

City of Marion

Comprehensive Bicycle Plan

MAY 2016



WalkBikeMarion

ACKNOWLEDGEMENTS

Thanks to the local residents, community leaders, and government staff that participated in the development of this plan through meetings, events, comment forms, and plan review. Special thanks to those who participated as steering committee members, listed below.

PROJECT STEERING COMMITTEE

The Steering Committee is made up of local residents, government staff, and community leaders.

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Adopted May 17, 2016

Prepared for the City of Marion, North Carolina

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Division of Bicycle and Pedestrian Transportation (DBPT) and the generous contribution of Kate B. Reynolds Charitable Trust.

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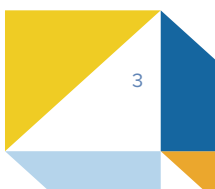
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CHAPTER ONE: INTRODUCTION & OVERVIEW

Project Background | Planning Process | Plan Vision & Goals |
Why this Plan is Important

PROJECT BACKGROUND

The Marion Bicycle Plan was made possible by joint funding from the City of Marion, the North Carolina Department of Transportation (NCDOT) and the Kate B. Reynolds Charitable Trust. In 2014, Marion was awarded a matching grant from the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Planning Grant Initiative. **The purpose of the grant is to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans.** To date, the initiative has funded planning efforts in more than 160 municipalities across the state. The program is administered through NCDOT's Division of Bicycle and Pedestrian Transportation.

PLANNING PROCESS

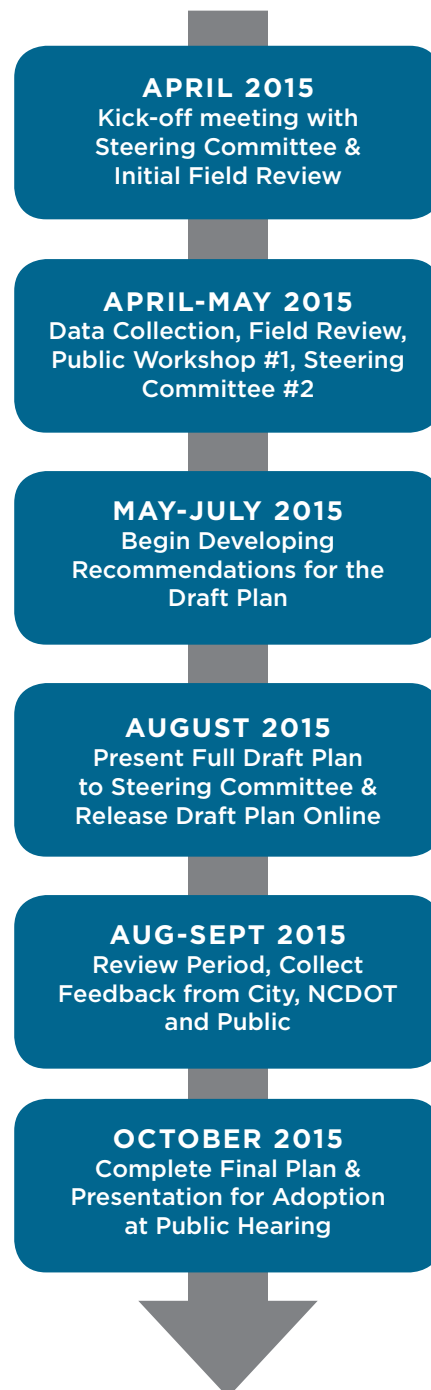
The planning process began with a Kickoff Meeting in Spring 2015, which was the first of four project Steering Committee meetings. The Steering Committee was made up of a combination of local residents, City staff and representatives, health professionals, and regional transportation planners. This Steering Committee guided the plan's development throughout the planning process. Key steps included crafting an overall vision for the plan, communicating existing bicycling conditions to City staff and project consultants, and providing feedback on plan recommendations.



Steering Committee members mark up base maps at the project Kick-Off Meeting.

Aside from the Steering Committee input, the planning process included several other important methods of public outreach and involvement. The project website, public comment form, press releases, and public workshops were all used to gather input for the plan and ask for feedback on the draft plan.

Key Steps in the Planning Process:



PLAN VISION & GOALS

Through this plan, the City of Marion aims to:

- » Promote biking as a viable, healthy, safe and efficient mode of transportation.
- » Encourage youth to bike through education and encouragement activities.
- » Develop a bike network that connects key destinations, such as the existing Catawba River Greenway to the Peavine Rail Corridor.
- » Designate neighborhood bike routes that connect local destinations and rural bike routes that connect to regional destinations.
- » Establish a framework for future City and regional planning and funding opportunities.
- » Develop a comprehensive bicycle program around the 5 E's (Engineering, Education, Encouragement, Enforcement, and Evaluation) .



The Catawba River Greenway was identified as a key destination by the steering committee and general public.

The following Vision Statement draws upon input from the Steering Committee at the Kick-Off Meeting, outlining the overall vision for the outcomes of this plan:

VISION STATEMENT

“The City of Marion is a bicycle-friendly community connected by a safe, convenient, and enjoyable bicycle network that provides access for users of all skill levels; links neighborhoods to destinations; and promotes healthy living through active transportation.”

WHY THIS PLAN IS IMPORTANT

In absence of research focused directly on Marion, the sections that follow highlight national and statewide trends for each topic.

SAFETY FOR PEDESTRIANS & BICYCLISTS

TRENDS AND CHALLENGES

According to a survey of 16,000 North Carolina residents for the 2011 North Carolina Bicycle and Pedestrian Safety Summit, the most commonly reported safety issue for walking and bicycling was inadequate infrastructure (75%).¹ A lack of bicycle and pedestrian facilities, such as sidewalks, bike lanes, trails, and safe crossings, lead to unsafe conditions for bicyclists and pedestrians:

- » Each year on average (2008-2012), 168 pedestrians and 22 bicyclists are killed in collisions with motor vehicles on North Carolina roads, while many more are seriously injured.²
- » North Carolina is ranked as one of the least safe states for walking (41st) and bicycling (44th).³
- » 13% of all traffic fatalities in North Carolina are bicyclists and pedestrians.
- » During the five-year period from 2008 to 2012, a total of 4,889 bicycle-motor vehicle crashes and 13,186 pedestrian-motor vehicle crashes were reported to North Carolina authorities.
- » In Marion, from 2007-2012, there were two bicycle-motor vehicle crashes.²

IMPROVING SAFETY

Separate studies conducted by the Federal Highway Administration and the University of North Carolina Highway Safety Research Center demonstrate that installing pedestrian and bicycle facilities directly improves safety by reducing the risk and severity of pedestrian-automobile and bicycle-automobile crashes. For example, installing a sidewalk along a roadway reduces the risk of a pedestrian “walking along roadway” crash by 88 percent. Furthermore, according to the aforementioned survey, 70% of respondents said they would walk or bicycle more if safety issues were addressed, citing a lack of bicycle and pedestrian facilities as the top issues¹

The following web addresses link to more comprehensive research on safety.

- » <http://www.ncdot.gov/bikeped/planning/walkbikenc/>
- » http://www.pedbikeinfo.org/data/factsheet_crash.cfm



Cyclists are currently using roads like Sugar Hill Road although there are no existing bicycle facilities.

HEALTH IMPACTS OF ACTIVE TRANSPORTATION

TRENDS AND CHALLENGES

North Carolina's transportation system is one of the most important elements of our public environment. Unfortunately, it includes many streets that are unsafe for walking and bicycling, posing barriers to healthy living and active transportation. In 2012, NCDOT's Board of Transportation revised its mission statement to include "health and well-being" and passed a "Healthy Transportation Policy," which declares the importance of a transportation system that supports positive health outcomes. Below are some key trends and challenges related to health and transportation in North Carolina:

- » 65% of adults in North Carolina are either overweight or obese. The state is also ranked 5th worst in the nation for childhood obesity.⁴
- » In a 2012 survey, 88% of North Carolinians responded that they spend no time walking or biking as a means of transportation.⁵

- » Recent reports have estimated the annual direct medical cost of physical inactivity in North Carolina at \$3.67 billion, plus an additional \$4.71 billion in lost productivity.⁶ However, every dollar invested in pedestrian and bicycle trails can result in a savings of nearly \$3 in direct medical expenses.⁷
- » Of North Carolinians surveyed, 60% would increase their level of physical activity if they had better access to sidewalks and trails.⁵

BETTER HEALTH THROUGH ACTIVE TRANSPORTATION

Using active transportation to and from school, work, parks, restaurants, and other routine destinations is one of the best ways that children and adults can lead measurably healthier lives. Increasing one's level of physical activity through walking and bicycling reduces the risk and impact of cardiovascular disease, diabetes, chronic disease, and some cancers. It also helps to control weight, improves mood, and reduces the risk of premature death.⁸

Active Transportation: Pathway to Health



Source: Alta Planning + Design; WalkBikeNC

ECONOMIC BENEFITS

TRANSPORTATION SAVINGS

When it comes to transportation costs, bicycling is one of the most affordable forms of transportation available, second only to walking. According to the American Automobile Association, the cost of owning and operating a medium-sized sedan for one year, assuming one drives 10,000 miles per year, is approximately \$7,804.90. Owning and operating a bicycle costs just \$120 per year, according to the League of American Bicyclists. The Pedestrian and Bicycle Information Center explains how these lower costs help individuals and communities as a whole: *“When safe facilities are provided for pedestrians and bicyclists, more people are able to be productive, active members of society. Car ownership is expensive, and consumes a major portion of many Americans’ income.”*

BIKE TOURISM

Bicycle facilities such as bike lanes, paths, and greenway trails are popular community amenities that add value to properties nearby and boost spending at businesses. Trends related to economics and bicycling in North Carolina:

- » North Carolina is the 6th most visited state in the United States and visitors spend as much as \$18 billion a year, many of whom partake in activities related to walking or biking.⁹
- » The annual return to local businesses and state and local governments on bicycle facility development in the Outer Banks is approximately nine times higher than the initial investment.¹⁰
- » Walking and biking are economically efficient transportation modes. Many North Carolinians cannot afford to own a vehicle and are dependent on walking and biking for transportation (6.6% of occupied housing units in North Carolina do not own a vehicle).¹¹

To determine your driving costs accurately, keep personal records on all the costs listed below. Use this worksheet to figure your total cost to drive.

Annual Cost Per Mile

costs		yearly totals
operating costs		
gas per mile		_____
total miles driven	×	_____
total gas	=	_____
maintenance	+	_____
tires	+	_____
total operating costs	+	= _____
ownership costs		
depreciation		_____
insurance	+	_____
taxes	+	_____
license and registration	+	_____
finance charges	+	_____
total ownership costs	+	= _____
other costs (washing, accessories, etc.)	+	= _____
total driving costs	=	= _____
total miles driven	÷	= _____
cost per mile	=	= _____

Driving Costs Worksheet. AmericanAutomobile Association, Your Driving Costs Report: 2013 Edition.

MOBILITY AND ACCESSIBILITY BENEFITS OF ACTIVE TRANSPORTATION

OPPORTUNITY TO INCREASE WALKING AND BICYCLING RATES

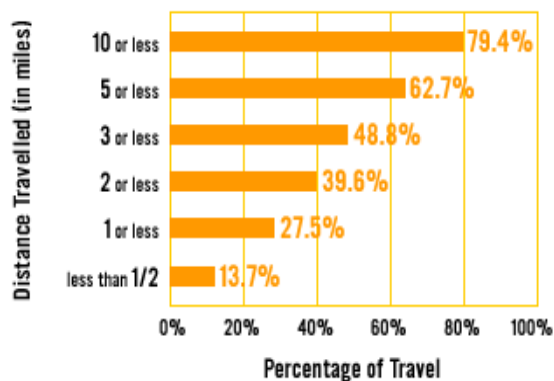
According to the 2011 Bicycle and Pedestrian Safety Survey, at least 70 percent of North Carolinians would walk or bike more for daily trips if walking and bicycling conditions were improved. With appropriate accommodations, walking and bicycling can provide alternatives to driving for commuting to work, running errands, or making other short trips.

Commute rates for walking and bicycling in North Carolina currently fall below the national average, with just 0.2% of North Carolina commuters bicycling to work and 1.8% walking to work, compared to 0.6% bicycling and 2.9% walking nationwide. This places North Carolina 42nd for walking commute rates and 41st for

bicycling commute rates in nationwide state rankings.³ Charts in Chapter 2 show national model communities for biking rates, model communities in North Carolina, and peer communities in the region.

An estimated 40% of all trips (commute and non-commute) taken by Americans each day are less than two miles, equivalent to a bike ride of 10 minutes or less; however, just 13% of all trips are made by walking or bicycling nationwide.³ To put these numbers into perspective, 34% of all trips are made by walking or bicycling in Denmark and Germany, and 51% of all trips in the Netherlands are by foot or by bike.¹² Germany, Denmark, and the Netherlands are wealthy countries with high rates of automobile ownership, just like the United States. Yet, an emphasis has been placed on providing quality walking and bicycling environments which has alleviated the reliance on motor vehicles for short trips.

Daily Trip Distances of Americans



Most driving trips are for a distance of five miles or less. Chart from the Bicycle and Pedestrian Information Center website, www.pedbikeinfo.org

REDUCED VEHICLE MILES TRAVELED (VMT) & CONGESTION

Taking short trips by foot or by bike can help to greatly reduce motor vehicle miles driven and traffic congestion. Under the Nonmotorized Transportation Pilot Program, walking and bicycling investments contributed to an estimated 23% increase in the number of walking trips and

an estimated 48% increase in the number of bicycling trips in four pilot communities between 2007 and 2013.¹³ These individual changes in travel behavior can add up to produce significant societal benefits. Traffic on arterials and other streets can be mitigated as people use sidewalks, bike lanes, paths, and other alternatives to get around. Parking lots can also be made less congested by reducing crowding, circling, and waiting for open spots.

The following web addresses link to more comprehensive research on transportation efficiency.

- » <http://www.ncdot.gov/bikeped/planning/walkbikenc/>
- » http://www.pedbikeinfo.org/data/factsheet_general.cfm

STEWARDSHIP BENEFITS OF ACTIVE TRANSPORTATION

TRENDS AND CHALLENGES

Below are some key trends and challenges related to stewardship and transportation in North Carolina:

- » Even a modest increase in walking and bicycling trips (in place of motor vehicle trips) can have significant positive impacts. For example, replacing two miles of driving each day with walking or bicycling will, in one year, prevent 730 pounds of carbon dioxide from entering the atmosphere.¹⁴
- » According to the National Association of Realtors and Transportation for America, 89% of Americans believe that transportation investments should support the goal of reducing energy use.¹⁵
- » North Carolina's 2009-2013 Statewide Comprehensive Outdoor Recreation Plan (SCORP) found "walking for pleasure" to be the most common outdoor recreational ac-

tivity, enjoyed by 82% of respondents, and bicycling by 31% of respondents.¹⁶

- » The natural buffer zones that are protected along greenways and trails, protect streams, rivers, and lakes, prevent soil erosion and filter pollution caused by agricultural and roadway runoff.¹⁷

Providing safe accommodations for walking and bicycling can help to reduce automobile dependency, which in turn leads to a reduction in vehicle emissions – a benefit for residents and visitors and the surrounding environment. As of 2003, 27 percent of U.S. greenhouse gas emissions are attributed to the transportation sector, and personal vehicles account for almost two-thirds (62 percent) of all transportation emissions.¹⁸ Primary emissions that pose potential health and environmental risks are carbon dioxide, carbon monoxide, volatile organic compounds, (VOCs), nitrous oxides

(NOx), and benzene. Children and senior citizens are particularly sensitive to the harmful affects of air pollution, as are individuals with heart or other respiratory illnesses. Increased health risks such as asthma and heart problems are associated with vehicle emissions.¹⁹

The following web addresses link to more comprehensive research on active transportation and stewardship.

- » <http://www.ncdot.gov/bikeped/planning/walkbikenc/>
- » http://www.pedbikeinfo.org/data/factsheet_environmental.cfm

Stewardship addresses the impact that transportation decisions (both at the government/policy level and individual level) can have on the land, water and air that Marion residents and visitors enjoy.



The Catawba River Greenway highlights the unique environmental assets of McDowell County.

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CHAPTER TWO: CURRENT CONDITIONS

Local Context | Current Conditions | Related Plans & Initiatives | Public Input

LOCAL CONTEXT

The City of Marion is located in the mountains of Western North Carolina in McDowell County. On the edge of the Blue Ridge Mountains, Marion is a charming small town “Where Main Street Meets the Mountains.” The City was named in honor of Brigadier General Francis Marion, an American Revolutionary War Hero.

Marion serves as a gateway from Interstate 40 to many nearby attractions and recreation activities in the Blue Ridge Mountains. There are seven parks in Marion operated by the city, the main one being downtown beside the Community Building. In 2010, the City opened the Joseph McDowell Greenway. Named in honor of the county’s namesake, Joseph McDowell, the greenway follows the flow of the Catawba River. Benches, picnic tables, fishing piers, and fitness stations are scattered throughout the Historic Joseph McDowell House, with access from Highway 70 between the intersections of Highway 221/226 By-Pass and Roby Conley Road.

Historic homes such as the Carson House and the Joseph McDowell House have kept the history of Marion alive for decades. In downtown Marion, the beautifully restored Marion Depot, the oldest surviving depot on the Western Rail Line, hosts numerous community events each month. Lake James provides fishing, camping, and recreation for McDowell and Burke Counties and is just minutes from Marion. Lake Tahoe-

ma, Linville Caverns, Linville Falls, and the Blue Ridge Parkway are also very close to town, and exhibit the diverse scenery of Western North Carolina. There are also several golf courses outside of town, as well as two waterparks and numerous campgrounds.

While Marion continues to grow and evolve economically, culturally, and environmentally, the City is committed to preserving Marion’s historically significant architecture, cultural and natural resources, and most of all its sense of place .

Marion is bound by the Catawba River to the north and US Interstate 40 to the south. The City is situated between the crossroads of three other major transportation corridors including US Highway 70, US Highway 221 and US Highway 226. As of the 2013 U.S. Census estimate, the population of Marion is 7,997.

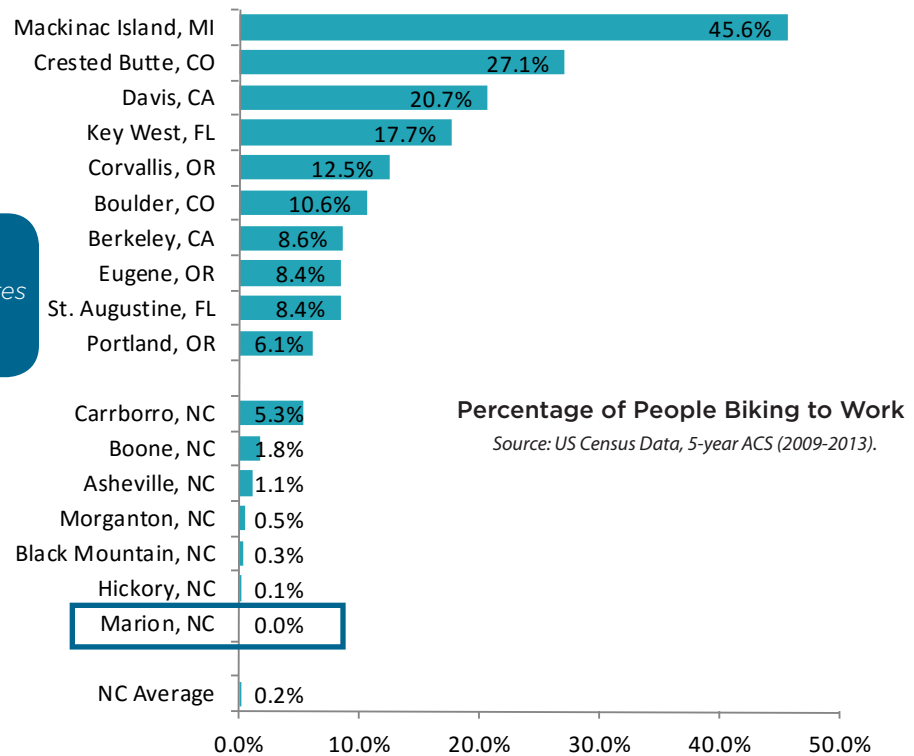
Table 2-1 provides a comparison of demographic data for Marion, McDowell County, and the State of North Carolina. The median age in Marion is 36.3, which is below the state average of 37.4 years. The average household income in Marion is \$24,509, which is around half of the state average of \$46,344. Safe and accessible bikeways will be an essential element of the transportation system for residents without access to a vehicle, for which Marion has double the state average of 6.6%.

	Marion	McDowell County	North Carolina
Population¹	7,997	44,965	9,651,380
Median Age¹	36.3	41.4	37.6
Median Household Income¹	\$24,509	\$35,297	\$46,344
% Households without a Vehicle¹	13.5%	8.3%	6.6%
% Walk to Work¹	2.6%	0.8%	1.8%
% Bike to Work¹	0.0%	0.0%	0.2%

**Table 2-1.
Demographic
Comparison**

¹ US Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

"Marion should strive to match the bike-to-work rates of Morganton, NC"



BICYCLING RATES

According to the latest census data, zero percent of Marion residents bike to work. For those who do live and work in Marion, there is ample opportunity to increase bicycling rates as compared to other communities statewide and nationally.

The chart above provides bicycle-to-work rates for model communities across the country, in North Carolina, and in peer communities for Marion. These numbers show that, with some effort to improve infrastructure, policies, and programs, high rates of walking and bicycling to work are possible in communities of all sizes.

In the short-term, Marion should strive to reach the bike-to-work rates of Morganton, NC, which has a 0.5% bike-to-work percentage. As bicy-

cling becomes more popular, Marion should work toward even higher rates to rival Asheville, NC and Boone, NC in western North Carolina.

CURRENT CONDITIONS

Current bicycling conditions in Marion are variable. There are local streets in and around downtown that have low traffic volumes and low speeds that can serve as the foundation of a bicycle network. There are several local destinations that are within a mile from the downtown core, thus easy to reach for all levels of bicyclists. However, two of the most desirable destinations to access by bike are further away: the Catawba River Greenway Trail Head is 3 miles and McDowell Technical Community College is 4 miles from the heart of downtown. Several key transportation corridors carry higher traffic volumes and speeds without dedicated space for bicycles.

