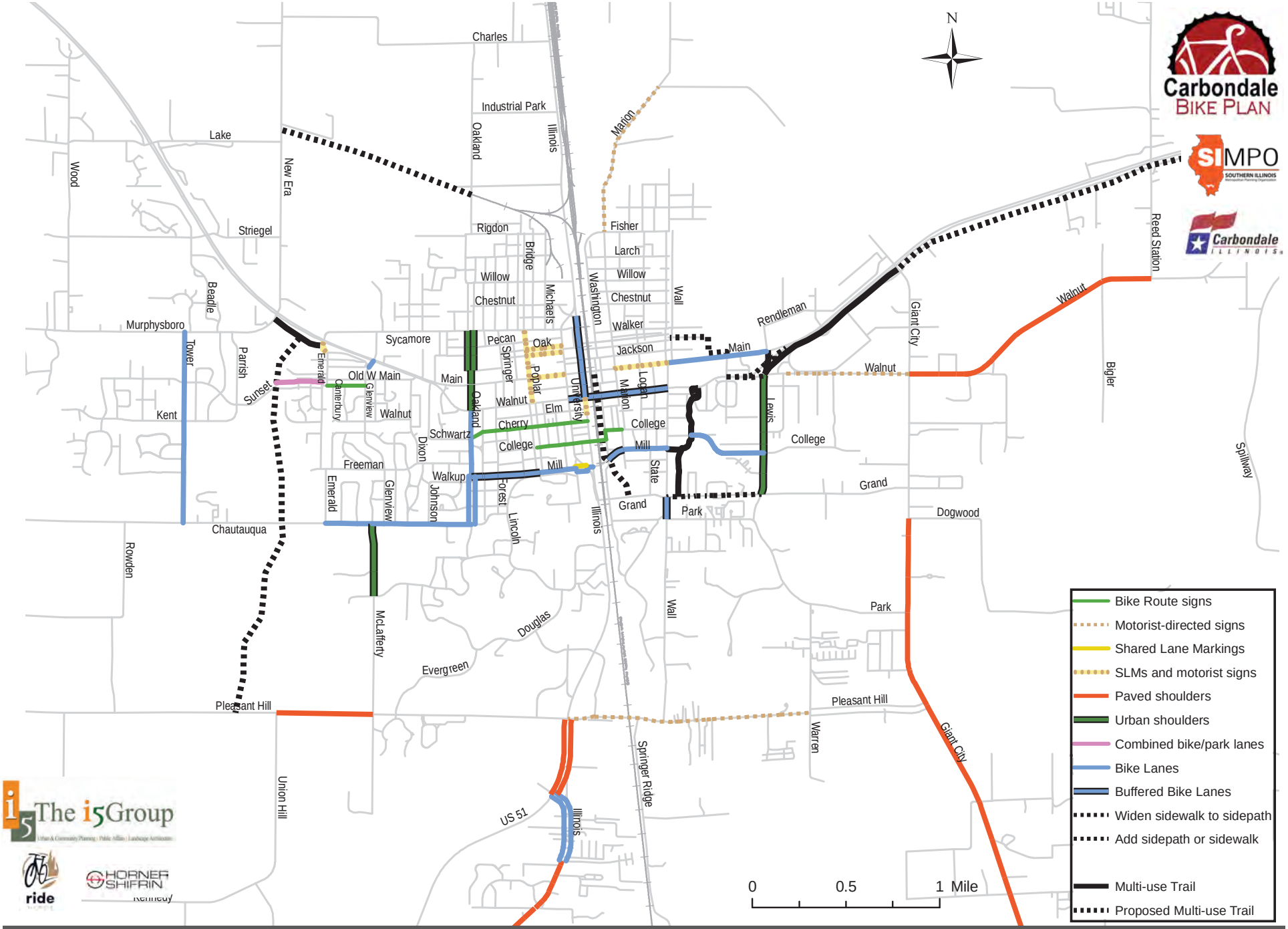


FIGURE 4.2: Recommended Bicycle Network - High Priority Projects

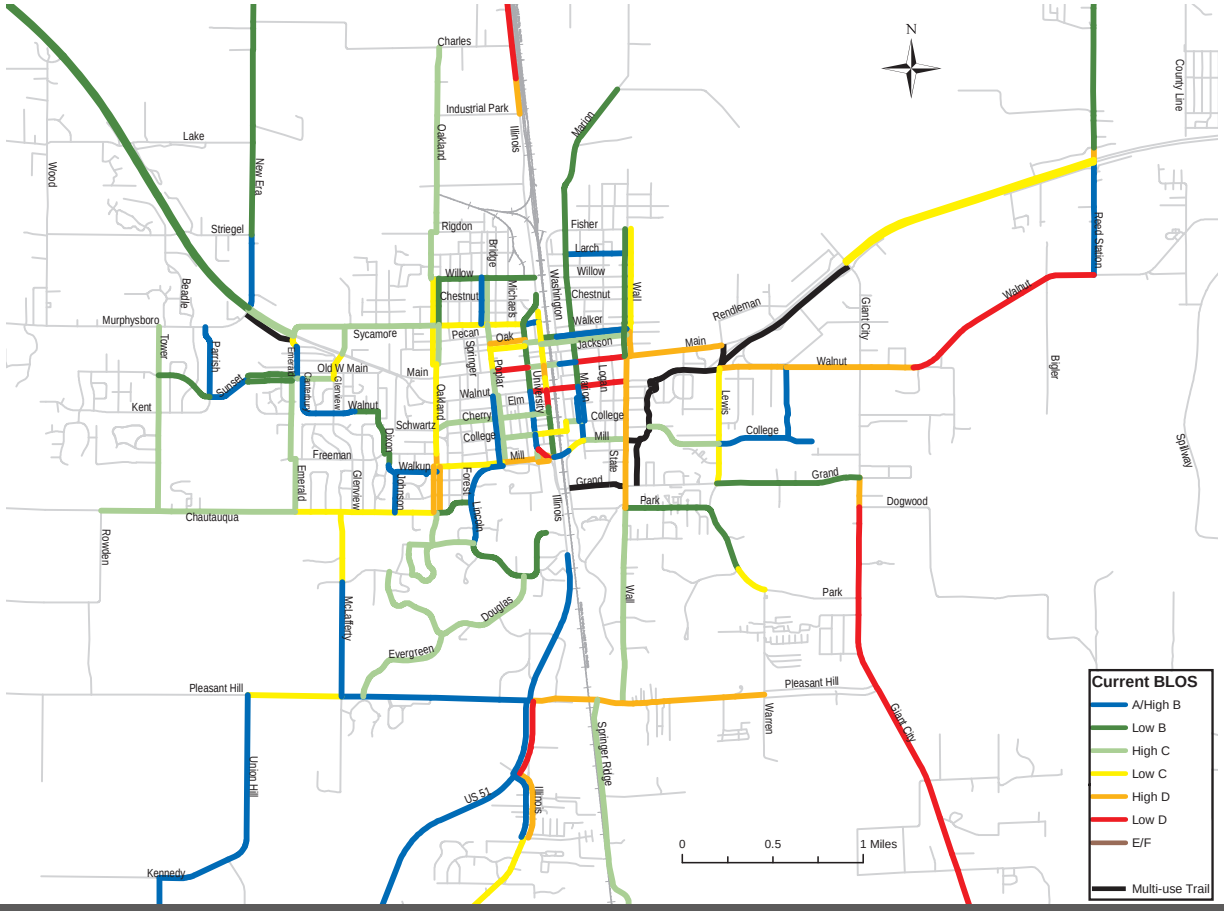


FIGURE 4.3: Current Bicycle Level of Service (BLOS)

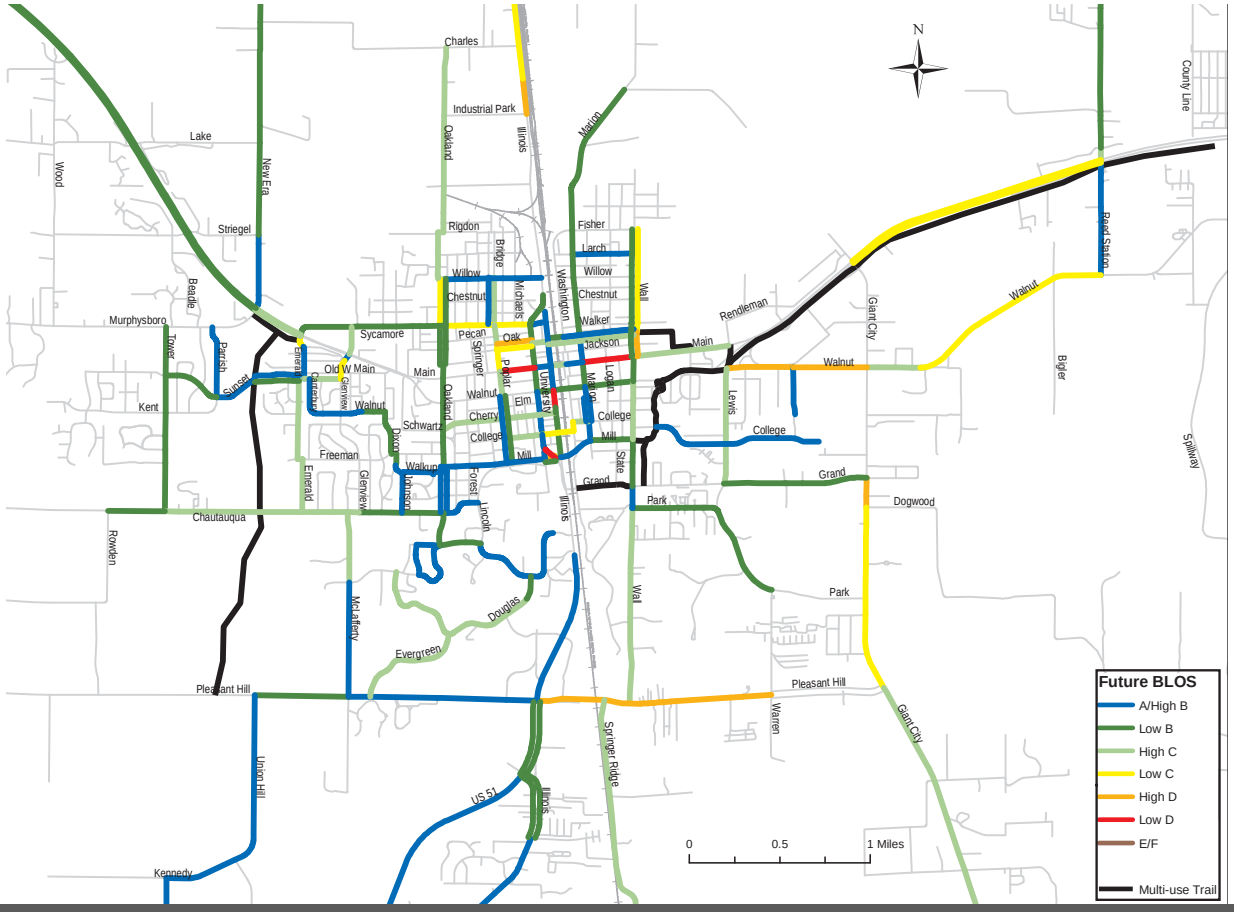


FIGURE 4.4: Future Bicycle Level of Service (BLOS) of the Recommended Network

Recommendation #2

Improve key intersections to provide greater safety and comfort for bicyclist navigation.

OVERVIEW

Figure 4.5 shows recommended improvements for key intersections in the city. These intersection improvements will provide important connections to key parts of the network. For many intersections, multiple improvements are recommended. For some intersections, multiple alternatives are proposed.

See Chapter 6 for a detailed discussion of routes including intersection treatments.

Intersection enhancements, such as the continental crosswalk above,can greatly increase safety and visibility of bicyclists (and pedestrians), especially for bicycle sidepaths. See the toolkit section in this report for the different types of intersections improvements. *(Source: www.pedbikeimages.org-DanBurden)*

Recommendation #3

For existing non-conforming bicycle routes, modify streets to conform to current standards. For streets that cannot be modified, re-classify streets within the bicycle network.

OVERVIEW

Some existing streets in the city, most notably Sycamore Street and Lewis Lane, are striped as bike lanes but do not meet the standard of bike lanes. On roads with no on-street parking and no curb-and-gutter, bike lane width must be at least 4' to the center of the bike lane stripe. On roads without parking but having curb-and-gutter, the minimum width must be 5', with these exceptions:

- 6', inclusive of the gutter, on higher-speed roads having 2' wide gutter pans
- 4' on constrained roads with minimum-width travel lanes and curbs without gutters

Wherever possible, 4' of usable bike lane width is recommended from gutter joint to bike lane stripe center.

EVALUATION

For several existing striped on-road bike routes in Carbondale, slight changes can be made to meet current standards for bike lanes.

Bike lanes have directional pavement markings that decrease wrong-way cycling on roads. Park Street east of Wall Street is a location where simply adding such markings raise a bikeway to bike lane status.

Reconfiguring the stripes between the following roads' travel lanes and striped bikeway areas would allow for official bike lane designation and markings and/or better compliance to recommendations:

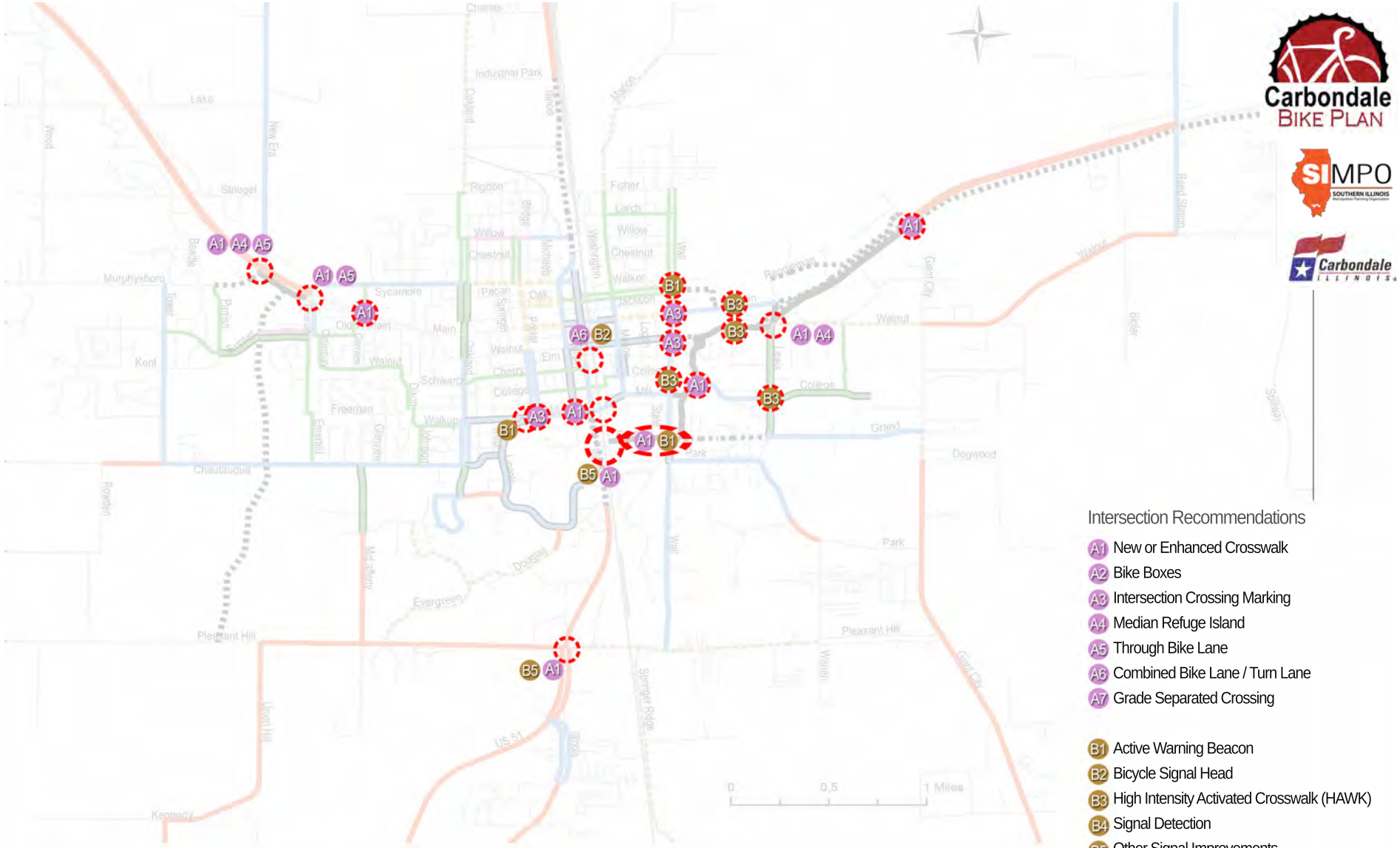
- S. Marion Street
- Sycamore Street
- New Era Road
- Northbound S. Poplar Street
- Sunset Drive, Parrish Lane to Little Crab Orchard Creek (with the bike route directly east, bike lane markings are not recommended)
- Grand Avenue, Lewis Lane to Giant City

“Urban Shoulders”

Oakland Avenue from Sycamore Street-Walnut Street, with 28’ pavement width and 1’ gutters, does not have enough width for both bike lanes and travel lanes having the minimum 11’ width. While official bike lanes cannot be recommended, slightly narrower “urban shoulders” (4’ including gutter) are feasible. Bike lane markings are omitted, but the stripe and wayfinding-based bike route signage are included. This approach uses the flexibility of bike route signage, which allows usage on preferred roadways regardless of that road’s geometry and striping.

Such is also the case for Lewis Lane from Walnut Street-Grand Avenue, where current pavement width does not allow for bike lanes. However, an additional recommendation is to mill the current 1.5’ gutters to 1’ width. This allows the current 2.5’ striped bicycle areas to expand to 3’ – reducing the chances of cyclists riding onto the gutter joint.

Lewis Lane is an example of a street where the existing striping does not meet the standard for a “bike lane” and there is not enough within the street to restripe for a full bike lane. In this situation, the striped area should be referred to as an “Urban Shoulder”. (Note: this existing urban shoulder incorrectly has bike lane markings. Bike lane markings should only be used on “official” bike lanes.



The i5Group

ride

HORNER SHIFRIN

FIGURE 4.5: Recommended Improvements for Key Intersections

Recommendation #4

Improve connections to SIU campus, especially at Grand Avenue, Poplar Street, Mill Street, and Pleasant Hill Road / Hwy 51.

OVERVIEW

By far, SIU is the leading bicycle destination within the City. In addition, students have a high desire to bicycle within the City including destinations such as the Mall, Murdale Shopping Center, and downtown. However, many students expressed concern about biking away from campus because they did not feel safe with current bicycle facilities. Connecting the campus to the greater citywide bicycle network should a high priority.

Connections should be improved to SIUC campus. See Chapter 6 for a detailed discussion of routes including intersection treatments.

Grand Avenue is a key connection to the SIU campus for bicyclists.

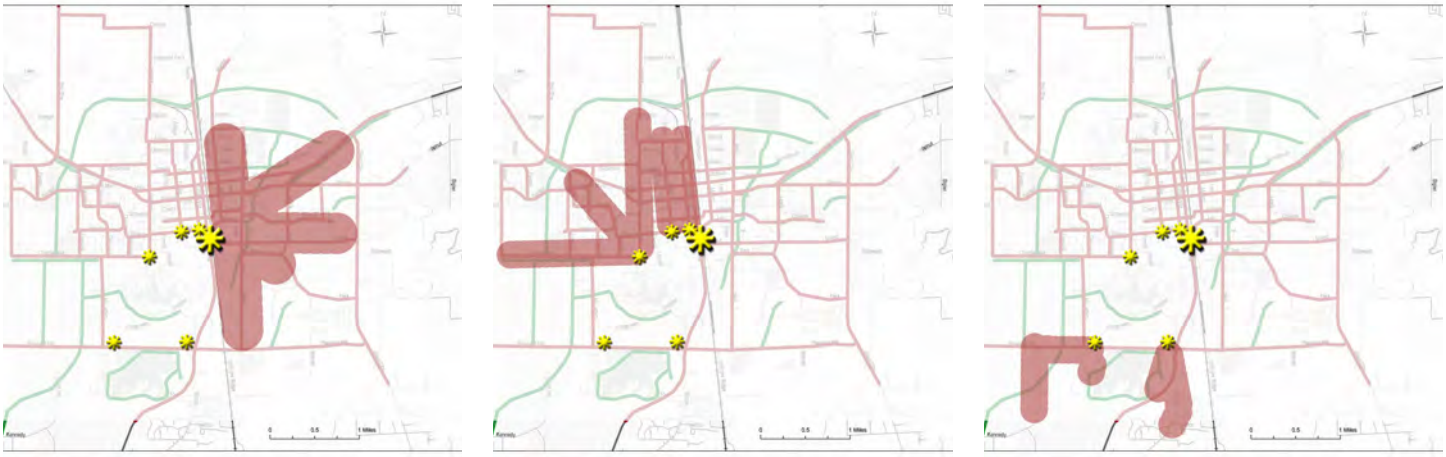
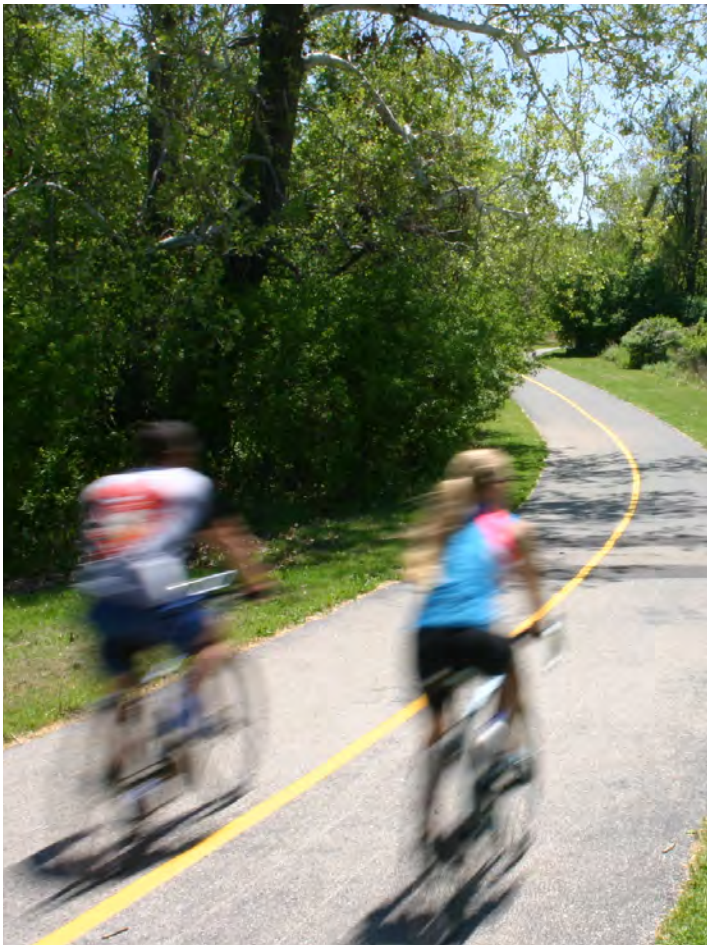


FIGURE 4.6: Connections to SIU campus for bicyclists.

Recommendation #5

Increase the number of off-road bicycle facilities. Improve existing off-road bicycle facilities.



OVERVIEW

An issue that was heard from the community engagement was the lack of recreational bicycle opportunities within the city, especially multi-use trails. A perimeter greenway trail network was suggested at Open House #1.

A perimeter greenway system would have multiple advantages. For instance, it would provide recreational options for bicycling, especially for families, and the greenways would connect many existing parks and Green Earth properties. Finally, the greenways would provide key connections in the overall bicycle network and could be used as a commuter and alternative transportation connections.

EVALUATION OF PERIMETER GREENWAYS

The feasibility of a perimeter greenway system was evaluated using existing parcel ownership as a key criteria. Figure 4.7 shows existing parcel ownership. Based on the screening of parcel ownership, three areas were identified as most feasible for greenways. The three areas are Oak Street connector, Little Crab Orchard Creek Greenway, and Oakland Avenue to New Era Road connection. These three areas had parcel ownership mostly by the city, the park

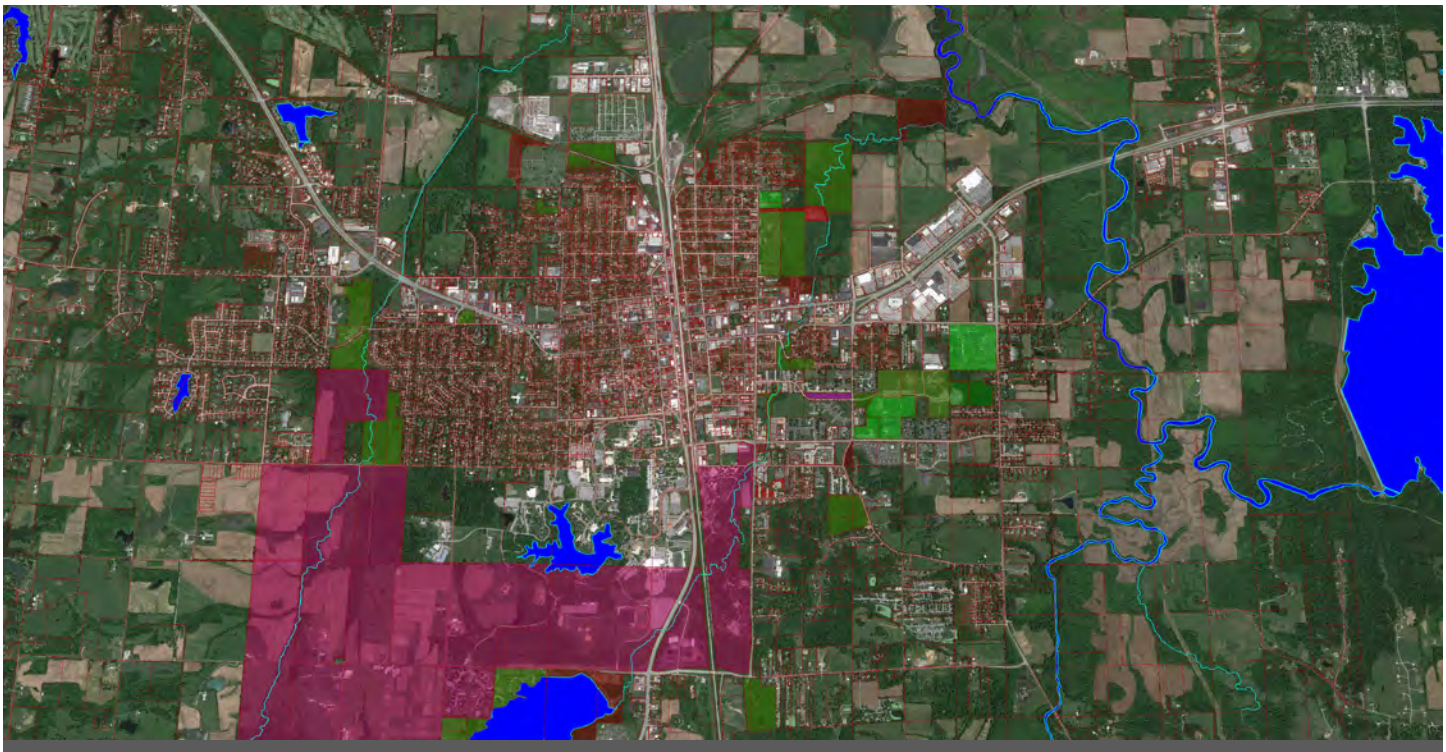


FIGURE 4.7: Parcel Analysis for Perimeter Greenway

district, Green Earth and the University.