OPPORTUNITIES

An analysis of existing conditions reveals several opportunities and constraints for bicycle network development in Marion. Opportunities include:

- » **Roadway configuration:** Several key roadways such as McDowell Ave, Main Street, Henderson Street and Rutherford Road have sections of pavement width and/or right-of-way to add bicycle facilities.
- » **Catawba Greenway Trail:** The existing 1.6 mile trail provides an excellent opportunity for recreation in Marion and McDowell County.
- » **YMCA Trail Network:** McDowell County partnered with the Corpening YMCA to develop two greenway loops off of Sugar Hill Road, near McDowell Hospital.
- » **Low volume streets:** Several streets such as State Street, Georgia Street and Park Avenue are quiet low traffic volume/speed streets that are already safe for bicycling and connect key locations in and across the City.
- » **Peavine Rail Corridor:** Marion purchased the right-of way of the former Peavine Rail Corridor, the section that extends from State Street to Jacktown Road.
- » **Existing groups:** Local efforts from McDowell Trails Association, McDowell County, NCDOT, private businesses, residents, and the City have already had a lasting effect on bicycling in Marion. They serve as a key building block for programmatic and bicycle infrastructure improvements.
- » **Downtown Marion:** Recent investments in the downtown core have continued to enhance economic activity in the heart of Marion.
- » **Programming:** The NCDOT Active Routes to School program has conducted bicycle education and outreach and the City will also be participating in the 2015 Watch for Me, NC education and enforcement campaign.



Catawba River Greenway



City-owned Peavine Rail Corridor



Downtown Marion



YMCA trail system

CHALLENGES

The following list is an overview of the potential challenges facing the existing bicycle network in Marion. These observations are based on input from the Steering Committee, general public, field review, and available data.

- » **Lack of existing bicycle facilities:** Besides the Catawba Greenway Trail and the YMCA Trail network, there are no existing bicycle facilities.
- » **High-volume, high-speed roadways:** There are several high-volume roadways throughout the City with high speeds and little shoulder with no off-road facility for bicyclists to travel safely. Examples include Court Street, Main Street (including the Five-Lane), Henderson Street, Sugar Hill Road, and Rutherford Road. Many intersections along these corridors are difficult to cross, especially intersections along the Peavine Corridor.
- » **Narrow roadways and lanes:** Many roadways do not contain enough space within the existing pavement to add separated facilities for bicyclists. State Street, Garden Street, Madison Street, and Fleming Avenue are examples.
- » **Lack of signage:** There is an overall lack of traffic and wayfinding signage for bicyclists. More signage is needed to make drivers aware of bicycle traffic, direct bicyclists to safe routes and crossings, and provide directions between popular destinations.
- » **Geographical constraints:** Steep topography is a limiting factor in encouraging more residents to cycle as a form of transportation and in bicycle facility development.
- » **Peavine Corridor Extension** The City owned right-of-way terminates near the intersection of Plato Drive and Jacktown Road. Connecting to the college campus will require extensive coordination with Norfolk Southern, CSX, NCDOT and private property owners. More details regarding the various route options are discussed in Chapter 3.



The underpass of NC 226 and I-40



Narrow, rural roadways in and around downtown

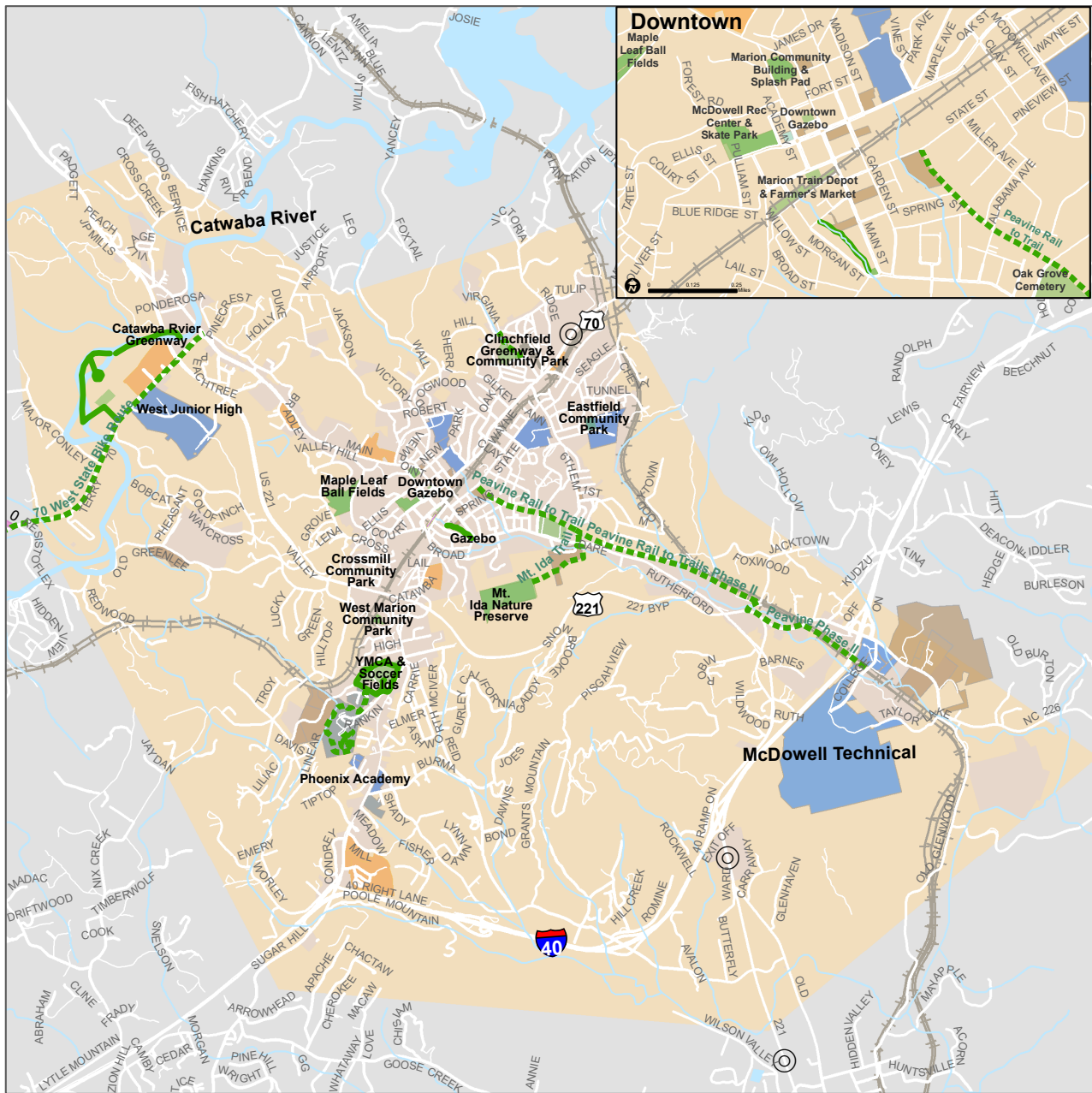


Steep grades are present on Court Street, headed east to Main Street



Peavine trestle bridge over NC 226

Map 2.1 - Current Conditions



Marion Comprehensive Bicycle Plan 2015

Base Map



LEGEND

- Bicycle Crashes (2007-2012)
- Existing Trails
- Proposed Trails
- Rail Line
- Planning Boundary
- City Limits
- Body of Water

Destinations

- College
- Government Services
- Shopping/Grocery
- Library
- Medical
- Park/Open Space
- School

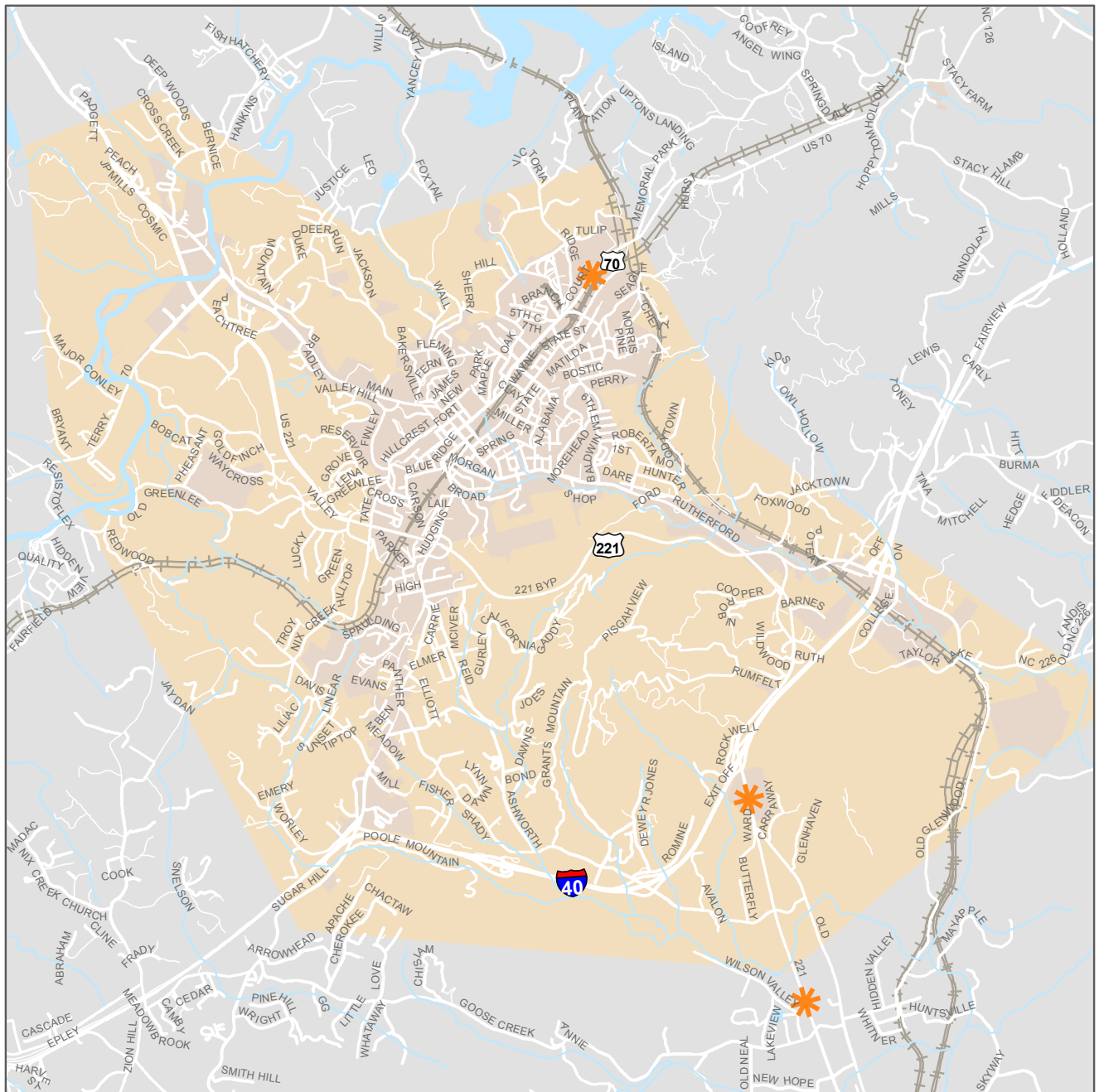


Data obtained from City of Marion.
Map created April, 2015.

Table 2-2. Roadway/Potential Bike Route Inventory

Road	From	To	Approximate Road Width (edge of pavement)	Existing Road Configuration (# of lanes)	Curb/Gutter (Y/N)	Parking (Y/N)	Speed Limit (mph)	AADT	Nearby Destinations
Main St	US 70	Logan St	47 ft	3 - 5	Varies	N	35-45	21000	Catawba River Greenway, Restaurants/Commercial, Downtown
Main St	Logan St	Garden St	38-50 ft	3	Y	Y	20	6800	City Hall Downtown, Peavine Trail, Gazebo, Restaurants, Shopping
Rutherford Rd	Garden St	Georgia Ave	30 -35 ft	2	Y	N	35	8900	Neighborhoods, Oak Grove Cemetery, Gazebo, Peavine Trail
Court St	Pulliam St	Park Ave	35.5 ft	2 - 3	Y	Varies	20	3800-11000	Downtown, Marion Train Depot, County Rec Dept, County Library
Court St	Park Ave	4th C St	32 - 43 ft	2 - 3	Varies	N	35	13000	Marion Elementary School, East Junior High, Clinchfield Greenway, Commercial
McDowell High School Rd	Main St	US 70	23 ft	2	N	N	35	N/A	McDowell High, Catawba River Greenway, Commercial
State St	S Main St	Finley Ave	25 - 40 ft	2	Y	Varies	20 - 25	N/A	Peavine Trail, Church, East McDowell Jr High School
Garden St	Crescent Dr	S Main St	28 - 36 ft	2 - 3	Y	Varies	20	N/A	Retail, Banks
Madison St	Fleming Ave	E Court St	23 ft	2	Y	N	20	N/A	Neighborhoods
Fleming Ave	Victory Dr	N Garden St	24 - 34 ft	2 -3	Y	N	25	2400	Marion Elementary School, Neighborhoods
Henderson St	S Garden St	California Ave	41 - 60 ft	3 - 5	Y	Varies	20 - 35	11,000	Children's Center of Marion, Shopping Center

Map 2.2 - Crashes



Marion Comprehensive Bicycle Plan 2015

Bicycle Crash Map



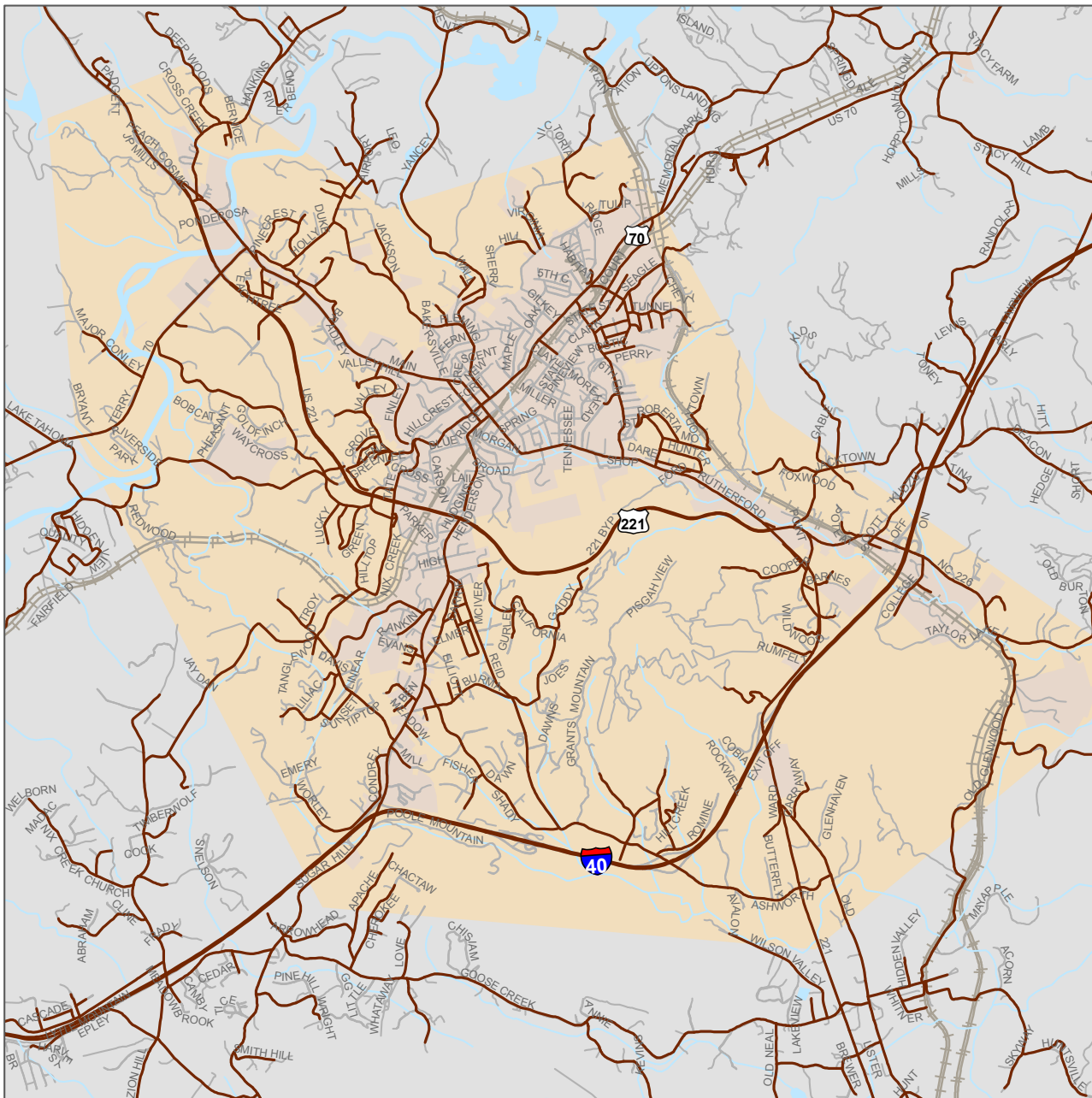
LEGEND

-  Bicycle Crashes (2007-2012)
-  Rail Line
-  Planning Boundary
-  City Limits
-  Body of Water



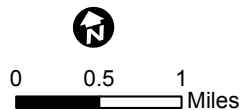
Data obtained from City of Marion.
Map created April, 2015.

Map 2.3 - NCDOT Owned Roads



Marion Comprehensive Bicycle Plan 2015

Road Ownership Map



LEGEND

- NCDOT Owned Roads
- Local Roads
- + — Rail Line
- Planning Boundary
- City Limits
- Body of Water



Data obtained from City of Marion.
Map created April, 2015.

NCDOT-REPORTED PEDESTRIAN AND BICYCLE CRASHES

Map 2.2 on page 2-8 shows bicycle crashes in Marion that were reported to the NCDOT between 2007 and 2012. During this period, 2 crashes were recorded within the City of Marion planning boundary and one just outside the boundary in McDowell County.

ROADWAY JURISDICTIONS

The roadway network in Marion is a combination of City-owned and state-owned roads. Knowledge of roadway ownership is important for determining the types of facilities that can be recommended along a roadway, the agency in charge of maintaining the roadway and implementing bicycle facility recommendations, and how improvements are scheduled, funded, and constructed. Map 2.3 on page 2-9 shows which roadways in Marion are state-owned.

RELATED PLANS AND INITIATIVES

MARION COMPREHENSIVE LAND USE PLAN (2012)

The Comprehensive Plan is the City's official statement of policies for direction growth and development in Marion for the next 20 years. Several goals and objectives relate directly to bicycle transportation. Goal 3.2 reflects the vision statement and goals of this study developed through the bicycle planning process:

- » Goal 3.2: Provide safe and comfortable routes for walking, bicycling, public transportation to increase use of these modes of transportation, enable convenient and active travel as part of daily activities, reduce pollution, and meet the needs of all users, including children, families, older adults, and people with disabilities.

MARION SAFE ROUTES TO SCHOOL ACTION PLAN (2009)

In 2008 the City received a technical assistance grant from NCDOT to complete a Safe Routes to School Action Plan for five area schools to improve bicycle and pedestrian safety within a two-mile radius of each campus. The planning radius for each school essentially allowed for a citywide bicycle and pedestrian plan to be developed based on existing roadway conditions to improve bicycle and pedestrian safety.

MCDOWELL COUNTY COMPREHENSIVE PARKS AND RECREATION MASTER PLAN (2014)

The McDowell County Comprehensive Parks and Recreation Master Plan 2014- 2024 provides the framework for guiding The County Board of Commissioners and Staff in both its current evaluation of/and long-range planning for the parks and recreation system for McDowell County. This effort was part of the Healthy Places NC initiative, and made possible by a grant from the Kate B. Reynolds Charitable Trust. The framework for this Master Plan is based upon conducting a review and inventory of the existing park system (including trails) and recording the observations. The assessment of these facilities, or lack of facilities, identified the immediate facility needs in the community and predicted the future needs of residents.

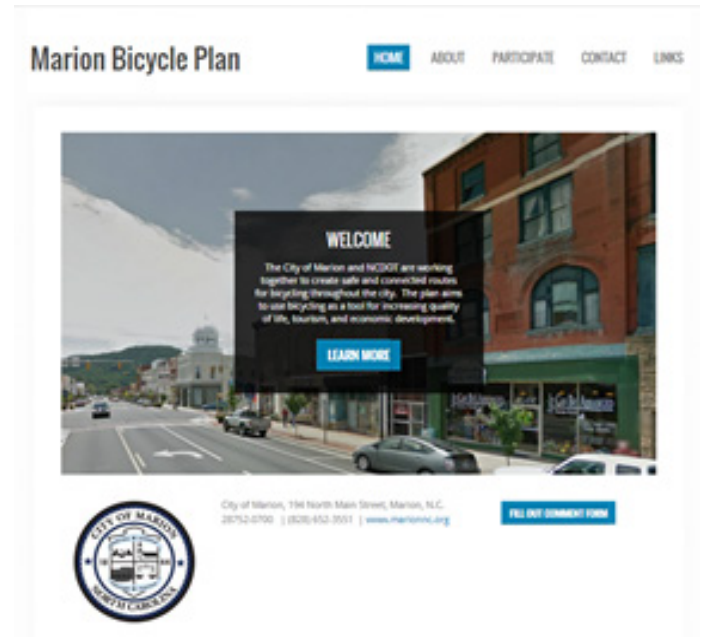
A community survey was crucial in developing a plan that reflects the needs and desires of residents. 413 surveys were completed, representing 1,098 individuals. 93% of survey participants were in favor of the continued expansion of the existing greenways throughout McDowell County.

PUBLIC INPUT

PUBLIC INPUT ON EXISTING CONDITIONS

Public input for this plan was collected through the project website, public comment form, and public workshops. Generally, the feedback from residents, visitors, and property owners is that they feel the current bicycling conditions are fair (40%) to poor (57%) and that improving them is very important (45%). Safety, opportunities for recreation and exercise, and increased overall quality of life/livability were the main topics identified by the public through the comment form as being important for this plan to address. 36% of participants were somewhat willing to pay an increase in taxes to fund bicycle improvements.

These issues were reflected in the public comments received about the desire to connect safely to the downtown core, grocery/shopping areas, and Catawba River Greenway Trail. Specific insight from the Steering Committee and members of the public from public outreach events is displayed in Map 2.5 on the following page.