A greenway/multi-use trail across the northern edge of the city is problematic due to the need for a grade separated crossing across the existing railroad tracks and existing parcel ownership. A connection is possible, but should be a lower priority and will require additional study.

A greenway/multi-use trail extension south of the existing Piles Fork Bikeway is also possible, but should be a lower priority.

RECOMMENDATIONS

Oak Street Connector

The Oak Street Connector will connect Oak Street at Wall Street to a northern extension of the Piles Fork Bikeway. The Connector will also connect to Route 13 and east to Rendleman Road. This multi-use trail provides a key segment of the east-west corridor through Carbondale. It connects important open space including Attucks Park and Green Earth's Piles Fork Preserve. See Figure 4.8.

There are two alternatives for the multi-use trail alignment. Alternative #1 would utilize existing right-of-way to the east of Wall Street and then utilize existing city owned parcels to connect to Route 13. Alternative #2 would utilize the southern edge of Attucks Park to connect to Piles Fork Creek. Both alternatives will require a new crossing of Route 13. A HAWK signal is recommended.

There are future opportunities to complete portions of the greenway. In 2015, SIMPO submitted a grant application to extend the Piles Fork Greenway to the north. Another option is the extension of Redleman Road. If Redleman Road is extended to Wall Street, the multi-use trail could utilize Redleman Road right-of-way or be a sidepath along Redleman Road.

Little Crab Orchard Creek Greenway

The Little Crab Orchard Creek Greenway will connect the existing multi-use trail along Route 13 to Pleasant Hill

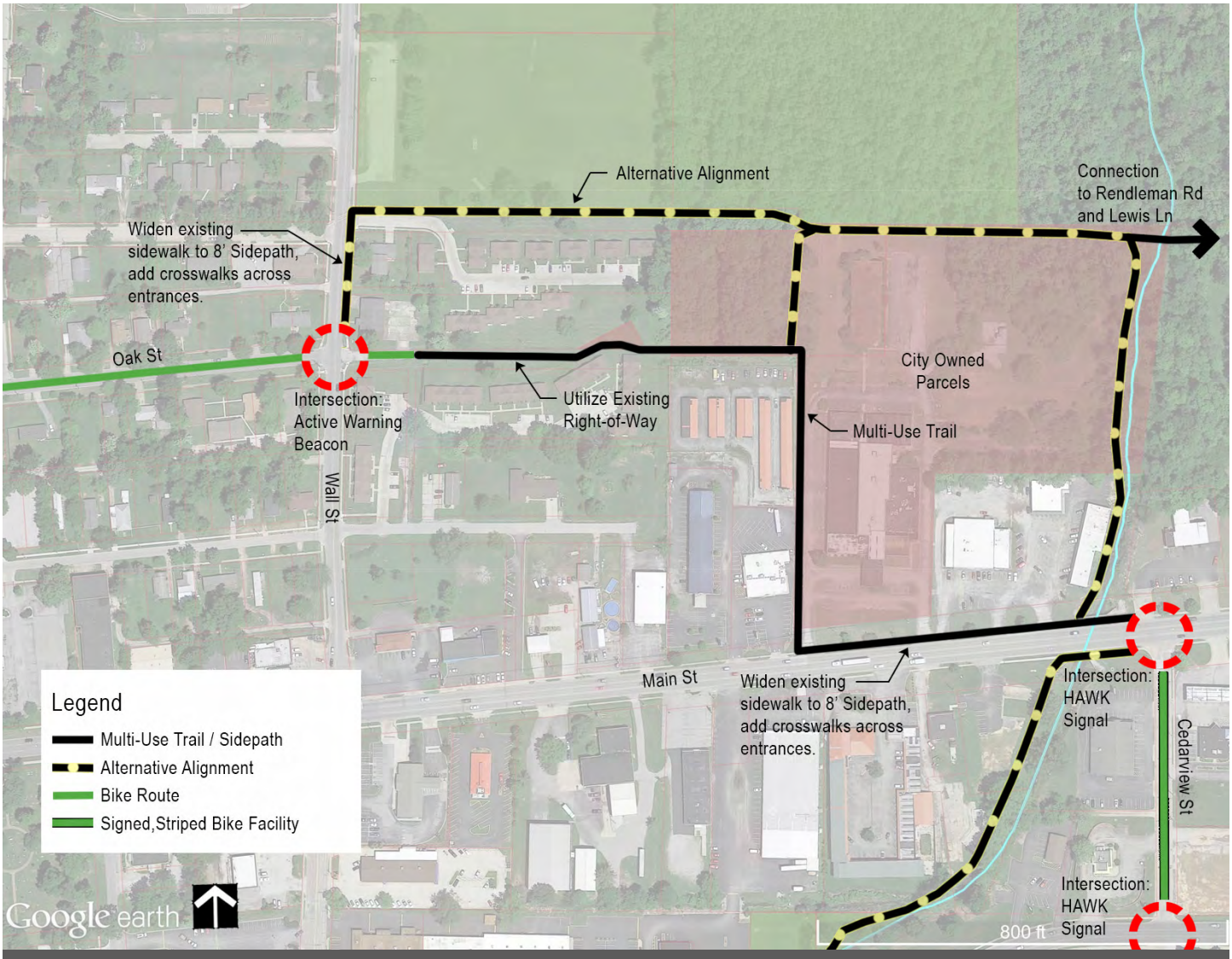


FIGURE 4.8: Oak Street Connector

Road and the Carbondale Reservoir. The greenway / multi-use trail could follow the alignment of the existing Green Earth trail within the Chautauqua Bottoms Nature Preserve or create a new alignment. South of Chautauqua Street, the trail could continue to follow Little Crab Orchard Creek or utilize an existing utility corridor to connect to Pleasant Hill Road.

A multi-use trail around the Carbondale Reservoir is recommended. This trail would provide additional recreational opportunities and create a southern loop to the Little Crab Orchard Creek Greenway. The trail would also service as a commuter connection for residents at the Saluki Point apartment complex.

Oakland Avenue to New Era Road Connection
The Oakland Avenue to New Era Road connection utilizes a former railroad right-of-way to connect two important streets in the overall bicycle network. Currently, the former railroad right-of-way is privately owned. An easement or land purchase will be required to implement the multi-use

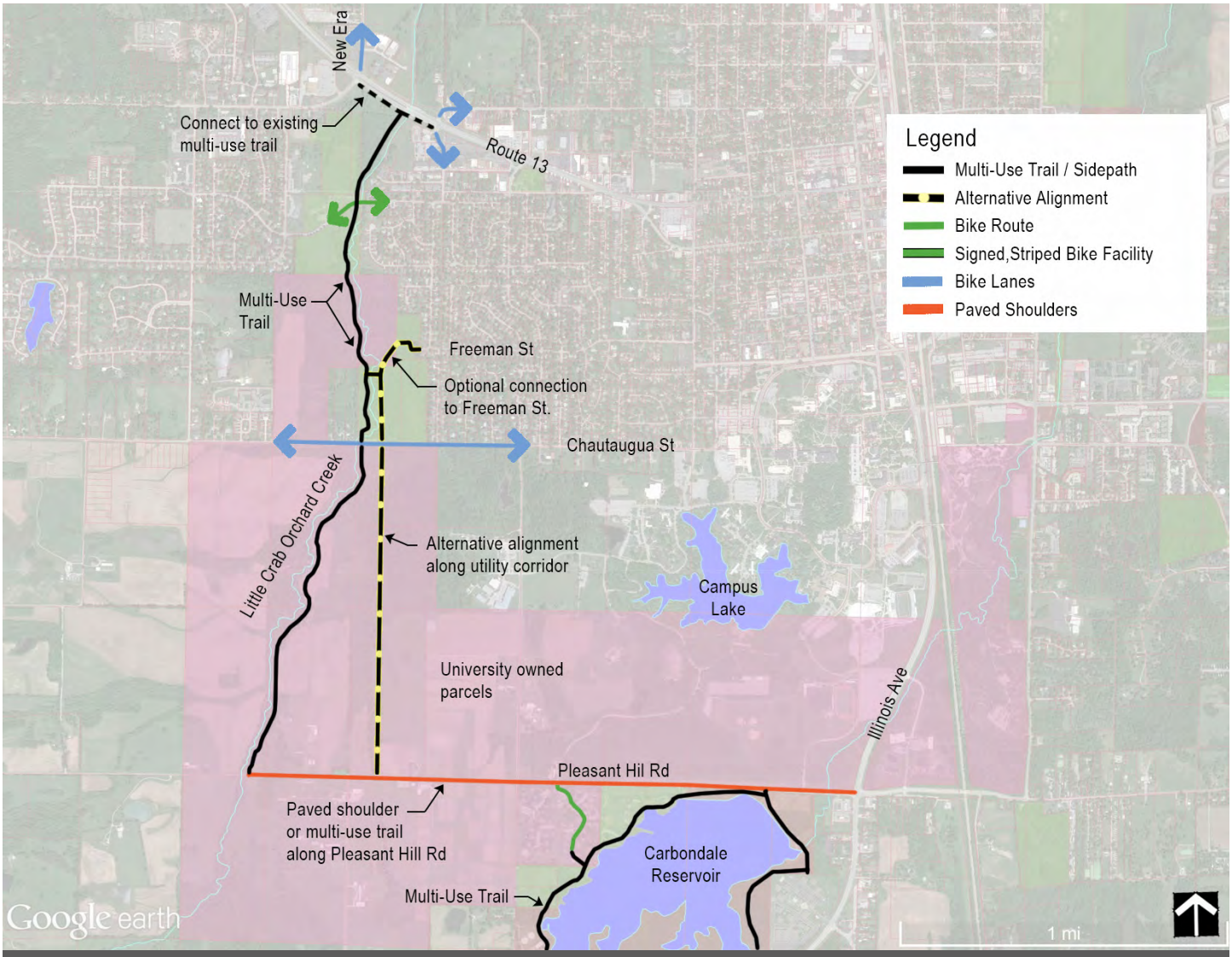


FIGURE 4.9: Little Crab Orchard Creek Greenway

trail.

Improvements to existing Greenway Bikeway along Piles Fork Creek

The existing Piles Fork Creek Bikeway is an important link from Grand Avenue to Walnut Street. However, the bikeway is in need of upgrades. Segments of the trail no longer meet current multi-use trail standards for width. Existing bridge railings no longer meet current standards. Recommended improvements include:

- Upgrade trail pavement. At minimum, the trail should be widened in certain segments. Ideally, the entire trail should be repaved.
- Upgrade bridges. At minimum, bridge railings should be upgraded. Ideally, the bridges should be replaced.
- Trail lighting should be installed. The trail is a good candidate for solar powered lighting that would save on conduit having to be installed.
- Existing outdated benches should be removed.
- Trailheads at Grand Avenue, Mill Street, College Street, and Walnut Street should be enhanced with wayfinding signage, paving, and seating. A fix-it station at one of the trailheads is recommended.

Greenway Bikeway: Existing trailhead at College Street is not visible or inviting. The trailhead should be enhanced.

Greenway Bikeway: Existing bridge railings do not meet current standards and should be upgraded.

Recommendation #6

Develop sidepath design standard to eliminate confusion over sidewalks versus sidepaths (multi-use trails) in the City.

OVERVIEW

Currently, there is confusion regarding riding on sidewalks in the city, especially by students. Students are allowed to ride on sidewalks on campus, however, in the city of Carbondale, ordinances prohibit bicyclists on sidewalks (except by children). Adding to the confusion, some existing 5' width sidewalks in the city have been marked as "bikeways". One example of this is along Grand Avenue.

To avoid confusion over sidewalks versus sidepath, design standard should be developed for sidepath and multi-use trails in the City. The design standard should be utilized by all partners involved with building bicycle facilities including: City of Carbondale, IDOT, Carbondale Park District, and SIU.

EVALUATION

Other urban areas have implemented better defined multi-use trails and sidepaths. Many of these treatments, however, while effective, are more costly that what is recommended for Carbondale. The following example from Washington University in St. Louis may be appropriate for high profile locations in the City, it is not necessary as a citywide standard.

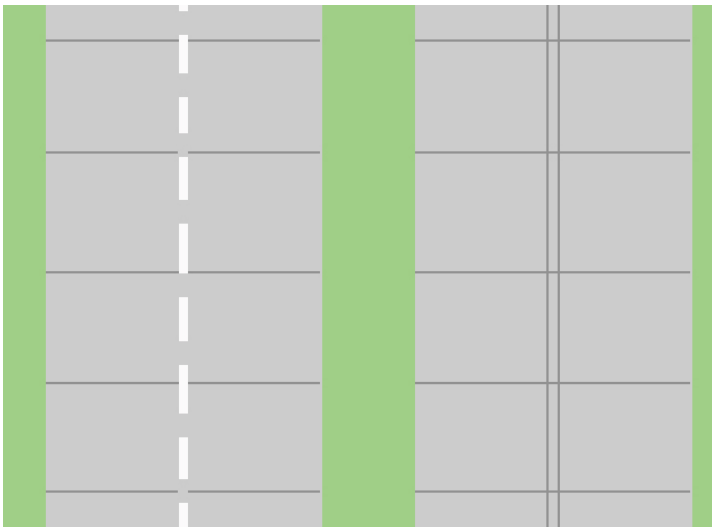
PRECEDENT

The 2015 installation of a multi-use trail along Route 13 has provided a precedent for a design standard for a multi-use trail / sidepath. The multi-use trail along Route 13 uses striping.

RECOMMENDATION

Future sidepaths and multi-use trails in the city (concrete or asphalt) should use the following design standard: Centerline marking with either striping (preferred) or scoring. If scoring is used, a double scored line should be used to make the center line more visible.

The multi-use trail or sidepath should be supplemented with signage designating it as a "shared-use". The signage should be part of the overall wayfinding hierarchy of the bicycle network.



Top: Example of urban sidepath with clear separation of pedestrians and bicyclists. While this treatment may be appropriate for high profile locations, it is not necessary as a citywide standard.

Above: Striping or scoring with supplemental signs is recommended as the sidepath/multi-use trail standard.

Recommendation #7

Increase frequency of street sweeping to help ensure bike lanes and shoulders are free of debris in the City.

OVERVIEW

"Debris in the lane" was the second most frequent answer in the bicycle survey regarding why bike lanes are unsafe. More frequent street sweeping will help to keep bike lanes and shoulder free of debris. Currently, the city sweeps major streets approximately once a month and downtown streets once a week. In the past, the city swept more frequently, but because of budgetary reasons, have cut back the frequency of sweeping.

The city and IDOT should evaluate increased street sweeping. Options for increased sweeping besides a year long commitment includes:

- Increased seasonal sweeping (spring, summer, fall).
- Increased key route sweeping. Key routes could be determined from heavy usage or heavier than normal debris (excessive litter, tree branches, tree fruit, etc).

Increased street sweeping will help decrease debris in bike lanes and the travel paths of bicyclists.

Recommendation #8

Seek opportunities, including Safe Routes to Schools, to improve intersections and network recommendations within ½ mile of schools to for students riding to school.

OVERVIEW

Parents that responded to the bicycle survey stated that very few had children that rode their bikes to school. Many parents said that safer facilities would increase the chances that their children rode to school. Intersection improvements and bicycle network recommendations within ½ mile of school should be a priority to increase the ability for students to ride to school. In Illinois, the Safe Routes to Schools program is administered by IDOT. The program is an excellent source of funding for infrastructure and non-infrastructure projects that improve bicycling and walking to school.

Recommendation #9

Further evaluate and develop preliminary plans for road diet candidates

OVERVIEW

Further evaluate and develop preliminary plans for the following road diet candidates:

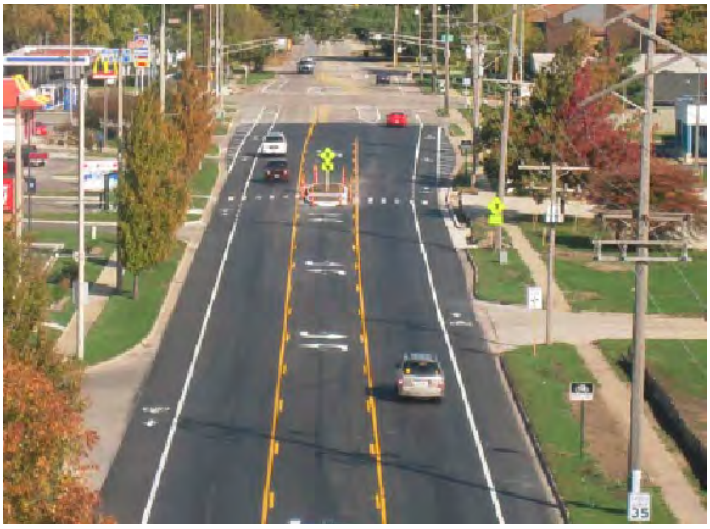
- Mill Street
- Wall Street
- Walnut Street (Between University Avenue and Illinois Avenue)

Implementation of some of the plan's bike lane recommendations is relatively straightforward, with sufficient pavement width under current conditions. However, some streets require creative approaches to accommodate both vehicular and bicycle traffic.

One such creative approach is the reduction of lanes – a "road diet." A road diet is a reduction of lanes on a road. The opportunity to reduce lanes is based on excess capacity to handle traffic volumes. Typically, the reduction is from four lanes to two lanes with a turn lane. However, depending on traffic volumes, lane reductions can vary.

The advantages of a road diet include:

- Traffic calming.
- Opportunity for bicycle and pedestrian facilities.
- Opportunity for streetscape enhancements such as medians.



Example of a road diet in Urbana. This road was previously four lanes.

The plan calls for road diets for five roadway sections in town (See Figure 4.10). The following are descriptions of three of the key road diets:

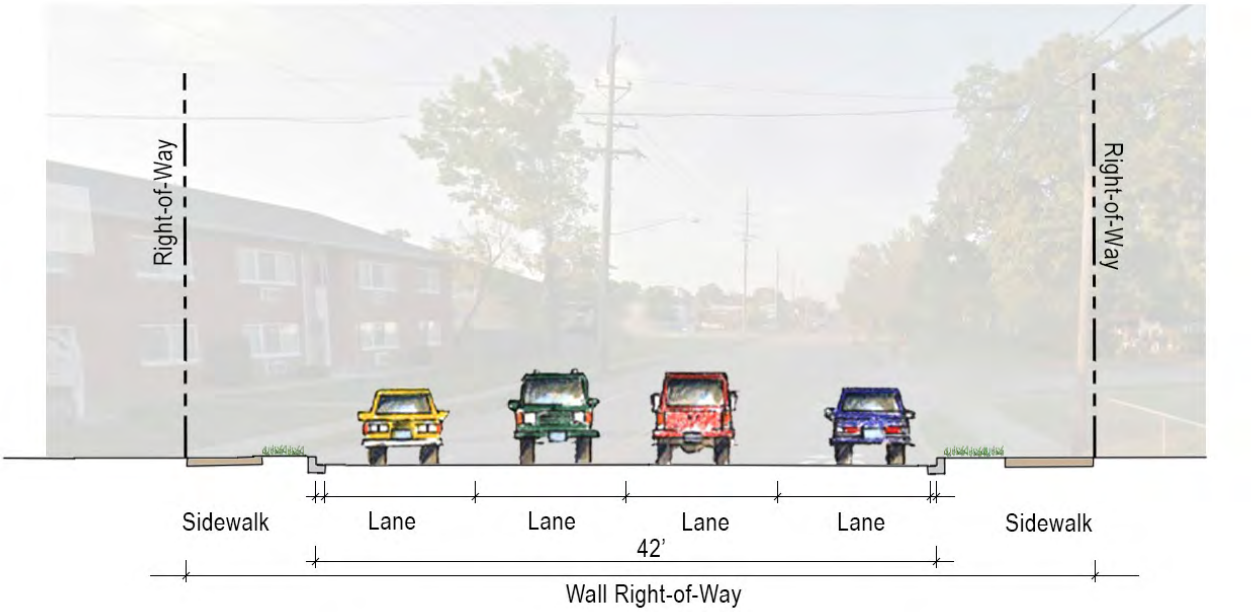
Wall Street from Main Street to Park Street. Study the conversion of the four-lane road to three lanes, with one travel lane in each direction, a continuous left-turn lane, and either striped bike routes or official bike lanes. (See Figure 4.11 for existing and proposed cross section)

IL 13/Walnut Street from University Avenue to Illinois Avenue. Study the removal of the left-turn only lane, to provide enough pavement for a regular or buffered bike lane. (See Figure 4.12 for existing and proposed cross section)

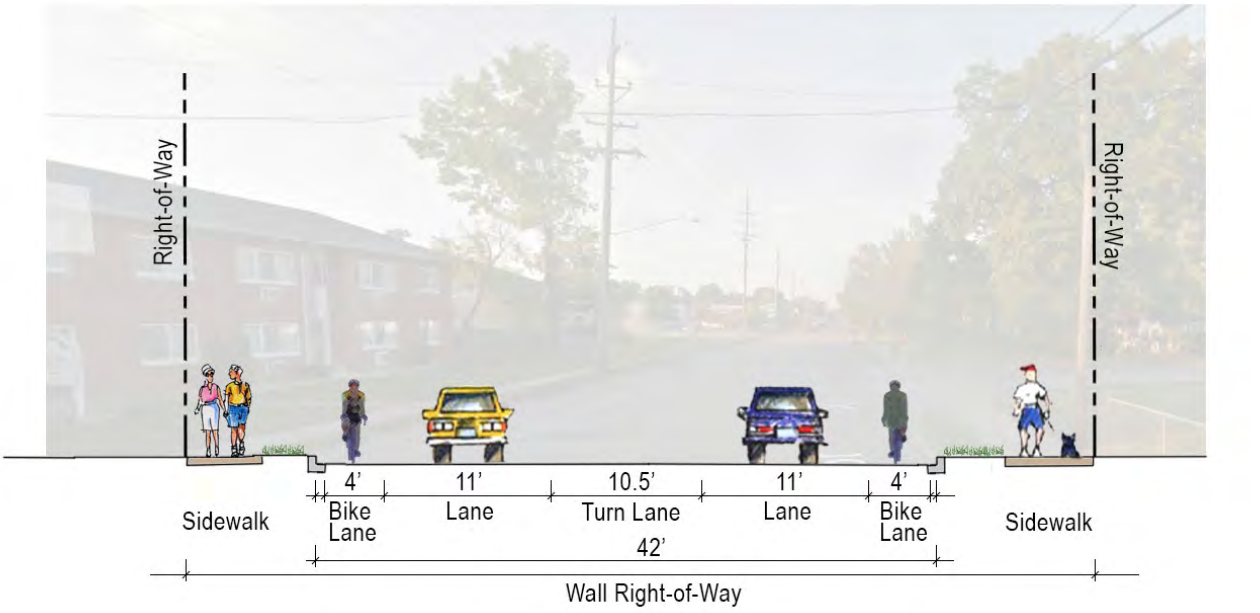
Mill Street from Oakland Avenue to Normal Avenue. Study the conversion of the four-lane road with median to three lanes, with one travel lane in each direction, a continuous left-turn lane, and buffered bike lanes. Such a study must factor in potential SIU traffic pattern changes as well as the desirability of maintaining a landscaped median. At present, Oakland Avenue to Poplar Street seems to be an especially strong road diet candidate for either the primary recommendation above, or an alternative maintaining the median. (See Figure 4.13 for existing and proposed cross sections)

The above are key potential road diet locations in Carbondale. It is important to note that these are potential candidates for road diets based on initial analysis. Additional traffic studies will be required to analyze peak traffic volumes, turning movements, and lane configurations. The Federal Highway Administration's Road Diet Informational Guide is a resource for the proposed traffic studies.

FIGURE 4.10: Potential Road Diet Locations



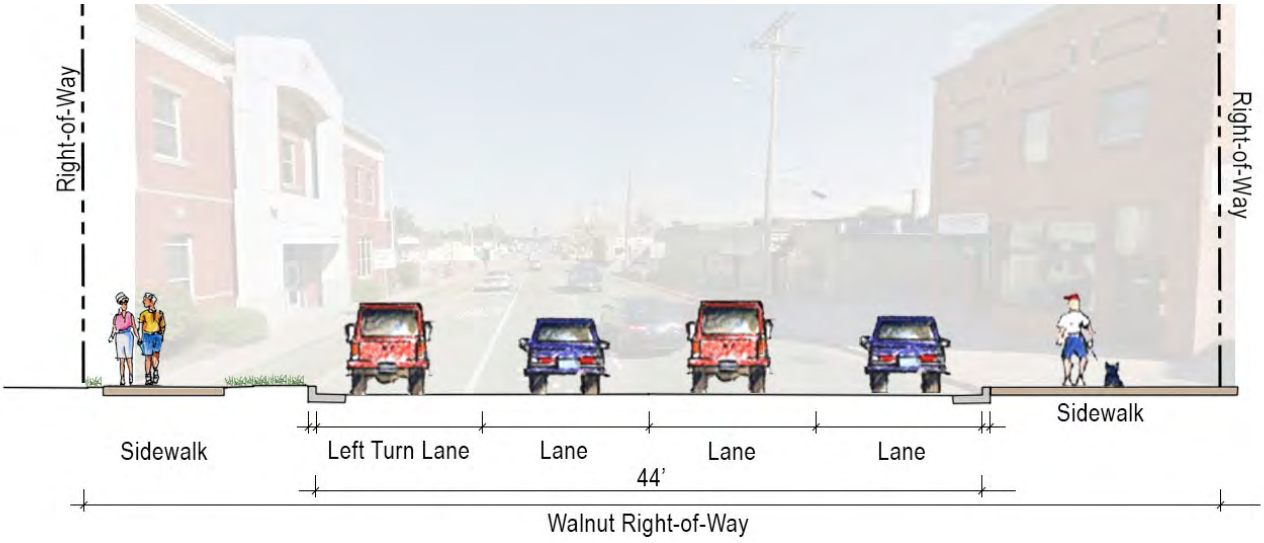
Wall Street Looking North - Existing Condition



Wall Street Looking North - Proposed

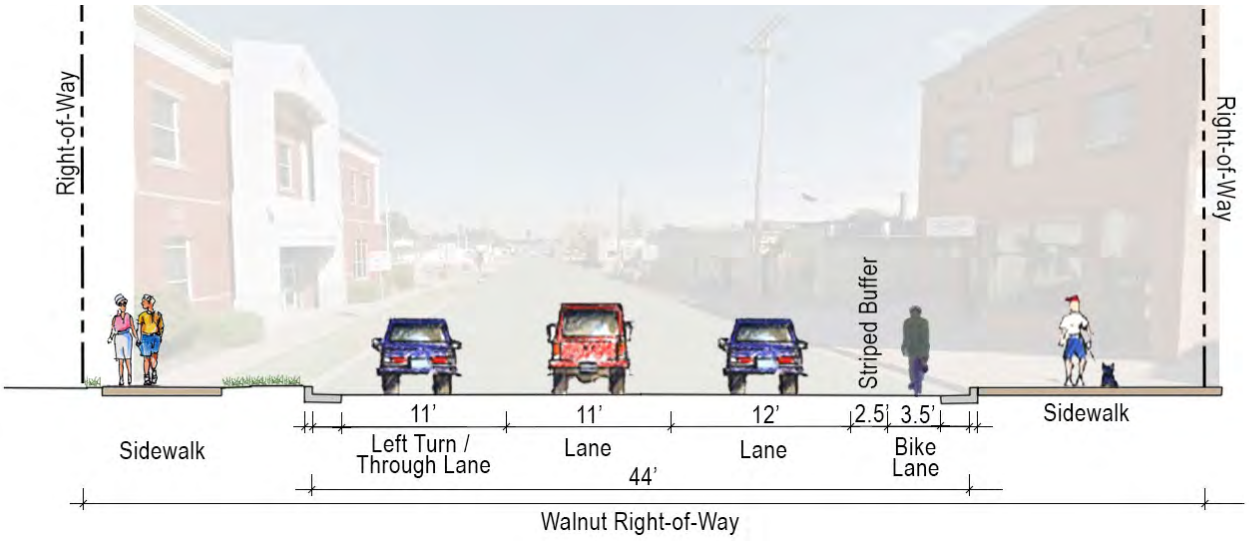
Two 11' vehicular lanes and a 10.5' turn lane will provide enough width for 4' bike lanes each direction.
The turn lane could also be used as a space for a median refuge island for street crosswalks across Wall Street, especially at College Street.

FIGURE 4.11: Wall Street - Road Diet Cross Sections



Walnut Street between University Ave and Illinois Ave: Existing Conditions

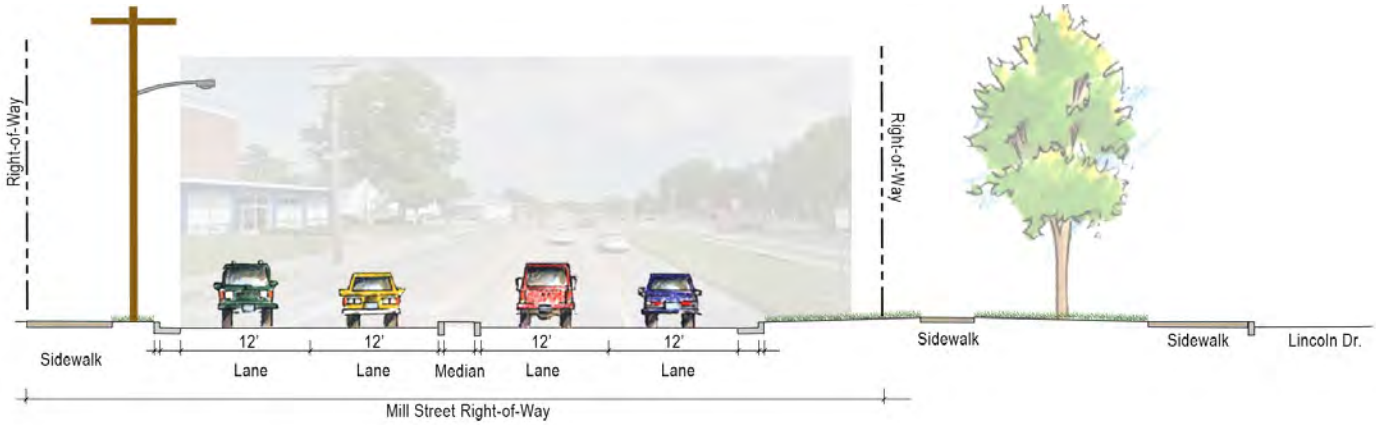
Existing Walnut Street has four lanes with a dedicated left turn lane.



Walnut Street between University Ave and Illinois Ave: Option 1 (Road Diet with Buffered Bike Lane)

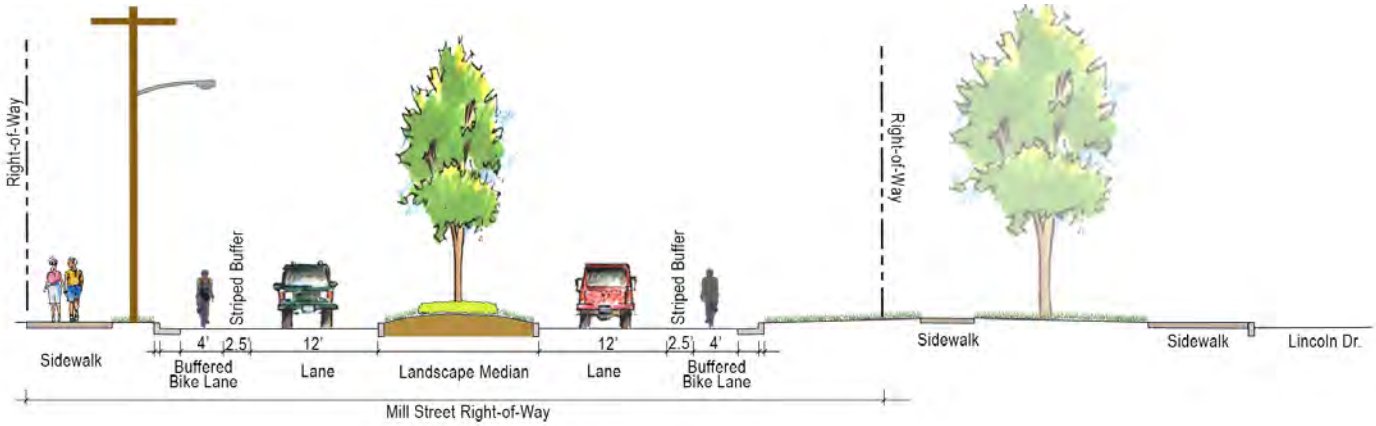
Option 1 for Walnut Street would reduce the number of lanes to three with a combined left turn / through lane. This would create room for a buffered bike lane.

FIGURE 4.12: Walnut Street - Road Diet Cross Sections



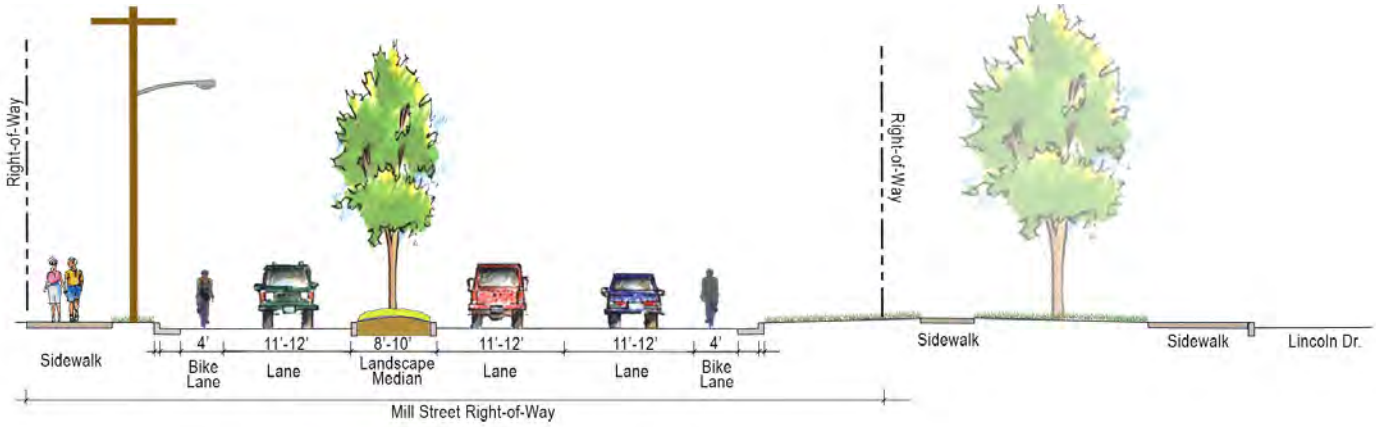
Mill Street Looking East, Just West of Poplar Street: Existing Conditions

There is limited opportunity within the existing curb line to have bicycle facilities that would significantly improve bicycle level of service.



Mill Street Looking East, Just West of Poplar Street: Option 1 - Road Diet with Buffered Bike Lanes

Option 1 includes one lane in each direction, with a center turn lane / landscape median. This configuration provides enough width for a buffered bike lane each direction.



Mill Street Looking East, Just West of Poplar Street: Option 2 - Minor Road Diet with Bike Lanes

Option 2 includes two lanes in one direction and a single lane in the opposite direction. This option provides additional traffic volume capacity. This configuration allows enough width for a small median, but it is still wide enough for enhancement opportunities. Bike lanes are 4' width each direction.

FIGURE 4.13: Mill Street - Road Diet Cross Sections

Recommendation #10

Update the City's Complete Streets policy to include capital projects involving utility work in the evaluation of bicycle and pedestrian facilities.

OVERVIEW

The City has a very good Complete Street policy that was adopted in 2015. The policy should also be applied for utility work that is done within the right-of-way of City streets or other bicycle corridors. Utility work, whether new utilities or maintenance of existing utilities, is an opportunity to add bicycle facilities when existing infrastructure is disturbed. This work may require pro-active coordination by the City or other partners in addition to cost-share to provide for bicycle facilities.

A Complete Streets policy is also just a starting point for recommended policy changes, including street design standards. See policy recommendations under 'Encouragement' for a detailed discussion of policy recommendations.

Encouragement

Recommendation #1 – Submit application for Bicycle Friendly Community designation.

Recommendation #2 – Continue and support existing programs such as “Bike to Work Day”.

Recommendation #3 - Work with the school district to observe National Bike to School Day (In May).

Recommendation #4 - Develop bicycle network wayfinding plan. Supplement standard MUTCD signs with branded Carbondale signs. Coordinate style and information with downtown signage/ wayfinding recommendations.

Recommendation #5 – Celebrate Carbondale as a location on the TransAmerica Bike Route.

Recommendation #6 – Continue expansion of citywide bike parking through existing development standards and incentives, downtown bike parking program, and grant opportunities.

Recommendation #7 – Continue efforts to improve city policies toward bicycling by updating zoning regulations, subdivision standards, and ordinances.

Recommendation #8 – Continue to support civic and community group who sponsor/coordinate bicycle programs and events.

Recommendation #9 – Evaluate feasibility of bike share for the City and SIUC.

Recommendation #1

Submit the application for Bicycle Friendly Community designation.

OVERVIEW

A goal of plan implementation should be official designation as a "Bicycle Friendly Community" (BFC). This national League of American Bicyclists award program has Honorable Mention, Bronze, Silver, Gold, Platinum, and Diamond gradations. The program comprehensively assesses a community based on Engineering, Education, Enforcement, Encouragement, and Evaluation.

The following is an infographic summarizing how Bronze and higher communities have fared in key criteria.

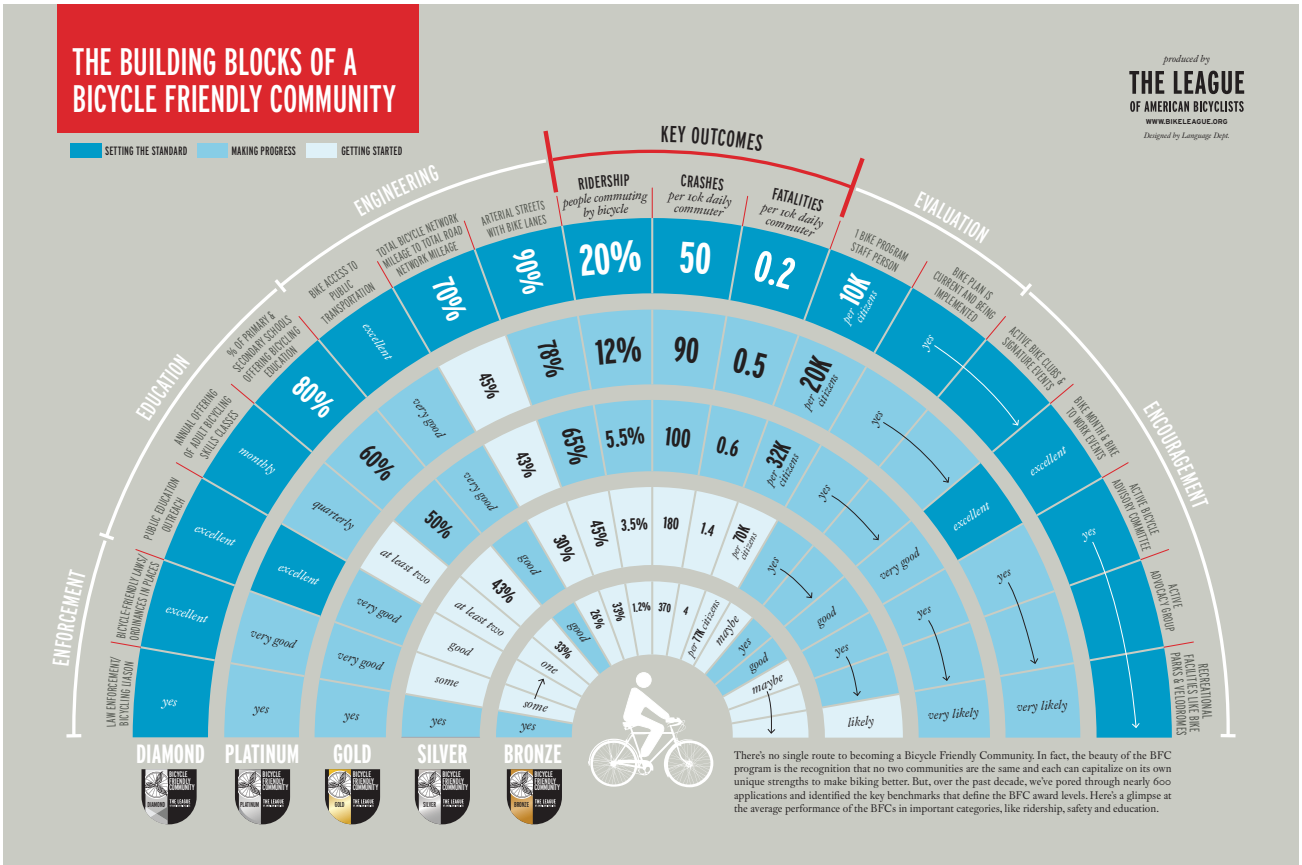
Winning designation is not easy - in fact, the only Bronze or higher BFCs in Illinois are Schaumburg, Naperville, Champaign, Batavia, Warrenville, Normal, Glenview and Elmhurst (Bronze); Chicago and Evanston (Silver); and Urbana (Gold). However, the recommendations in this plan encompass most of the award criteria.

EVALUATION

Ride Illinois, a longtime observer of and "local reviewer" for the BFC program, believes Carbondale could achieve the Bronze level within two to four years, with steps such as:

- Adopting this plan, officially designating an existing staff member as the Bicycle/Pedestrian Coordinator, and creating a Bicycle (or Bicycle/Pedestrian) Advisory Commission.
- Providing clarity to the Complete Streets policy by adopting bicycle and pedestrian friendly road design standards.
- Implementing at least a couple more high-priority segments of on-road bikeways, especially bike lane sections.
- Implementing at least two of the Education recommendations from this plan.
- Implementing at least one of the Enforcement recommendations from this plan.
- Proclaiming Bike to Work Day, Week, or Month, with some accompanying public educational outreach.

As suggested in this report, Bicycle Advisory Committee members could lead several of these efforts.



Recommendation #2

Continue and support existing programs such as "Bike to Work" Day.

OVERVIEW

Bike to Work Day has been an existing program in the past by the City and other partners. The program should continue and be a high priority event every May. Programs such as Bike to Work evaluate the culture of bicycling.

Additional ideas for Bike to Work Day or Week:

- Press conference with Mayor and other Civic Leaders after they bike to work.
- Social media campaign – Offer a prize for best biking photo during the week using hashtag #bikecarbondale
- Bike breakfast stations – Offer refreshments for bike commuters at key destinations such as City Hall.
- Group bike commuting – Offer group commuting to encourage new commuters or reluctant bicyclists.
- Promote Bike to Work Day/Week events on the website of the City and other partners.

One of the most important aspects of successful Bike to Work Day/Week events is partnerships. Multiple partners should be invited to help plan and coordinate the event. For Carbondale, partners should include:

- City
- Park District
- Chamber of Commerce
- SIU
- Carbondale Main Street
- Jackson County Health Department
- Church Groups
- Bike Shops
- Bicycle Advocacy Groups
- Other Civic Groups

Since Bike to Work Day/Week is in mid-May every year, planning should start in January or February with events confirmed by the end of March. April and early May should be used to market and promote the event(s).

Example of a Bike to Work Day breakfast station in O'Fallon, Illinois.

A great resource for Bike to Work activities can be found at the League of American Bicyclists.

Recommendation #3

Work with the school district to observe National Bike to School Day (In May).

OVERVIEW

A close companion to Bike to Work Day is National Bike to School Day. Both events are in May. As community partners work to plan Bike to Work events, they should partner with the school district for Bike to School Day activities. This would be a great opportunity to expand on existing community programs such as the kids bicycle helmet program sponsored by the Rotary, Park District, and other partners.

A good resource for Bike to School events and planning is www.walkbiketoschool.org.

A group bike ride to school is a recommended activity for Bike to School Day. In the picture below, the police department is leading the bike ride.
Source: www.pedbikeimages.org/Dan Burden

Recommendation #4

Develop a bicycle network wayfinding plan. Supplement standard MUTCD signs with branded Carbondale signs. Coordinate style and information with downtown signage/wayfinding recommendations.

OVERVIEW

The recommended bicycle network includes a variety of on-road and off-road bikeway types. For each of these, network signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bikeway system
- Helping users identify the best routes to significant destinations
- Helping to overcome a "barrier to entry" for people who do not bicycle much but who want to get started
- Alerting motorists to expect bicyclists on the route

It is recommended that Carbondale adopt wayfinding conventions consistent with Section 4.11 of the 2012 AASHTO bike guide (see Figure 4.14). In general, signs should be placed where a route turns at an intersection, crosses another route, and crosses major intersections. Confirmation signs should be placed periodically, too. NACTO's Urban Bikeway Design Guide further details purpose, content, and placement of confirmation, turn, and decision signs as well as destinations to list.

Ideally, wayfinding signage would be installed for the entire Carbondale bikeway network, during the same time period. If priorities must be set, or if phasing will be done, then a suggested order or prioritization is as follows:

1. Trails on their own right-of way, especially trails with confusing decision points.
2. On-road bikeway sections implemented by that time.
3. Sidepaths along major roads.

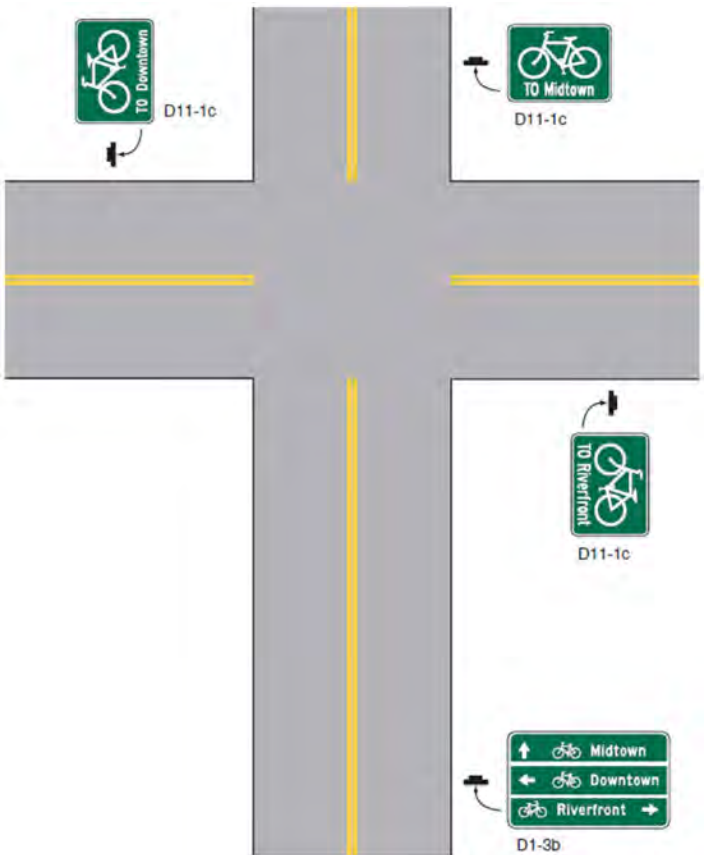
WAYFINDING / SIGNAGE PLAN

Carbondale should develop a community-wide bicycle wayfinding signage plan that identifies:

Sign locations along existing and planned bicycle routes;

Sign type – what information should be included and what is the sign design:

- Destinations to be highlighted on each sign – key destinations for bicyclists.
- Approximate distance to each destination.



Confirmation Sign

Turn Sign

Decision Sign

Standard MUCTD Wayfinding Signs

FIGURE 4.14: AASHTO Bike Signage Guidance

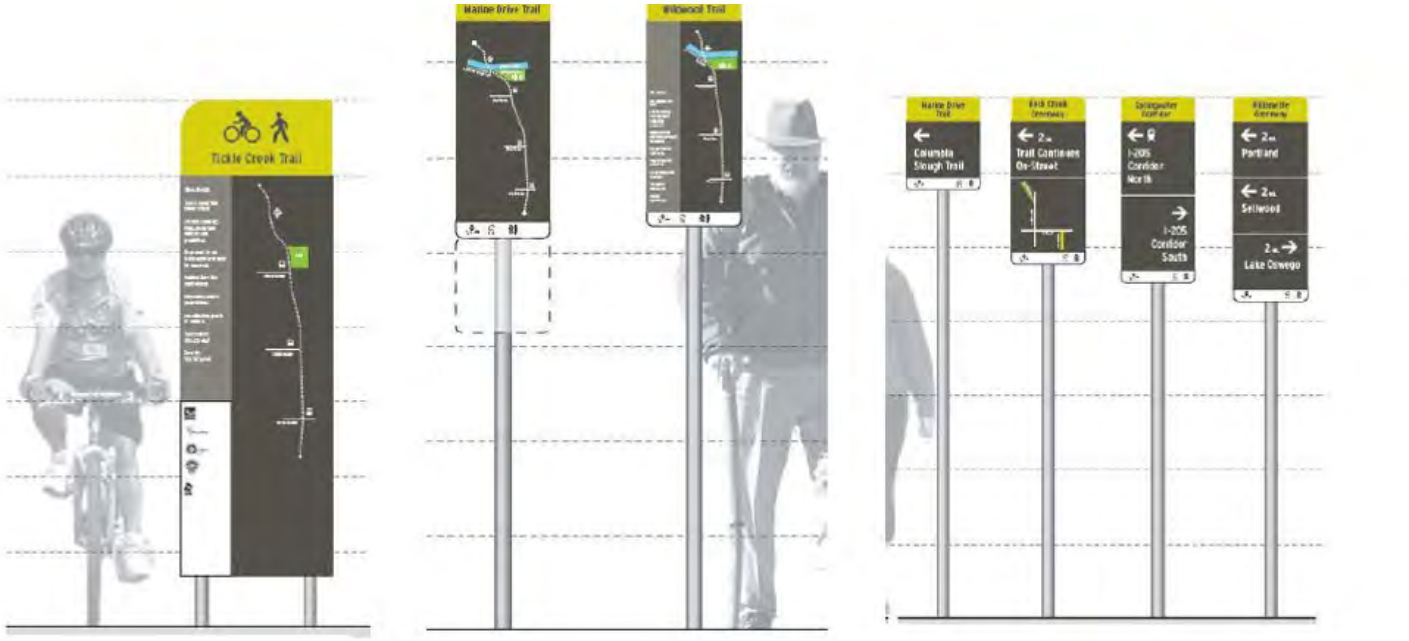


FIGURE 4.15: Example of a Hierarchy of a Custom Wayfinding Sign Kit of Parts

The wayfinding plan should also include a hierarchy of sign types (see Figure 4.15). The hierarchy of sign types becomes the kit of parts for the wayfinding system.

The wayfinding plan can also be an opportunity to celebrate Carbondale as a location on the Trans American Bike Route.

Typical wayfinding / system signs include:

Confirming Signs
Confirming signs are signs that provide bicyclists confirmation that they are on a recommended bicycle network route. Confirming signs can both confirm route and destination information. A typical placement of a confirming sign is after a turn or decision point sign to let a bicyclist know they are on the correct route.

Decision Signs
Decision signs alert bicyclists to when a change in direction or route is required, usually at a point where a bicyclist must choose between multiple destinations.

Turning Signs
Turning signs alert bicyclists when the bicycle route changes direction or utilizes another street.

Kiosks/Trailheads
Kiosks/Trailheads are major wayfinding elements, usually located at key destinations, trailheads, and other highly visible locations. They typically have an overall system map and other bicycle network information.

Markers
Markers are typically branded sign elements that help reinforce route directions or other elements of a bicycle network such as bicycle parking locations.
Markers can often be the bicycle network "logo" placed along the route to provide confidence and awareness along the route. The marker can be placed on existing signs, structures, or buildings.

Example of a kiosk/trailhead sign.

Recommendation #5

Celebrate Carbondale as a location on the TransAmerica Bike Route.

OVERVIEW

Carbondale is a major destination on the TransAmerica Bike Route. The TransAmerica Bike Route is a cross country bike route stretching from Oregon to Virginia. Thousands of bicyclists ride the TransAmerica route every year. Carbondale is already a well known stop on the route. The Adventure Cycling Association website mentions Carbondale as "another fun college town" when describing segments of the route.

There are several advantages in celebrating Carbondale as a location on the TransAmerican Bike Route. For bicyclists using the route, celebrating Carbondale can help bicyclists choose Carbondale for accommodations, supplies, or dining. It can also raise the profile of Carbondale nationally as a bike friendly community. Locally, it can raise awareness of bicycling and the tourist potential of the route.