Screenshot of the Project Website
(marionbikeplan.weebly.com)

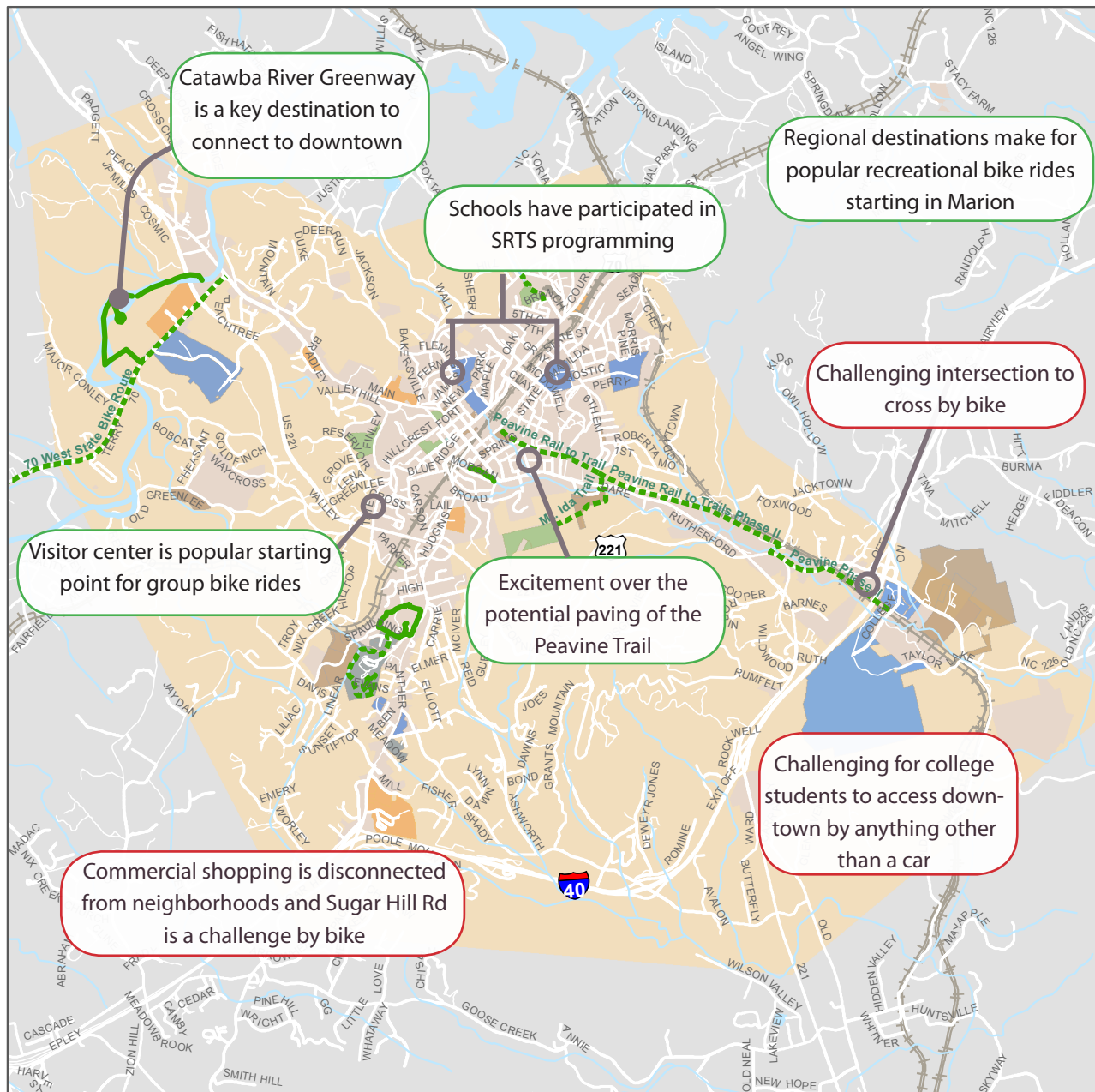


Public outreach at the Relay for Life of McDowell County Event on May 8th, 2015



Public outreach at the Marion Cyclovia on May 9th, 2015

Map 2.5 - Public Input



Marion Comprehensive Bicycle Plan 2015

Public Input Map



LEGEND

- Existing Trails
- - - Proposed Trails
- + + + Rail Line
- Planning Boundary
- City Limits
- Body of Water

Destinations

- College
- Government Services
- Shopping/Grocery
- Library
- Medical
- Park/Open Space
- School



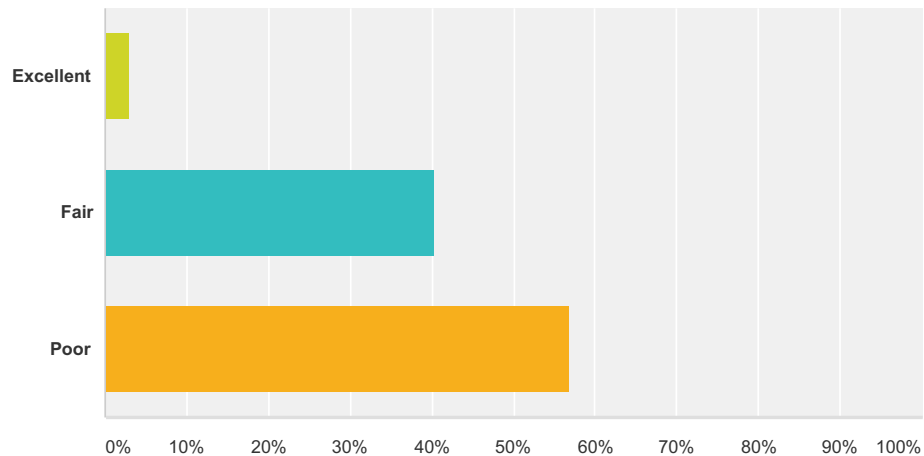
Data obtained from City of Marion.
Map created May, 2015.

PUBLIC COMMENT FORM RESULTS

The charts below summarize public input collected during this planning process in Spring/Summer 2015. 21 local residents, property owners, employees, and visitors contributed their input.

Q1 How do you rate bicycling conditions in Marion?

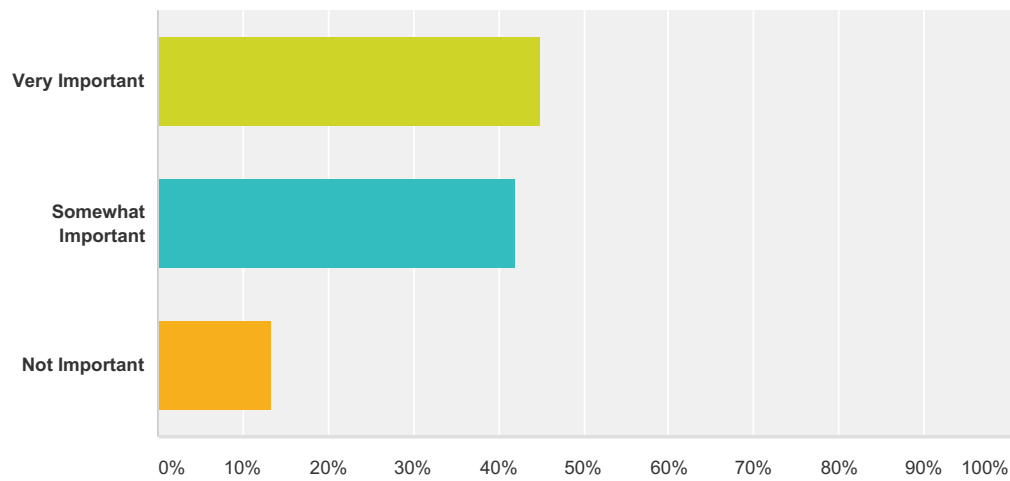
Answered: 238 Skipped: 3



Answer Choices	Responses
Excellent	2.94% 7
Fair	40.34% 96
Poor	56.72% 135
Total	238

Q2 How important to you is improving bicycling conditions in Marion?

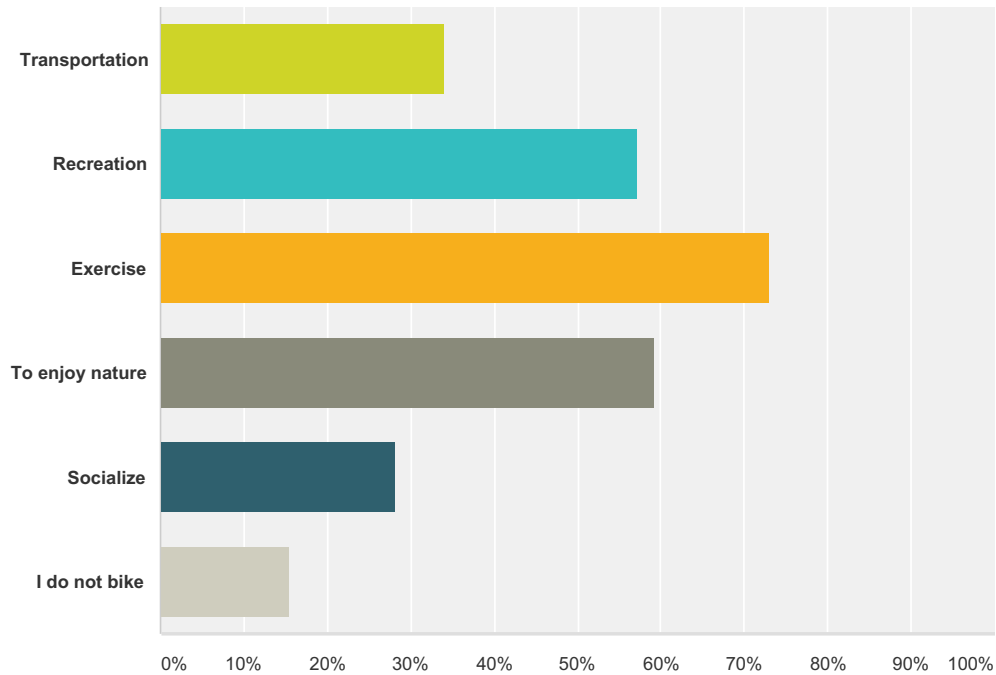
Answered: 241 Skipped: 0



Answer Choices	Responses	
Very Important	44.81%	108
Somewhat Important	41.91%	101
Not Important	13.28%	32
Total		241

Q3 When bicycling in Marion, what is (or would be) the primary purpose of your trip? (check all that apply)

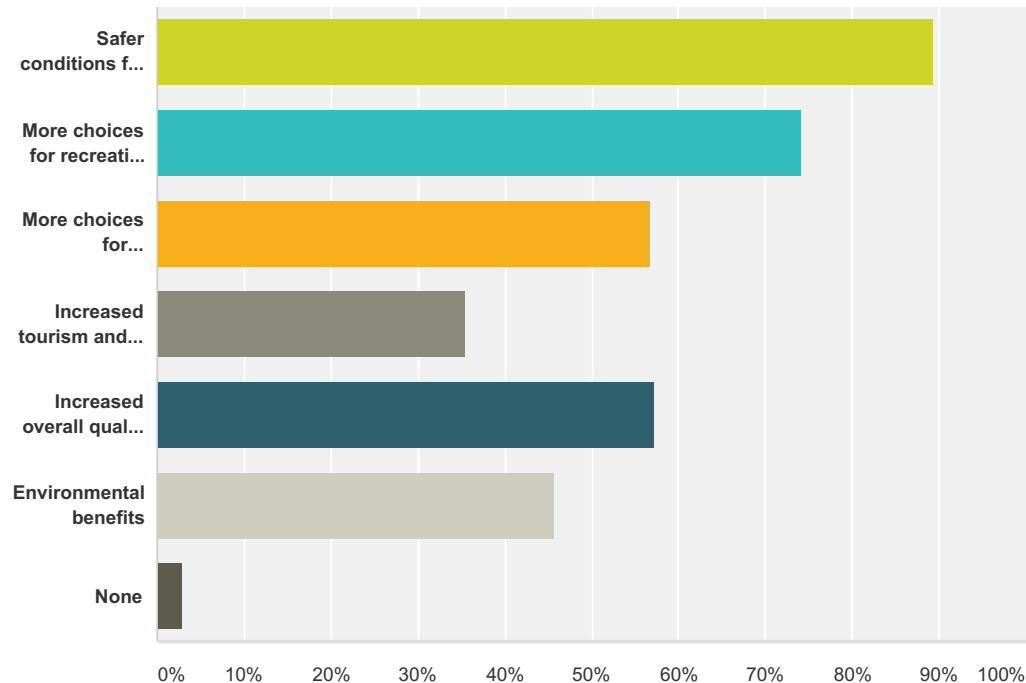
Answered: 238 Skipped: 3



Answer Choices	Responses	
Transportation	34.03%	81
Recreation	57.14%	136
Exercise	73.11%	174
To enjoy nature	59.24%	141
Socialize	28.15%	67
I do not bike	15.55%	37
Total Respondents: 238		

Q4 What should be the most important goals and outcomes of this plan? (check all the apply)

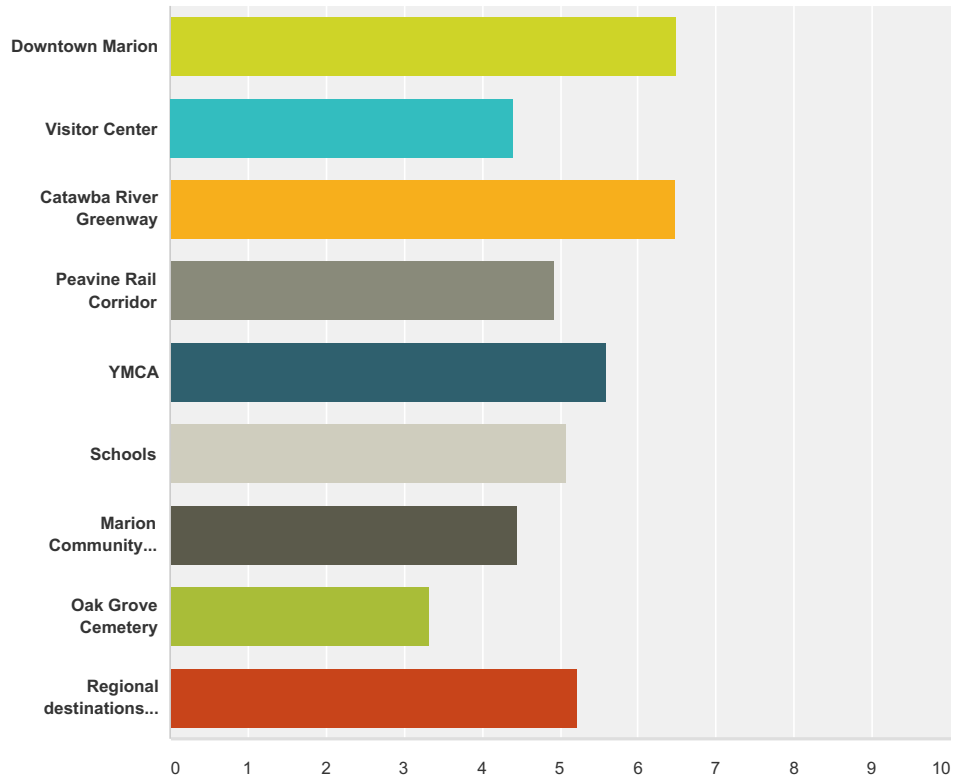
Answered: 208 Skipped: 33



Answer Choices	Responses	
Safer conditions for bicycling	89.42%	186
More choices for recreation and exercise	74.04%	154
More choices for transportation between neighborhoods and local destinations	56.73%	118
Increased tourism and property values	35.58%	74
Increased overall quality of life/livability	57.21%	119
Environmental benefits	45.67%	95
None	2.88%	6
Total Respondents: 208		

Q5 What destinations would you most like to be able to reach by bicycling? Please rank (1 = most like to reach, 9 = least like to reach)

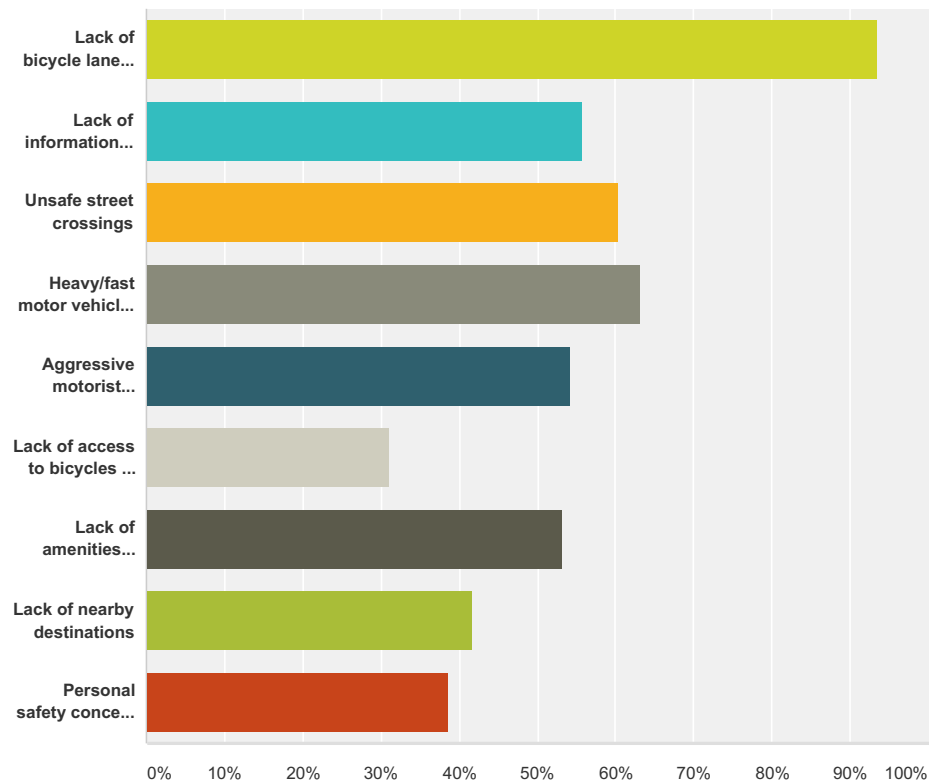
Answered: 198 Skipped: 43



	1	2	3	4	5	6	7	8	9	Total	Score
Downtown Marion	30.67% 46	10.67% 16	13.33% 20	18.67% 28	8.67% 13	3.33% 5	2.67% 4	5.33% 8	6.67% 10	150	6.49
Visitor Center	4.96% 7	12.77% 18	9.22% 13	6.38% 9	11.35% 16	14.89% 21	11.35% 16	12.06% 17	17.02% 24	141	4.41
Catawba River Greenway	23.97% 35	19.18% 28	16.44% 24	10.96% 16	7.53% 11	8.22% 12	5.48% 8	2.74% 4	5.48% 8	146	6.48
Peavine Rail Corridor	4.23% 6	11.97% 17	14.08% 20	13.38% 19	12.68% 18	10.56% 15	15.49% 22	10.56% 15	7.04% 10	142	4.93
YMCA	6.25% 9	15.28% 22	17.36% 25	15.28% 22	17.36% 25	11.11% 16	5.56% 8	7.64% 11	4.17% 6	144	5.59
Schools	14.48% 21	7.59% 11	10.34% 15	8.97% 13	13.79% 20	11.72% 17	16.55% 24	8.97% 13	7.59% 11	145	5.08
Marion Community Building Park	4.32% 6	9.35% 13	2.88% 4	9.35% 13	17.27% 24	21.58% 30	16.55% 23	13.67% 19	5.04% 7	139	4.45
Oak Grove Cemetery											
Regional destinations...											

**Q6 What do you think are the factors that most DISCOURAGE bicycling in Marion?
Please select up to five factors.**

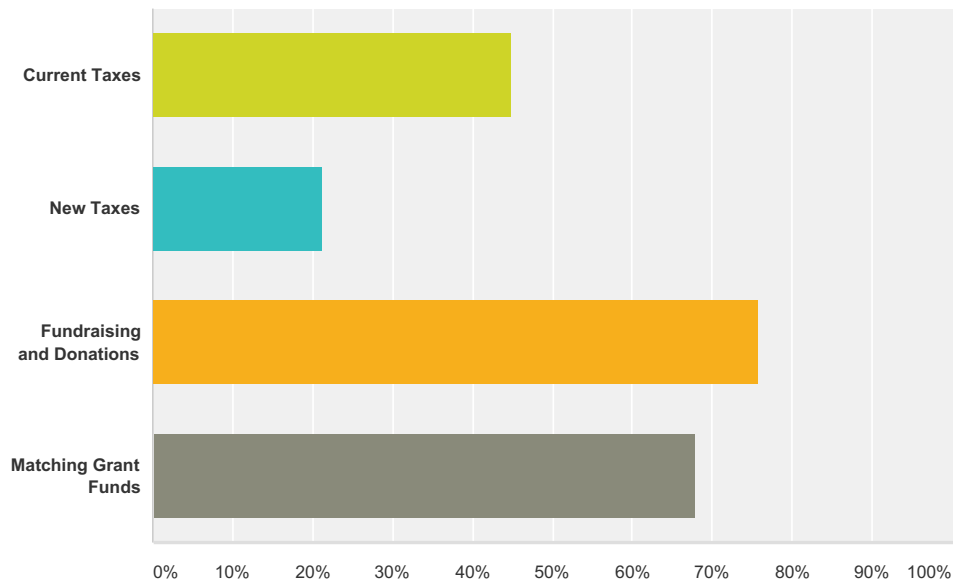
Answered: 199 Skipped: 42



Answer Choices	Responses	
Lack of bicycle lanes and trails	93.47%	186
Lack of information about local trails and bicycle routes	55.78%	111
Unsafe street crossings	60.30%	120
Heavy/fast motor vehicle traffic	63.32%	126
Aggressive motorist behavior	54.27%	108
Lack of access to bicycles and bicycling equipment	31.16%	62
Lack of amenities (bicycle racks, wayfinding signs, water fountains, etc.)	53.27%	106
Lack of nearby destinations	41.71%	83
Personal safety concerns (other than traffic)	38.69%	77
Total Respondents: 199		

Q8 How should bicycle facilities be funded within Marion (Select all that apply)

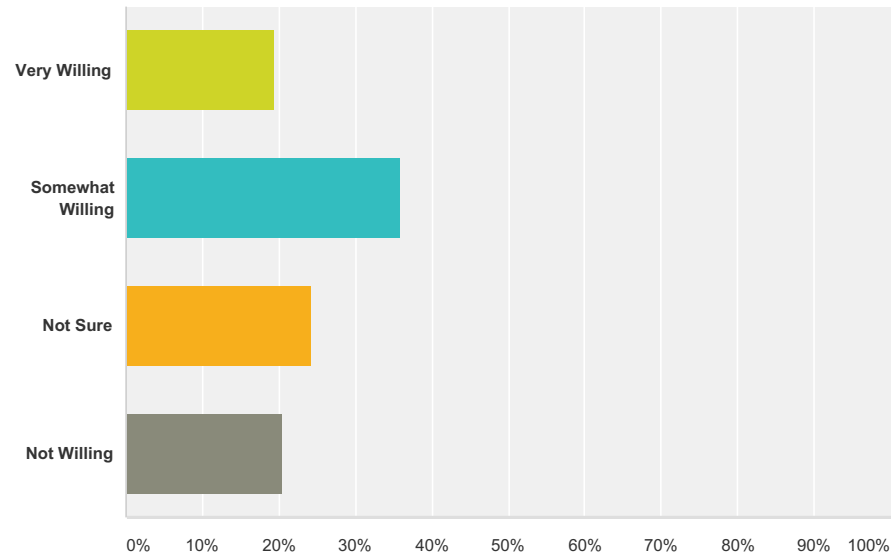
Answered: 174 Skipped: 67



Answer Choices	Responses	
Current Taxes	44.83%	78
New Taxes	21.26%	37
Fundraising and Donations	75.86%	132
Matching Grant Funds	67.82%	118
Total Respondents: 174		

Q9 How willing would you be to pay some increase in taxes to fund bicycle facilities in Marion?