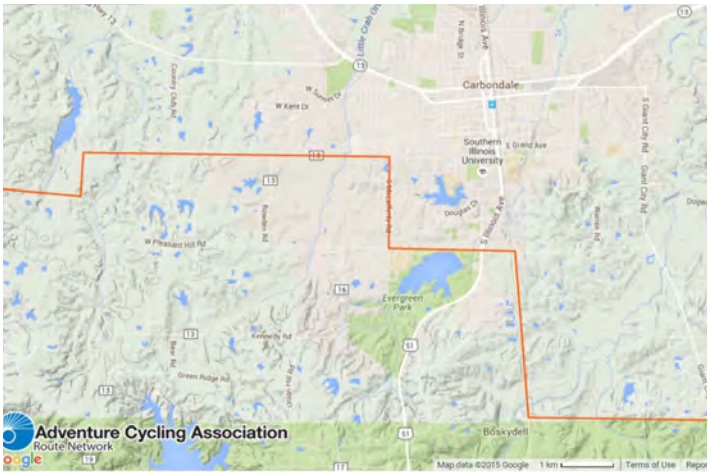
Branded Wayfinding Signs

Branded wayfinding signs would welcome TransAmerica riders and guide them through the City. The signs would have functional benefits in terms of directional signage, but also create opportunities for bicyclists to share photos of Carbondale as they pass through.

Marketing the City

The City and local/regional partners should investigate marketing the City to TransAmerica route users through social media and the Adventure Cycling Association.

Right: Riders frequently post pictures of their trip on the TransAmerica Bike Route. As part of the citywide wayfinding system, the City should have TransAmerica signage as a popular photo spot.



The official TransAmerica Bike Route skirts the south edge of Carbondale using Chautauqua and Pleasant Hill. However, a large number of riders use Route 13.

Source: Instagram

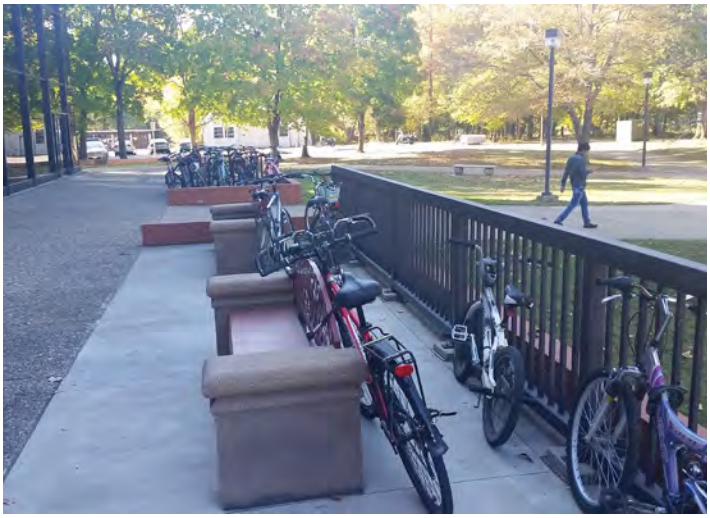
Source: Instagram

Recommendation #6

Continue expansion of citywide bike parking through existing development standards and incentives, downtown bike parking program, and grant opportunities.

OVERVIEW

The City, SIU, and other partners have made great progress in adding bike parking throughout the City through implementation and policy. The City has installed a number of bike racks and fix-it stations with plans for expansion. The City has also updated its ordinances requiring bike parking for new development. The Jackson County Health Department has donated bicycle racks to businesses in the community with grant funding. Carbondale Main Street is working with local artists to produce unique artistic bike racks in the downtown area. SIU monitors the need for bike parking on campus and regularly expands bike parking as demand increases.

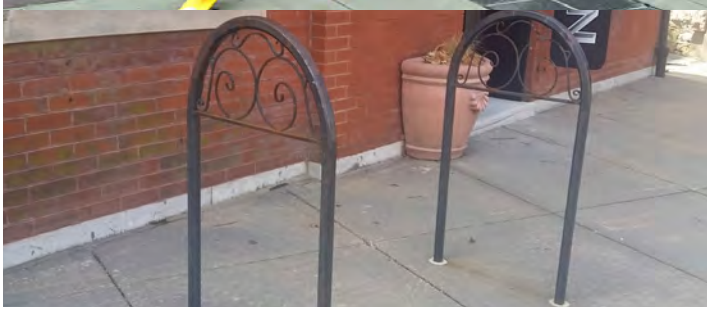


SIU continues to expand bicycle parking to meet the increasing demand. Without adequate parking, bicyclists will use other resources to secure their bikes.

Bike parking should continue to be expanded in the City. Recommendations include:

- Implement recommendations of the Downtown Master Plan for parking.
- Update ordinances for bike parking for businesses (see policy analysis).
- Continue to seek grants to provide bike racks for existing businesses.
- Seek creative ways to provide bike parking instead of traditional bike racks where space is limited.

In addition to conventional bike racks, creative bicycle parking should be utilized where space is limited. Right: Example of bicycle parking for a parking meter post.



Bicycle racks are an opportunity to enhance the streetscape experience through art and creative design. The City should have minimal standards for bicycle rack design. However, creative approaches to bike racks should also be encouraged.

Recommendation #7

Continue efforts to improve city policies toward bicycling by updating zoning regulations, subdivision standards, and ordinances.

OVERVIEW

Carbondale has made great progress in adopting city policies that promote bicycling in the City. In 2015, the City adopted a Complete Street policy. The City has a bicycle parking ordinance requiring bicycle parking for new development.

The following is an analysis of existing city zoning, subdivision standards, and ordinances for further recommendations to improve policies toward bicycling in the City.

Policy Topic	Existing Policy	Recommendation
Riding on the sidewalk.	No person shall ride a bicycle upon and along a sidewalk or across a roadway upon and along a crosswalk in the city except that persons under twelve (12) years of age may ride a bicycle with wheel size of less than twenty-four inches (24") upon and along sidewalks or across roadways upon and along a crosswalk in nonbusiness districts. Exception; Bikeway Areas: Any place designated in accordance with the bikeway network map as stated herein under this chapter is an exception. (Ord. 2015-29)	No policy change is suggested. However, education about the dangers of sidewalk riding, rather than enforcement is usually more effective (such as a ticket diversion program). This is especially true for areas where pedestrian conflicts are high such as downtown. Riding on the sidewalk (by adults) is usually a sign of unsafe or perceived unsafe on-street conditions. Three items from this plan will help with sidewalk riding: 1. Implementation of on-street improvements. 2. Development of a sidepath/multi-use trail standard in the City. 3. Increased bicycle education for SIU students.
Bicycle Registration/License	Section 18-14-15: BICYCLE LICENSE REQUIRED. It shall be unlawful for any person to operate or use a bicycle propelled in whole or in part by muscular power upon any of the streets, sidewalks, alleys, described bike paths or networks, drainways/greenways path, or public highways within the city without first obtaining a license therefor and having a tag or decalcomania placed thereon as hereinafter provided. (Ord. 2015-29)	Mandatory bicycle registration has several drawbacks including: administration time and cost to process and track registrations, rider deterrence, and lack of enforcement (or inconsistent enforcement). A benefit of the program is to help track bicycles if they are stolen. It is recommended that mandatory bicycle registration ordinances be eliminated. A voluntary program can remain, especially with education about the benefits of bicycle registration (tracking a bike if it is stolen, etc).
Sidepath/Multi-Use Trail Standards	Section 18-14-14: BIKEWAY NETWORK. Bikeways Not Sidewalks: Any portion of any sidewalk designated by official signs or markings as part of the bikeway network shall not be considered a sidewalk for the purposes of section 18-14-28 of this chapter. (Ord. 2015-29)	There is existing confusion over what is considered a sidewalk versus a "sidepath" or "multi-use trail" in the City. Sidewalks that do not meet the minimum width for multi-use (8') have been classified as "bikeways". Update Section 18-14-14 to include minimum width standards (8' width) and sidepath design standards. Potential language: "Sidepaths and multi-use trails in the City that are a minimum of 8' width and are designated by official signs and markings as part of the bikeway network...."

Policy Topic	Existing Policy	Recommendation
Bicycle Parking	15.4.8.10: BICYCLE PARKING. Provides standards for: Number of spaces Location of parking Types of racks Space, lighting, and signage requirements.	No policy change is suggested. The bicycle parking requirements are strong. Bike rack types are specified, but flexibility is allowed if they meet certain criteria (securing bicycle frame and one tire to the rack with the use of a U-frame lock)
Subdivision Planning	15.8.4.4: PLATS AND DATA FOR PRELIMINARY PLAT APPROVAL This sectios lists the requirements for preliminary plat approval.	Require the bicycle network (existing and proposed per the master plan) to be shown that are part or adjacent to the tract. Require to show how the tract will connect to the overall bicycle network either through on-street facilities or off-road facilities.
Subdivision Planning	15.8.7.3: BLOCKS: Paragraph D. Pedestrian accessway of not less than ten feet (10') in width shall be required where deemed essential to provide circulation or access to schools, playgrounds, shopping centers, transportation, and other community facilities. (Ord. 2013-20)	Add "Bikeways" as a part of requirement of Paragraph D. Change "where deemed essential" to "accessway of not less than ten feet (10') shall be provided to....unless there is documented no current or future need for non-motorized users." This better aligns with the City's Complete Streets policy.
Subdivision Planning	15.8.7.5: EASEMENTS:	Add subparagraph to provide easement for future multi-use trail connections (especially along drainage ways/creeks). Note: developer would provide easement only, trail construction by City or others. To ensure future multi-use trail connectivity, provide easements for future multi-use trails to connect all abutting properties or to logically extend the multi-use trail system into the surrounding area. Easement shall be a minimum of 20' in width.
Sidepath Requirements		Update subdivision standards and other sections of the ordinance where sidewalk requirements are listed. Ensure that sidepaths (8' width) are required instead of sidewalks for development in areas as recommended by the bicycle master plan.
Street / Road Criteria for Bicyclists	Multiple sections of the ordinance including: 17-8-3: MINIMUM PAVEMENT WIDTHS FOR STREETS WITH CURBS AND GUTTERS, and 15.8.7.2: STREETS	Update standards for streets and roads to provide minimum criteria for bicycle facilities. See following page for outline of recommended bicycle facility criteria.

SUGGESTED BICYCLE ACCOMMODATION IN ROAD DESIGNS

Minor urban 25-30 mph roads			
	No Parking	Sparse (<10%) Parking	Heavy (>25%) Parking
Local Residential	None Required	None Required	None Required
(Preferred Bicycle Route)	SLM-4	Combined Bike/Parking Lane	SLM-11
Minor Collector	None Required	None Required	None Required
(Preferred Bicycle Route)	SLM-4 or BL-5	Combined Bike/Parking Lane	SLM-11 (or BL-5*)

Arterial or Major Collector			
	2,000-8,000 ADT	8,000-15,000 ADT	Over 15,000 ADT
<35 mph	BL-5	BL-5 (or Buffered BL-5)	Buffered BL-5 (or SP**)
35-40 mph	BL-5 (or SP**)	SP (or Buffered BL-5**)	SP (or Buffered BL-5**)
>40 mph	SP	SP	SP
55 mph rural	SH-4 (or SH-6*)	SH-6 (or SH-8*)	SH-8

Notes:
(*) Indicates the alternative recommendation may be used at the higher ends of the range and/or where the need is greater.
(**) As the frequency of crossing (side streets, commercial entrances, driveways, etc) increase, the use of a sidepath should be more carefully evaluated. Bike lanes are recommended if there is a high frequency of crossings.

SLM-4: Shared Lane Markings 4’ from curb faces. MUTCD D1 or D11 wayfinding signage preferred as a supplement.

SLM-11: Shared Lane Markings 11’ from curb faces (on-street parking present). D1 or D11 wayfinding signage preferred as a supplement.

CBPL: Combined Bike/Parking Lanes, solid stripes 7’-8’ from curb faces. Parking permission indicated with signage. D1 or D11 wayfinding signage preferred as a supplement.

BL-5 or Buffered BL-5: Bike Lanes of width 5’, with pavement stencils and signage per AASHTO. Where there is no parallel on-road parking next to the bike lane, indicate through signage that parking is not permitted in the bike lane.

SP: Off-road sidepath trail designed per AASHTO, on at least one side of the road.

SH-4, SH-6, or SH-8: Paved shoulders of width 4, 6, or 8 ft, respectively. Any rumble strips should have longitudinal breaks and a minimum 4 ft clear zone for bikes.

Recommendation #8

Continue to support civic and community group who sponsor/coordinate bicycle programs and events.

OVERVIEW

Carbondale already has many great events for bicycling such as the Rotary's annual Beautiful Southern Ride and special events such as the '51 on 51' bike ride in 2015 which celebrated the new bicycle lanes on Hwy 51. Bicycle program and events should continue to be supported and coordinated. A key role of the on-going bicycle advisory committee should be to coordinate and market bicycle programs and events.

There is no magic number for the number of events or programs. Since most of these events are coordinated by volunteers, the only limit to capacity is the number of volunteers.

Considerations for planning future events.

Events and programs should target all types of bicyclists. Not every event needs to accommodate all cyclists, but there should be a variety of events throughout the year that will engage the various types of cyclists. The types of cyclists to keep in mind when planning events:

- Strong and Fearless / Enthused and Confident (Usually about 10 percent of the population)
- Interested but Concerned (60-70 percent of the population) – This group should be heavily marketed for Bike to Work Day events such as group commuting.
- No Way No How (About 30 percent of the population) – At first it may seem counterintuitive to reach out to this group for events. In fact, this group shouldn't be marketed to attend events, but the success of the events should be communicated to this group.
- School Age Kids
- SIUC Students

Scheduling events throughout the year.

May is dominated by Bike to School and Bike to Work events, usually aimed at more casual bicyclists (Interested but Concerned).

August/September/October should focus on incoming SIUC students.

Above: Registration for a bicycle ride sponsored by the Rotary.
Source: Carbondale Rotary

Recommendation #9

Evaluate feasibility of bike share for the City and SIUC

OVERVIEW

A feasibility study should be conducted for the potential of a bike share system in the City and on campus. The study, however, should be a low priority. It appears from observations on campus and talking with University staff that student demand for bicycles are being adequately met by low cost bicycles. Bicycle usage is already high on campus and the University is frequently expanding bicycle parking to meet increased demand.

Bike share systems, while receiving great attention in recent years in many cities, is most often a loss leader and must be subsidized by the community or other partners. Communities that have invested in bike share systems usually make the decision to promote tourism or the "cachet" of having bike share.

Education

Recommendation #1 – Expand existing children safety and helmet program. Expand use of SIUC student groups and civic partners to increase volunteer capacity for program.

Recommendation #2 – Increase education to incoming SIUC students about bicycle safety and Campus and City bicycle rules.

Recommendation #3 –For motorists, promote the use of the “Motorist Quiz” (www.bikesafetyquiz.com).

Recommendation #4 – For bicyclists, distribute education material and best practices through city, schools, and community groups.

There is a big educational gap – for both bicyclists and motorists – on how to legally and properly share the road. The result: avoidable crashes, too many people afraid to bike, and lots of anger and resentment. Education of both road user types is crucial to improving real and perceived bicycling safety in Carbondale. Investing some resources on public outreach and education would greatly leverage the City’s infrastructure investment.

Many of the safety resources listed in this section are free, except for the time to get and use them. Much of this time could come from volunteers.

Recommendation #1

Expand existing children safety and helmet program. Expand use of SIUC student groups and civic partners to increase volunteer capacity for the program.

OVERVIEW

There is already a strong kid's helmet program in the City run by the Rotary, Carbondale Park District, Carbondale Police, and other partners. The program should be expanded to include bicycle safety programs such as a "bike rodeo". Short term benefits include increased bicycle riding by kids. Long term benefits include increased awareness of bicycle rules by parents and motorists.

The education programs should be a part of Bike to School events in May event year.

Resources for children's bicycle education and bike rodeos include:
http://www.safekids.org/sites/default/files/documents/Bike-Rodeo-Station-Guide.pdf

In addition, many civic organizations such as Rotary and Kiwanis have guides from their national offices.

The existing bicycle helmet program (below photo) should be expanded to include bicycle education such as a bicycle rodeo (above photos).
Above Photos Source: www.pedbikeimages.org-Mike Cynecki

Recommendation #2

Increase education to incoming SIUC students about bicycle safety and Campus and City bicycle rules.

OVERVIEW

SIU staff, faculty, and students are working on a number of initiatives to promote bicycling on campus. Increased education to incoming SIUC students has been mentioned as a potential priority topic.

A precedent example of campus bicycle education is the Bike2Campus program that is conducted by several Chicago area universities. The Bike2Campus program is a competition amongst the universities that include:

- Most recorded bike rides.
- Completion of the Illinois Bike Safety Quiz (www.bikesafetyquiz.com/). Once complete, respondents get a certificate of completion.
- Instagram photo contest.
- Special campus events.

SIU should include bicycle education as part of new student orientation.

Recommendation #3

Increase education to incoming SIUC students about bicycle safety and Campus and City bicycle rules.

OVERVIEW

Drivers not trained on car-bike interactions are much more likely to make mistakes that are dangerous to people on bikes. The following safety resources are available from Ride Illinois, for driver education programs and existing motorists:

- The “Motorist Quiz” online lesson at www.bikesafetyquiz.com, covering relevant laws and avoidance of the most common car-bike crashes.
- “Share the Road: Same Road, Same Rights, Same Rules”, a 7-minute DVD video describing how to handle some situational “danger zones” around bikes.
- Motorist-relevant articles for the City website and communication materials.

The plan recommends that local high schools and private driver education programs be encouraged to use www.bikesafetyquiz.com as a computer assignment – as is done by more than 60 Illinois high schools. Links to the Motorist quiz and the video could be added to the City website. During warmer months, the video could be shown on the local cable channel and the articles could be published for residents.

Recommendation #4

For bicyclists, distribute education material and best practices through city, schools, and community groups.

OVERVIEW

Many people are afraid to bike, or bike only on off-road trails, because of their concern about safety. Improving education can lessen these concerns and instill the skills and confidence to bike to more places around town more safely.

The following safety materials could be distributed through schools and PTAs, at public places such as City Hall, the library, and on the City's and park district's websites:

- Bicycle Rules of the Road, a free guide from the Illinois Secretary of State: www.cyberdriveillinois.com/publications/pdf_publications/dsd_a143.pdf
- Bike Safety, a free brochure from the Illinois State Police: www.isp.state.il.us/docs/5-035.pdf
- Ride Illinois' single-page summaries for children and their parents. rideillinois.org/safety/kids-and-biking-resources
- Illinois Bicycle Law cards, free from Ride Illinois. Relevant state laws, folds to business-card size. rideillinois.org/wp-content/uploads/2015/10/BikeLawCard2015.pdf
- Ride Illinois offers free bike safety articles for newspapers, City newsletters and websites, and other municipal outreach.

An online interactive resource on relevant laws and safety techniques is Ride Illinois' www.bikesafetyquiz.com. Concise quiz-based lessons are freely available for Adult Bicyclists, Child Bicyclists, and Motorists. Besides individual use, the application has functionality for easy use by school teachers or parent PTA groups, driver education programs, scouts, YMCAs, and more. Quiz promotional sheets are available for use by these groups, bike shops, and others.

In addition, the state has a network of bicycle safety instructors, nationally-certified by the League of American Bicyclists, to teach a menu of classes for children and adults. These classes – or training of new instructors – could be conducted in Carbondale. Details are at www.bikeleague.org/bfa/search/list?bfaq=illinois#education.

Grant funding for grades K-8 education programs may be available from the Illinois Safe Routes to School program.

Evaluation

Recommendation #1 – Continue City Bicycle Advisory Committee to monitor plan implementation and plan metrics.

Enforcement

Recommendation #1 – Implement ticket diversion program which encourages education and positive reinforcement of state and local laws.

Recommendation #2 – Encourage police officers to learn or refresh their own knowledge on the common crash types through completion of the Motorist and Adult Bicyclist quiz lessons.

Recommendation #1

Continue the Bicycle Advisory Committee to monitor plan implementation and metrics.

OVERVIEW

Perhaps the most important implementation tool is time. The plan recommends dedicating some fraction of a staff member's time as the City's Bicycle Coordinator. This individual would work on plan implementation and other active transportation issues. Also, the coordinator would regularly collaborate with other City staff and relevant agencies to ensure their work conforms to the goals of the plan. Routine review of development plans and road project designs is a prime example.

In addition, the plan recommends the ongoing continuation of the Bicycle Master Plan Advisory Committee. The Bicycle Advisory Committee (BAC) should report to the Planning Board or directly to the City Administrator/ Mayor's Office. Volunteer involvement by a few energetic, knowledgeable, and dedicated residents can greatly leverage the staff time investment of the Bicycle Coordinator, who would serve as the lead staff liaison to the BAC. The advisory committee could also include pedestrian issues and be the Bicycle and Pedestrian Advisory Committee

REPRESENTATION OF THE ADVISORY COMMITTEE

The Master Plan Bicycle Advisory Committee has a good cross section of representation from the community. In the future, as membership on the committee changes, it will be important to keep a cross section of community representation on the committee. The recommendation for committee representation should include:
(2-3) At-large citizens who are bicycle enthusiasts.
(2) SIU facility/staff representatives
(1) SIU student representative
(1) Carbondale Park District representative
(1) Illinois Department of Transportation representative
(1) Chamber of Commerce or other business association representative
(1) Police Department representative
(1) Healthcare / Active Living representative
(1) School District representative
(1) Downtown representative
City staff should be ex-officio members and should include the representatives from planning and public works. Meetings should be held every one to four months, depending on level of activity. For example, the committee may meet more frequently in the spring in preparing for May Bike to Work/School events. The rest of the year, the committee may only meet quarterly.

Another option for the committee is to have a smaller core committee, but with additional ex-officio members. For example, representatives from IDOT, the chamber, a downtown representative, etc. could be ex-officio members and participate as needed or less frequently.

ROLE OF THE ADVISORY COMMITTEE

The BAC should routinely be given the opportunity to provide input into these City processes:
Capital Improvement Program – How can designs of the CIP's road projects and other capital projects implement bicycle plan recommendations or otherwise impact bicycling (and walking) positively? Also, the BAC should propose stand-alone bike and/or pedestrian projects as priorities for the next CIP, each year.

Site design and other development review – Provide bicycle and pedestrian perspective to the Planning Commission's review of new development or re-development projects.
Maintenance – The BAC should periodically review conditions on the City's bikeway system and make prioritized maintenance recommendations.

In addition, the BAC members should be empowered to work on several one-time and ongoing recommendations from this plan and other efforts. Examples include:

- Prioritize specific locations where bicycle parking is needed.
- Prioritize Carbondale bikeways needing wayfinding signage, and specifying destination content for each sign based on general guidelines from this plan.
- "Field test" demand-actuated traffic signals along the planned bikeway network, to determine and prioritize where bicycle-actuation improvements are needed.
- Bring or apply a variety of available education, enforcement, and outreach resources – such as those detailed elsewhere in the plan – to Carbondale.
- Act as volunteer "bicycle ambassadors" at community events.
- Lead bike-related events, such as Bike to Work Day/ Week/Month or Bike to School Day.
- Put together Safe Routes to School programming and grant applications
- Head the effort to win national Bicycle Friendly Community designation, including filling out the application, and strategizing which areas need improvement.

It is strongly recommended that each commission member should have "ownership" of at least one topic or effort. This will keep members energized and ensure the commission is a net positive in City time investment.

Enforcement

A vital component of a safe bicycling environment is enforcement with education to reduce common car-bike collision types. According to Illinois law, bicyclists have both the rights and responsibilities of other vehicle users. Many cyclists do not know about the law as it applies to bikes and how following the law leads to safe cycling. Other cyclists ignore the law while riding in traffic, not only creating dangerous situations but also causing motorist resentment toward other cyclists trying to share the road safely.

Recommendation #1

Ticket diversion program.

OVERVIEW

Police are encouraged to stop cyclists if the situation dictates, to educate, issue warning citations, or issue tickets. Changing their behavior could save their lives. Cards listing Illinois bike laws are available from Ride Illinois. Also, Ride Illinois has piloted a bicycle ticket diversion program in Champaign, Urbana, University of Illinois, and elsewhere. To reduce a ticket to a warning, offenders take the Adult Bicyclist quiz at www.bikesafetyquiz.com, emailing their completion certificate to the police department. This has been received well and is suitable for Carbondale and SIUC.

In a car-bike crash, the motor vehicle does the most damage. Some aggressive motorists intentionally harass cyclists, while others simply don't know how to avoid common crash types. As with cyclists, police are encouraged to stop motorists if needed, to educate, issue warnings, or issue tickets. An annually conducted, brief but well-publicized targeted enforcement campaign (aka "sting") can raise community awareness about particular problem issues. Warning tickets would be issued, along with instructions to complete the appropriate www.bikesafetyquiz.com lesson.

Recommendation #2

Encourage police officers to learn or refresh their own knowledge on the common crash types through completion of the Motorist and Adult Bicyclist quiz lessons.

OVERVIEW

Officers are encouraged to learn or refresh their own knowledge on the common crash types through completion of the Motorist and Adult Bicyclist quiz lessons. (www.bikesafetyquiz.com)

Finally, the police department might consider replicating an earlier Hoffman Estates, Illinois "bike safety kit" program. There, the police regularly noticed 50-60 mostly low-income workers, relying on their bicycles for year-round transportation to their jobs. These residents, riding at dark on busy roads, were often at risk due to a lack of bike lights and reflective clothing. Officers distributed a kit of these items when they witnessed a cyclist in that situation. This low-cost program was a much-appreciated success that could be duplicated.

Chapter 5
Implementation

Chapter 5
Implementation

Overview

This chapter provides strategies and information to implement the Carbondale Bicycle Master Plan. Sections of this chapter include:

- Overall Strategy
- Cost Opinions
- Funding Sources
- Metrics

Overall Strategy

Perhaps the most important implementation tool is time. The plan recommends dedicating some fraction of a staff member's time as the City's Bicycle Coordinator. This individual would work on plan implementation and other active transportation issues. Also, the coordinator would regularly collaborate with other City staff and relevant agencies to ensure their work conforms to the goals of the plan. Routine review of development plans and road project designs is a prime example.

In addition, the plan recommends the ongoing continuation of the Bicycle Advisory Committee (BAC), reporting to the Planning Board or directly to the City Administrator/ Mayor's Office. Volunteer involvement by a few energetic, knowledgeable, and dedicated residents can greatly leverage the staff time investment of the Bicycle Coordinator, who would serve as the lead staff liaison to the BAC.

Be opportunistic by implementing improvements during other projects and development. An example is restriping during resurfacing. Widening a road to add an on-road bikeway will be considered as part of a major road reconstruction, but not as a standalone project.

GENERATING PUBLIC SUPPORT

To improve public support for plan implementation, these additional approaches are suggested:

- Achieve early, easy successes ("low-hanging fruit") to gather momentum.

- Work with local businesses and media to help promote the plan and highlight progress. Have a yearly progress report of improvements and progress.