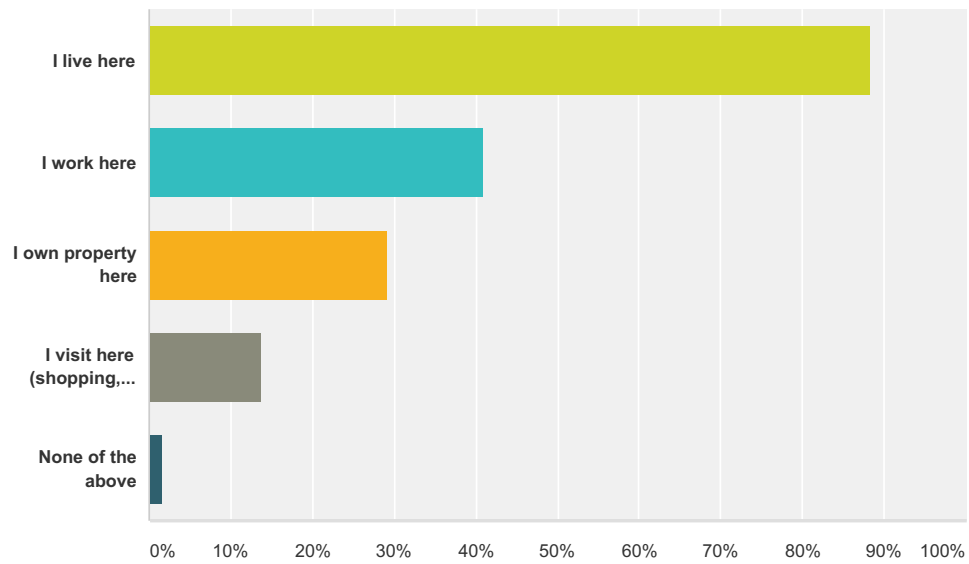
Answered: 181 Skipped: 60



Answer Choices	Responses
Very Willing	19.34% 35
Somewhat Willing	35.91% 65
Not Sure	24.31% 44
Not Willing	20.44% 37
Total	181

Q10 What is your relationship to Marion?

Answered: 181 Skipped: 60



Answer Choices	Responses	
I live here	88.40%	160
I work here	40.88%	74
I own property here	29.28%	53
I visit here (shopping, dining, local services)	13.81%	25
None of the above	1.66%	3
Total Respondents: 181		



CHAPTER THREE: RECOMMENDATIONS

Overview | Methodology | Chapter Organization |
Types of Bicyclists | Bicycle Facility Types | Recommendations |
Project Prioritization | Priority Projects & Investments |
Program Recommendations

Overview

This chapter features recommendations for bicycle facilities in the City of Marion, followed by recommendations for related programs and policies. The recommended bicycle network consists of existing and proposed facilities such as trails, sidepaths, bicycle lanes, and shared lanes/routes. Conceptually, these bicycle facilities and the destinations they connect form a network of ‘hubs and spokes’. Downtown Marion, shopping centers, parks, neighborhoods, schools, and other places where people bicycle to and from are the ‘hubs’, whereas bicycle lanes, trails, and other bicycle facilities are the ‘spokes’ that connect them (see diagram to the right).

Methodology for Bicycle Network Design

The recommended bicycle network was developed by assembling and analyzing information from several sources: input from the staff and steering committee, public input from comment forms and public events, previous plans and studies, locations of existing facilities and destinations, and the consultant’s field analysis. Field work examined the potential and need for bicycle facilities along key corridors in Marion, with a focus on potential connections between key destinations.



McDowell Community College is a key destination



Chapter Organization

An overview of recommended bicycle facility descriptions is followed by a series of recommendations maps. Maps 3.1 and 3.2 outline the overall recommendations, representing the comprehensive network of all recommended facilities. A full project list can be found in Append C.

Priority recommendations are featured in the pages following the overall recommendations maps, including four high-impact priority projects that can be implemented at relatively low-cost, followed by four priority investments, that will have the greatest positive impact on bicycling, but that are more complex and expensive to implement.

Appendix C contains the full project list including both priority and non-priority projects.

Program recommendations are at the end of this chapter, beginning at page 3-15.

Types of Bicyclists

Bicyclists can be categorized into four distinct groups based on comfort level and riding skills. Bicyclists' skill levels greatly influence expected speeds and behavior, both in separated bikeways and on shared roadways. Each of these groups has different bicycle facility needs, so it is important to consider how a bicycle network will accommodate each type of cyclist when creating a non-motorized plan or project. The bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people. In the US population, people are generally categorized into one of four cyclist types. The characteristics, attitudes, and infrastructure preferences of each type are described below.

Source: Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation. Supported by data collected nationally since 2005.



HIGHLY EXPERIENCED (~1% OF POPULATION)

Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections -- even if shared with vehicles -- over separate bicycle facilities such as shared use paths.



ENTHUSED AND CONFIDENT (~ 5-10% OF POPULATION)

This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or sidepaths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.



INTERESTED BUT CONCERNED (~ 60% OF POPULATION)

This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "Enthusied & Confident" with encouragement, education and experience.



NO WAY, NO HOW (~ 30% OF POPULATION)

Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances.

Bicycle Facility Types

The descriptions on this page offer a brief overview of the primary facility types recommended in this plan. For more information on facility design, please see Appendix A: Design Guidelines.

Trail (Independent Right-of-Way)

A trail is a facility that is separated from the roadway and designed for a variety of users, including bicyclists, walkers, hikers, joggers, wheelchair users, and skaters.

- » Trails may be paved or unpaved and are the preferred facility for novice and average bicyclists.

- » These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors, away from roadway ROW where there are few conflicts with motorized vehicles. Trails in Marion should be a minimum of 10' in width.

- » Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

Proposed trails are symbolized in the recommendation maps as shown below. Further details on trails are found in the Design Guidelines in Appendix A.

Map Key:

- Proposed Trail
- Existing



The paved trail above is an example of a facility that is independent of the roadway right-of-way.



An unpaved trail example (independent ROW) from the Browns Creek trail in Marion (photo from Cape Fear SORBA).

Sidepaths

A sidepath is a type of shared use path that follows a road corridor but is separated from on-road traffic. Sidepaths are more transportation-oriented in character and used by bicyclists and pedestrians. Because of operational concerns, it is generally preferable to place paths within independent rights-of-way away from roadways. However, there are situations where existing roads provide the only corridors available.

- » Sidepaths are most appropriate in corridors with few driveways and intersections.
- » Signage should be included along sidepaths to direct users to access points with high-visibility crosswalks.

- » Families and novice bicyclists are most comfortable on sidepaths. Therefore, a comprehensive network of sidepaths, that includes trails built in open space, is an integral part of the overall bicycle facility network, and its development should be a priority of Marion.
- » The key difference between a sidepath and a typical sidewalk is the extra width. A 10' wide path, for example, allows for safer shared use by bicyclists, pedestrians, and other users, whereas the typical 5'-wide sidewalk does not allow for safe passing.

Proposed sidepaths are symbolized in the recommendation maps as shown below. Further details on sidepaths are found in the Design Guidelines in Appendix A.

Map Key:

— Sidepath



Sidepath example with curb and gutter in Wilmington, NC, along Museum Dr.



Sidepath example without curb and gutter in Conover, NC.

Bike Lanes

Bike lanes are described as a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists.

- » Bike lanes always carry bicyclists in the same direction as adjacent motor vehicle traffic.
- » While bike lanes on both sides of the roadway are preferred. However, when space is limited, uphill bike lanes and downhill shared lane markings are an option.
- » The minimum width for a bike lane is four feet; five- and six-foot bike lanes are typical for collector and arterial roads.
- » Road diets are one method of implementing bike lane recommendations. A road diet removes excess travel lanes or narrows existing lanes to install bicycle facilities.

» **Buffered bike lanes** are conventional bicycle lanes paired with a designated buffer space, separating the bike lane from the adjacent motor vehicle travel lane and/or parking lane. Buffered bike lanes are allowed as per MUTCD guidelines for buffered preferential lanes (section 3D-01).

» **Buffered bike lanes** are designed to increase the space between the bike lane and the travel lane or parked cars. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speed, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic.

Proposed bike lanes, bike lane/sharrow combo, and road diets are symbolized in the recommendations maps as shown below. Further details on bike lanes are found in the Design Guidelines in Appendix A.

Map Key:

- — — Bike Lanes
- — — Bike Lanes/Sharrow Combo
- Road Diet



Bike lanes on Salisbury Street in Raleigh, NC were installed during a resurfacing project.



Buffered bike lane example.

Marked Shared Roadways (Sharrows)/Bike Routes

Marked shared roadways (also known as “sharrows”) have become more popular as a pavement marking treatment to help align bicyclists properly in both urban and rural landscapes that may feature on-street parking, a variety of lane widths, and other factors.

- » On shared roadways, bicyclists and motor vehicles use the same roadway space.
- » These facilities are typically used on roads with low speeds and/or traffic volumes. However, they can be used on higher volume roads with wide outside lanes.
- » A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist.

- » Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.

Proposed shared roadways/routes are symbolized in the recommendation maps as shown below. To avoid heavy maintenance costs, sharrows were recommended on a limited basis. Perhaps in the future, roadways such as Garden Street, Madison Street, Fleming Avenue and Robert Street could be considered marked as shared roadways.

Further details on shared roadways/routes are found in the Design Guidelines in Appendix A.

Map Key:

■ ■ ■ Sharrows



Marked shared roadway (sharrow) example in Downtown Wilmington, NC, on Front Street.



Bike route signage example, with distances

Bike Routes

Typically found in less-dense areas, bike routes highlight a particular route that connects people to key destinations. In Marion, several local roadways provide direct access to schools, parks, community centers, and shopping. Similarly, the Rural Bike Routes create a network that connects cyclists to the many regional destinations in and around Marion and provide opportunities for group rides and long, recreational rides.

While the cost of improving these roads with dedicated bicycle facilities may be prohibitive, labeling the network as Neighborhood or Rural Bike Routes can be a great short-term improvement. The addition of signage will help cyclists find their way as well as alert motorists to expect bicycle traffic.

Facility types along the bike route network will vary based on road conditions, traffic volumes, and project opportunities. Ideally, bike routes are paved roadways with striped shoulders (4'+) wide enough for bicycle travel.

- » Bike routes should include signage alerting motorists to expect bicycle travel along the roadway.
- » As roadways are widened to accommodate increasing traffic volumes, upgrades to dedicated bicycle facilities, such as a shoulder, a bike lane or a road-separated sidepaths should be considered.

Proposed neighborhood and rural bike routes are symbolized in the recommendations maps as shown below.

Map Key:

- Neighborhood Bike Routes
- Rural Bike Routes



Paved shoulder examples

City of Marion
2015 Bicycle Plan
DRAFT
Recommendations

Legend

Recommended Facility Type

- Bike Lanes
- Bike Lanes/Sharrows Combo
- Neighborhood Bike Routes
- Road Diet
- Rural Bike Routes
- Sharrows
- Sidepath

Trails

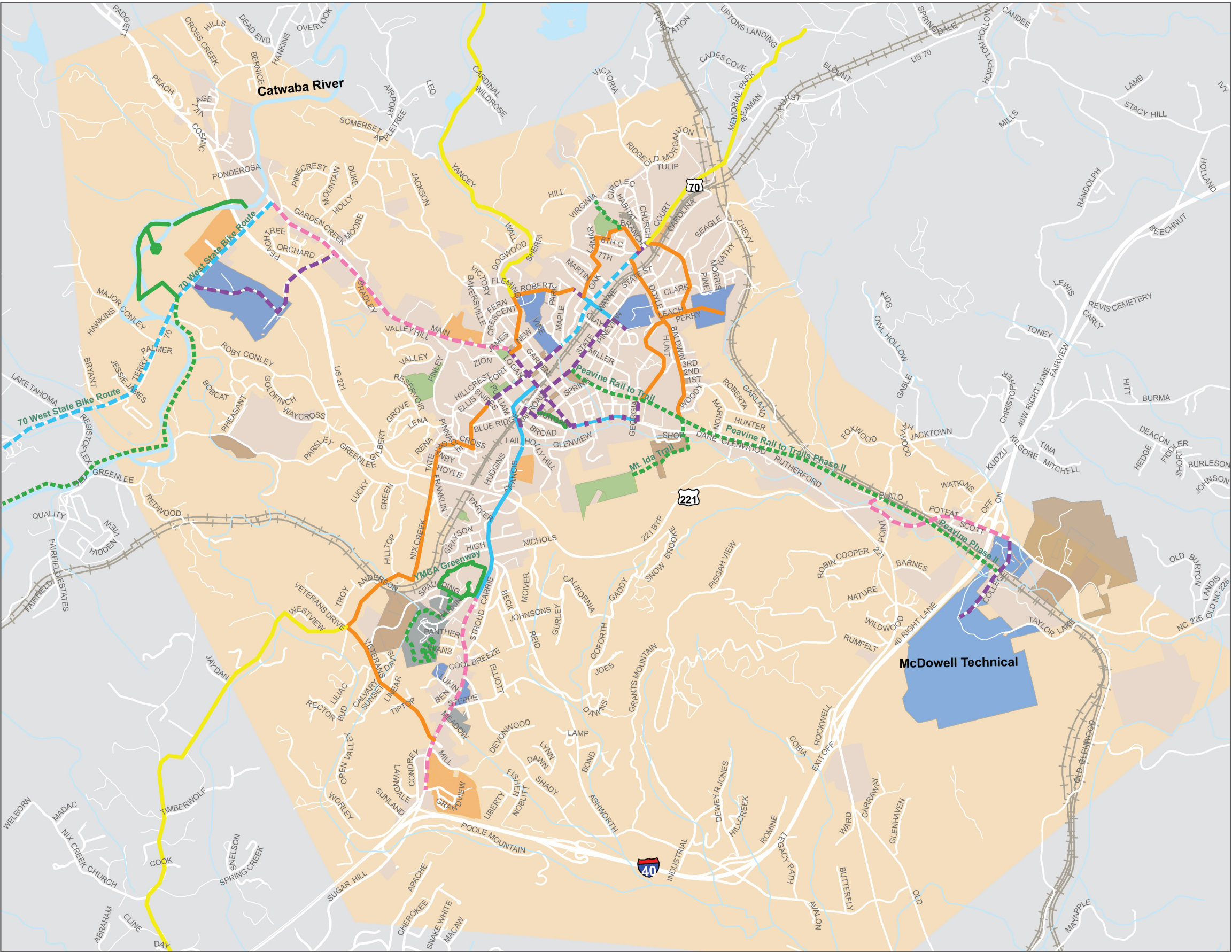
- Existing Trails
- Proposed Trails

Destinations

- College
- Government Services
- Shopping/Grocery
- Library
- Medical
- Park/Open Space
- School
- Body of Water
- Rail Line
- City Limits
- Planning Boundary



Data obtained from City of Marion.
Map created August, 2015.



Map 3.2 - Recommendations - Downtown

May 2016

MARION BICYCLE PLAN

City of Marion
2015 Bicycle Plan
DRAFT
Recommendations

Legend

Recommended Facility Type

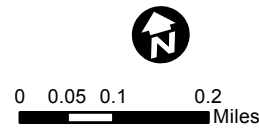
- Bike Lanes
- Bike Lanes/Sharrows Combo
- Neighborhood Bike Routes
- Road Diet
- Rural Bike Routes
- Sharrows
- Sidepath

Trails

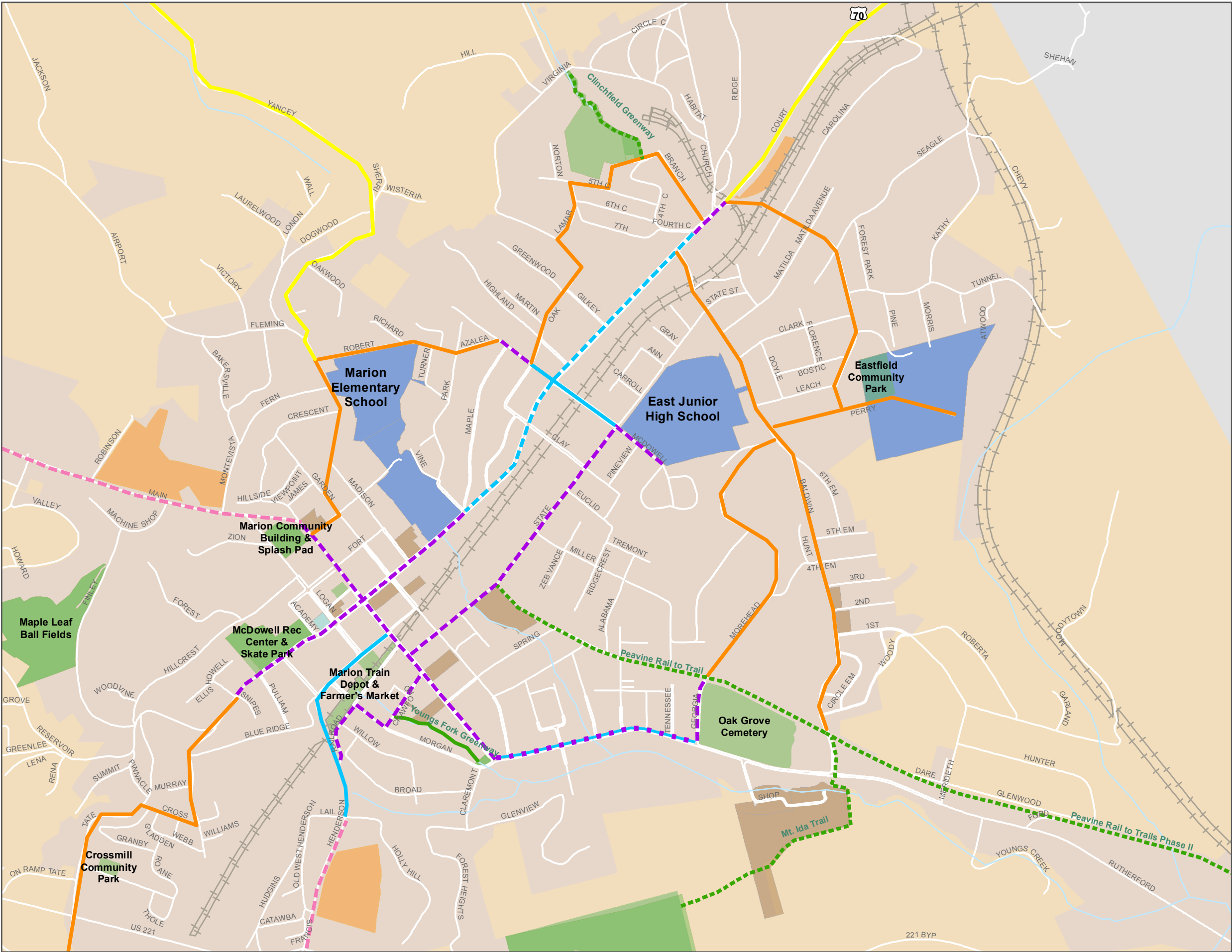
- Existing Trails
- Proposed Trails

Destinations

- Government Services
- Shopping/Grocery
- Library
- Park/Open Space
- School
- Body of Water
- Rail Line
- City Limits
- Planning Boundary



Data obtained from City of Marion.
Map created July, 2015.



Project Prioritization

The prioritization process began with input from City staff and steering committee members on high priority areas and corridors during the third steering committee meeting. During fieldwork investigations, the consultant team evaluated and ground-truthed the high priority areas and corridors to identify the most appropriate facility type for each corridor. Priority projects were then reviewed and discussed with the steering committee, public, City staff, and NCDOT staff.

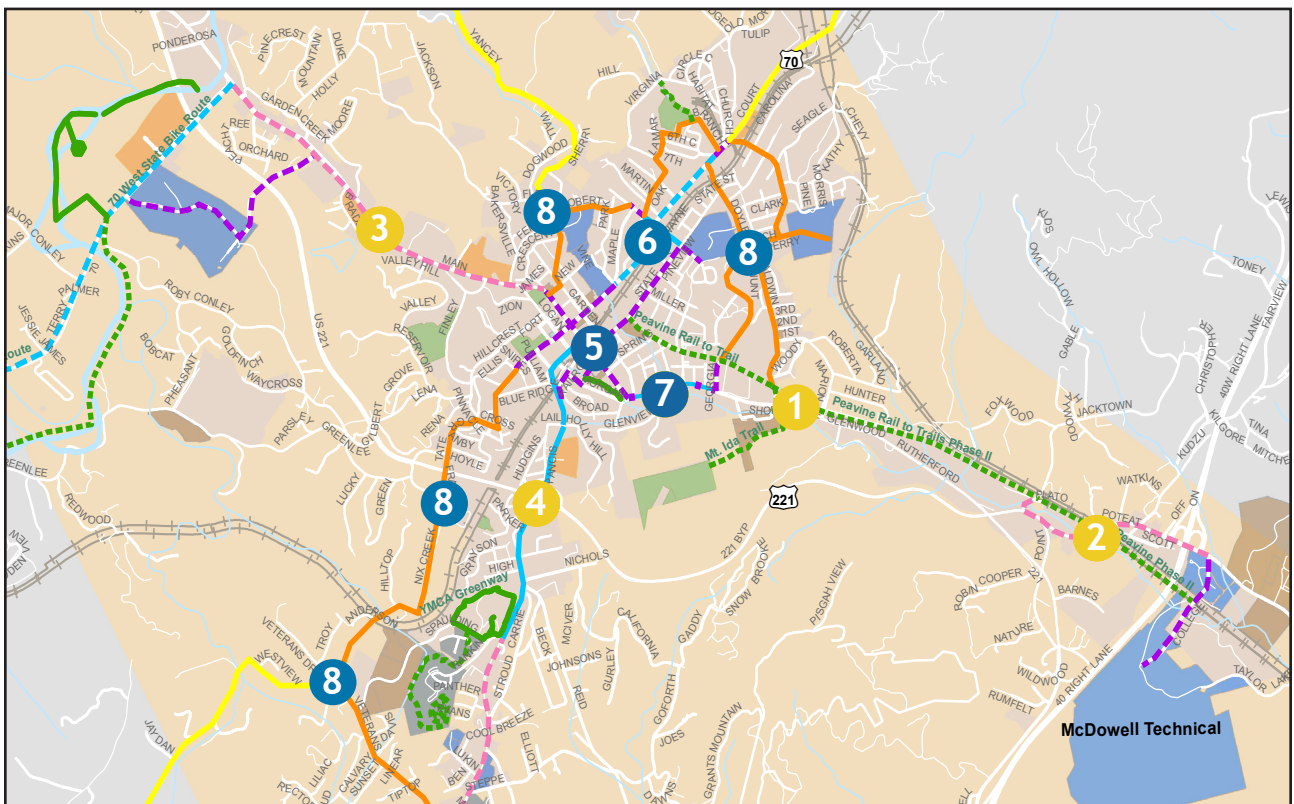
Projects were split into two groups: **priority projects** and **priority investments**. Priority projects are low-cost, easy-to-install projects.

Priority investments are typically higher cost, complex implementation projects that may require more study and coordination. These projects have the ability to yield a greater return on investment by generating more bicycle traffic in Marion.

Any recommendations along a NCDOT-maintained roadway will require review and approval by NCDOT Highway Division 13 prior to implementation.

The eight priority project segments are displayed in the map below, with more details on the following pages.

Map 3.7 Priority Project & Priority Investment Locations (see following pages for details)



Priority Investments: 1) Peavine Trail, Phase 1; 2) Peavine Trail, Phase 2; 3) Main St; 4) Henderson St.

Priority Projects: 5) Main St; 6) Court St; 7) Rutherford Rd; 8) Wayfinding Signage.

1. Priority Investment: Peavine Trail

Phase 1: State Street to Ford Way: 1.3 Miles



**PLANNING-LEVEL
COST ESTIMATE:
\$1.2 MILLION**



Project Description

Phase One of the Peavine Trail links residents who live in the far east of Marion to downtown. Recommended width is 12-foot paved asphalt trail with proposed centerline striping to encourage safe bicycle and pedestrian traffic. This trail project also includes crossing improvements at each of the seven road crossings. Trailheads are recommended at each end of Phase 1 (State Street and Ford Way).

Destinations Served

- Downtown Marion
- Joseph McDowell House
- Oak Grove Cemetery
- Proposed Mt. Ida Trail Corridor

PROJECT LOCATION



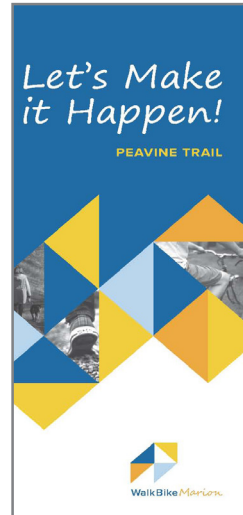
2. Priority Investment: Peavine Trail

Phase 2: Ford Way to College Ave: 1.82 Miles

Project Description

Phase Two of the Peavine Trail makes the critical connection to McDowell Technical Community College. This phase is much more challenging to implement and will require coordination with both rail road companies (Norfolk Southern and CSX). The preferred trail alignment follows the rail corridor and provides a consistent off-road trail experience. However, further analysis is needed in order to determine the trail location. Trail design and amenities should be consistent with Phase One (details on previous page). Because this section is an active rail corridor and approval for rail-with-trails are often difficult to obtain, an on-road connection is also recommended as an alternative.

While the cost of implementing the entire Peavine Trail is high, the project has the potential to significantly increase Marion's bicycle mode share and bicycle-friendliness. A brochure was created as part of this process to energize the public, stakeholders, and potential funding partners around the Peavine Trail concept.



Peavine Trail Brochure



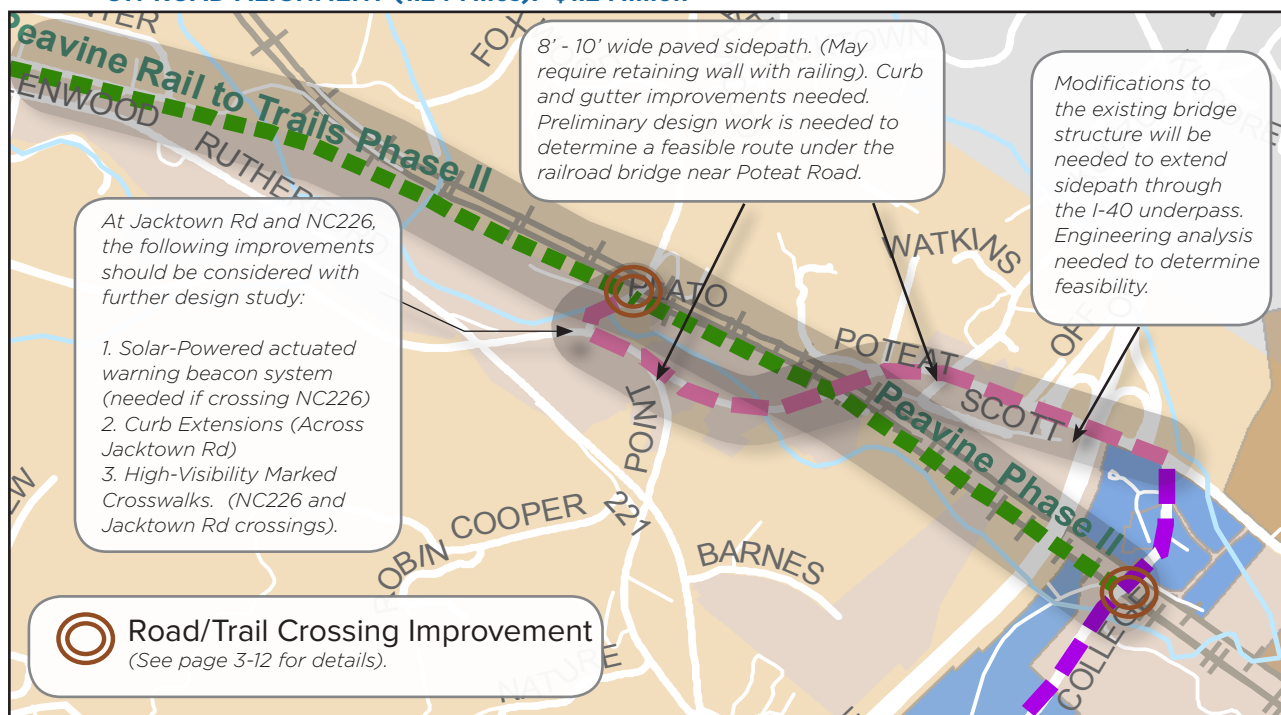
The active rail line and challenging road crossings make both alignment options challenging and costly.

PLANNING-LEVEL COST ESTIMATES:

» **RAIL ALIGNMENT (1.77 Miles): \$1.8 Million**

» **ON-ROAD ALIGNMENT (1.24 Miles): \$1.2 Million**

PROJECT LOCATION



3. Priority Investment: Main Street

Viewpoint Dr to US 70: 2 Miles



Project Description

The long term vision for Main Street, headed north from downtown, is to install a sidepath to integrate bicycle and pedestrian traffic safely along the corridor. There are several pinch points that will make construction challenging, such as limited right-of-way, driveway crossings, and steep slopes. These constraints will require the path to alternate along both sides of the corridor. A thorough engineering assessment will be needed to determine the feasibility of the project.

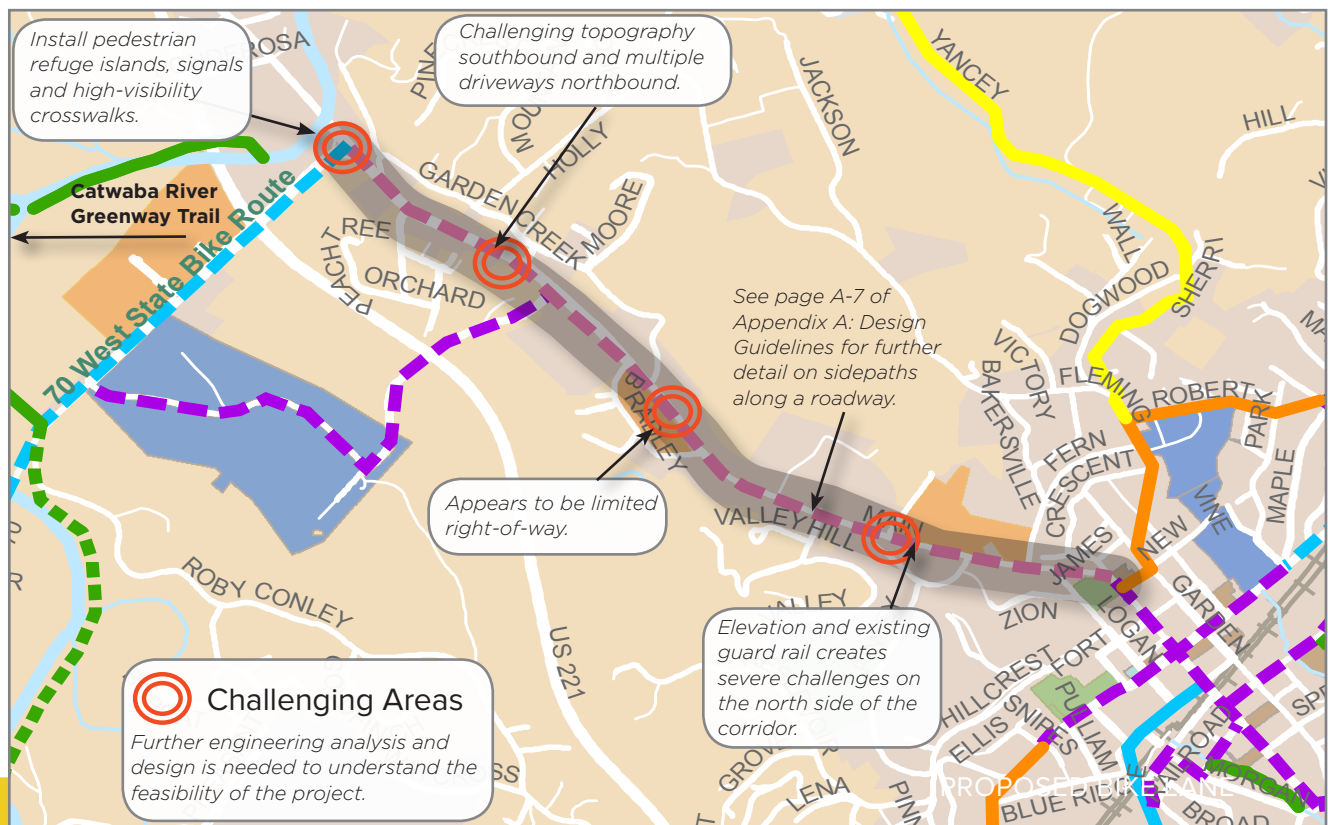
As the corridor develops, the City should take the opportunity to partner with the development community and NCDOT to implement this project.

Destinations Served

- Downtown
- Catwaba River Greenway Trail
- 70 West State Bike Route
- Marion City Square (Retail)

PLANNING-LEVEL COST ESTIMATE: \$2.10 MILLION

PROJECT LOCATION



4. Priority Investment: Henderson Street

Rankin Dr to Main Street: 1.4 Miles

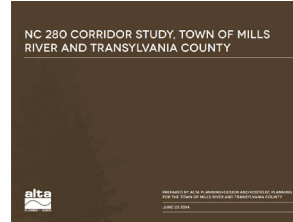
Project Description

A corridor study is recommended for Henderson Street to bring various stakeholders together and develop a vision for the corridor. Henderson Street serves as a key connection between the YMCA and downtown, both significant bicycle destinations. Today, the corridor lacks consistent facilities to safely integrate non-motorized traffic. A thorough traffic analysis is needed to determine the feasibility of reducing the number of travel lanes to add streetscape amenities without widening the roadway.

Project stakeholders include adjacent property owners, business owners, residents, City officials, NCDOT officials, Isothermal RPO staff and McDowell County staff. The City should work with NCDOT and the Isothermal RPO to investigate funding sources to complete the study.

Destinations Served

- Downtown
- McDowell County Senior Center
- YMCA
- George Hutchins Trail
- Bill Hendley Trail
- McDowell County Health Department
- McDowell Hospital



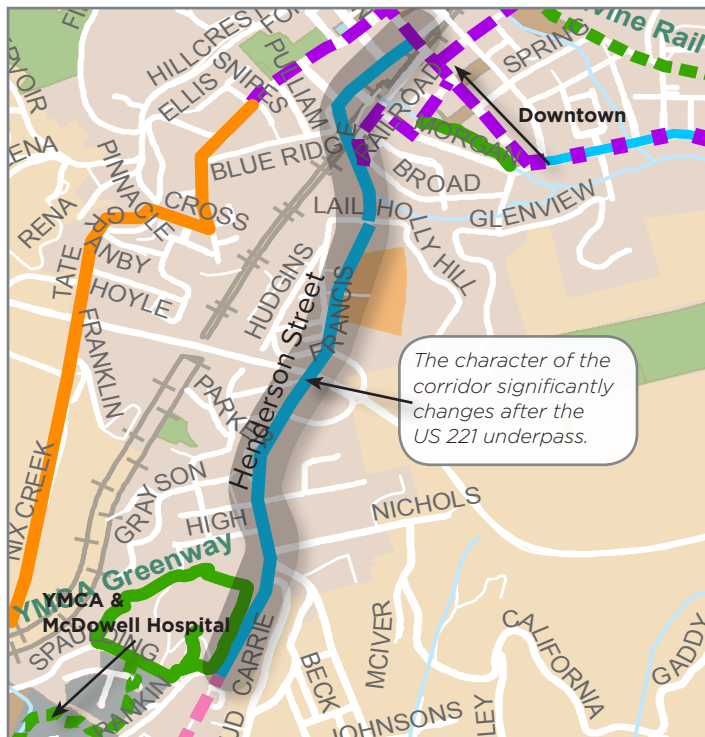
The Town of Mills River developed a corridor study for NC 280 that brought property owners, residents, business owners, NCDOT, and town officials together to create a bicycle-friendly concept for the corridor



The City of Charlotte worked with NCDOT to reduce travel lanes from four to three while adding bicycle facilities and making improvements to intersections for pedestrians along West Morehead Road.

PLANNING-LEVEL COST ESTIMATE: \$20,000 - \$40,000 (DEPENDING ON SCOPE)

PROJECT LOCATION



In Downtown, the corridor varies between two to three lanes of traffic.



Near McDowell Hospital, the corridor carries higher traffic volumes and higher speed.

5. Priority Project: Main Street

Viewpoint Dr to Morgan Street: 0.66 Miles



EXISTING CONDITIONS

Project Description

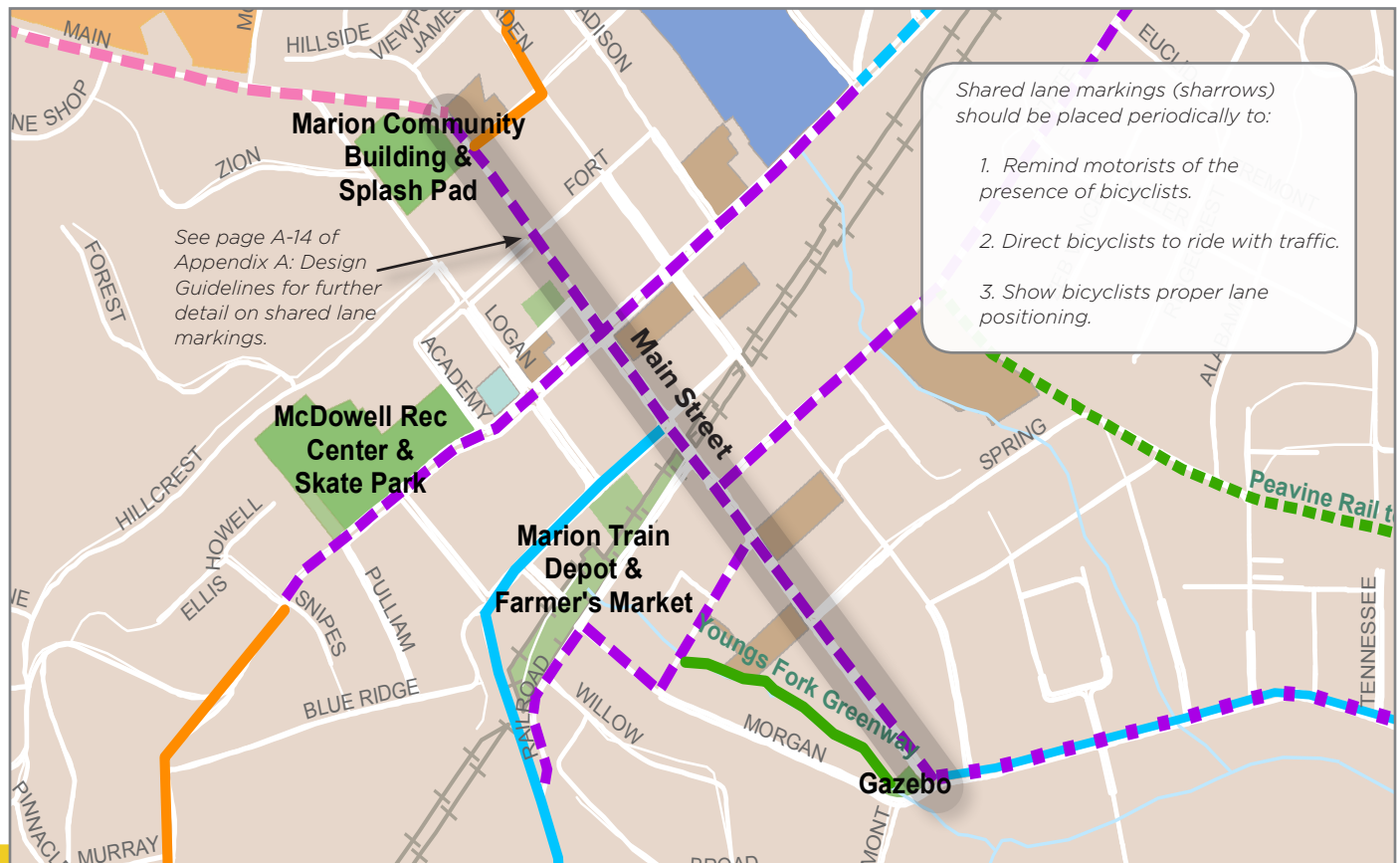
This bicycle improvement project will add shared lane markings, or “sharrows”, to Main Street, the heart of downtown. A streetscape project was completed within the last five years along Main Street. Adding the shared lane markings will complete the corridor and ultimately serve as the spine of the bicycle network.

Destinations Served

- Downtown
- Marion City Hall
- Retail
- Marion Community Building Park
- McDowell County Register
- Post Office
- Marion Police Department

PLANNING-LEVEL COST ESTIMATE: \$7,245

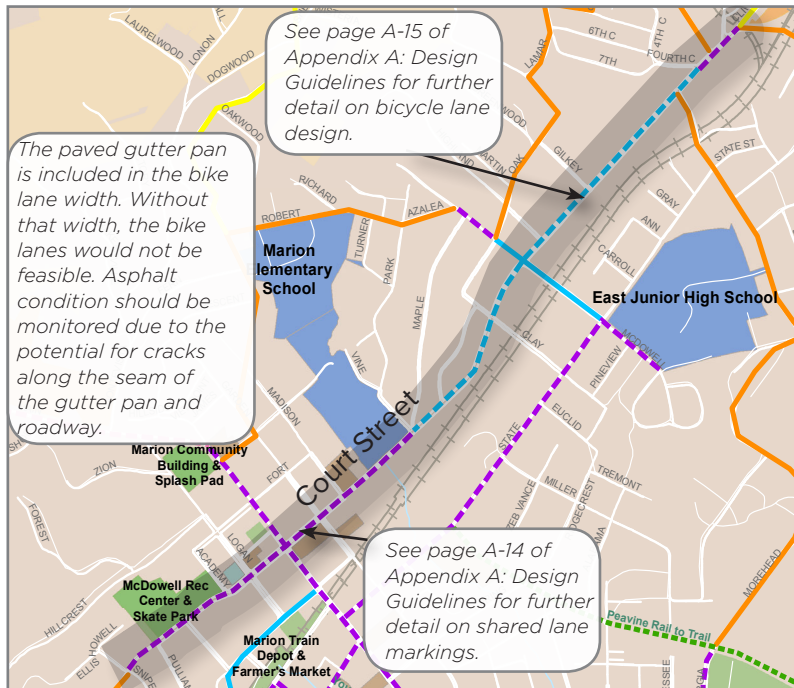
PROJECT LOCATION



6. Priority Project: Court Street

Snipes Street to Church Street: 1.4 Miles

PROJECT LOCATION



Project Description

This bicycle improvement project will add a combination of bicycle lanes and shared lane markings, or "sharrows", to Court Street connecting several destinations. Approaching downtown, Court Street narrows significantly. Sharrows are a helpful tool when the roadway width is too narrow for bicycle lanes.