- Avoid removing on-road parking if at all possible, especially by businesses and on roads with more than very low parking occupancy. When a primary recommendation calls for the removal of any parking, provide secondary, fall back recommendations as options.

- Where appropriate, use road striping to serve not only bicyclists but adjacent residents, as well. Cite the traffic calming (slowing) and other benefits of striped, narrower roads.

- Unless there is strong public demand, do not widen 4-5 foot sidewalks to 8-10 foot sidepath widths where at least some residential front yards would be impacted.

- Unless there is strong public demand, do not widen residential roads solely for bikeways.

The plan should be evaluated every 5 to 10 years to measure progress and to re-evaluate priorities.

Cost Opinions

Cost opinions below are a master plan level cost estimate and should be used to approximate costs of projects for budgeting. Individual project costs will vary based on existing conditions.

The unit costs are based on new construction and do not include removal of existing facilities. This assumption is based on most bicycle improvements taking place when streets are resurfaced or reconstructed.

Depending on the project, design and permitting should be included as part of project costs.

A segment level cost estimate has been prepared and included as part of the appendix.

Treatment	Consists of	Unit Price	
Combined Bike / Parking Lane	Striping	$ 0.75	per foot
Bike Route Signage	Bike Route Signage	$ 230.00	each
Shared Bike Lane Striping	Striping, Shared Bike Symbol	$ 0.86	per foot
Bike Lane Striping	Striping, Bike Symbol	$ 0.90	per foot
Buffered Bike Lane Striping	Double Striping, Bike Symbol	$ 1.65	per foot
Widen Sidewalk into Sidepath	Widen to Sidepath, Striping	$ 30.75	per foot
New Sidepath	New Sidepath, Striping	$ 60.75	per foot
New Sidewalk	New Sidewalk	$ 30.75	per foot
Restriping	Striping Removal, Striping	$ 1.36	per foot
Crosswalk	Crosswalk Striping	$ 960.00	per intersection
Paved Shoulders 4'	Paved Shoulders 4'	$ 26.89	per foot
Paved Shoulders 6'	Paved Shoulders 6', Curb & Gutter	$ 81.44	per foot
Road Diet	Striping Removal, Striping, Median Removal, B-	$ 684.57	per foot
Detector Actuation	Detector Loop	$ 110.00	per intersection
RFFB	Beacon, Ped Push Button, Ped Signal Head, Post, Concrete Foundation Ty A, Flasher Controller	$ 7,250.00	each
Curb Narrowing	Diamond Grinding, Milling, Surface Lift	$ 52.53	per foot
Multi-Use Trail	Surface Lift, Aggregate, Striping	$ 59.31	per foot
Median Refuge Island	B-6.06 Curb & Gutter, Fill	$ 5,833.33	per intersection
Bicycle Signal Head	Bicycle Signal Head	$ 750.00	each
HAWK	Signal Pole, Concrete Foundation Ty E, (3) LED Signal Heads, Flasher Controller, Pedestrian Push	$ 10,850.00	each
Active Warning Beacon	Detector Loop, Beacon, Ped Signal Head, Post,	$ 7,010.00	each
Bike Box	Striping, Bike Box Striping, Stop Bar	$ 14,068.80	per intersection
Multi-Use Trail Rehab	Pavement Removal, Solar Lighting, Foundation	$ 70.04	per foot
Pedestrian Bridge	Pedestrian Bridge	$ 100,000.00	each

Funding Sources

LOCAL FUNDING SOURCES

Capital Improvement Program (CIP)

The main source of local funding is the city's capital improvement program. While the plan recommends that the majority of infrastructure improvements should take place as part of other resurfacing or reconstruction projects, the city should consider funding some stand alone projects as part of the city's capital improvement program. Intersection improvements could be a prime candidate for stand alone projects.

Volunteer Resources

Many of the recommendations for education and encouragement are based on volunteer capacity. Local civic organizations can provide invaluable resources for items such as Bike to Work events and bicycle education to students.

FEDERAL / STATE FUNDING SOURCES

Illinois Transportation Enhancements Program (ITEP)

Federal source with 80% federal/state, 20% local cost shares. Administered by IDOT. Calls for applications have been irregularly scheduled. In recent years in which grants were offered, applications have been due in spring. ITEP is one component of the federal Transportation Alternatives Program (TAP), along with Safe Routes to School, Recreational Trails Program, and suballocated TAP dollars administered by Illinois' five largest urbanized regions.

While there are some other eligible uses, a very high fraction of the most recent ITEP funds have gone to bicycle-related projects. There is a high funding demand to supply ratio (5:1 in 2013-2014), but that ratio is not as bad outside the Chicagoland area. Emphasis on transportation potential and inclusion in a larger, officially-adopted plan.

With more stringent federal engineering standards and review processes, this source is better suited for significant ($400K to $1M+) bikeway projects and those requiring substantial engineering work, such as bridges. In part to accommodate the tremendous demand, medium-sized projects are usually funded more than very large projects.

Illinois State Bike Grant Program

State source for off-road trails, with 50% state, 50% local cost shares; a $200K grant ($400K project) limit; and easier (local, not federal) implementation process. The State's financial crisis has put this program on hold.

Recreational Trails Program

Federal source with 80% federal/state, 20% local cost shares.
Administered by IDNR with IDOT. Annual March 1 deadline. $1.5M per year. About half is dedicated for non-motorized, off-road trails emphasizing underserved user types. $200K limit (except for land acquisition projects). Much less competitive, with application demand usually not much more than grant supply.

This has been an underutilized source. Because of the recent decline of the Illinois State Bike Path Grant program, more standard multi-use (bike) trails are getting funded recently. A good target range is $100-200K.

Illinois Safe Routes to School program

Federal source with 80% federal/state, 20% local cost shares; reimbursable grants. SRTS is a component of Transportation Alternatives Program funding. Administered by IDOT.

The most recent cycle totaled $6M for two years. $5M went for infrastructure projects ($200K limit each) within 2 miles of schools serving any K-8 grades. $1M went for education and encouragement programs for the same grades, with an application maximum of $30K. Demand to supply ratio was 2:1 in 2008 and 2011. Non-infrastructure grants are much less competitive.

Sidewalk/sidepath, trail link, and road crossing projects fare well under the SRTS program.

NON-GOVERNMENT SOURCES

Private foundations, local businesses, and individual donors can be another resource, especially for high profile projects. The national focus on public health is also creating more opportunities for active transportation. Many high profile organizations, such the Robert Wood Johnson Foundation, are committing resources to projects that promote public health.

Metrics

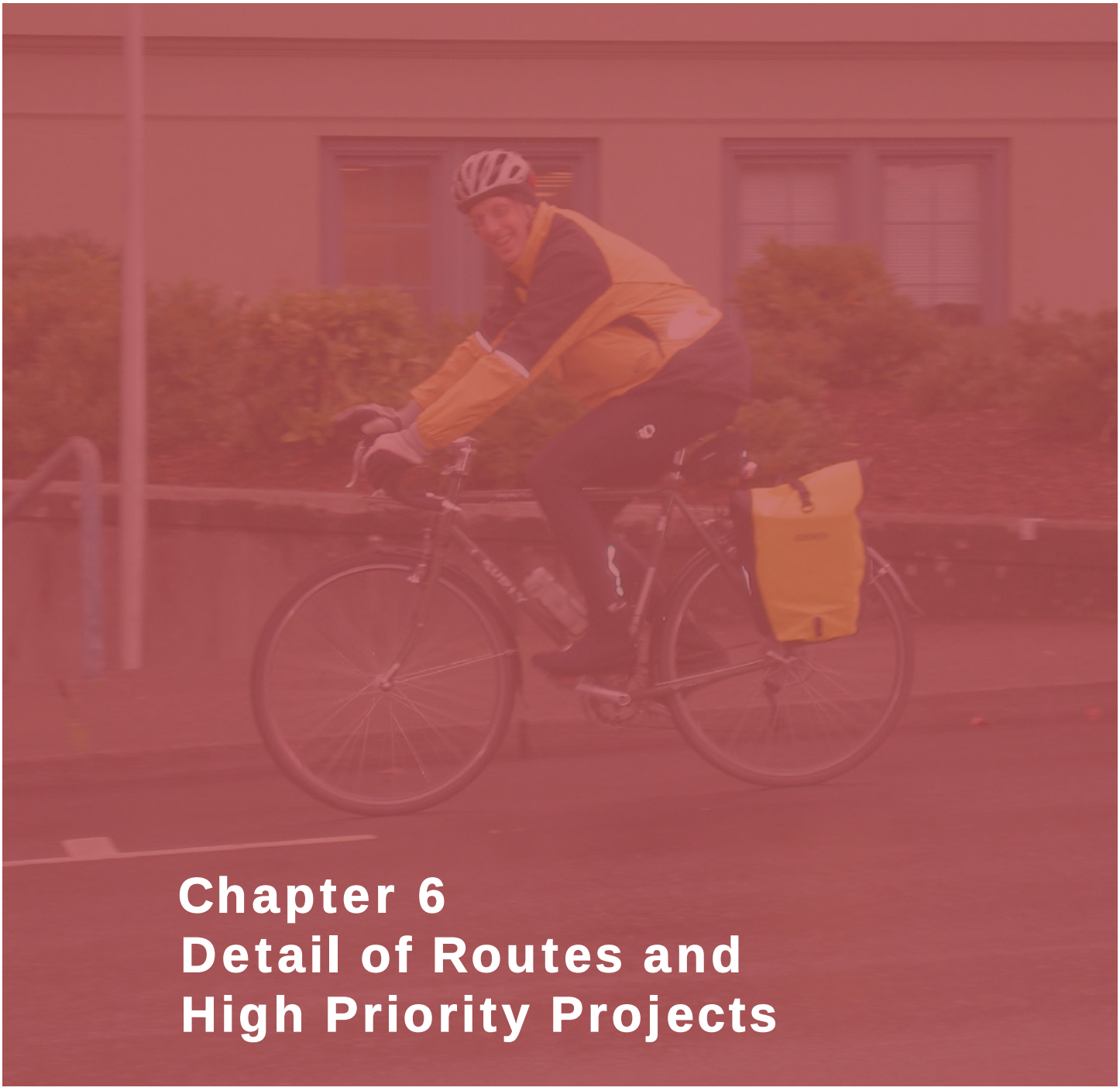
Establishing metrics is an important way to track the long-term success of the implementing the master plan. This section should be used as a starting point in developing and tracking metrics. The Bicycle Advisory Committee should develop a final list of metrics to track.

In determining what metrics to track, there are several important considerations. One, what is possible to track in terms of data and information? Two, can the data and information be easily updated on a regular basis (yearly)? In addition, who will track the data is key as many different partners will be involved in implementing the master plan.

Metrics should be placed in the proper context of plan goals. This plan recommends using metrics to measure progress and not as a benchmark.

Finally, some metrics may seem counterintuitive in trying to measure. For example, measuring safety. Implementing improved bicycle facilities will help increase overall bicycle safety. However, there are some issues with attempting to measure increased safety. As more people bicycle in the City because of the increase in bicycle facilities, the overall *number* of accidents may increase, especially in the short term. However, the *rate* of accidents will likely have decreased.

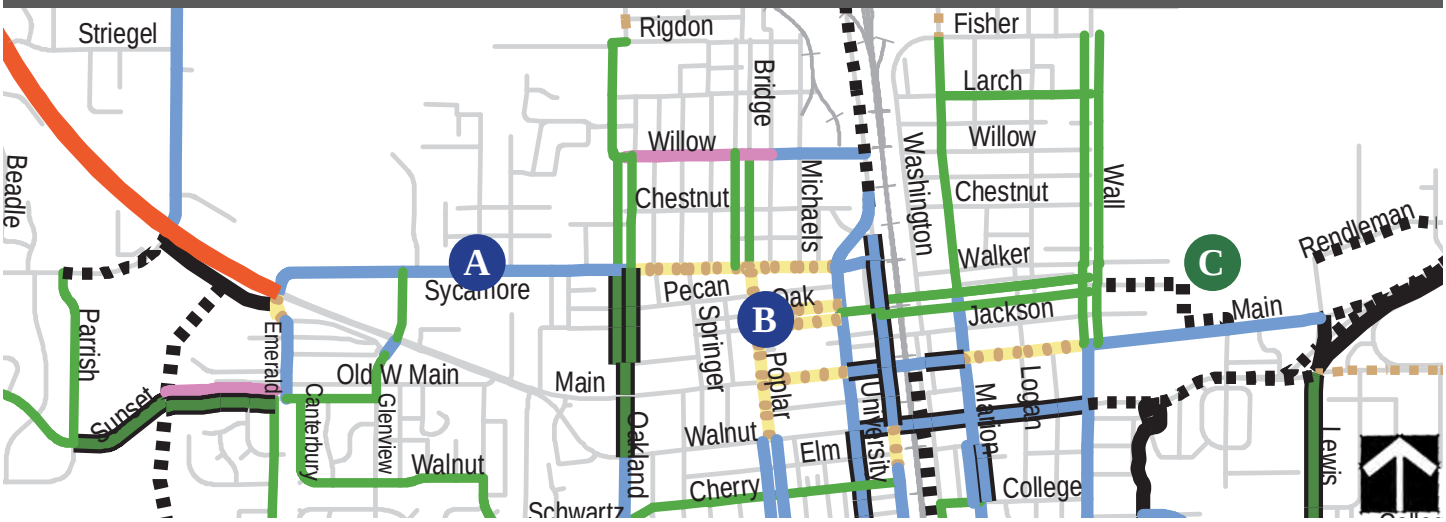
UPCOMING PLANNING / STUDIES	MEASURE
Traffic Analysis for Road Diet for Wall Street	*date completed*
Traffic Analysis for Road Diet for Walnut	*date completed*
Traffic Analysis for Road Diet for Mill Street	*date completed*
Preliminary Design for Little Crab Orchard Creek Greenway	*date completed*
Wayfinding Plan for City	*date completed*
INFRASTRUCTURE METRICS	
Miles of Bike Lanes or Buffered Bike Lanes added per year.	*miles per year*
Miles of Off-Road Facilities added (Sidepaths and Multi-Use Trails) per year.	*miles per year*
Frequency of street sweeping.	*frequency of street sweeping (i.e. monthly, weekly, etc)*
Crosswalks installed or re-striped.	*number of crosswalks (street or driveway)*
EDUCATION, ENCOURAGEMENT, EVALUATION, AND ENFORCEMENT METRICS	
Number of children receiving bicycle helmets per year.	*number of children*
Number of children participating in bicycle education events per year.	*number of children*
Number of partners/businesses involved with Bike to Work day.	*number of partners and businesses*
Number of children participating in Bike to School day at each school.	*number of children*



Chapter 6
Detail of Routes and High Priority Projects

Chapter 6
Detail of Routes and High Priority Projects

East/West Corridor (Sycamore/Pecan/Oak)



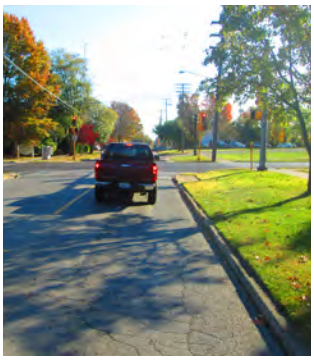
A Sycamore St: Route 13 to Oakland Ave

- Minimally: restripe for 11' vehicular lanes and 3.1' bike lanes
- Add bike lane markings.
- Upgrade to wayfinding signs.
- Ideally, when reconstructed, mill gutter pan to 1' width to allow for 4' bike lanes.
- Priority: Medium

B Pecan St / Oak St: Oakland Ave to Wall St

- Add wayfinding signs to connect Oak St and Sycamore St (using Oakland, Pecan, and Springer).
- Add shared lane markings on Oak St east of Poplar St, centered 4' and 11' from the eastbound and westbound curbs, respectively.
- The road remains well below the Bicycle Level of Service target comfort level, so supplement with "State Law – 3 Feet Min to Pass Bicycles" signs eastbound past Poplar St and westbound past University Ave. Add a Bicycle Detector Pavement Marking and accompanying MUTCD R10-22 sign eastbound at University Ave, at a point where an on-road bicycle can trigger a green signal.
- Priority: High

Oak Street at Almond Street.



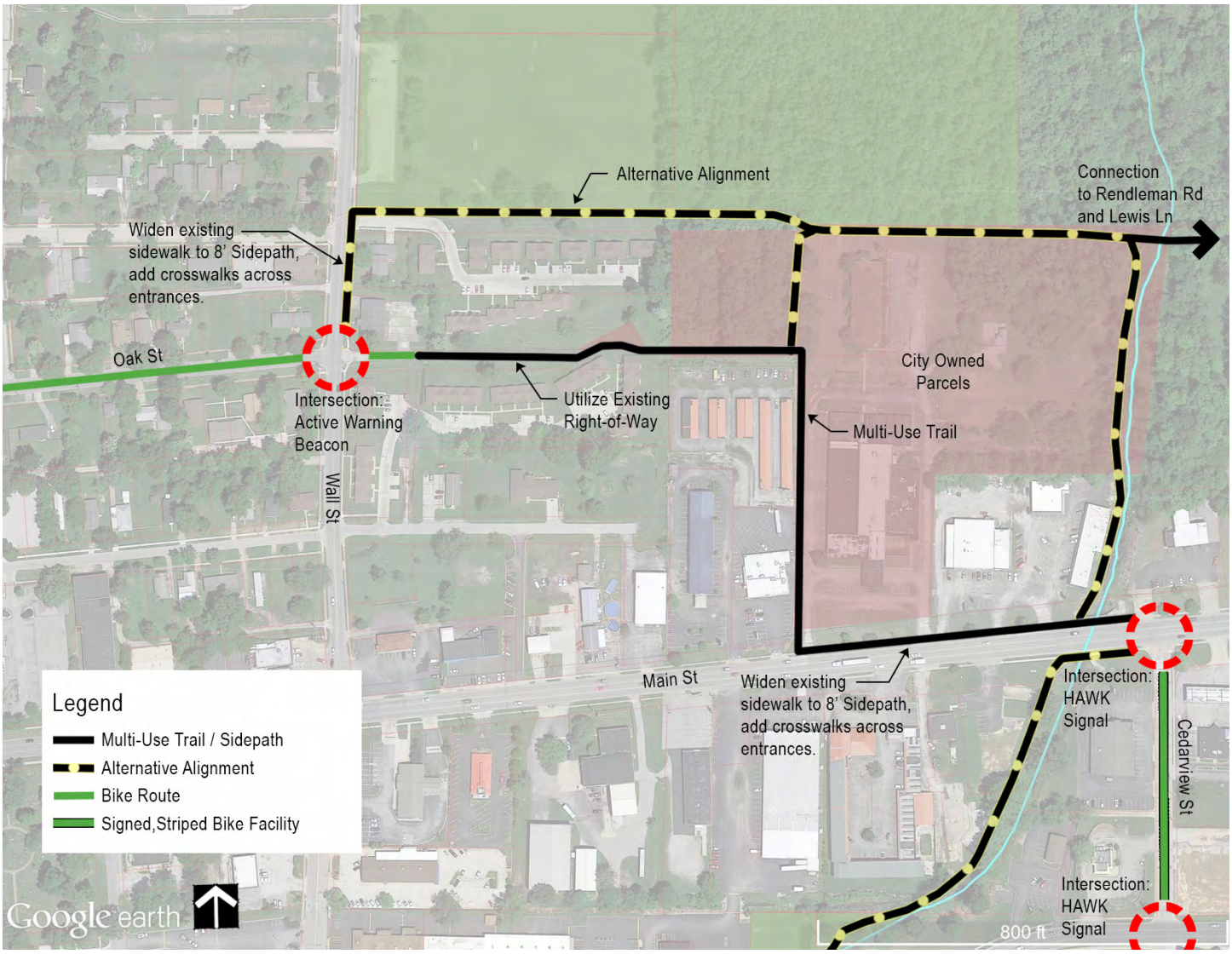
Oak Street at University Avenue.

C Trail/Sidepath: Wall St to Route 13

- Connection from Oak St to Main St and Greenway via multi-use trail on existing right-of-way and city owned parcels.
- New bicycle/pedestrian crosswalk and signals at Main St and Cedarview St and Walnut St and Cedarview St.
- Priority: High

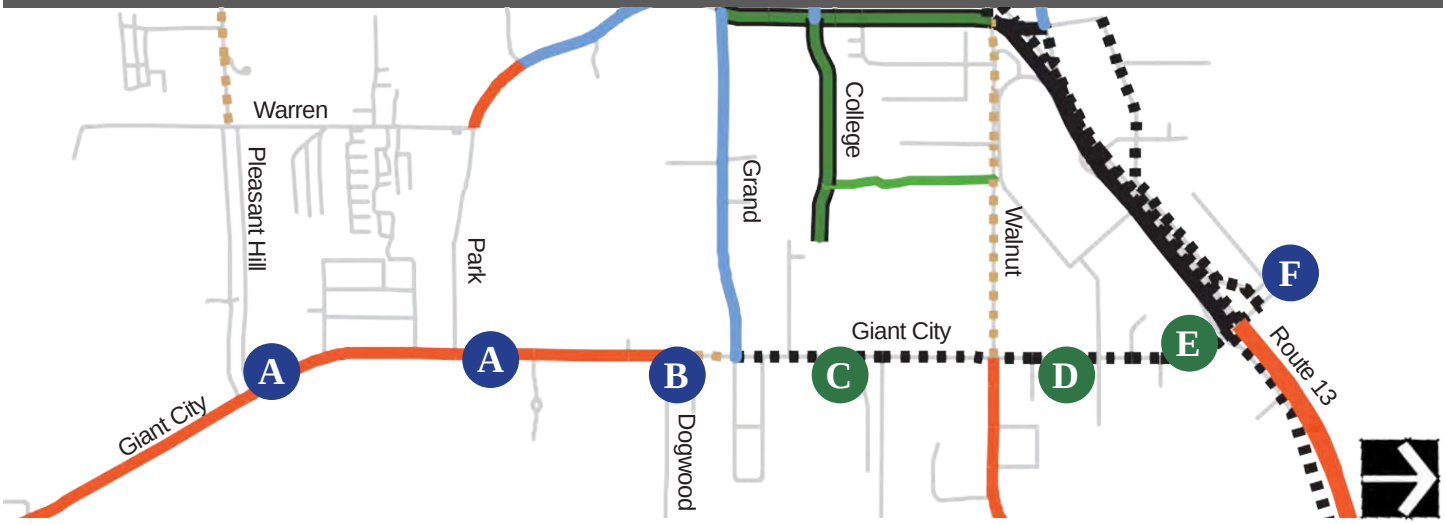
See plan detail.

East/West Corridor (Sycamore/Pecan/Oak)



C Trail/Sidepath: Wall Street to Route 13

Giant City Road Corridor



A Giant City Rd: Pleasant Hill Rd to Dogwood Rd

- Widen paved shoulders to 4', using IDOT's bike-friendlier rumble strip standard (4" from fogline, 8" wide, 3' clear zone, longitudinal gaps).
- Priority: High

B Giant City Rd: Dogwood Rd to Grand Ave

- Add one "State Law - 3 Ft Min to Pass Bicycles" sign each direction for this segment. (Medium Priority)
- Lower priority: widen west side to 8' sidepath width.
- Lower priority: add east side 8' sidepath.

C Giant City Rd: Grand Ave to Walnut St

- Add crosswalks across sidestreets, entrances.
- Widen west side to 8' sidepath width.
- Add east side 8' sidepath.
- Priority: Low *(Not part of recommended network.)*

D Giant City Rd: Walnut St to South Frontage Rd

- Add crosswalks across sidestreets, entrances.
- Widen one side to 8’ sidepath width (Preferably west side).
- Opportunity: New development to install 8’ sidepath as development occurs.
- Priority: Low *(Not part of recommended network.)*

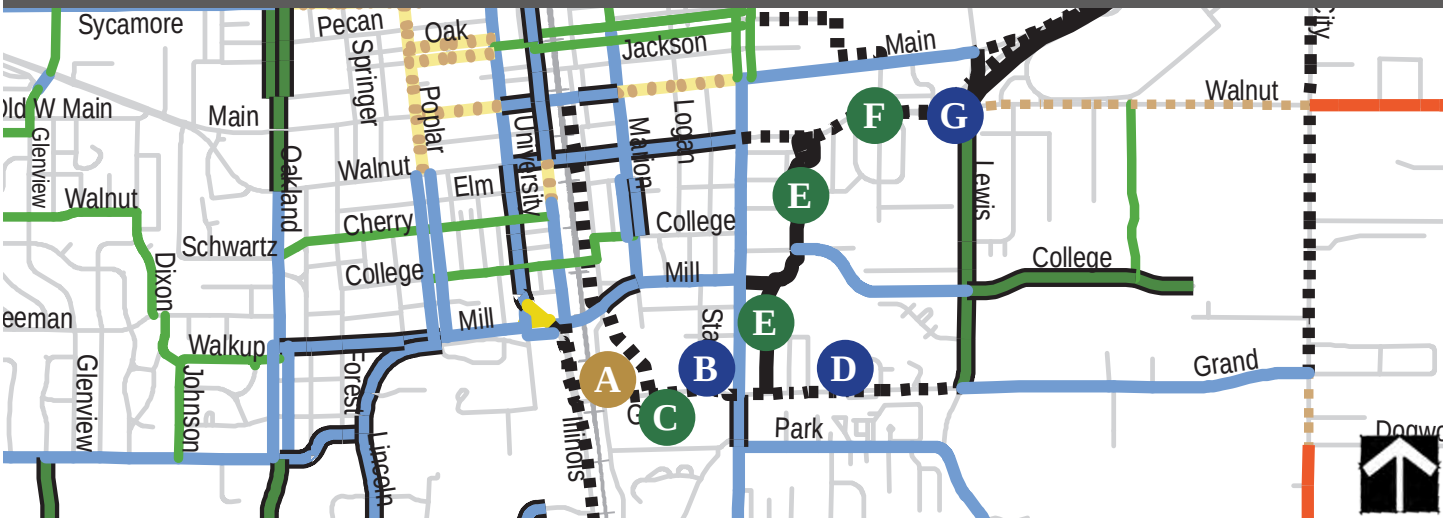
E Giant City Rd: South Frontage Rd to North Frontage Rd

- Add 8’ sidepath (both sides preferred, at minimum west side) to Route 13.
- Add crosswalks across Route 13.
- Priority: Medium

F Giant City Rd: North Frontage Rd Northward

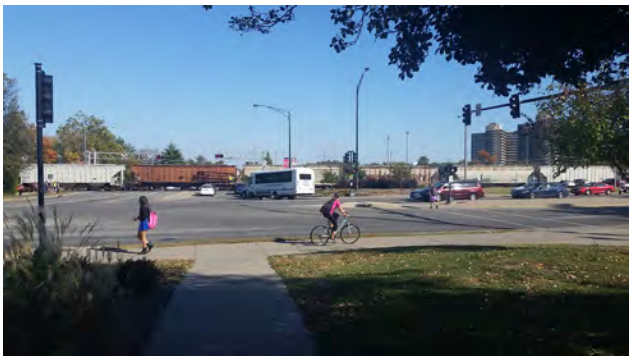
- Future road extension to north: add bike lanes.
- Restripe existing section for 4’ (+gutter) Bike Lane:11.5’-12’-11.5’-4 (BL).
- Priority: Low *(Not part of recommended network.)*

SIU to Route 13/Mall Corridor



A Grand Ave and Illinois Ave Intersection

- Consider Illinois Ave and Grand Ave intersection for lead pedestrian interval or actuated ped-only phase.
- Add continental crosswalks.
- Priority: High



The intersection at Grand Avenue and Illinois Avenue is a key gateway for bicyclists and pedestrians to campus.