Destinations Served

- Clinchfield Community Park
- Clinchfield Greenway
- New Manna Christian School & Baptist Church
- Downtown Marion
- McDowell County Public Library
- McDowell County Recreation Department

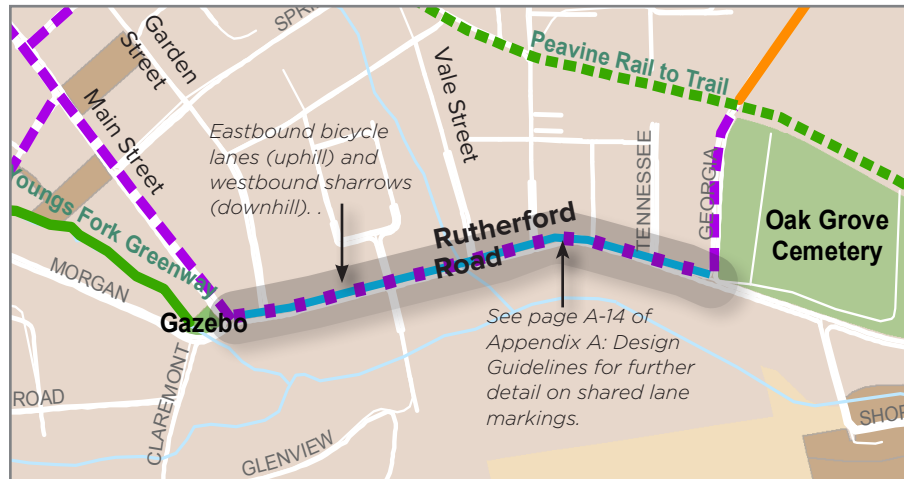
PLANNING-LEVEL COST ESTIMATE:
\$146,050



7. Priority Project: Rutherford Road

Main Street to Georgia Avenue: 0.5 Miles

PROJECT LOCATION



Project Description

This bicycle improvement project will add a combination of bicycle lanes and shared lane markings, or "sharrows", to Rutherford Road. The roadway width isn't wide enough to accommodate bicycle lanes in both directions. The bicycle lane should be placed along the uphill portion, as bicycle travel speed will be slower. The sharrows should be placed on the downhill side, in the center of the travel lane.

Destinations Served

- Downtown Marion
- Neighborhoods
- Gazebo
- Oak Grove Cemetery

PLANNING-LEVEL COST ESTIMATE: \$89,067



8. Priority Project: Bicycle Wayfinding

Neighborhood Bike Routes

Project Description

Wayfinding signage, as part of a signage program that also includes warning and regulatory signage, enhances resident and visitor orientation. A clear wayfinding system should contribute to economic development by pointing visitors to key destinations around Marion. The City of Marion should develop a customized wayfinding program that includes directional signage to local destinations. The proposed neighborhood bike routes would be the perfect place to begin implementing a bicycle wayfinding program (see Map 3.3 for proposed sign locations).

Materials for signs should reflect the character of Marion and be selected for longevity and ease of maintenance. A wayfinding program could include directional signage, on-road markings, and kiosks with City maps. If funding is not immediately available to develop a complete wayfinding program, a good first step is temporary wayfinding signage that incorporates the newly designed WalkBikeMarion logo. The Marion Chamber of Commerce may be an ideal partner based on the nexus with tourism and economic development.



Brand recognition through logos and programming will help build awareness of Marion's bicycle and pedestrian efforts.

PLANNING-LEVEL COST ESTIMATE: \$13,225 (MAP 3.3)



NCDOT and the Eastern Carolina Council completed the Croatan Regional Bicycle + Trails Plan in 2014. This plan included guidance for bicycle route and trail signage. Marion could take a similar approach along the proposed neighborhood and rural bike routes, using a local logo or symbol in conjunction with the required standards for signage on NCDOT roadways.



Bicycle wayfinding example promoting key destinations.



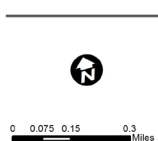
Bicycle wayfinding example that shows distance and time.

Map 3.3 - Proposed Sign Locations



City of Marion 2015 Bicycle Plan

Proposed Wayfinding Sign Location Map



LEGEND

Recommended Facility Type

- Neighborhood Bike Routes
- Body of Water
- Rail Line
- City Limits
- Planning Boundary

Destinations

- Government Services
- Shopping/Grocery
- Library
- Medical
- Park/Open Space
- School



Data obtained from City of Marion.
Map created September 2015.

Planning Level Cost Estimates

The planning level cost estimates are based on the average per-mile cost of built projects:

<i>Sideways (10-12')</i>	<i>\$600,000/mile</i>
<i>Signed Bike Route/Sharrows/Shared Roadways</i>	<i>\$25,070/mile</i>
<i>Striped Bicycle Lane</i>	<i>\$150,000/mile</i>

Per unit cost estimate for additional elements included in select priority projects and priority investments are as follows:

<i>Rectangular Rapid Flashing Beacon</i>	<i>\$22,250/each</i>
<i>Median Refuge Island</i>	<i>\$13,520/each</i>
<i>High-visibility Crosswalk</i>	<i>\$2,540/each</i>
<i>Curb Extensions</i>	<i>\$13,000/each</i>
<i>Wayfinding Signage</i>	<i>\$250/each</i>
<i>Sharrow Markings</i>	<i>\$350/each</i>

The source for the above costs utilizes a combination of recently constructed bicycle and pedestrian projects in North Carolina and the 2013 report, 'Costs for Pedestrian and Bicyclist Infrastructure Improvements' by the UNC Highway Safety Research Center (HSRC), prepared for the Federal Highway Administration. Planning level cost estimates for priority projects include 15% mobility/contingency factor. Priority investments include 20% mobility/contingency due to their complexity.

It is important to note that costs for bicycle and pedestrian infrastructure vary greatly from city to city and site to site. The per unit cost information in table 3.1 below is included to aid in future project planning. All cost estimates should be used only for estimating purposes and not necessarily for determining actual bid prices for a specific infrastructure project.

Table 3.1 Per Unit Cost Estimate Summary

Per Unit Cost Estimates	
STRIPING ESTIMATES (per Linear Foot (LF))	
\$/LF per single line removal	\$2.00
\$/LF per single dashed line removal	\$0.25
\$/LF per single line stripe (Thermo)	\$1.85
\$/LF per single line stripe	\$0.46
ASPHALT AND AGGREGATE BASE COURSE (ABC) ESTIMATES	
\$/Ton of Asphalt	\$33.00*
\$/Ton of ABC	\$20.00**
PAVEMENT MARKINGS, REFLECTOR, SIGNAGE ESTIMATES	
SHARROW thermoplastic symbol	\$220.00
\$/reflective marker (stick-on)	\$7.00
\$/reflective marker (embedded)	\$25.00

Bike Parking

Bike parking can range from a simple bicycle rack to storage in a bicycle locker or cage that protects against weather, vandalism and theft. Marion bicyclists visiting downtown and other popular destinations do not have available bicycle parking and instead may lock their bikes to street fixtures such as parking meters, trees, utility poles and sign poles.

Short-term Bike Parking

Bicycle racks are the preferred device for short-term parking (less than two-hours). These racks serve people who leave their bicycles for relatively short periods of time, typically for shopping or errands, eating or recreation. Bicycle racks provide a high level of convenience and moderate level of security. Short-term parking should support the bicycle at two points and have a design that is intuitive to use. A “U-rack” is an example of a standard and accepted bicycle rack and is the recommended standard for many cities across North Carolina.

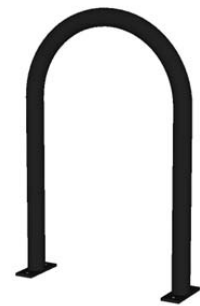
Recommended locations for short-term bike parking are displayed on map 3.3. Below are examples of the standard bike rack design in Marion.



*Bike Shaped Rack
(Schools)*



*Penny Farthing Hitch
(Downtown)*



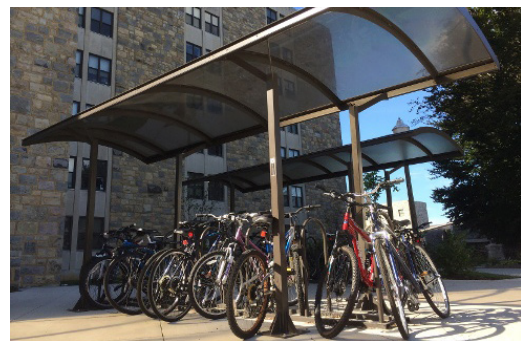
*Hoop Rack
(New Development)*

Long-term Bike Parking

Long-term bike parking includes bike lockers and bike stations and serve people who intend to leave their bicycles for longer periods of time and are typically found at transit stations, multi-family residential buildings and commercial buildings. These facilities provide a high level of security but are less convenient than bicycle racks. Below are examples of long-term bicycle parking. Although this plan does not recommend long-term bike parking locations, they should be considered as part of future transit projects or large scale developments.

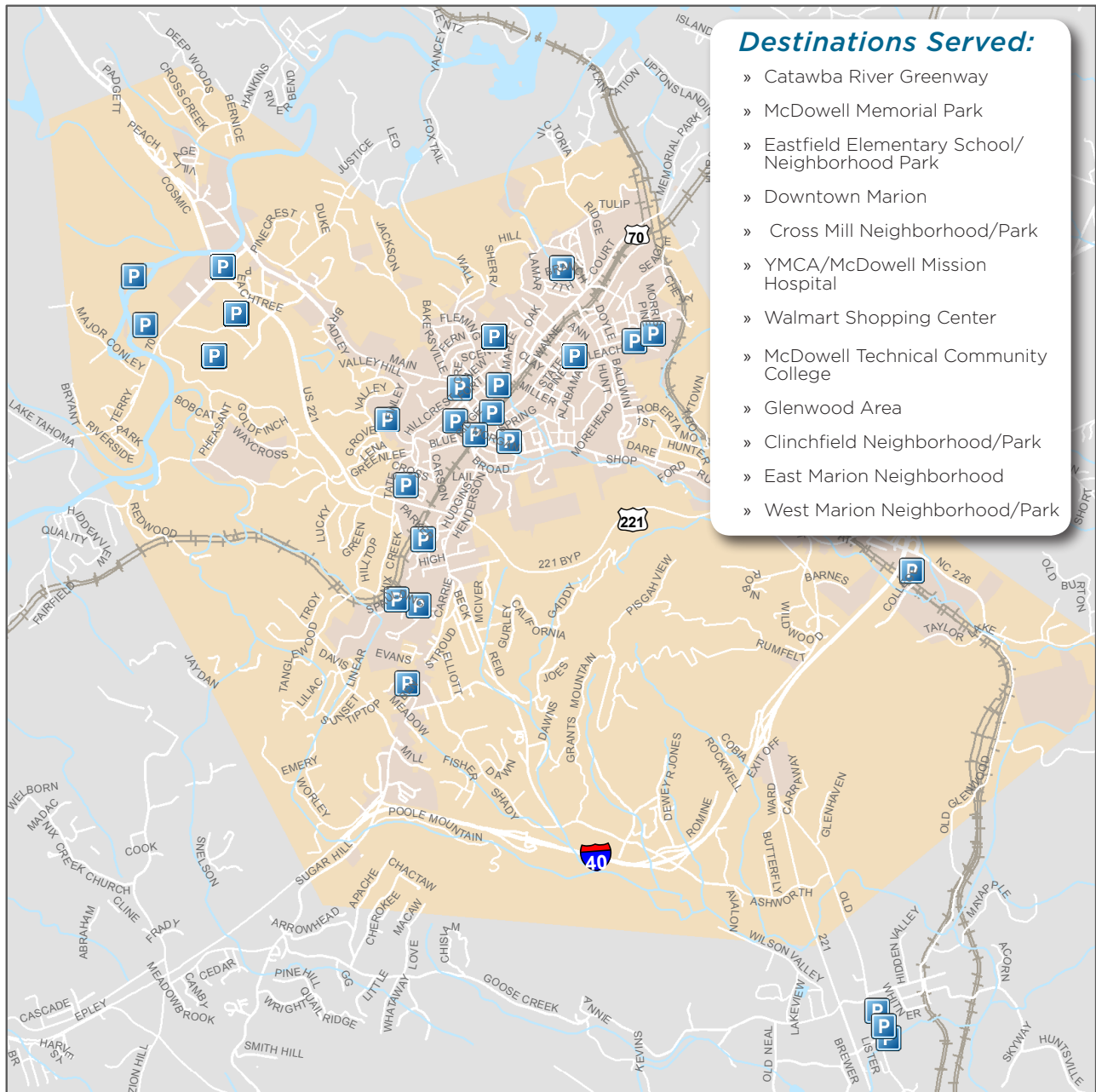


The City of Asheville, NC installed bike lockers in the parking deck on Rankin Avenue.



Covered bike parking at Virginia Tech in Blacksburg, VA.

Map 3.4 - Proposed Bike Parking



Marion Comprehensive Bicycle Plan 2015

Proposed Bike Parking Map



LEGEND

-  Bike Parking
-  Rail Line
-  Planning Boundary
-  City Limits
-  Body of Water



Data obtained from City of Marion.
Map created July, 2015.

Bikes and Public Transit

Coordinating bicycling with public transport is mutually beneficial, enhancing the benefits of both modes and encouraging more bicycling as well as more public transport use. Furthermore, bicycling extends the catchment area of transit stops far beyond the walking range and at a much lower cost than neighborhood feeder buses and park-and-ride facilities. Bicycle services may increase transit ridership by:

- » Extending the range that customers can travel to reach transit stops and stations;
- » Increasing the flexibility that passengers have to reach destinations at the end of a transit trip;
- » Providing “seamless” transportation between bicycle and transit modes; and
- » Offering an additional amenity to customers that increases the attractiveness of transit.

Public Transit in Marion

The City does not operate or fund any local public transportation services. The McDowell County Transportation Planning Board Inc operates McDowell Transit providing service for three human service agencies that transport people to and from work, medical services, and other select destinations. Currently, there is no public transportation service offered to the general public, and it is most likely to remain so until demand dictates otherwise.

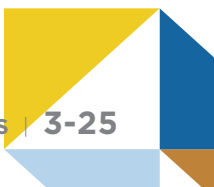
Bike Racks on Transit Vans

To fully integrate biking within the current transit system offered in Marion, bicycle racks could be purchased for each van in the McDowell Transit system. The racks can be fitted to the rear of the vehicle and hold up to three vehicles.



All DART vanpools and transit vans are equipped with bike racks in Des Moines, IA.

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Program Recommendations

Below are key program recommendations that are essential and complementary to improvements in infrastructure. See Chapter 4: Implementation for more information on program actions related to plan implementation.

Media Campaign to Educate Motorists, Bicyclists, and Pedestrians

Watch for Me NC is a comprehensive campaign aimed at reducing the number of bicyclists and pedestrians hit and injured in crashes with vehicles. The campaign consists of educational messages on traffic laws and safety, and an enforcement effort by area police in several Triangle communities.

The ongoing grant program, in which local jurisdictions are encouraged to apply, has been expanded statewide and Marion has been selected to participate in the 2015 campaign. As a part of this program, the City could:

- » Distribute the educational materials made available by NCDOT at local festivals and other events, at local bike shops and other businesses, and in renters' information packets and property owners' guest information books.
- » Work with police officers to hand out bicycle lights along with bicycle and pedestrian safety cards.
- » Broadcast program promotions and educational videos on the local government access channel.

Watch for Me NC website: <http://www.watchformenc.org/>

Purpose: To educate all road users about their rights and responsibilities, to increase awareness and improve traffic safety

Partners: City of Marion Police Department, Bicycle and Pedestrian Advisory Committee, City staff



One-Stop Website

Many current and potential bicyclists and pedestrians do not know where to find information on traffic laws, events, maps, tips, and recreation groups. The City of Marion could develop a “one-stop” website that houses all bicycle- and pedestrian-related information and promotions. A website is not difficult to set up, but it will only be successful if the site is easy to use, easy to find, and updated frequently. The site should be reviewed and updated regularly with the most current information.

The Bicycle and Pedestrian Advisory Committee (see Chapter 4: Implementation) can assist in keeping the site up to date. Other recommended programs in this chapter could be housed on the website, such as a hike and bike map, Watch for Me NC materials and links, and a calendar of upcoming events.

Sample bicycle and pedestrian information websites:

- » Portland, OR: <http://www.portlandoregon.gov/transportation/60164>
- » Austin, TX: <http://austintexas.gov/bicycle>
- » Duck, NC: <http://www.Cityofduck.com/ducktrail/>

Purpose: To provide a single, accessible source of all bicycle- and pedestrian-relevant information for Marion residents and visitors.

Partners: Bicycle and Pedestrian Advisory Committee, Marion Public Works Department, Marion Planning & Zoning Department

The City of Duck has a great example website for City trail information. The Duck Trail page presents safety information, route information, and other tips for residents and tourists to enjoy walking and bicycling on the trails in Duck.

www.Cityofduck.com/ducktrail/



Bike Rodeo

A Bike Rodeo is an event where children can learn and practice bicycling skills in a controlled, supervised environment. Depending on the age of the children involved, a bike rodeo event can include educational components, such as teaching hand signals, proper helmet fitting, and even basic maintenance skills such as changing and inflating a tire. The highlight of any bike rodeo event is a skills course, where children ride through a designed obstacle course to practice turns, braking, and coasting. Some bike rodeo leaders hand out awards to positively reinforce good bicycling habits. This could be an excellent edition to the events of Kids Appreciation Day.

Bike Rodeo resources:

- » National Center for Safe Routes to School: <http://www.saferoutesinfo.org/program-tools/organizers-guide-bicycle-rodeos>
- » Safe Kids Worldwide: <http://www.safekids.org/sites/default/files/documents/Bike-Rodeo-Station-Guide.pdf>

Purpose: To celebrate bicycling, teach children and their parents traffic laws and safe riding skills, and improve bicycling confidence and awareness

Partners: City of Marion Police Department, Bicycle and Pedestrian Advisory Committee, McDowell County Health & Human Services Department



Photos from the Holly Springs Bike Rodeo, Holly Springs, NC. Volunteers conducted helmet fittings, bicycle education, and a parking lot obstacle course to provide a safe place for children to practice safe riding skills.

Hike & Bike Map

One of the most effective ways of encouraging people to ride a bicycle is through the use of maps and guides to show where you can bike (and hike), and to guide people to enjoyable routes and destinations. The City should create a Marion Hike and Bike Map to reflect the most current public bicycle and pedestrian infrastructure in City, with a list of bicycle rental locations, suggestions for self-guided bike rides and walks around City, and recommended routes.

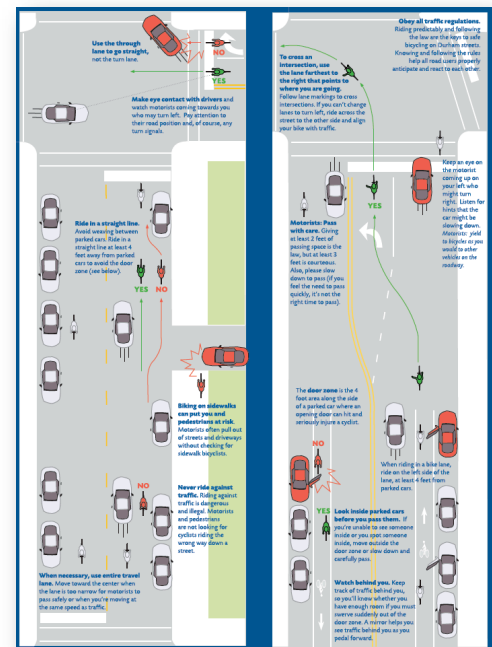
A portion of the map could be devoted to bicycle and pedestrian safety education, such as informational graphics that demonstrate bicycle hand signals and how to share the road and the trail safely. The map should be made available online and printed as needed to be actively distributed to residents and visitors. It should also be updated on a regular basis as new facilities are implemented.

Durham Hike & Bike Map:

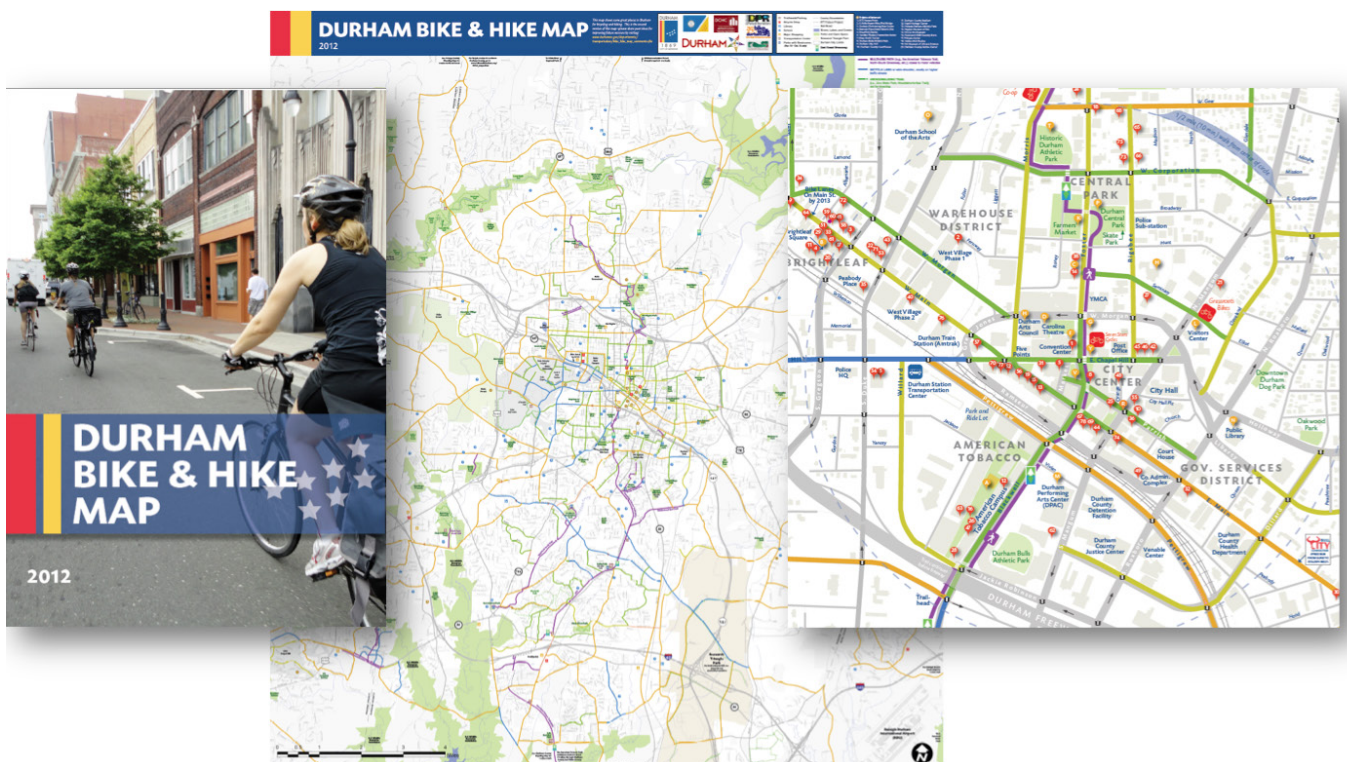
- » <http://durhamnc.gov/ich/op/dot/Pages/Durham-Bike--Hike-Map.aspx>

Purpose: To encourage bicycling and walking by providing route and facility information and highlighting bicycling and walking destinations.

Partners: City of Marion, Marion Chamber of Commerce, Marion GIS staff



More than 19,000 Durham Hike & Bike Maps have been distributed since it was first published in 2010. The map also features safety information and tips for safe riding (at left). Produced by Alta Planning & Design.



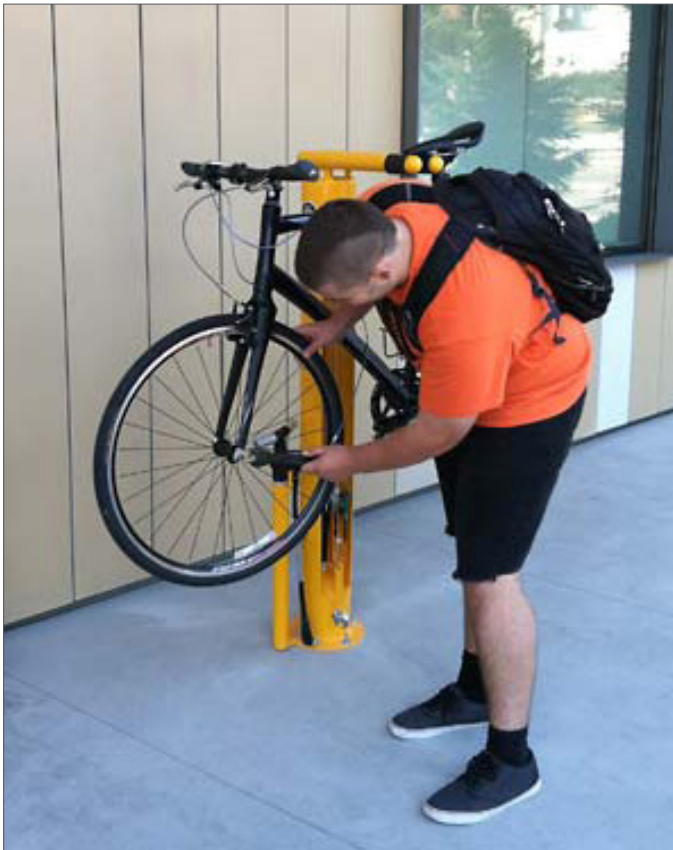
Public Bicycle Maintenance Stand

Public maintenance stands have become a popular amenity in bicycle friendly communities because they provide bicyclists with access to tools on-the-go and encourage people to teach and learn bicycle maintenance in an informal setting. They can also help to reduce the number of abandoned or trashed bikes in a community; bikes are often abandoned by their owners when they have a minor mechanical issue that they do not have the tools or knowledge to fix. Public maintenance stands encourage people to learn bicycling skills from one another and send a message to residents and visitors that bicycling is supported in the community. These fixtures can be placed in a park or in another public place and require little upkeep or oversight, since the tools and stand are designed to be self-contained and theft-resistant.

Public bicycle maintenance and tool stand examples.

Purpose: To provide an easy to use bicycle stand and tool kit that encourages people, particularly youth, to learn bicycle maintenance and fix minor bicycle issues on-the-go, and to make bicycling a visible part of the community.

Partners: Local businesses, City of Marion



Bike Share/Lending Library Program

Bike sharing typically refers to a system in which individuals can enjoy the benefits of access to a bicycle on an as-needed basis without the burden of private bike ownership, such as purchase and maintenance costs, storage, and parking. A “lending library” is a bike share model under which a staff member helps the user borrow a fleet of bikes, typically stored in a single location. Users sign up for a membership online or in person, and are then eligible to borrow bikes from the library. Bicycles are typically checked out from and returned to a single location.

There are several examples of successful bike lending libraries across North Carolina and across the country. Chapel Hill, NC is home to ReCYCLERY, who manage several bike lending programs, such as Earn-a-Bike and Balance Bike Lending Library. North Carolina State University has a student-initiated program called Quad Bikes. Fort Collins, CO launched a bike lending program in 2008 and operates with funds from private fundraising efforts.

To implement a bike lending program in Marion, the City will need to collaborate with potential partners such as Corpening YMCA, Marion Chamber of Commerce, McDowell County Public Schools, and non-profit organizations.

Purpose: To encourage bicycling by providing access to bicycles to residents or visitors who don't have own one.

Partners: City of Marion, the Marion Chamber of Commerce, Corpening YMCA, private businesses and local non-profits.



ReCYCLERY, in Chapel Hill, NC operates a private Lending Library and Earn-a-Bike program.



Students at North Carolina State University organized a student initiated bike library in 2013.



Fort Collins, CO has a public bike library.

CHAPTER FOUR: IMPLEMENTATION

Implementation Overview | Action Steps Table |
Key Action Step Descriptions | Key Partners in Implementation |
Performance Measures | Facility Development Methods

IMPLEMENTATION OVERVIEW

This chapter defines a structure for managing the implementation of the Marion Bicycle Plan. Implementing the recommendations within this plan will require leadership and dedication to bicycle facility development on the part of a variety of agencies. Equally critical, and perhaps more challenging, will be meeting the need for a recurring source of revenue. Even small amounts of local funding could be very useful and beneficial when matched with outside sources. Most importantly, the City need not accomplish the recommendations of this plan by acting alone; success will be realized through collaboration with regional and state agencies, the private sector, and non-profit organizations. Funding resources that may be available to Marion are presented in Appendix B of this plan.

Given the economic challenges faced by local governments (as well as their state, federal, and private sector partners), it is difficult to know what financial resources will be available at different time frames during the implementation of this plan. However, there are still important actions to take in advance of infrastructure investments, including key organizational steps, the initiation of education and safety programs, and the development of strategic, lower-cost bicycle facilities, trails, and crossing facilities. Following through on these priorities will allow the key stakeholders to prepare for the development of larger bicycle projects over time, while taking advantage of strategic opportunities as they arise.

The organizational framework below and Table 4.1 summarize the key players and steps involved in implementation.

Organizational Framework for Implementation

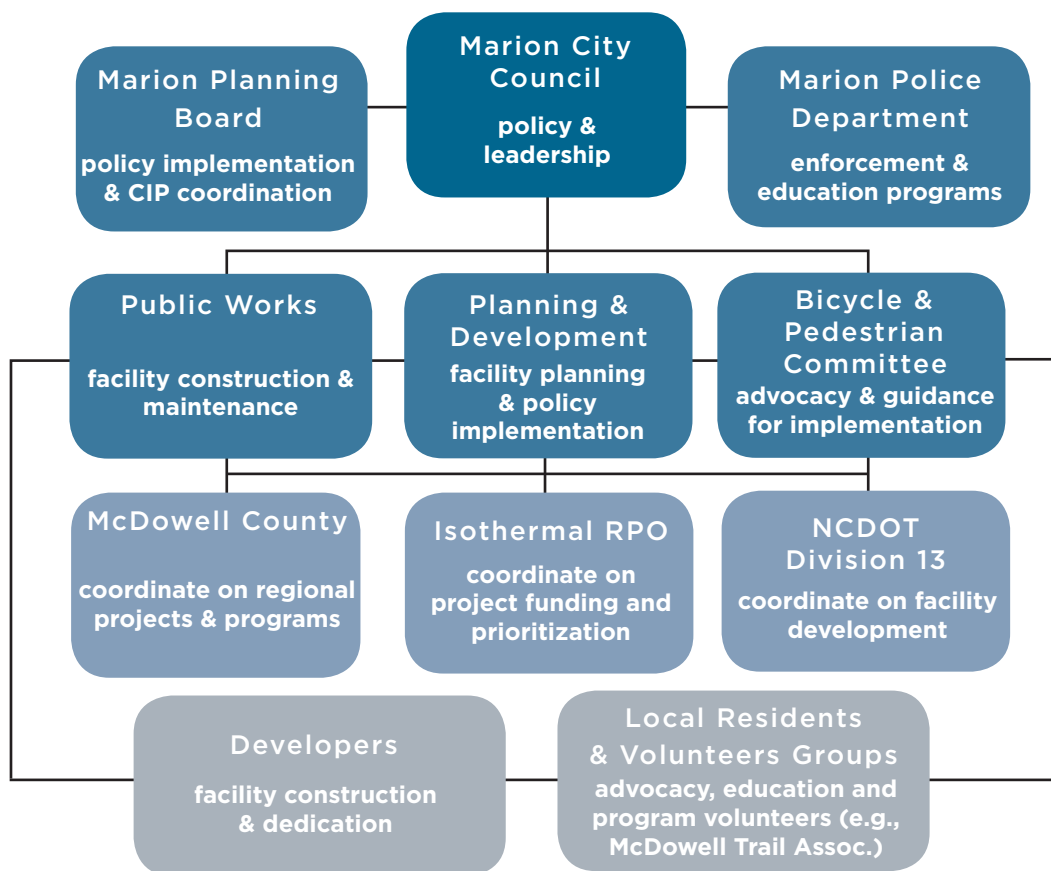


Table 4-1 Implementation Action Steps

TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Present Plan to City Council	Project Consultants	City Manager, Bicycle Plan Steering Committee	Presentation to City Council in Fall 2015.	Short-term (2015)
Approve this plan	NCDOT Bike/Ped Division	Project Consultants	Official letter of approval in Fall 2015.	Short-term (2015)
Adopt this plan	City Council	City Manager, Project Consultants	Through adoption, the Plan becomes an official planning document of the City. Adoption shows that Marion has undergone a successful, supported planning process. After adoption, this plan should be incorporated into the 2015 City of Marion CTP.	Short-term (2015)
Designate Staff	City Council	City Manager	Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed. This role is referred to below as "Designated City Staff"	Short-term (2015)
Form a Bicycle and Pedestrian Technical Advisory Committee (BPAC)	City Council	City Manager, Bicycle Plan Steering Committee	Form and confirm the goals of the BPAC, which should focus on implementation of this plan.	Short-term (2015)
Ensure that Priority Projects are Incorporated in NCDOT's Prioritization Process	Designated City Staff, Planning & Zoning	Isothermal RPO, NCDOT Division 13	Communicate with the RPO and NCDOT Division 13 about the importance of this plan's top projects.	Short-term (2015)
Begin Annual Meeting With Key Project Partners	Designated City Staff	Public Works, NCDOT, BPAC, and local & regional stakeholders	Key project partners (see org. chart on page 4-2) should meet on an annual basis to evaluate the implementation of this Plan. Meetings could also include on-site tours of priority project corridors.	Short-term/Ongoing (Beginning 2016)
Present this plan to other local and regional groups, to ensure planning efforts are integrated and supported regionally	Designated City Staff	BPAC, regional partners, NCDOT Planning Branch	Possible groups to receive a presentation: The Isothermal RPO, regional transportation planners, McDowell County planners and health department leaders, McDowell Trail Association Board, and the Kate B. Reynolds Charitable Trust Board.	Short-term/Ongoing (Beginning 2016)
Policy & Law Orientation	Marion Police	NCDOT Bike/Ped Division, BPAC	Police staff should be familiar with state bicycle and pedestrian policies and laws, including best practices for reporting on accidents involving people walking or bicycling: http://www.ncdot.gov/bikeped/lawspolicies/policies/	Short-term (2016)

Table 4-1 Implementation Action Steps (Continued)

TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Consider reducing speed limits when new bicycle facilities are added in some locations	City Council	NCDOT, BPAC	For example, consider lowering the speed limit when improvements are made on Rutherford Rd. See Priority Project 7 on page 3-18 for more information.	Short-term/Ongoing (2016 onward)
Develop new policies & approaches for implementation	Designated City Staff	City Council	Establish land right-of-way acquisition mechanisms, coordinate development plans, & implement driveway access management. See pages 4-6 and 4-7 for details.	Short-term/Ongoing (2016 onward)
Design Orientation	Public Works and NCDOT Division 13	NCDOT Bike/Ped Division	Become familiar with the guidelines in Appendix A of this Plan, as well as state and national standards for bicycle and pedestrian facility design.	Short-term/Ongoing (2016 onward)
Seek Multiple Funding Sources and Facility Development Options	Designated City Staff	City Council, BPAC, Planning & Zoning, Division 13, Isothermal RPO	Chapter 3 contains project cost estimates and Appendix B contains potential funding opportunities.	Short-term/Ongoing (2016 onward)
Launch New Programs	BPAC	Planning & Zoning, Marion Police Department, McDowell County Health Department	These groups should coordinate to launch new programs, such as those described in Chapter 3, including a media campaign, hike & bike map, one-stop website, wayfinding program, and a bicycle maintenance stand.	Short-term/Ongoing (2016 onward)
Maintain Bicycle Facilities	Public Works, NCDOT Division 13	BPAC, General Public (for reporting maintenance needs), Planning & Zoning	Public Works and NCDOT should maintain existing and future bicycle facilities and pavement markings	Short-term/Ongoing (2016 onward)
Notify Planning & Zoning of upcoming roadway reconstruction, resurfacing, and restriping projects	Public Works Director, NCDOT Division 13	Isothermal RPO, NCDOT Bike/Ped Division	Provide sufficient time for comments (in advance of the design phase); Incorporate bicycle/pedestrian recommendations from this Plan into future updates to the CTP and into future project design plans.	Short-term/Ongoing (2016 onward)
Develop a Long-Term Funding Strategy	Designated Staff	City Council, City Manager, Isothermal RPO, NCDOT Division 13	To allow continued development of the overall system, capital funds for bicycle and pedestrian facility construction should be set aside every year. Powell Bill funds should be programmed for facility construction. Funding for an ongoing maintenance program should also be included in the City's operating budget.	Short-term/Ongoing (2016 onward)
Install bike racks throughout City	Public Works, BPAC	Planning & Zoning, local businesses	Install bike racks at parks, public buildings, schools, shopping centers, downtown destinations, and other important destinations. See Map 3.4 for proposed locations	Mid-term (2016-2018)
Install bike racks on McDowell Transit Vans	McDowell County Planning Dept	Planning & Zoning,	Install and promote bike racks that can hold up to three bikes on all McDowell Transit vans in order to further the reach of the transit system.	Mid-term (2016-2018)

Table 4-1 Implementation Action Steps (Continued)

TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Provide Enforcement and Education Training for Police Officers Through Free Online Resources	Police Department	Planning & Zoning, NCDOT Bike/Ped Division	Resources are available from the National Highway Traffic Safety Administration, and from webinars by the Association of Pedestrian and Bicycle Professionals. Continue to implement the WatchForMeNC campaign and take advantage of valuable materials and resources provided by NCDOT.	Mid-term (2016-2018)
Complete Three Priority Projects	Planning, Public Works, NCDOT Division 13	Isothermal RPO, NCDOT Bike/Ped Division	Chapter 3 provides information on priority projects. Aim to complete at least three of the priority projects by the end of 2017.	Mid-term (2016-2018)
Distribute Bicycle and Pedestrian Safety Information	BPAC, Designated City Staff	NCDOT Bike/Ped Division, Police Department	NCDOT has print material with safety tips for motorists, bicyclists and pedestrians through the WatchForMe program, which are available for download at www.watchforme.org/campaign-materials . Other methods of distribution could include web sites, social media, and 'on-the-ground' in trail kiosks.	Mid-term (2016-2018)
Communication & Outreach	BPAC, Designated City Staff	Local newspapers, City web site & social media managers	The BPAC should establish a communication campaign to celebrate successes as facilities are developed and otherwise raise awareness of the overall bicycle network and its benefits. A key first task of this group is to establish a page on the City website dedicated to bike/ped education and project updates. The page should provide information to residents and visitors on bicycling in the region. To begin, the website can include the maps included in this plan.	Mid-term (2016-2018)
Seek designation as a Bicycle-Friendly Community	Designated City Staff	BPAC	The development and implementation of this plan is an essential first step toward becoming a designated Bicycle-Friendly Community. With ongoing efforts and the short-term work program recommended here, the City should be in a position to apply for and receive recognition within a few years.	Mid-term (2018-2020)
Complete Additional Priority Projects	Planning & Zoning, Public Works + NCDOT Division 13	Isothermal RPO, NCDOT Bike/Ped Division	Chapter 3 provides information on the Priority Projects. Aim to complete at least three of the priority projects by the end of 2020.	Mid- to Long-term (2018-2020)
Plan Update	City Council & BPAC	Planning	This plan should be updated in 2020. If many projects and programs have been completed by then, a new set of priorities should be established. If many projects and programs have not been completed, a new implementation strategy should be established.	Long-Term (2020)
Coordinate with ARTS Coordinator	Designated City Staff	NCDOT	Continue coordinating with the Region 2 Active Routes to School Coordinator to implement programs in Chapter 3.	On-going

KEY ACTION STEP DESCRIPTIONS

POLICY ACTION STEPS

Several policy steps are crucial to the success of future facility development. These steps will legitimize the recommendations found in this plan and enable the right-of-way acquisition necessary to carry out those recommendations.

ADOPT THIS PLAN

Before any other action takes place, the City of Marion should adopt this plan. This should be considered the first step in implementation. Through adoption of this plan and its accompanying maps as the City's official bicycle plan, Marion will be better able to shape transportation and development decisions so that they fit with the goals of this plan. Most importantly, having an adopted plan is extremely helpful in securing funding from state, federal, and private agencies. Adopting this plan does not commit the Marion to dedicate or allocate funds, but rather indicates intent to implement this plan over time, starting with these action steps.

The Planning Board should review and recommend the plan to the City Council, which in turn must consider and officially incorporate the recommended infrastructure improvements of this plan into its land-use plans. The following entities should adopt this plan:

- » The City of Marion
- » Isothermal RPO

This plan and its recommended facilities should be approved by the NCDOT, and they should be included in the future planning of the NCDOT Planning Branch, the Division of Bicycle and Pedestrian Transportation (DBPT), and NCDOT Division 13. This plan's recommendations should also be integrated into an update to the Comprehensive Transportation Plan (CTP) for McDowell County. NCDOT should refer to this

document when assessing the impact for future projects and plans. Likewise, NCDENR's Division of Parks and Recreation should refer to this plan in any projects for future state parks or trails near Marion.

ESTABLISH LAND RIGHT-OF-WAY ACQUISITION MECHANISMS

It is recommended that local zoning and subdivision ordinances be amended to ensure that, as developments are planned and reviewed, the bicycle facilities and greenway corridors identified in this plan are protected. This would entail amending development regulations to have developers set aside land for trail infrastructure whenever a development proposal overlaps with the proposed routes, as adopted. Marion staff should ensure that an effective review of all bicycle elements in proposed developments takes place.

In addition, local policies should also be revised to appropriately address the ROW needs. For example, revising policy language to allow for public access for trail users, as a matter of right, on all new sewer and utility easements, or to mandate the installation of "bicycle-friendly" drainage grates on all roadways during future roadway projects would have a significant impact on the bicycling environment in Marion.

COORDINATE DEVELOPMENT PLANS

The City of Marion should ensure that adopted bicycle and multi-use path recommendations from this plan are included in future residential and commercial developments that connect with such proposed facilities.

IMPLEMENT DRIVEWAY ACCESS MANAGEMENT

Marion should consider adding access management language to the City ordinances for both future development and retrofits to existing development, especially high-volume corridors. The NCDOT's policy on 'Street and Driveway Access to North Carolina Highways' provides exam-

ples on how to reduce conflict points between motor vehicles and pedestrians and bicyclists. For more information: www.ncdot.org/doh/pre-construct/altern/value/manuals/pos.pdf

PROGRAM ACTION STEPS

While policies provide support for facility development, the program recommendations featured at the end of Chapter 3 will build community support for the creation of new facilities and help establish a stronger bicycling culture. The action steps that follow will support these programing efforts.

DESIGNATE STAFF

Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed. It is recommended that a combination of existing planning staff and public works staff oversee the day-to-day implementation of this plan. In many municipalities, a full-time bicycle and pedestrian coordinator covers this task, but in smaller Cities, such as Marion, it makes more sense to fold these responsibilities into current staff responsibilities.

FORM A BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE

The City of Marion should form a bicycle and pedestrian advisory committee (BPAC) out of the plan's steering committee to assist in the implementation of this plan. The BPAC should have representation from active pedestrians and commuting and recreational cyclists and should champion the recommendations of this plan. The formation of this group would be a significant step in becoming designated as a Bicycle Friendly Community (see section that follows). The committee would provide a communications link between the citizens of the community and local government. They should also continue to meet periodically, and be tasked with assisting Marion staff in community

outreach, marketing, and educational activities recommended by this plan.

BECOME DESIGNATED AS A BICYCLE FRIENDLY COMMUNITY

A goal for Marion should be to seek a "Bicycle Friendly Community" (BFC) designation from the League of American Bicyclists. The BFC campaign is an award program that recognizes municipalities that actively support bicycling activities and safety. A Bicycle Friendly Community provides safe accommodation for bicycling and encourages its residents to bicycle for transportation and recreation. Carrboro and Davidson are examples of small North Carolina cities that have become designated as Bicycle Friendly Communities.

Becoming designated as a Bicycle-Friendly Community signals to current residents, potential residents, and visitors that the City is a safe and welcoming place for individuals and families to live and recreate. The development and implementation of this plan is an essential first step toward becoming a Bicycle Friendly Community. With ongoing efforts and the short-term work program recommended here, the City should be in a position to apply for and receive BFC status within a few years.

COMMUNICATION AND OUTREACH

The BPAC should lead the effort to establish a communication campaign to celebrate successes as facilities are developed and otherwise raise awareness of the overall pedestrian and bicycle network and its benefits. A key first task of this group is to design and launch a one-stop website (or a web page on the City's current website).

Many current and potential bicyclists do not know where to turn to find out about traffic laws, events, maps, tips, and groups. Developing a "Bike Central" web page provides information to a wide audience and encour-

ages people to walk and bicycle. This would be especially useful in attracting visitors who are seeking out a vacation destination where bicycling is safe and enjoyable. Such a site is not usually difficult to set up, but it will only be successful if the site is both easy to use and updated frequently. All website content should be reviewed regularly for accuracy. Walking groups, the bicycling community, and volunteer organizations interested in safety and health can assist in keeping the site up to date.

ESTABLISH A MONITORING PROGRAM

From the beginning, and continuously through the life of a bicycle facility project, the BPAC should brainstorm specific benchmarks to track through a monitoring program and honor the completion of projects with public events and media coverage. Benchmarks should be revisited and revised periodically as the pedestrian and bicycle facility network evolves.