B Grand Ave: Illinois Ave to Wall St

- Widen existing sidewalk on north and south sides to 10’ width sidepath.
- Add continental crosswalks at Washington St, State St and south parking lots.
- Add transverse crosswalks at minor entrances.
- Add Sign R1-5c at State St and Grand Ave.
- Replace trail crossing’s continuous flashing beacon with actuated Rectangular Rapid Flash Beacon (RRFB) for better effectiveness.
- Priority: High

Replace existing continuous flash beacon with RRFB. Widen existing sidewalk to 10’ sidepath.

C Pedestrian Bridge to Grand Ave

- Add wayfinding signs at bridge landing.
- Add multi-use trail striping to existing 10’ sidewalk.
- Consider additional 5’ wide sidewalk adjacent to 10’ multi-use trail from Park St to Grand Ave.
- Priority: Medium

D Grand Ave: Wall St to Lewis Ln

- Widen at least one side to 10’ sidepath, preferably widen both sides to 10’ sidepath.
- Add crosswalks at entrances, using continental at busier crossings.
- If road reconstructed, add bike lanes.
- Priority: **Highest**

E Greenway Bikeway

- Enhance trailhead locations at Grand Ave, College St, Mill St and Walnut St with wayfinding signs, enhanced paving, and lighting.
- Remove existing dated site furnishings.
- Upgrade bridge railings.
- Upgrade trail to 10’ width.
- Add solar power lighting.
- Add crosswalk at College St.
- Priority: Medium

Greenway Bikeway: Existing trailhead at College Street is not visible or inviting. The trailhead should be enhanced.

Greenway Bikeway: Existing bridge railings do not meet current standards and should be upgraded.

F Walnut St: Piles Fork Creek to Lewis Ln

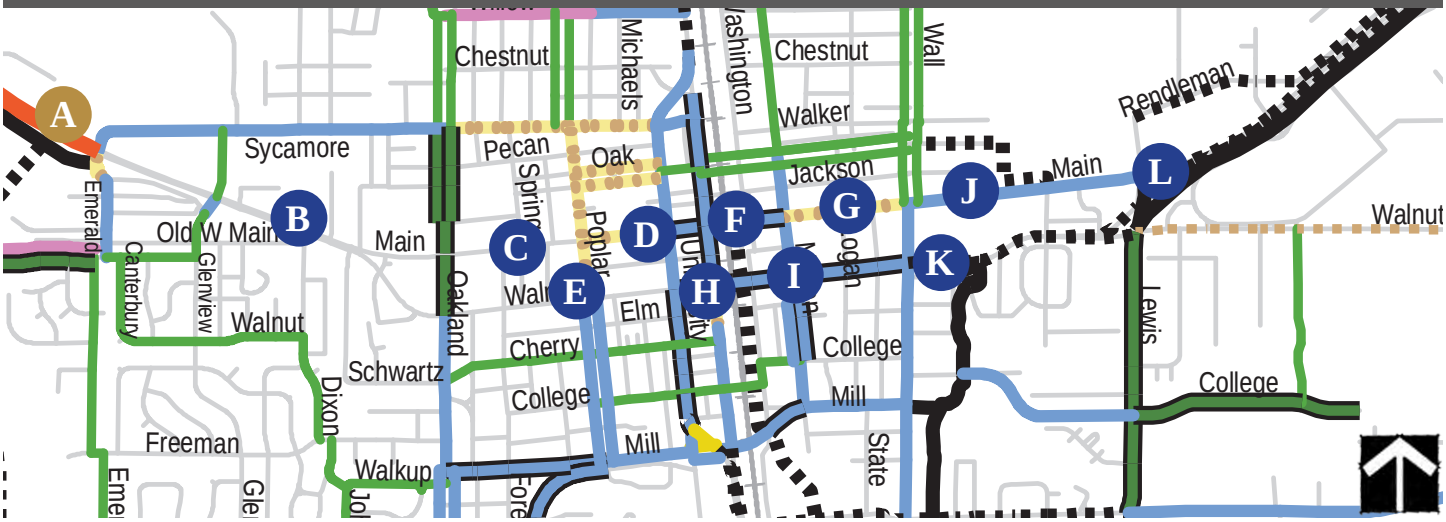
- Widen existing sidewalk to 8’ sidepath along south side of Walnut St.
- Priority: High

G Walnut St and Lewis Ln Intersection

- Provide continental crosswalk across Lewis Ln.
- Priority: High

Existing Lewis Lane intersection: There is a lack of a crosswalk. A crosswalk should be added to connect to the multi-use trail constructed in 2015 on the west side of Lewis Lane.

Route 13 Corridor



A Route 13 at New Era Rd, Sycamore St, and Glenview Dr

- Utilize existing shoulders. Existing shoulders are 10' except when they narrow to 4' westbound at New Era Rd.
- Intersection improvements at New Era Rd: Crosswalks, median refuge, and through bike lanes.
- Intersection improvements at Sycamore St: Crosswalks and through bike lanes.
- Intersection improvements at Glenview Dr: Relocate Main's south sidewalk crossing to the intersection. Reduce southbound Glenview Dr to one lane with 6' bike lanes (both sides) as far south as possible. Use dashed lines in the merge area that would result from the northbound bike lane and the right turn lane. Also dash the southbound bike lane stripe through the intersection with the frontage road. Include wayfinding-based bike route signs.
- Priority: High

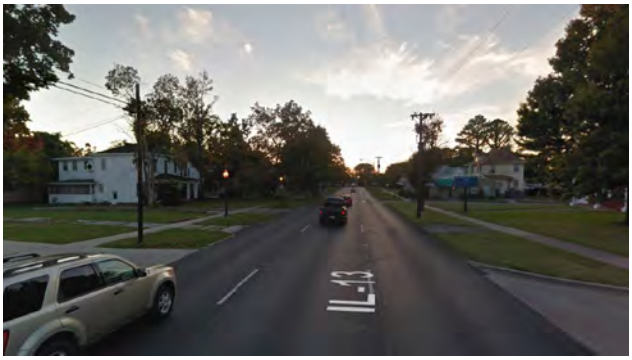
Improvements at the intersection along Route 13 at New Era Road, Sycamore Street, and Glenview Drive are a high priority.

B Main St: East of Sycamore St

- Widen existing sidewalk to 8' width sidepath.
- Provide crosswalks at commercial and street entrances.
- Priority: Low *(Not part of recommended network.)*

C Main St: Poplar St to Walnut St

- On-street facilities (bike lanes) not feasible without major reconstruction.
- Add crosswalks at commercial entrances.
- Move sidewalk crosswalks closer to intersection east of Springer St.
- Evaluate widening existing sidewalk on one side to 8' sidepath.
- Priority: Low *(Not part of recommended network.)*



D Main St: University St to Poplar St

- Gap from end of existing bike lane to important north/south route along Poplar.
- Alternative 1: From Bike Lane end to Poplar St, add Shared Lane Marking 4' from curb; add "Change Lanes to Pass Bicycles" or "State Law - 3 Ft Min to Pass Bicycles" sign. Still, very far below BLOS target.
- Alternative 2: Widen existing sidewalk to 8' sidepath.
- Priority: High

Alt #1

Alt #2

Existing bike lane ends mid-block and creates gap to existing north/south route along Poplar Street.

E Walnut St: Oakland Ave to University Ave

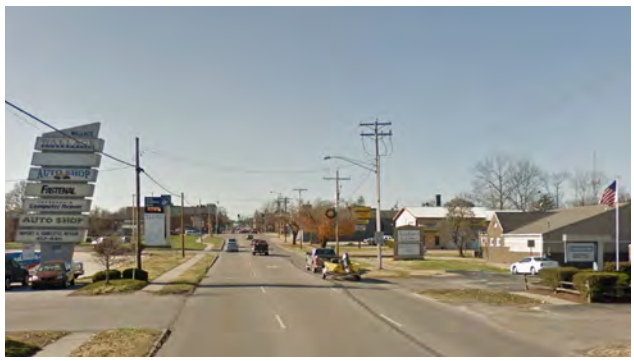
- On-street facilities not feasible without major reconstruction.
- Add and maintain crosswalks at commercial entrances, side streets.
- If parking is ever removed or road reduced to 2 through lanes, buffered bike lane recommended.
- Widening to sidewalks to sidepaths would impact trees and street elements.
- Priority: Low *(Not part of recommended network)*

F Main St: Marion St to University Ave

- Replace solid Bike Lane line with dashes, approaching Illinois Ave. Evaluate using a bike box at intersection of Main St and University Ave.
- Replace solid Bike Lane line with dashes, approaching Washington St.
- Restripe for 12' travel lanes, 3' buffer, 5' bike lane from University Ave to Illinois Ave.
- Add 2.5' bike lane buffer from Marion St to Washington St.
- Priority: Medium

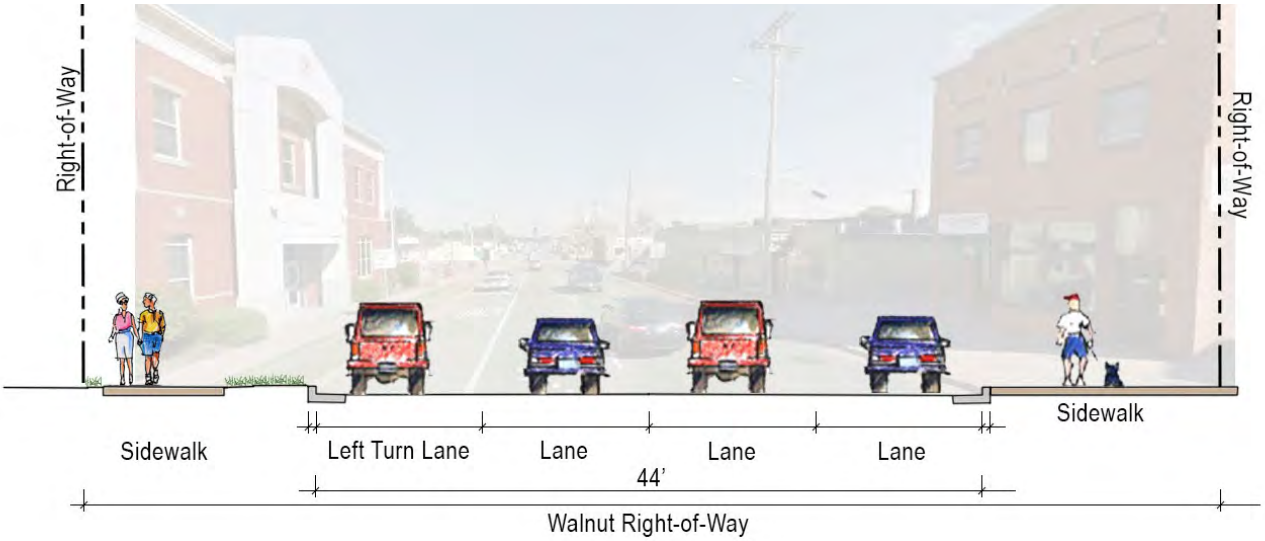
G Main St: Wall St to Marion St

- Add Shared Lane Markings 4' from curb
- Add "Change Lanes to Pass Bicycles" or "State Law - 3 Ft Min to Pass Bicycles" sign.
- Still, very far below BLOS target. If no on-road facilities, at least mark commercial entrance crosswalks for north sidewalk. Widen north sidewalk to 8' sidepath.
- Priority: High



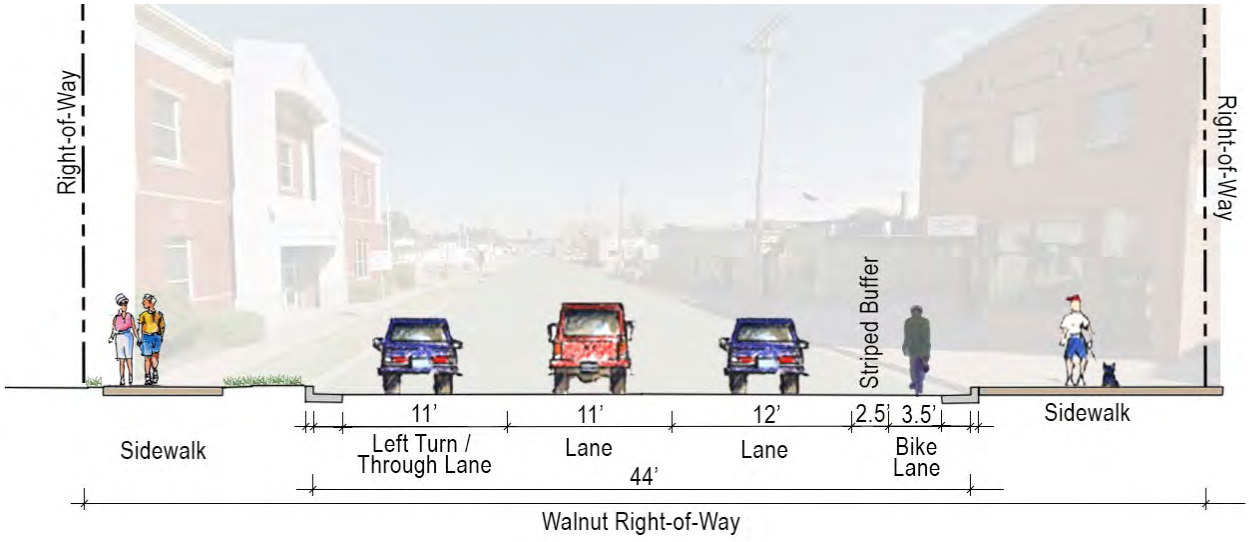
H Walnut St: University Ave to Illinois Ave

- Reduce to 3 (wider) traffic lanes.
- From University Ave transition Walnut St to (left-to-right) combined left/through lane, two travel lanes, buffered bike lane. This one block segment connects the existing bike lanes on University Ave.
- Priority: High



H Walnut Street between University Ave and Illinois Ave: Existing Conditions

Existing Walnut Street has four lanes with a dedicated left turn lane.



H Walnut Street between University Ave and Illinois Ave: Option 1 (Road Diet with Buffered Bike Lane)

Option 1 for Walnut Street would reduce the number of lanes to three with a combined left turn / through lane. This would create room for a buffered bike lane.

I Walnut St: Illinois Ave to Wall St

- Add Bike Lane, or Buffered Bike Lane by restriping to narrower lanes with buffered bike lane:
- Dimensions: 2'pan,11'-11'-12' lanes, 2.5' buffer, 3.5' bike lane, 2'pan
- Dimensions with bike lane only: 2'pan, 11.5'-11.5'-13' lanes, 4' bike lane, 2'pan
- Priority: High

J Main St: Lewis Ln to Wall St

- Narrow travel lanes for 5' Bike Lane on north side, with up to 3' buffer where width allows (east part).
- Complete north side sidewalk gaps on east part
- If no on-road facilities, at least mark commercial entrance with crosswalks for north side sidewalk.
- Priority: High

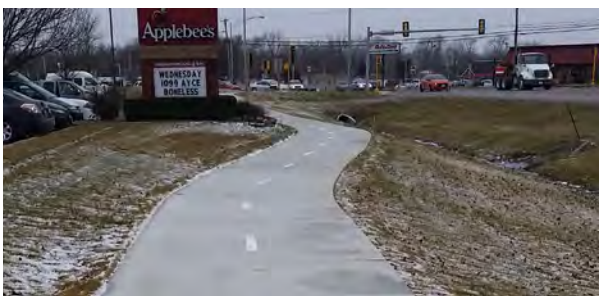
K Walnut St: Wall St to Lewis Ln

- Widen existing sidewalk to 8' width sidepath.
- Add and maintain crosswalks at commercial entrances and side streets.
- Priority: High

By widening existing sidewalk to 8' width sidepath, it will connect the existing Piles Fork Creek Bikeway to the new multi-use trail east of Lewis Lane.

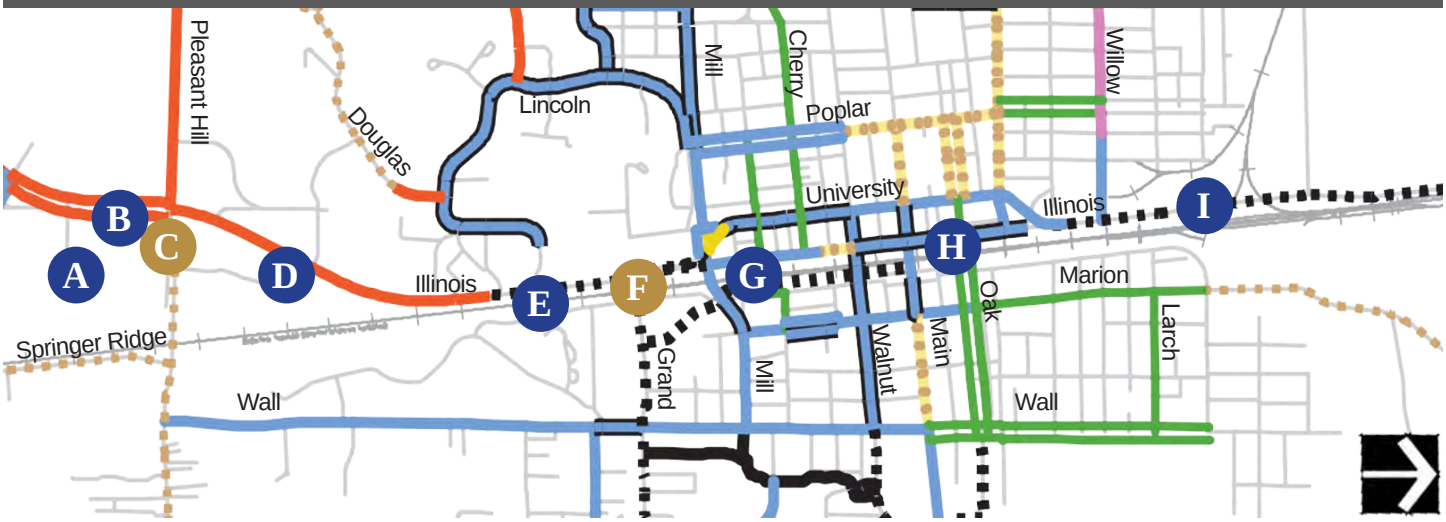
L Route 13: East of Lewis Ln

- Add occasional links from south side multi-use trail to access south frontage road and stores.
- Add north side multi-use trail.
- Priority: Medium



Occasional links should be added to connect existing south side multi-use trail to frontage road and stores.

Highway 51 Corridor



A Old Hwy 51: Park Lane to Hwy 51

- Add sidewalk on one side.
- Restripe to move lanes over and narrow existing southbound shoulder
- Add/mark 4' bike lanes each side (+2' gutter northbound)
- Priority: High

B Hwy 51: Old Hwy 51 to Pleasant Hill Rd

- Alternative 1: Add 6' northbound paved shoulders in addition to existing southbound shoulders. Will require widening the northbound pavement.
- Alternative 2: Restripe to move lanes west to create northbound shoulder. Will narrow existing southbound shoulder.
- Alternative 3: Add multi-use trail along west side of Hwy 51 or through Saluki Point and Reservoir parcels to Pleasant Hill Rd.
- Priority: **Highest**

Alt #1&2

Alt #3

C Intersection: Hwy 51 and Pleasant Hill Rd

- Add crosswalks.
- Add pedestrian signals.
- Upgrade existing path to campus on northwest corner to 8' width multi-use trail.
- Priority: High

D Illinois Ave: Pleasant Hill Rd to South Overpass

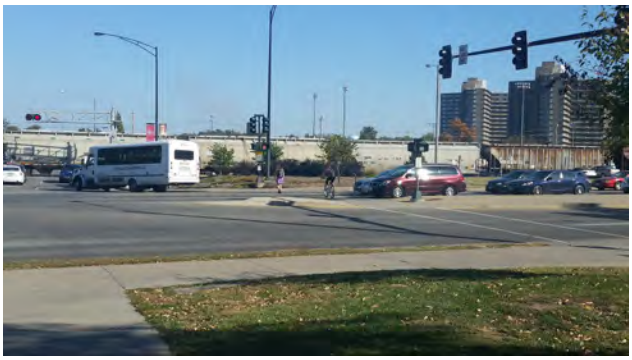
- Utilize existing shoulders on each side.
- 8’ width sidepath on west side is feasible (low priority).

E Illinois Ave: South Overpass to Mill St

- Add 8’ width sidepath on west side from south overpass to connect to existing sidepath near Grand.
- Add crosswalks and pedestrian signals at Lincoln Drive.
- Priority: Medium

F Intersection: Illinois Ave and Grand Ave

- Crosswalk and sidepath needed on south face of Mill St/Illinois Ave intersection.
- Grand Ave intersection candidate for lead pedestrian interval or actuated ped-only phase.
- Priority: High



G Illinois Ave: Mill St to Walnut St

- Utilize existing bike lanes.

Approach to Walnut intersection:

- Alternative 1: Restrict center lane to straight-only. Add sharrows in left/inside part of right-turn lane (combined bike/turn lane), with merge dashes on approach, per NACTO page 83. (Still very far below BLOS target.)
- Alternative 2: Keep both vehicular turn lanes. Add sharrows in right-turn lane (combined bike/turn lane) and add bike signal to allow bicyclists to pass through intersection prior to vehicular movement.
- Priority: High

Alt #1

Alt #2

Existing bike lane along Illinois Avenue ends prior to a dual right turn at Walnut Street.

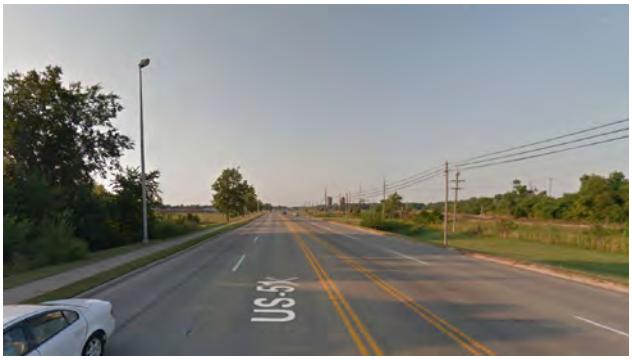
Left: Photo and aerial view example of bike signal at dual right turn intersection. The bike sign allows a bicyclist to move through the intersection prior to vehicles.

H Illinois Ave: Walnut St to Chestnut St

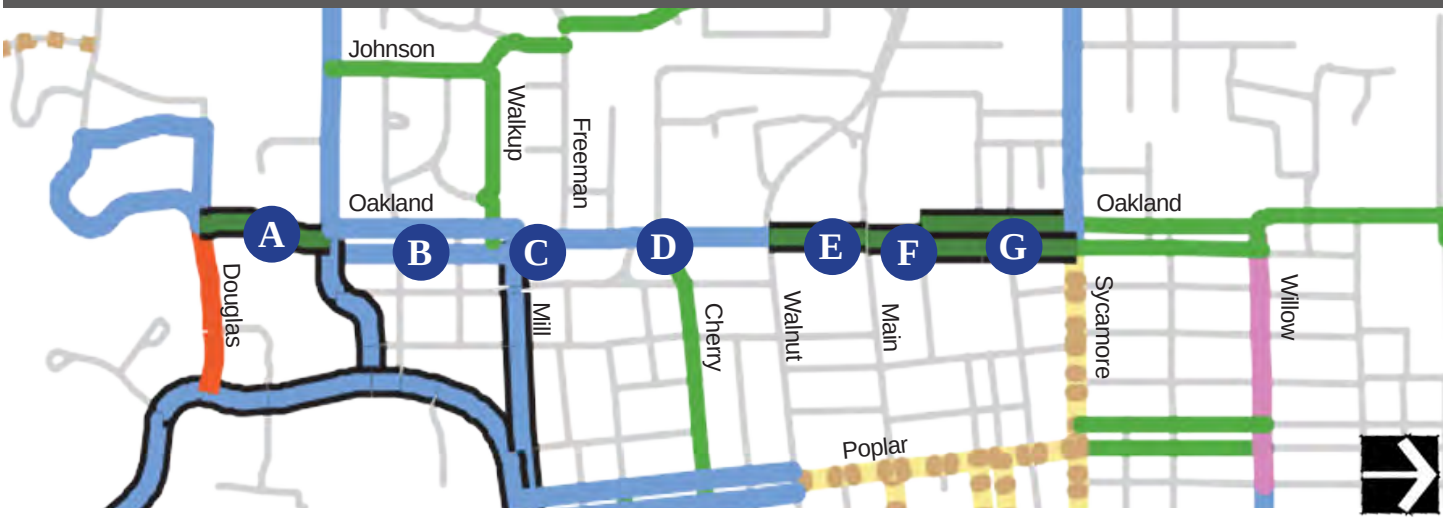
- Restripe for buffered bike lane: 8’ parking, 2’ buffer minimum, 4’ bike lane. Lane widths vary per block, 11’ minimum.
- Priority: High

I Illinois Ave: Chestnut St to Industrial Park Rd

- Widen existing sidewalk to 8’-10’ width sidepath. Provide new 8’-10’ width sidepath in locations where there is no existing sidewalk.
- Priority: Low



Oakland Avenue Corridor



A Oakland Ave: Douglas Dr to Chautauqua St

- Consider striping for 10' lanes, 3' shoulder, 1.7' pan without any bike signage, as passive traffic calming.
- Priority: Low

B Oakland Ave: Chautauqua St to Mill St

- Preferred Alternative: Study north bound parking removal. If parking removed, 5' bike lane each side 2' buffer, 11.2' lanes. Removal of parking is recommended.
- Alternative 2: If parking cannot be removed. Northbound: use shared lane markings 11' from curb. Soundbound: use shared lane markings 4' from curb. (This would be far below BLOS target.)
- If Oakland Ave is widened, provide 5' bike lane each side.
- Priority: High

Alt #1

Alt #2

C Oakland Ave: Mill St to Freeman St

- Preferred Alternative: Remove left turn lane and restripe for 11' lane and 5' bike lanes.
- Alternative 2: 'Bikes May Use Full Lanes' signs and shared lane markings 4' from curb. (This would be far below BLOS target.)
- If Oakland is widened, provide 5' bike lane each side.
- Priority: **Highest**

Alt #1

Alt #2

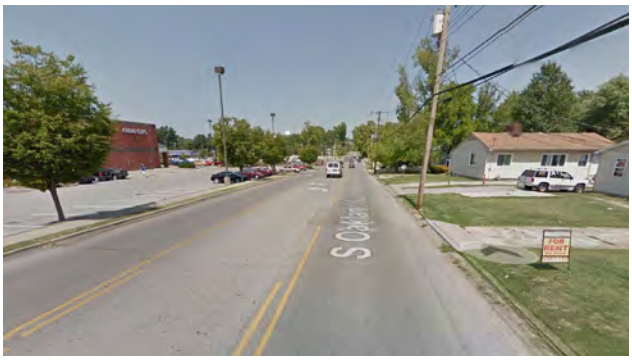
Oakland Avenue Corridor

D Oakland Ave: Freeman St to Walnut St

- Stripe for 11’ lane and 5’ bike lanes.
- Bike lanes should be dashed lines before intersections.
- Priority: **Highest**

E Oakland Ave: Walnut St to Main St

- Stripe for 11’ lanes and 4’ urban shoulder.
- If Oakland Ave is widened, provide 5’ bike lane each side.
- Priority: **Highest**



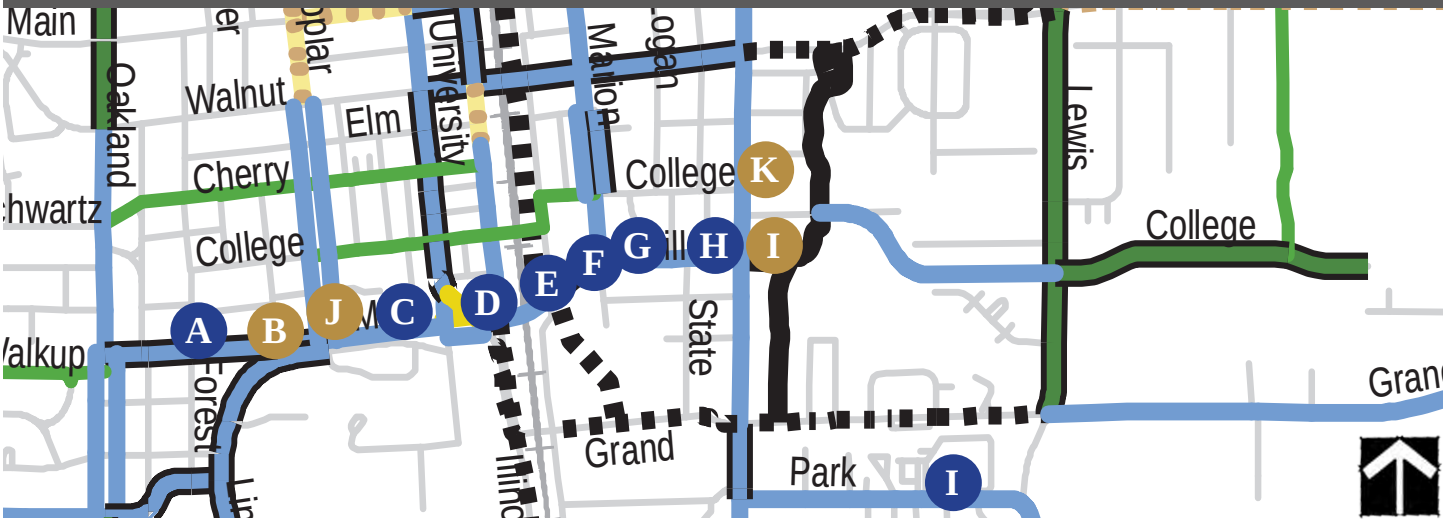
F Oakland Ave: Main St to High St

- Add stripe for 11’ lanes and 4’ urban shoulder.
- If Oakland Ave is widened, provide 5’ bike lane each side.
- Priority: **Highest**

G Oakland Ave: High St to Sycamore St

- Preferred Alternative: Explore parking removal, which affects only a few houses. If parking is removed, stripe for 11’ lanes and 4’ urban shoulder. (4’ shoulder includes 1’ gutters).
- Alternative 2: If parking is not removed, use wayfinding-based Bike Route signs (slightly below BLOS target).
- Priority: High

Mill Street Corridor



A Mill St: Oakland Ave to Poplar St

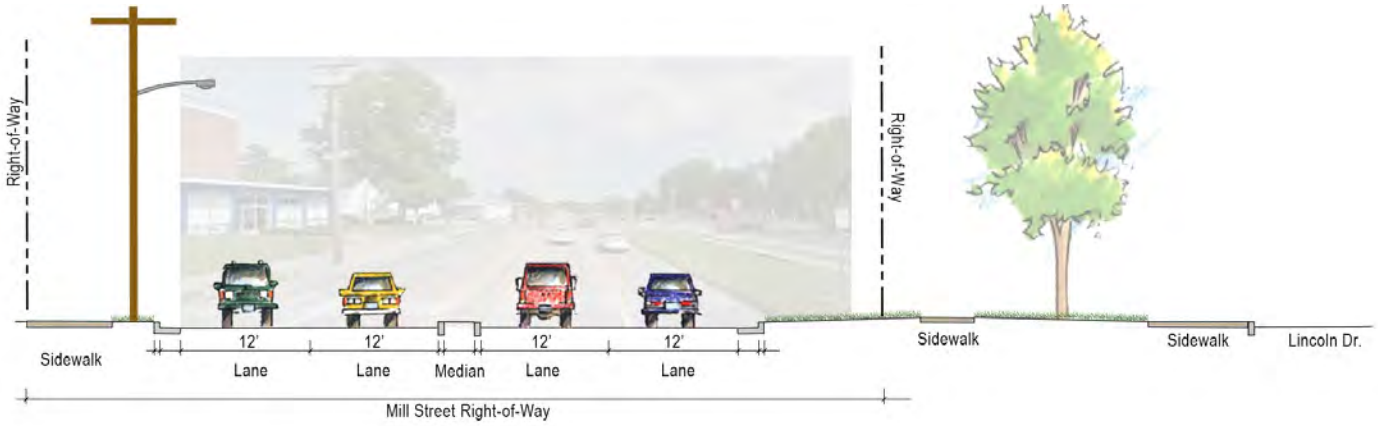
- Ideally, remove median for 4-to-3 road diet
- Dimensions 4' bike lane (excluding gutter)-2.5' (buffer)-12.5' lane -15' (center turn lane /painted median)-12.5' lane -2.5' buffer-4' bike lane.
- See road diet sections for additional alternatives.
- Note: Additional traffic analysis will be required to confirm feasibility of road diet.
- Priority: **Highest**

B Mill St: Intersection at Rawlings St

- Add Rectangular Rapid Flash Beacon (RRFB) to existing crosswalk at Rawlings St.
- Priority: **Highest**

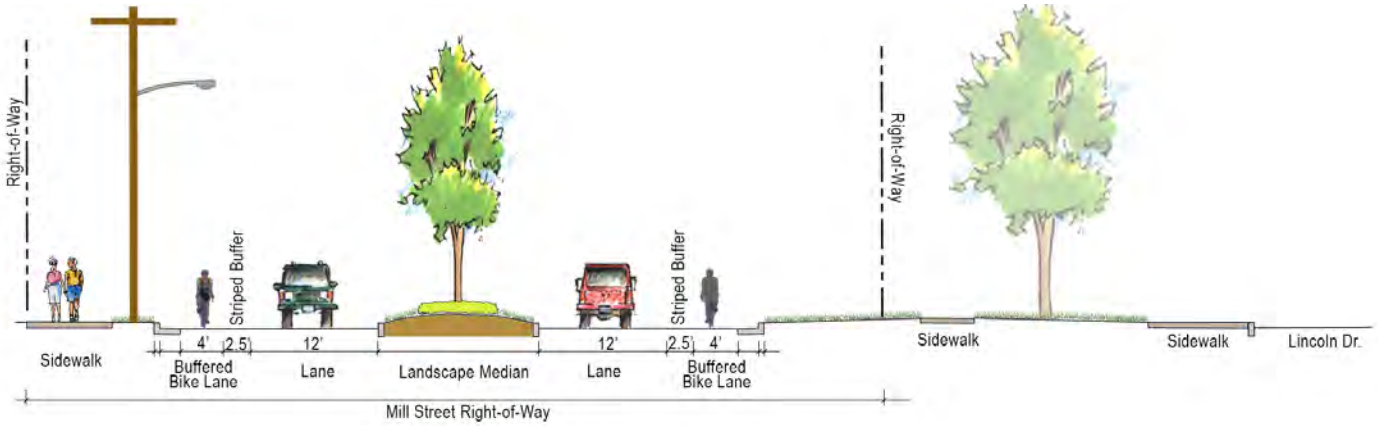
C Mill St: Poplar St to Normal Ave

- Study whether 4-to-3 road diet can be implemented. Additional traffic analysis will be required to confirm the feasibility of a road diet.
- If road diet is not feasible, alternative is shared lane markings 4' from the curb. (This would be far below BLOS target)



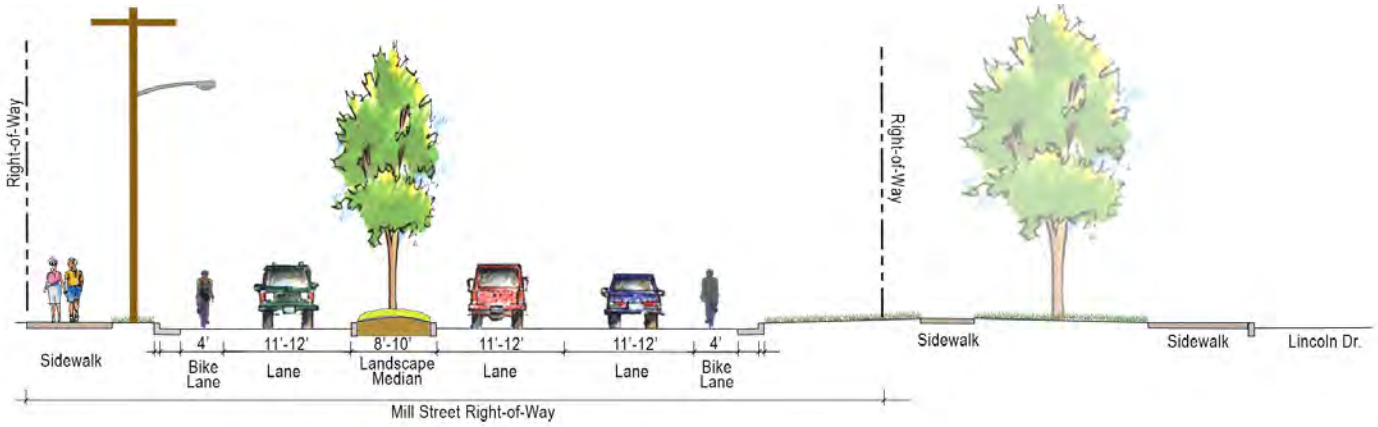
A Mill St Looking East, Just West of Poplar St: Existing Conditions

There is limited opportunity within the existing curb line to have bicycle facilities that would significantly improve bicycle level of service.



A Mill St Looking East, Just West of Poplar St: Option 1 - Road Diet with Buffered Bike Lanes

Option 1 includes one lane in each direction, with a center turn lane / landscape median. This configuration provides enough width for a buffered bike lane each direction. The median can transition to a turn lane at intersections, including at Poplar.



A Mill St Looking East, Just West of Poplar St: Option 2 - Minor Road Diet with Bike Lanes

Option 2 includes two lanes in one direction and a single lane in the opposite direction. This option provides additional traffic volume capacity. This configuration allows enough width for a small median, but it is still wide enough for enhancement opportunities. Bike lanes are 4' width each direction.

D Mill St: Normal Ave to University Ave

- West Bound: Shared lane markings 4’ from curb (but far below BLOS target).
- East Bound: Narrow each of 4 lanes to 11’, providing space for 4’ bike lane between right-turn and through lane. Place SLM shortly after Normal Ave, before right-turn lane widens.
- Add continental style crosswalks at intersections.
- Priority: High

Existing bike lane ends mid-block and creates gap to existing north/south route along Poplar Street.

E Mill St: University Ave to Illinois Ave

- Add bike lanes if space allows
- Add intersection crossing markings to guide bicyclists through intersections.
- Add sidewalk, crosswalks to close sidewalk gap on south side.
- Priority: High

F Mill St: Illinois Ave to Washington St

- Add bike lane symbol markings to existing bike lanes.
- Upgrade to wayfinding signage.
- Could restripe to add 2.5’ buffers in parts.
- Wesbound: Mill St/Illinois Ave intersection - restripe to add bike lane left of right-turn lane.
- Eastbound: Continue bike lanes to Washington, using dashes in right-turn merge area.
- Evaluate feasibility of pedestrian bridge across Mill St on east side of railroad bridge to provide grade separated crossing for north-south multi-use trail.
- Priority: Medium

G Mill St: Washington St to Marion St

- Evaluate for 4-to-3 road diet.
- Dimensions: 4’ bike lane (excluding gutter)-2’ buffer-12’ lane-12’ center turn lane-12’lane-2’buffer-4’bike lane.
- For intersection approaches, transition buffer to dashed lines.
- Priority: High

Mill Street between Washington Street and Marion Street is a candidate for a 4-to-3 road diet.

H Mill St: Marion St to Wall St

- Add bike lane stripes: 11' lane-4' bike lane-1.5'gutter, with markings and wayfinding signage.
- Priority: High

I Mill St: Intersection of Mill St and Wall St

- Add combined bike lane/turn lane by adding SLM to left part of right-turn lane approaching Wall (combined bike lane/turn lane).
- Add the Bicycle Detector Pavement Marking and accompanying MUTCD R10-22 sign eastbound at Wall, at a point where an on-road bicycle can trigger a green signal.
- Priority: High

J Mill St: Intersection of Mill St and Poplar St

- Add both a northbound and southbound shared lane marking at least 4' into the lanes at the minimum width point between Mill and Lincoln.
- Add continental style crosswalks.
- Priority: **Highest**

Poplar Street and Mill Street is a confusing intersection with the proximity of Lincoln Drive. Enhanced crosswalks and shared lane markings will increase the visibility of bicyclists and pedestrians.

K Intersection of College St and Wall St

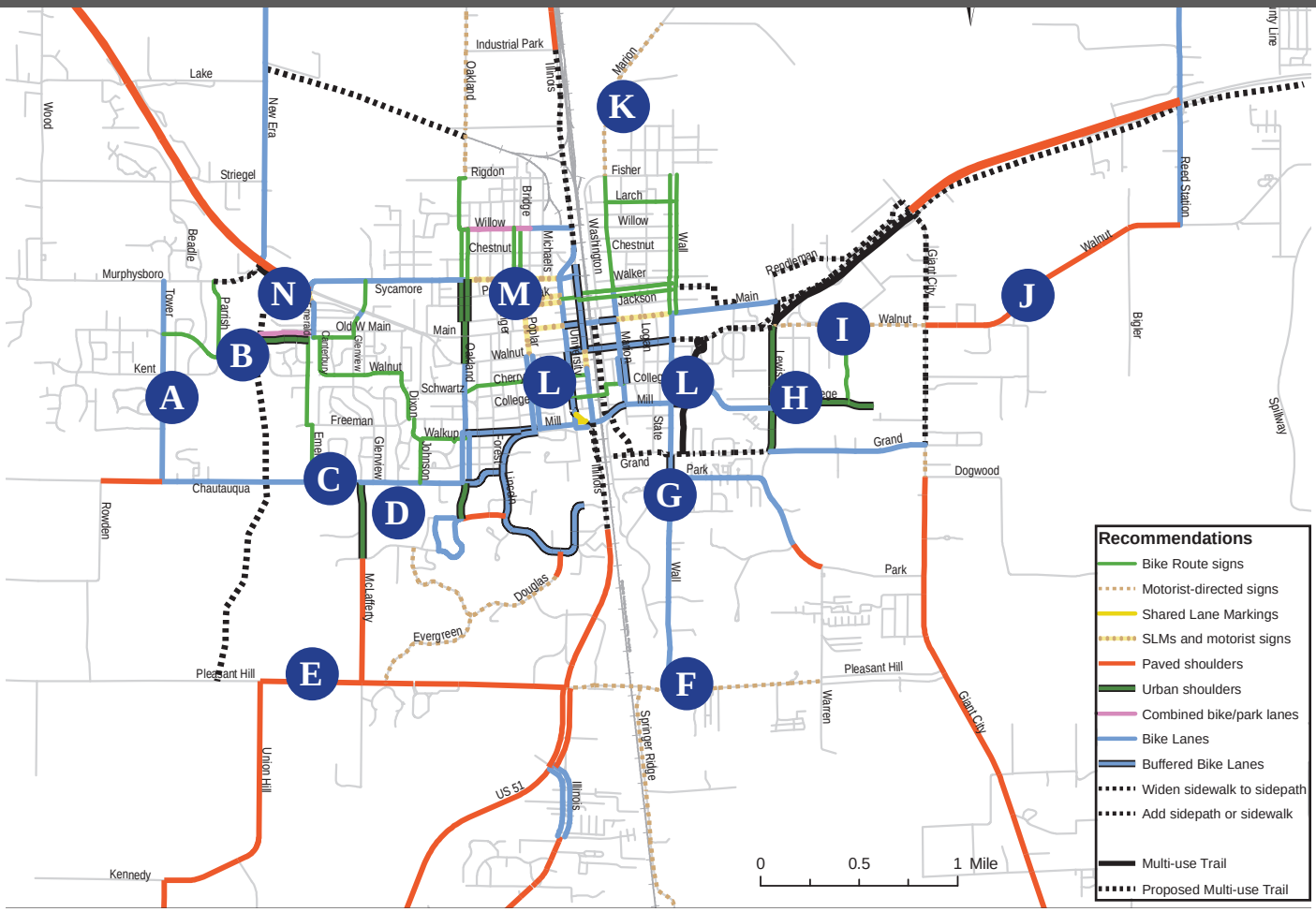
- Alternative 1: As part of road diet evaluation of Wall St evaluate median refuge island in turn lane of Wall St.
- Alternative 2: If no road diet, widened sidewalk to 8' sidepath on Wall St. Install HAWK signal and crosswalk.
- Priority: High

Alt #1

Alt #2

College Street has a short jog at Wall Street. A safer crossing should be installed to accommodate bicyclists on College Street.

Other High Priority Projects



A Tower Rd: Murphysboro Rd to Chautauqua St

- Stripe and mark 4' bike lanes, leaving 11' travel lanes.
- Include wayfinding based bike route signs.
- Priority: High

B Sunset Dr: Emerald Ln to Little Crab Orchard Creek

- Westbound: stripe a 7.2' Combined bike/parking lane or urban shoulder, leaving an 11' travel lane.
- Eastbound: restripe for 11' travel lane and 4' urban shoulder.
- Include wayfinding-based bike route signs.
- Priority: High

Other High Priority Projects

C Chautauqua St: Emerald Ln to Oakland Ave

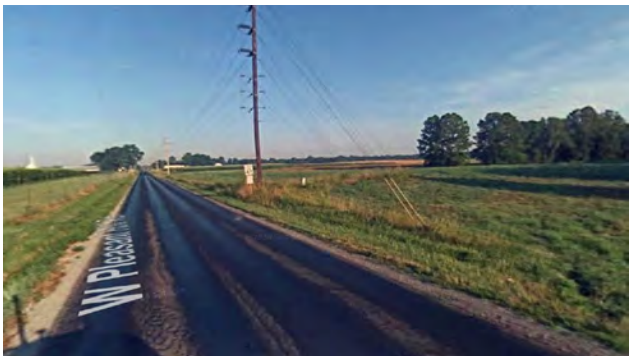
- Stripe and mark 4’ bike lanes, leaving 11’ travel lanes.
- Include wayfinding based bike route signs.
- Priority: **Highest**

D McLafferty Rd: Chautauqua St to Poultry Center Dr

- Add striping 4’ from curbs to provide a shoulder and 11’ travel lanes. Ideally, if the road is reconstructed, widen at least 2’ to allow for at least 5’ bike lanes and 11’ travel lanes.
- Include wayfinding based bike route signs.
- Priority: High

E Pleasant Hill Rd: Union Hill Rd to McLafferty Rd

- Add 4’ paved shoulders, especially if the road is reconstructed. Use wider shoulders if higher traffic counts are projected.
- Alternative: As an alternative, construct a multi-use trail parallel to Pleasant Hill.
- Priority: High



F Pleasant Hill Rd: Illinois Ave to Warren Rd

or

- Eastbound past Illinois and westbound past Warren, add either “State Law – 3 Feet Min to Pass Bicycles” signs or MUTCD W11-1 Bicycle Warning signs with “Change Lanes to Pass Bicycles” plaques, in fluorescent yellow green color.
- Priority: High

Other High Priority Projects

G Wall St: Grand Ave to Park St

- Repave for a 4-to-3 road diet, striping and marking 5.3' bike lanes (including gutters) and 1.8' buffers, leaving 11.5' travel lanes and a 12' continuous left-turn lane.
- Include wayfinding-based bike route signs.
- Add another continental crosswalk and roadway warning signage at the north face of the Park St intersection.
- Priority: High

H Lewis Ln: Walnut St to Grand Ave

- During the next reconstruction, mill the gutter pan from 2' to 1', allowing for 3' striped areas outside of the gutter. This would still be an "urban shoulder" and not a full "bike lane".
- Add wayfinding-based bike route signs.
- Ideally, expand pavement to allow for 5' bike lanes (including 1' gutter).
- Priority: High

I Walnut St: Lake Heights Ave to Giant City Rd

or

- Eastbound past Lake Heights Ave and westbound past Giant City Rd, add either "State Law – 3 Feet Min to Pass Bicycles" signs or MUTCD W11-1 Bicycle Warning signs with "Change Lanes to Pass Bicycles" plaques, in fluorescent yellow green color.
- If the road is reconstructed without widening, reduce gutter pan width to 1', stripe 3.5' shoulders, and narrow travel lanes to 11'.
- Priority: High

J Walnut St / Old Hwy 13: Giant City Rd to Reed Station Rd

- If major reconstruction or a safety improvement is done, add 4' paved shoulders. If not, consider adding signs ("State Law – 3 Feet Min to Pass Bicycles" signs or MUTCD W11-1 Bicycle Warning signs with "Change Lanes to Pass Bicycles" plaques, in fluorescent yellow green color) eastbound past Giant City Rd and westbound past Reed Station Rd.
- Priority: High

Other High Priority Projects

K Marion St: Fisher St Northward

- Add either “State Law – 3 Feet Min to Pass Bicycles” signs or MUTCD W11-1 Bicycle Warning signs with “Change Lanes to Pass Bicycles” plaques, in fluorescent yellow green color.
- Priority: High

or

L1 Cherry St: Oakland Ave to Poplar St

- Add wayfinding-based bike route signs.
- Since Cherry St crosses Poplar St at an unprotected crossing, add MUTCD W11-1 Bicycle Warning signs (in FYG color) before Cherry St on northbound and southbound Poplar St.
- Priority: High

L2 College St: Poplar St to Marion St

- Add wayfinding-based bike route signs. The road remains below the Bicycle Level of Service target comfort level, so supplement with “State Law – 3 Feet Min to Pass Bicycles” signs eastbound past Poplar St and westbound past Washington St.
- Add Bicycle Detector Pavement Markings and accompanying MUTCD R10-22 signs at University Ave and Illinois Ave, at a point where an on-road bicycle can trigger a green signal.
- Priority: High

Add Bicycle Detector Pavement Markings and accompanying MUTCD R10-22 signs at University Avenue and Illinois Avenue.

L3 College St: Piles Fork Trail to Lewis Ln

- Stripe and mark 4’ bike lanes, leaving 11’ travel lanes.
- Include wayfinding-based bike route signs.
- Add a continental crosswalk where the Piles Fork trail crosses College St, with MUTCD W11-15 Combined Bicycle/Pedestrian Warning signs and W11-15p Trail X-ing plaques, both in FYG color, at or possibly in advance of the crossing.
- Priority: High

Other High Priority Projects

M Poplar St: Sycamore St to Walnut St

- Add shared lane markings, centered 4’ from the curbs. Include wayfinding-based bike route signs. The road remains below the Bicycle Level of Service target comfort level, so supplement with “State Law – 3 Feet Min to Pass Bicycles” signs southbound past Sycamore St and northbound past Walnut St.
- Check on-road signal actuation northbound at Main and Walnut St, adding Bicycle Detector Pavement Markings and accompanying MUTCD R10-22 signs, if needed.
- Priority: High

N Emerald Ln: Main St to Finer Foods Store

- For on-road bicyclists, add shared lane markings centered 4’ from the curb. Include wayfinding-based bike route signs.
- The road remains well below the Bicycle Level of Service target comfort level, so supplement with “Bikes May Use Full Lane” signs.
- Check on-road signal actuation northbound at Main, adding the Bicycle Detector Pavement Marking and accompanying MUTCD R10-22 sign, if needed.
- Priority: High

Chapter 7
Planning Toolkit

Chapter 7
Planning Toolkit

Chapter Overview

This chapter provides descriptions of the bicycle planning toolkit. This chapter includes:

- Planning Principles
- Facility Types
  - On-Road Facilities
  - Off-Road Facilities
  - Intersection Improvements
- Definitions and Acronyms

Planning Principles

TECHNICAL GUIDES

The 2012 Guide for the Development of Bicycle Facilities by the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration's (FHWA) Manual of Uniform Traffic Control Devices (MUTCD), and the NACTO Urban Bikeway Design Guide (NACTO) form the technical basis for the plan's recommendations.

The AASHTO guidelines are generally recognized by the industry – and the court system – as the standard for bicycle facility design. The Illinois Department of Transportation encourages communities to consult these guidelines and the MUTCD when developing bicycle plans.

This master plan is a guidance document and should not be considered as final design or as construction drawings. Before any projects or facilities are implemented or constructed, the designer shall consult with the most up to date national standards and follow all local, state, and federal laws and requirements. If there are discrepancies in this report with national standards, the national standards shall prevail.

PLANNING PRINCIPLES

The following general guiding principles were used for the plan's recommended improvements to Carbondale's bikeway network.

- Plan for a target audience of casual adult cyclists. At the same time, address the needs of those who are more advanced and those who are less traffic-tolerant, including children.
- Strive for a network that is continuous, forming a grid of target spacing of ½ to 1 mile to facilitate bicycle transportation throughout the City.
- As much as possible, choose direct routes with lower traffic, ample width, stoplights for crossing busy roads – and at least some level of traffic control priority (minor collectors or higher classification) so that cyclists do not encounter stop signs at every street.
- Look for spot improvements, short links, and other small projects that make an impact.
- Be opportunistic, implementing improvements during other projects and development. An example is restriping during resurfacing. Widening a road to add an on-road bikeway will be considered as part of a major road reconstruction, but not as a standalone project.

These guidelines were used for making recommendations for specific route segments:

- Consider both on-road and off-road improvements. Narrowing lane width to 11' was considered if necessary to implement an on-road bikeway on roads with lower speed and lower truck traffic.

- Where on-road bikeways are recommended, try to achieve a Bicycle Level of Service rating of High C (marginal), B (ideal), or better for designation in the network. This is an appropriate goal for accommodating the casual adult bicyclist. Depending on the situation, use Bike Lane or Bike Route signage, plus wayfinding signage to indicate inclusion in the network.

- For the on-road segments designated as being in the network, raise the priority of filling sidewalk or sidepath gaps on at least one side of the road. This recognizes that children – and more traffic-intolerant adults – will ride on the sidewalk. However, sidewalks with width under sidepath standards should not be designated or marked as part of the bikeway network.

- Only in special cases should sidepaths be recommended where there are too many crossing conflicts (driveways, entrances, cross streets) or where residential front yards will be impacted. Where sidepaths are recommended, use the design techniques described in this chapter to somewhat reduce the risks at intersections.

- Where there is sufficient width and need, and speeds are moderate to low, use striping to improve on-road cyclist comfort level. Depending on the available width and parking occupancy, the striping may be in the form of either dedicated bike lanes or combined bike/parking lanes. Where such roads have insufficient width for striping, shared lane markings or simply Bike Route wayfinding signs are recommended, depending on parking occupancy and assuming an on-road comfort level meeting the target Bicycle Level of Service.

- Use Shared Lane Marking and bike signal actuation pavement markings to indicate proper on-road bicycle position, especially where heavy bicycle traffic is expected. Shared Lane Markings should be used in straight-ahead lanes, at intersections where turn lanes require the interruption of striped bike lanes or Combined Bike/Parking Lanes.

OVERVIEW

The majority of streets do not require special bicycle facilities. Bicyclists can share vehicular lanes. Shared roadways are most suitable for low volume and low speed streets such as residential streets and minor collector roads.

ON-ROAD BIKEWAY TYPES

Shared Roadways

ADVANTAGES

- The majority of streets do not require special bicycle facilities.
- Lowest cost of bikeway types.

Source: www.bikepedimages.org/Mike Cynecki

DISADVANTAGES

- Few disadvantages if utilized in the proper context.
- Wayfinding signage may need to be incorporated if shared roadways are part of a defined bicycle route.

APPLICABILITY FOR CARBONDALE

High applicability, especially for the residential streets in southwest Carbondale.

Pecan Street (above) is an example of a low volume, low speed street that is suitable as a Shared Roadway.

OVERVIEW

Bike lanes are portions of the roadway designated for bicyclist use. Bike lanes are typically between five and six feet wide (including gutter pan) on each side of the road with a stripe, signage, and pavement markings. In some situations, a bike lane can be four feet wide. Cyclists in each bike lane travel one-way with the flow of traffic. Most suitable for lower-speed (< 40mph) urban arterials, collectors, dedicated space.

Parking is not permitted in designated bicycle lanes. When a road has bike lanes and adjacent parking, the bike lanes should be striped between the parking space and the travel lanes. Regular sweeping is important, as bike lanes tend to collect debris.

Buffered bike lanes are bicycle lanes with a designated buffer space separating the bicycle lane from the adjacent vehicle travel lane and/or parking lane.

ADVANTAGES

- Traffic-calming effect for motor vehicles.
- More predictable movements by both cars and bikes.
- Better cyclist adherence to laws about riding on the right side of the road.
- Dramatic increases in bike usage with lower car-bike crash rates.
- Buffered bike lanes provide greater shy distance between motor vehicles and bicyclists and increase the level of comfort and safety for bicyclists.

CONSIDERATIONS

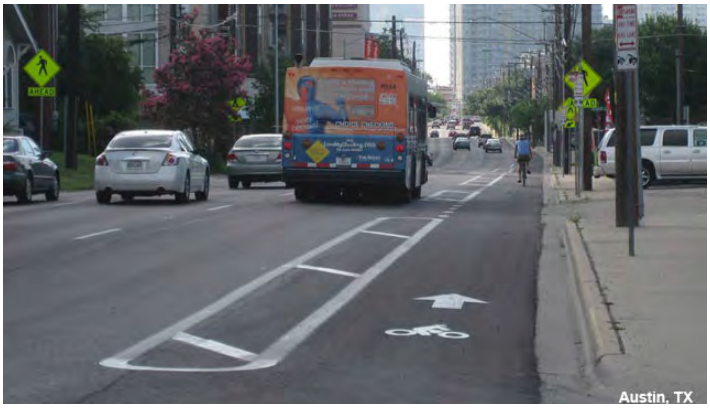
- Few disadvantages if utilized in the proper context.
- Car door opening into bike lane can be an issue when bike lane is adjacent to on-street parking.
- Transitions through intersections or when a street narrows or important. Bicyclists can be "stuck" when a bike lane unexpectedly ends.
- The buffer area shall have interior diagonal cross hatching or chevron markings if 3 feet in width or wider.

APPLICABILITY FOR CARBONDALE

High applicability. High request by public and stakeholders.

Source: National Association of City Transportation Officials

Existing bike lane along University Avenue.



Example of a buffered bike lane.
Source: National Association of City Transportation Officials

OVERVIEW

The Sharrow (Shared Lane Marking) is used primarily for streets with speed limits below 40 mph having insufficient width (or need) for bike lanes. On such roads with significantly occupied on-street parallel parking, the center of the marking shall be 11 feet (or more) from the curb; with no occupied parking, the center of the marking shall be 4 feet (or more) from the curb. The markings should be placed right after an intersection and spaced at intervals of 250 feet thereafter. The shared lane marking also can be used to indicate correct straight-ahead bicycle position at intersections with turn lanes, where bike lanes or combined bike/parking lanes have been temporarily dropped.

ON-ROAD BIKEWAY TYPES

Sharrows

Source: Ride Illinois

ADVANTAGES

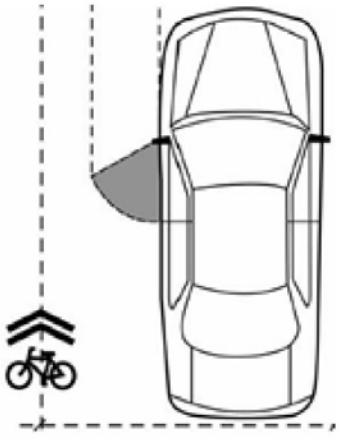
- Alerts motorist more effectively than signs that bicyclists are sharing a lane.
- Positions bicyclists outside of car “door zone”.
- Can be especially effective at intersections to better position bicyclists and alert motorists.

CONSIDERATIONS

- Sharrows should be supplemented with wayfinding signage.

APPLICABILITY FOR CARBONDALE

Moderate applicability. Most applicable for intersections to better position bicyclists and alert motorists.



Sharrows should be placed outside of the door zone of parked cars.

OVERVIEW

These “signed shared roadways” may be appropriate where there is not enough room or less of a need for dedicated bike lanes. A road does not require a specific geometry to be signed as a Bike Route, providing flexibility. A Bike Route may be a striped or unstriped street, or a road with paved shoulders.

It is recommended to use the updated signage styles available in the Manual of Uniform Traffic Control Devices (MUTCD). Some can also provide wayfinding assistance at intersections with supplemental destination plates and arrows placed beneath them. The 2009 version of the MUTCD manual includes signs that combine bike route designation with wayfinding information. Some Illinois towns have put two or three destinations on a single sign, with mileages.

ON-ROAD BIKEWAY TYPES

Bike Routes

ADVANTAGES

- Flexibility. Can be used to supplement other bicycle facilities such as bike lanes, paved shoulders, sharrows, etc.
- Can also provide wayfinding assistance to destinations.

CONSIDERATIONS

- Signage alone usually does not increase bicyclist comfort or safety.

Frequently Used Signs in This Plan

MUTCD R10-22

MUTCD W11-1 Bicycle Warning signs with “Change Lanes to Pass Bicycles” plaques, in fluorescent yellow green color.

MUTCD W11-15 Combined Bicycle/Pedestrian Warning signs and W11-15p Trail X-ing plaques, both in fluorescent yellow green color.

APPLICABILITY FOR CARBONDALE

High applicability. Signs with wayfinding destinations would help new bicyclists (SIUC students) better navigate the City and increase awareness about City’s bicycle network.

ON-ROAD BIKEWAY TYPES

Combined Bike / Parking Lane

OVERVIEW

Some residential collector streets with wide lane widths permit on-street parking, but parked cars are sparse – under 5% or 10% occupancy – except perhaps on special occasions ("party-parking"). While this may be an opportunity for dedicated bike lanes, removal of parking on even one side may be politically infeasible – even though the wider lanes often encourage faster traffic speeds through neighborhoods.

A fall back option is to stripe off 7-8 feet (including gutter pan) for the occasional parked car. This space, essentially an "urban paved shoulder", may be used by bikes, too. Sign the road as a Bike Route, but do not include any designated Bike Lane signage or pavement markings. Cyclists in this space would pass parked cars just as they do on road shoulders and unstripe roads.

Source: Ride Illinois

ADVANTAGES

- An increased perception of comfort by the cyclist.
- Lower likelihood of the occasional parked car being hit by another car.
- The traffic-calming effect of narrower lanes (slowing car speeds).

CONSIDERATIONS

- "Combined Bike/Parking Lanes" allow parking, but Bike Lanes do not. Steps should be taken to avoid confusion. Combined Bike/Parking Lanes should use signage indicating parking permission information.
- This treatment is less appropriate on roads with moderate-to-high traffic counts and/or moderate-to-high on-street parking.

APPLICABILITY FOR CARBONDALE

Moderate applicability.

OVERVIEW

For rural roads and collectors, the use of a paved shoulder for bicyclists can be an acceptable bicycle facility type, especially when there are limited options for other facility types. Typically, a paved shoulder will have vehicular uses such as an emergency parking area or safety recovery area.

ON-ROAD BIKEWAY TYPES

Paved Shoulders

Source: www.pedbikeimages.org-Laura Sandt

ADVANTAGES

- Provides a increased level of safety for significant rural roads or collector roads.
- Shoulders have multiple purposes for vehicles, including emergency parking or safety recovery area.

CONSIDERATIONS

- Widths of shoulders will vary according to traffic level, type.
- If rumble strips must be used, use bike-friendly designs.
- Like bike lanes, shoulders need sweeping.
- Where vehicular traffic is high volume or high speed, the comfort level for bicyclists will be low. Where there are narrow shoulders adjacent to high speed traffic, safety can be a concern, especially for less experienced bicyclists.
- If a high volume of bicyclists is expected, sidepaths should be considered instead of using the shoulder.

APPLICABILITY FOR CARBONDALE

Moderate to high applicability, especially for roads at the edge of the City that are used for commuting.

OVERVIEW

These are roads where there is a lane striped for bikes, but the lane width does not meet the standard width for a full "bike lane". For these roads to have a full 5' (or 4' width) width bike lane would be cost prohibitive. The roads will need to be widened which would require moving the curb line and reconstructing stormwater inlets.

In the short term, these roads should be striped with additional signage. They are part of the overall bicycle network, but they are acknowledged that they do not meet the requirements of a full bike lane.

Long term if the road is reconstructed, the road width should accommodate a full bike lane width or a sidepath should be added.

ON-ROAD BIKEWAY TYPES

Urban Shoulders

Existing "Urban Shoulder" along Lewis Lane. The road is too narrow to accommodate a full width "bike lane". Note: this existing urban shoulder incorrectly has bike lane markings (although the bike lane markings are fading). Bike lane markings should only be used on "official" bike lanes. The gutter seam also creates a safety hazard for bicyclists. The goal should be at least 3' width between the stripe and the gutter seam.

ADVANTAGES

- Although the striping does not meet the width requirement of a standard "bike lane", the urban shoulder does provide a measure of safety for bicyclists and provides traffic calming.

CONSIDERATIONS

- The joint between the asphalt and gutter can create a safety issue for bicyclists, especially with the width of the lane already less than a standard bike lane. When the street is resurfaced, a portion of the gutter should be milled to allow a wider area for bicyclists. The goal should be at least 3' width between the stripe and the gutter seam.
- Urban shoulders cannot be called, marked, and/or signed as official "bike lanes".

APPLICABILITY FOR CARBONDALE

Moderate. Several roads (Lewis Lane, College Street, etc) are too narrow to accommodate a full bike lane.

OVERVIEW

Multi-use trails are physically separated from motor vehicle traffic, except at road crossings. Trails accommodate a variety of users, including pedestrians, bicyclists, and others, for both recreation and transportation purposes. Trails away from roads, on easements or their own rights-of-way, tend to be more pleasant and popular.

The ideal width for multi-use trails is 10', with a minimum recommendation of 8', in order to facilitate bi-directional and multi-modal traffic.

A trail within a connected system of greenspace is often referred to as a "greenway".

OFF-ROAD BIKEWAY TYPES

Multi-Use Trails

ADVANTAGES

- One of the most popular bicycle facility types. High demand from the public.
- Complete separation from vehicular traffic (except at street crossings).
- Trails can be a catalyst for other development since it shows a fixed investment in bicycle facilities.

CONSIDERATIONS

- Available right-of-way or easements for trail location.
- Long-term maintenance of trails.
- Relatively high cost compared to other facility types.

Source: www.pedbikeimages.org-Laura Sandt

APPLICABILITY FOR CARBONDALE

Moderate applicability. The existing Gateway Bikeway along Piles Fork needs to be upgraded. New multi-use trails are most feasible within southwest Carbondale along the Little Crab Orchard Creek. New trails to the north of Carbondale would require property or easement acquisition.

OVERVIEW

A "Sidepath" is a trail parallel to the road. Sidepaths are ideally 10 ft wide, with a minimum recommendation of 8', in order to facilitate bi-directional and multi-modal traffic. A 5 ft buffer is recommended between the sidepath and vehicular traffic. If a 5' buffer cannot be achieved, a barrier is recommended. Sidepaths are generally for busier, faster (posted 40mph+) roads without many crossings.

While the physical separation from traffic provides a sense of security to sidepath users,intersections present inherent conflicts and visibility problems – especially for sidepath cyclists riding against the flow of adjacent traffic.

Sidepath conflicts can be reduced through engineering by: bringing the sidepath closer to the road at intersections for better visibility during all turning motions and better stop line adherence for right-turners, using pedestrian refuge islands to break up major crossings, and using higher visibility crosswalks.

ADVANTAGES

- Complete separation from vehicular traffic (except at street crossings and intersections).

CONSIDERATIONS

- Sidepaths crossings at intersections and driveways can be a substantial conflict point for bicyclists and vehicles.
- A sidepath can often be confused as a sidewalk. In locations where riding on sidewalks is prohibited, confusing can result between riding on sidewalks versus a sidepath. A sidepath is 8' width or wider)

APPLICABILITY FOR CARBONDALE

Moderate to high applicability. Several key locations would benefit from the use of sidepaths.

OFF-ROAD BIKEWAY TYPES

Sidepaths

INTERSECTION TYPES

New or Enhanced Crosswalks

OVERVIEW

Crosswalks enhance pedestrian and bicycle safety by alerting motorists to the presence of pedestrians and bicyclists. Crosswalks also assist in defining the recommended route for pedestrians and bicyclists.

A standard crosswalk typically consists of two parallel lines. Styles of high visibility crosswalks include: continental, zebra, and ladder.

Continental style high visibility crosswalk.
Source: www.bikepedimages.org/Dan Burden

ADVANTAGES

- Makes vehicular drivers more aware of bicyclists and pedestrians.

High visibility crosswalks are easier to see at night.
Source: www.bikepedimages.org/Dan Burden

CONSIDERATIONS

- Maintenance of striping.

Ladder style high visibility crosswalk.
Source: www.bikepedimages.org/Mike Cynecki

APPLICABILITY FOR CARBONDALE

High applicability. Many intersections and driveways would benefit from new or enhanced crosswalks.

INTERSECTION TYPES

Bike Boxes

OVERVIEW

A bike box is an area at a signalized intersection where a bicyclist can queue in front of traffic during a red signal. It is a safe and highly visible way for bicyclists to get ahead of traffic

A bike box is created by pulling the stop bar back from the crosswalk to create a 10-15 foot area between the stop bar and crosswalk where bicyclists can queue at the traffic light.

The bike box can facilitate better and safer left turn movements for bicyclist when the bike box extends across the lanes to the centerline.

Source: National Association of City Transportation Officials

ADVANTAGES

- Increase visibility of bicyclists.
- Groups of bicyclists can clear intersection quickly and thus reduces conflicts between bicyclists and motorists.
- Helps to facilitate left turns for bicyclists.
- Helps to reduce right turn conflicts.

CONSIDERATIONS

- Maintenance of the painted bike box and markings.

APPLICABILITY FOR CARBONDALE

Low to moderate applicability.

INTERSECTION TYPES

Intersection Crossing Markings

OVERVIEW

Intersection crossing markings indicate the intended path of bicyclists. They guide bicyclists on a safe and direct path through intersections, including driveways and ramps.

The markings raise awareness of both bicyclists and motorists to better avoid conflicts. The markings reinforce that through bicyclists have priority over turning vehicles or other vehicles entering the roadway.

Source: National Association of City Transportation Officials

ADVANTAGES

- Increase visibility of bicyclists.
- Guides bicyclists through the intersection in a straight and direct path.
- Reduces conflicts of turning vehicles and bicyclists.

Source: Tulsa GOPlan

CONSIDERATIONS

- Maintenance of the markings.

APPLICABILITY FOR CARBONDALE

Moderate applicability. Several key intersections would benefit from through markings.

INTERSECTION TYPES

Median Refuge Island

OVERVIEW

Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings. Crossings of two-way streets are facilitated by allowing bicyclists and pedestrians to navigate only one direction of traffic at a time.

Allows bicyclists and pedestrians to more safely cross streets by providing refuge and only crossing one direction of traffic at a time.

Median refuge islands can offer a significant reduction in accidents. According to the Crash Modification Factor Clearinghouse, raised median refuge islands with crosswalks have shown to reduce crashes by 46 percent.

Source: www.bikepedimages.org/Dan Burden

ADVANTAGES

- Provides a protected space while bicyclists wait for gaps in traffic.
- On two way streets, bicyclists can wait for gaps in traffic one direction at a time.
- Can act as a traffic calming device.
- 46% crash reduction factor (Source: FHWA's Crash Modification Factor Clearinghouse)

CONSIDERATIONS

- Most applicable for bicyclists at mid-block crossings. At intersections, should be used as part of a sidepath or trail to benefit bicyclists.

APPLICABILITY FOR CARBONDALE

Low to moderate applicability.

OVERVIEW

A through bike lane carries a bike lane to the intersection to better position a bicyclist from conflicts with turning vehicles. Sometimes a through bike lane is also know as a 'bike pocket'.

Bicyclists can position themselves to the left of right turning vehicles and to the right of left turning vehicles.

Through bike lanes provide greater confidence to bicyclists on how they should navigate and proceed through an intersection.

INTERSECTION TYPES

Through Bike Lane

Source: National Association of City Transportation Officials

ADVANTAGES

- Reduces conflicts with turning vehicles.
- Alerts motorists to bicycles at the intersection.
- Allows bicyclists to better position themselves to avoid conflicts with turning vehicles.

CONSIDERATIONS

- Maintenance of markings, especially the dotted stripes.

APPLICABILITY FOR CARBONDALE

Moderate applicability.

INTERSECTION TYPES

Combined Bike and Turn Lane

OVERVIEW

Where there is a right turn lane but not enough space to maintain a standard-width bicycle lane at the intersection, a combined bike lane and turn lane provides for bicycle markings in the vehicular turn lane.

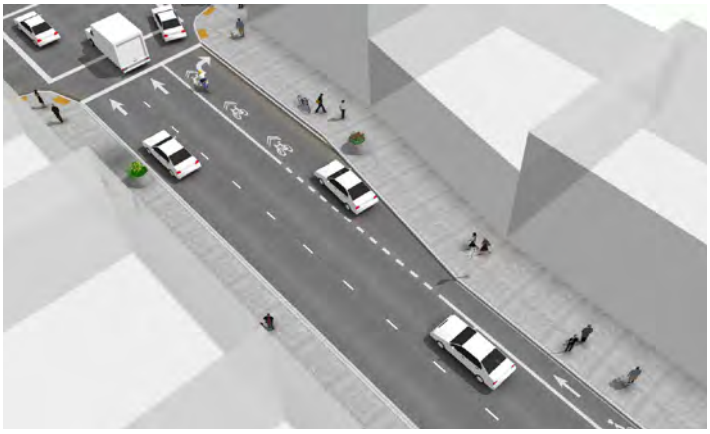
The combined lane provides guidance for bicyclists in a situation where the bicycle lane would otherwise be dropped prior to an intersection. Encourages motorists to yield to bicyclists when crossing into the narrow right-turn lane.

According to MUTCD and FHWA, a combined bicycle lane/turn lane where the lane attempts to establish a bike lane is not allowed. Thus, this report recommends shared lane markings should be used. However, NACTO shows both shared lane markings and bike lanes as options. The designer shall consult on the current standards.

Source: National Association of City Transportation Officials

ADVANTAGES

- Provides guidance to a bicyclist in a situation where a standard bike lane would be dropped at the intersection.
- Encourages motorists to yield to bicyclists.
- Helps to avoid right hook collisions at intersections.



Source: National Association of City Transportation Officials

CONSIDERATIONS

- Maintenance of markings.
- According to MUTCD and FHWA, a combined bicycle lane/turn lane where the lane attempts to establish a bike lane is not allowed. Thus, this report recommends shared lane markings should be used.

APPLICABILITY FOR CARBONDALE

Low applicability.

INTERSECTION TYPES

Active Warning Beacon

OVERVIEW

Rectangular Rapid Flash Beacons (RRFBs) are user-actuated amber LEDs that supplement warning signs at unsignalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system. RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles.

Source: www.bikepedimages.org/Michael Frederick

ADVANTAGES

- RRFBs are a lower cost alternative to traffic signals and hybrid signals that are shown to increase driver yielding behavior at crosswalks significantly when supplementing standard pedestrian crossing warning signs and markings.

CONSIDERATIONS

- RRFBs can supplement other treatments such as YIELD (or STOP) HERE FOR PEDESTRIANS signs or markings.
- RRFBs can use manual push-buttons or automated pedestrian detection, and should be unlit when not activated.

APPLICABILITY FOR CARBONDALE

Moderate applicability. May be applicable for only a few locations, but the locations are key areas.

OVERVIEW

INTERSECTION TYPES

HAWK Signal

The pedestrian hybrid beacon (also known as the High intensity Activated crossWalK (or HAWK)) is a pedestrian activated warning device located on the roadside or on mast arms over midblock pedestrian crossings. The beacon head consists of two red lenses above a single yellow lens. The beacon head is "dark" until the pedestrian desires to cross the street. The pedestrian will push an easy to reach button that activates the beacon. After displaying brief flashing and steady yellow intervals, the device displays a steady red indication to drivers and a "WALK" indication to pedestrians, allowing them to cross a major roadway while traffic is stopped. After the pedestrian phase ends, the "WALK" indication changes to a flashing orange hand to notify pedestrians that their clearance time is ending. The hybrid beacon displays alternating flashing red lights to drivers while pedestrians finish their crossings before once again going dark at the conclusion of the cycle.
(Source: FHWA)

Source: www.bikepedimages.org/Mike Cynecki

ADVANTAGES

- Intermediate option between a RRFB (Rectangular Rapid Flash Beacon) and a full pedestrian signal.
- Provides a control in areas without the high pedestrian/ bicycle traffic volumes that typically warrant the installation of a full signal.

Source: FHWA

CONSIDERATIONS

- Although less expensive than a full pedestrian signal, still more expensive than a RRFB.

APPLICABILITY FOR CARBONDALE

Low applicability. May only be applicable for only a few locations, but the locations are key areas.

INTERSECTION TYPES

Bicycle Signal Head

OVERVIEW

Bicycle signals are typically used to improve identified safety or operational problems involving bicycle facilities or to provide guidance for bicyclists at intersections where they may have different needs from other road users (e.g., bicycle only movements, leading bicycle intervals). Bicycle signal heads may be installed at signalized intersections to indicate bicycle signal phases and other bicycle-specific timing strategies. In the United States, bicycle signal heads typically use standard three-lens signal heads in green, yellow, and red lenses.
(Source: National Association of City Transportation Officials)

Bicycle signal head can be seen highlighted in the red circle.
Source: National Association of City Transportation Officials

ADVANTAGES

- Provides priority to bicycle movements at intersections such as a leading bicycle interval.
- Helps to simplify bicycle movements through complex intersections

Source: National Association of City Transportation Officials

CONSIDERATIONS

- If the bicycle phase is not set to recall each cycle, bicycle signals shall be installed with appropriate detection and actuation.

APPLICABILITY FOR CARBONDALE

Low applicability. May only be applicable for only a few locations, but the locations are key areas.

INTERSECTION TYPES

Signal Detection

OVERVIEW

Both bicycles and motorcycles have difficulty activating demand-actuated traffic signals. Cars may not be present to trip the signal, or cars may be stopped too far back of a bike. Pedestrian push-button actuation, if present, is often inconveniently located for on-road bikes.

Illinois has a law by which bicyclists and motorcyclists may treat stop lights like stop signs, after two minutes of not being detected. Engineering solutions, however, are safer and preferred.

For existing intersections, the MUTCD-approved Bicycle Detector Pavement Marking with the R10-22 Bicycle Signal Actuation Sign, can indicate a detector trigger point for actuating the signal. For standard detectors, the detector's perimeter – such as its right edge – is more sensitive to bicycles. Correct tuning of the detector may be needed, too.

For new intersections, quadrupole loop detectors or new camera detection technology could be used, as they are more sensitive to bikes and motorcycles.

The detector marking also serves to indicate proper bicycle position at an intersection.

Source: National Association of City Transportation Officials

ADVANTAGES

- Allows detection of bicyclists at intersections.
- The detector marking also serves to indicate proper bicycle position at an intersection.

CONSIDERATIONS

- Visibility of bicyclist at the intersection. A bike box or other markings should be evaluated to provide greater visibility of bicyclists.

MUTCD R10-22 Sign

APPLICABILITY FOR CARBONDALE

Moderate to high applicability. Several key intersections.

DEFINITIONS AND ACRONYMS

ADA: American with Disabilities Act

ADT: average daily traffic

FHWA: Federal Highway Administration

FYG: fluorescent yellow green

IDOT: Illinois Department of Transportation

IDNR: Illinois Department of Natural Resources

MUTCD: Manual on Uniform Traffic Control Devices

NACTO: National Association of City Transportation Officials

ROW: right-of-way

RR: railroad

SIMPO: Southern Illinois Metropolitan Planning Organization

STP: Surface Transportation Program

PHOTO CREDITS

All photos in this report are by the i5Group except as noted within the report.
Street photos within Chapter 6 are Google Street View.

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Carbondale
BIKE PLAN