BEGIN ANNUAL MEETING WITH KEY PROJECT PARTNERS

Coordination between key project partners will establish a system of checks and balances, provide a level of accountability, and ensure that recommendations are implemented. This meeting should be organized by the designated City staff, and should include representatives from the Organizational Chart shown on page 4-2. The purpose of the meeting should be to ensure that this plan's recommendations are integrated with other transportation planning efforts in the region, as well as long-range and current land use planning, economic development planning, and environmental planning. Attendees should work together to identify and secure funding necessary to immediately begin the first year's work, and start working on a funding strategy that will allow the City to incrementally complete each of the suggested physical improvements, policy changes and programs over a 5-10 year period. A brief progress benchmark memo should be a product of these meetings, and

participants should reconfirm the plan's goals each year. The meetings could also occasionally feature special training sessions on pedestrian, on-road bicycle, and trail issues.

SEEK MULTIPLE FUNDING SOURCES AND FACILITY DEVELOPMENT OPTIONS

Multiple approaches should be taken to support bicycle and pedestrian facility development and programming. It is important to secure the funding necessary to undertake priority projects but also to develop a long-term funding strategy to allow continued development of the overall system. Dedicated local funding sources will be important for the implementation of this plan. Capital and local funds for pedestrian facilities and trail construction should be set aside every year, even if only for a small amount. Small amounts of local funding can be matched to outside funding sources or could be used to enhance NCDOT projects with bicycle features that may otherwise not be budgeted for by the state. A variety of local, state, and federal options and sources exist and should be pursued. These funding options are described in Appendix B.

A priority action is to immediately evaluate the recommendations against transportation projects that are currently programmed in the Transportation Improvement Program (TIP) to see where projects overlap, compliment, or conflict with each other. The City should also evaluate which of the proposed projects could be added to future TIP updates, and should coordinate closely with NCDOT Division 13 and the Isothermal RPO on priority projects.

DEVELOP BICYCLE AND PEDESTRIAN FACILITY DESIGNS AND SPECIFICATIONS FOR PROPOSED PROJECTS

City of Marion staff could prepare these in-house to save resources, using the design guidelines of this plan and the project cut-sheets as starting points. The public should have an opportunity to comment on the design of new facilities.

LAUNCH NEW PROGRAMS

The program recommendations found in Chapter 3 provide a set of programmatic resources that will support the goals of the Marion Bicycle Plan. The City should reference the recommendations to develop new programs that promote walking and bicycling.

Through cooperation between the City, the BPAC, and groups such as walking and bicycling clubs, strong education, encouragement, and enforcement campaigns could also occur as new facilities are built. When an improvement has been made, the roadway environment has changed and proper interaction between motorists, bicyclists, and pedestrians is critical for the safety of all users. A campaign through local television, on-site enforcement, education events, and other methods will bring attention to the new facility, and educate, encourage, and enforce proper use and behavior. Chapter 3 provides program ideas to choose from, some of which are included in the action steps table starting on page 4-3.

PROVIDE ENFORCEMENT AND EDUCATION TRAINING FOR POLICE OFFICERS

Law enforcement officers have many important responsibilities, yet pedestrians and bicyclists remain the most vulnerable forms of traffic. The Marion Police Department has been aware of this planning process, and should be involved in implementation. In many cases, citizens (and even sometimes officers) are not fully aware of state and local laws related to bicyclists and pedestrians. Training on this topic can lead to additional education and enforcement programs that promote safety. Training for Marion's officers could be done through free online resources available from the National Highway Traffic Safety Administration (NHTSA) (see links at www.bicyclinginfo.org/enforcement/training.cfm), or through fee-based webinars available through the Association of Pedestrian and Bicycle Professionals (APBP).

INFRASTRUCTURE ACTION STEPS

While establishing the policies and programs described, Marion should move forward with the design and construction of priority projects. They should also work to identify funding for long-term, higher-cost projects.

IDENTIFY FUNDING

Achieving the vision defined within this plan will require, among other things, a stable and recurring source of funding. Communities across the country that have successfully engaged in pedestrian and bicycle programs have relied on multiple funding sources to achieve their goals. No single source of funding will meet the recommendations identified in this Plan. Instead, stakeholders will need to work cooperatively with municipal, state, and federal partners to generate funds sufficient to implement the program.

A stable and recurring source of revenue is needed that can then be used to leverage grant dollars from state, federal, and private sources. The ability of local agencies to generate a source of funding for pedestrian and bicycle facilities depends on a variety of factors, such as taxing capacity, budgetary resources, voter preferences, and political will. It is very important that these local agencies explore the ability to establish a stable and recurring source of revenue for facilities.

Donations from individuals or companies are another potential source of funding. The BPAC should establish an "Adopt a Trail" program as a mechanism to collect these donations for the development of the trail and sidepath recommendations discussed in Chapter 3. In addition to a formalized program, a website should be set up as an easy way for individuals to donate smaller amounts.

Federal and state grants should be pursued along with local funds to pay for necessary

right-of-way acquisition and project design, construction, and maintenance expenses. “Shovel-ready” designed projects should be prepared in the event that future federal stimulus funds become available. Additional recommended funding sources may be found in Appendix B.

COMPLETE SHORT-TERM PRIORITY PROJECTS

By quickly moving forward on priority projects, Marion will demonstrate its commitment to carrying out this plan and will better sustain momentum generated during the planning process. Refer to Chapter 3: Network Recommendations for priority projects.

KEY PARTNERS IN IMPLEMENTATION

ROLE OF THE MARION CITY COUNCIL

The City Council will be responsible for adopting this plan. Through adoption, the City’s leadership is further recognizing the value of bicycle and pedestrian transportation and is putting forth a well-thought out set of recommendations for improving public safety and overall quality of life (see the ‘Why This Plan is Important’ section in Chapter 1). By adopting this plan, the City Council is also signifying that they are prepared to support the efforts of other key partners in the plan’s implementation, including the work of City departments and NCDOT.

Adoption of this plan is in line with public support. Marion’s online comment form for the planning process yielded less than 50 responses, but showed strong support for improving bicycling conditions.

ROLE OF THE MARION PLANNING BOARD

The Marion Planning Board serves as an advisory board to the City Council on matters of planning and zoning. The Planning Board should be prepared to:

- » Become familiar with the recommendations of this plan, and support its implementation.
- » Learn about pedestrian- and bicycle-related policies in North Carolina. (see: www.ncdot.gov/bikeped/lawspolicies/policies/)

ROLE OF THE MARION PUBLIC WORKS DEPARTMENT

The Public Works Department is responsible for the construction and maintenance of pedestrian and bicycle facilities on locally owned and maintained roadways, as well as on NCDOT roadways, where encroachment agreements are secured. This department should be prepared to:

- » Communicate and coordinate with other City departments and the BPAC on priority bicycle and pedestrian projects.
- » Become familiar with the standards set forth in Appendix A of this plan, as well as state and national standards for bicycle and pedestrian facility design.
- » Secure encroachment agreements for work on NCDOT-owned and maintained roadways.
- » Design, construct, and maintain pedestrian and bicycle facilities.
- » Assist the Planning & Zoning Department in communicating with NCDOT and regional partners.
- » Work with NCDOT Division 13 to ensure that when NCDOT-owned and maintained roadways in Marion are resurfaced or reconstructed, this plan’s adopted recommendations for bicycle and pedestrian facilities are included on those streets. If a compromise to the original recommendation is needed, then contact NCDOT Division of Bicycle and Pedestrian Transportation for guidance on appropriate alternatives.

ROLE OF MARION PLANNING & DEVELOPMENT

Planning & Development staff will take primary responsibility for the contact with new development to implement the plan (with support

from the Public Works Department). The staff should be prepared to:

- » Communicate and coordinate with local developers on adopted recommendations for bicycle and pedestrian facilities, including paved multi-use trails.
- » Communicate and coordinate with NCDOT Division 13 on this plan's recommendations for NCDOT-owned and maintained roadways. Provide comment and reminders about this plan's recommendations no later than the design phase.
- » Communicate and coordinate with McDowell County, Isothermal RPO, and neighboring municipalities on regional facilities; partner for joint-funding opportunities.
- » Become experts on bicycle-related policies in North Carolina. (see: www.ncdot.gov/bikeped/lawspolicies/policies/)

ROLE OF THE BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE

The Committee should be prepared to:

- » Meet with staff from Planning & Development and the Public Utilities Department; evaluate progress of the plan's implementation and offer input regarding pedestrian, bicycle, and trail-related issues; assist Marion staff in applying for grants and organizing bicycle- and pedestrian-related events and educational activities.
- » Build upon current levels of local support for pedestrian and bicycle issues and advocate for local project funding.

ROLE OF THE LOCAL NCDOT DIVISION 13

Division 13 of the NCDOT is responsible for the construction and maintenance of pedestrian and bicycle facilities on NCDOT-owned and maintained roadways in Marion, OR is expected to allow for the City to do so with encroach-

ment agreements. Division 13 should be prepared to:

- » Recognize this plan as not only as an adopted plan of the City of Marion, but also as an approved plan of the NCDOT.
- » Become familiar with the bicycle and pedestrian facility recommendations for NCDOT roadways in this plan (Chapter 3); take initiative in incorporating this plan's recommendations into the Division's schedule of improvements whenever possible.
- » Become familiar with the standards set forth in Appendix A of this plan, as well as state and national standards for facility design; construct and maintain recommended facilities using the highest standards allowed by the State (including the use of innovative treatments on a trial basis).
- » Notify the City of Marion Public Works Department of all upcoming roadway reconstruction or resurfacing/restriping projects in City, no later than the design phase. Provide sufficient time for comments from the planning staff.
- » If needed, seek guidance and direction from the NCDOT Division of Bicycle and Pedestrian Transportation on issues related to this plan and its implementation.

ROLE OF THE ACTIVE ROUTES TO SCHOOL PROGRAM COORDINATOR (REGION 2)

The Active Routes to School Program (ARTS) coordinator should continue to work with the City of Marion to implement Safe Routes to School programs and projects. More information on the program can be found here:

[HTTP://WWW.NCDOT.GOV/DOWNLOAD/PROGRAMS/SRTS/SRTS.PDF](http://www.ncdot.gov/download/programs/srts/srts.pdf)

ROLE OF THE MARION POLICE DEPARTMENT

The Marion Police Department is responsible for providing the community the highest quality law enforcement service and protection to ensure the safety of the citizens and visitors. The Police Department should be prepared to:

- » Become experts on pedestrian-related laws in North Carolina. (see: www.ncdot.gov/bikeped/lawspolicies/laws/ and www.bikelaw.com/wp-content/uploads/2014/11/BIKELAW_RG_NC_Web.pdf)
- » Continue to enforce not only bicycle- and pedestrian-related laws, but also motorist laws that affect walking and bicycling, such as speeding, running red lights, aggressive driving, etc.
- » Participate in bicycle- and pedestrian-related education programs.
- » Review safety considerations with the Public Works Department as projects are implemented.

ROLE OF DEVELOPERS

Developers in Marion can play an important role in facility development whenever a project requires the enhancement of transportation facilities or the dedication and development of on-road bicycle facilities, sidewalks, trails or crossing facilities. Developers should be prepared to:

- » Become familiar with the benefits, both financial and otherwise, of providing amenities for walking and biking (including trails) in residential and commercial developments.
- » Become familiar with the standards set forth in Appendix A of this plan, as well as state and national standards for facility design.
- » Be prepared to account for bicycle and pedestrian circulation and connectivity in future developments.

ROLE OF LOCAL & REGIONAL STAKEHOLDERS

Stakeholders for bicycle and pedestrian facility development and related programs, such as McDowell County, Isothermal RPO, and local organizations play important roles in the implementation of this plan. Local and regional stakeholders should be prepared to do the following:

- » The RPO should become familiar with the recommendations of this plan as well as communicate & coordinate with the City for implementation, specifically in relation to funding opportunities, such as grant writing and developing local matches for facility construction.
- » The RPO should work with Marion on populating the Strategic Transportation Improvement (STI) list with pedestrian and bicycle infrastructure projects.
- » McDowell County should coordinate with the City on trail development.
- » Business owners and organizations should look for opportunities to partner on specific projects, such as streetscape improvements, or comprehensive signage and wayfinding projects.

ROLE OF LOCAL RESIDENTS, CLUBS AND ADVOCACY GROUPS

Local residents, clubs, and advocacy groups play a critical role in the success of this plan. They should be prepared to:

- » Continue offering input regarding pedestrian and bicycling issues in Marion.
- » Assist City staff and the BPAC by volunteering for bicycle- and pedestrian-related events and educational activities and/or participate in such activities.
- » Assist Marion staff and the BPAC by speaking at City Council meetings and advocating for local pedestrian and bicycle project and program funding.

ROLE OF VOLUNTEERS

Services from volunteers, student labor, and seniors, or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail/greenway or adopt-a-highway can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations, clubs or a neighborhood's community service to provide for many of the program ideas outlined in Chapter 3 of this plan. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and personal connections to the City's greenway, bicycle, and pedestrian networks.

PERFORMANCE MEASURES (EVALUATION AND MONITORING)

Marion should establish performance measures to benchmark progress towards fulfilling the recommendations of this plan. These performance measures should be stated in an official report within two years after the plan is adopted. Performance measures could address the following aspects of pedestrian and bicycle transportation and recreation in Marion:

- » *Safety.* Measures of pedestrian- and bicycle-related crashes and injuries.
- » *Facilities.* Measures of how many pedestrian and bicycle facilities have been funded and constructed since the plan's adoption.
- » *Maintenance.* Measures of existing sidewalk/crosswalk or bicycle facility deficiency or maintenance needs.
- » *Counts.* Measures of pedestrian and/or bicycle traffic at specific locations.
- » *Education, Encouragement and Enforcement.* Measures of the number of people who have participated in part of a pedestrian- or bicycle-related program since the plan's adoption.

FACILITY DEVELOPMENT METHODS

This section describes different construction methods for the proposed pedestrian and bicycle facilities outlined in Chapter 3. It is much more cost-effective to provide bicycle and pedestrian facilities during roadway construction and re-construction projects than to initiate the improvements later as "retrofit" projects.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STRATEGIC TRANSPORTATION INVESTMENTS (STI)

The NCDOT's State Transportation Improvement Program is based on the Strategic Transportation Investments Bill, signed into law in 2013. The Strategic Transportation Investments (STI) Initiative introduces the Strategic Mobility Formula, a new way to fund and prioritize transportation projects.

The new Strategic Transportation Investments Initiative was scheduled to be fully implemented by July 1, 2015. Projects that were slated for construction after this date will be ranked and programmed according to the new formula. The new Strategic mobility formula assigns projects for all modes into one of three categories: 1) Statewide Mobility, 2) Regional Impact, and 3) Division Needs.

All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are ranked based on 50% data (safety, access, demand, connectivity, and cost effectiveness) and 50% local input. ***See Appendix B, page B-8 to B-10 for more information.***

LOCAL ROADWAY CONSTRUCTION OR RECONSTRUCTION

Pedestrians and bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed. In the longer-term, all new roads with moderate to heavy

motor vehicle traffic should have sidewalks, bicycle facilities, and safe intersections. However, side paths can be an acceptable solution when a road has few driveways and high-speed, high-volume traffic.

More information is available on the following website:
<http://www.ada.gov/doj-fhwa-ta.htm>.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

The construction of sidewalks, bicycle facilities, trails, and safe crosswalks should be required during development. Construction of facilities that corresponds with site construction is more cost-effective than retrofitting. In commercial development, emphasis should also be focused on safe pedestrian and bicyclist access into, within, and through large parking lots. This ensures the future growth of the pedestrian and bicycle networks and the development of safe communities.

REMOVING PARKING

Some neighborhood collector roadways are wide enough to add pedestrian and bicycle facilities, but they are used by residents for on-street parking, especially in the evening. In locations like this, removing parking is likely to create considerable controversy and is not recommended unless there is no other solution or the parking is rarely used. In the rare case that removing parking is being considered, the parking should not be removed unless there is a great deal of public support for the facilities on that particular roadway and a full public involvement process with adjacent residents and businesses is undertaken prior to removing parking.

If it is not practical to add a bike lane, edgelines and shared lane markings may be considered. On roads where the outside lane and parking area combined are more than 17 feet wide, 10 foot wide travel lanes can be striped with an edgeline, leaving the rest of the space on either

side for parking. The stripe would help slow motor vehicles and provide extra comfort for bicyclists, especially during the daytime when fewer cars would be parked along the curb. On roads with outside lane and parking areas that are narrower than 17 feet wide, shared lane markings can be provided every 250 feet on the right side of the motor vehicle travel lane to increase the visibility of the bike route.

REPAVING

Repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to create narrower lanes and provide space for bike lanes and shoulders, where feasible. NCDOT has a three-year resurfacing schedule, which can be found at <https://connect.ncdot.gov/resources/Asset-Management/Pages/HMIPDIV.aspx>

In addition, if the spaces on the sides of non-curb and gutter streets have relatively level grades and few obstructions, the total pavement width can be widened to include paved shoulders.

INSTALLING SHARED LANE MARKINGS

Marion should adopt the use of shared lane markings, or “sharrows,” as one of its bicycle facility types. Shared lane markings have been newly incorporated into the Manual on Uniform Traffic Control Devices (MUTCD). They take the place of traditional bicycle lanes where travel lanes cannot be narrowed, where speeds do not exceed 35 mph, and/or where there is on-street parking. The intent of the shared lane marking is threefold:

- » They draw attention to the fact that the roadway is accommodating bicycle use and traffic;
- » They clearly define the direction of travel for both bicyclists and motorists; and

- » With proper placement, they remind bicyclists to bike further from parked cars to prevent “dooring” collisions.

While shared-lane markings are not typically recommended or needed on local, residential streets, they are sometimes used along such streets when part of a signed route or bicycle boulevard. It should be noted that sharrows are not a replacement for bicycle lanes in their effectiveness or use.

RETROFIT ROADWAYS WITH NEW BICYCLE AND PEDESTRIAN FACILITIES

There may be critical locations in the pedestrian and bicycle network that have safety issues or are essential links to destinations. In these locations, it may be justifiable to add new pedestrian and bicycle facilities before scheduling a roadway to be repaved or reconstructed. In some other locations, it may be relatively easy to add sidewalk or to add extra pavement for shoulders, but other segments may require removing trees, relocating landscaping or fences, or re-grading ditches. Retrofitting roadways with side paths creates similar challenges.

BRIDGE CONSTRUCTION OR REPLACEMENT

Provisions should always be made to include a walking and bicycling facility as a part of vehicular bridges. All new or replacement bridges should accommodate two-way travel for all users. Even though bridge construction and replacement does not occur regularly, it is important to consider these policies for long-term bicycle and pedestrian planning. Facility design standards such as widths of facilities and heights of handrails are presented in Appendix A: Design Guidelines, providing guidance for facilities that also accommodates bicycles in this context.

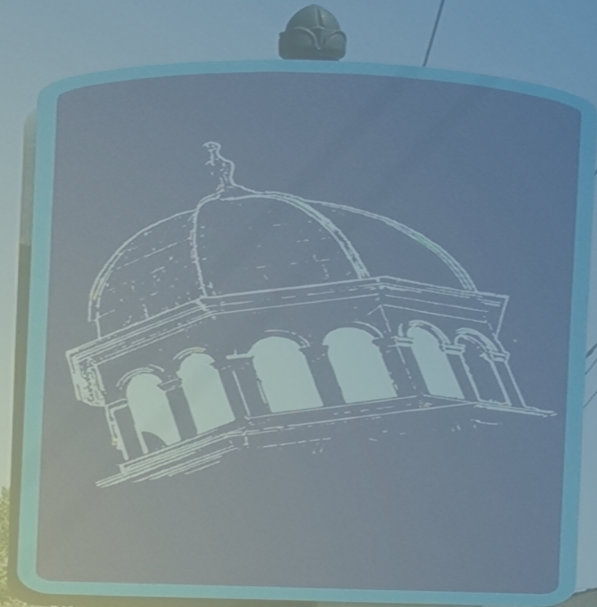
SIGNAGE AND WAYFINDING PROJECTS

A relatively low-cost, short-term action that Marion can pursue immediately is to develop and adopt a wayfinding signage style policy and procedure, to be applied throughout the entire community, to make it easier for people to find destinations. Bicycle route signs are one example of these wayfinding signs, and should be installed along routes independently of other signage projects or as a part of a more comprehensive wayfinding improvement project. Posting signage that includes bicycle and walk travel times to major destinations can help to increase awareness of the ease and efficiency of bicycle and pedestrian travel. See Appendix A: Design Guidelines for more detailed guidance on signage and wayfinding improvements.

For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: www.pps.org/reference/signage_guide

CITY EASEMENTS

Marion should explore opportunities to revise existing easements to accommodate public access greenway trail facilities. Similarly, as new easements are acquired in the future, the possibility of public access should be considered. Sewer easements are very commonly used for this purpose, offering cleared and graded corridors that easily accommodate trails. This approach avoids the difficulties associated with acquiring land, and it better utilizes the City’s resources.



Appendix A: Design Guidelines

Overview | Design Needs of Bicyclists | Shared Use Paths |
Bicycle Facilities | Retrofitting Existing Streets to Add Bikeways |
Intersections | Bicycle Support Facilities & Maintenance

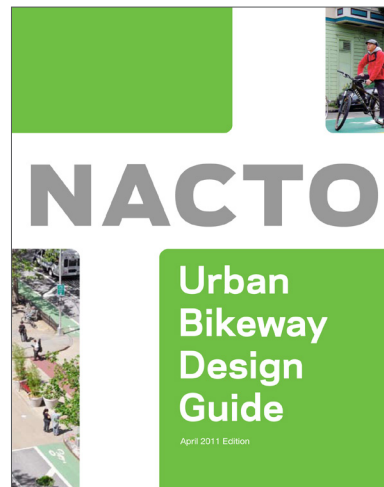
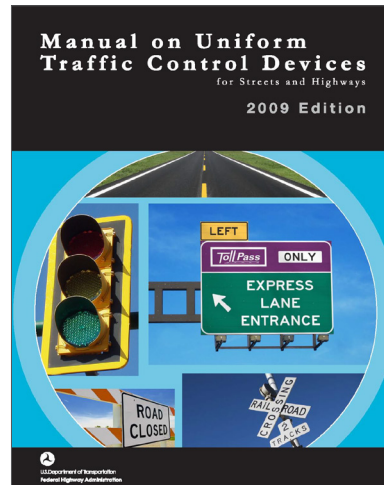
OVERVIEW

The sections that follow serve as an inventory of bicycle design treatments and provides guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a safe, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a landscape architect or engineer upon implementation of facility improvements. Some improvements may also require cooperation with the North Carolina Department of Transportation (NCDOT) for specific design solutions as well as adherence to NCDOT's Complete Streets Guidelines (<http://www.completestreetsnc.org/>).

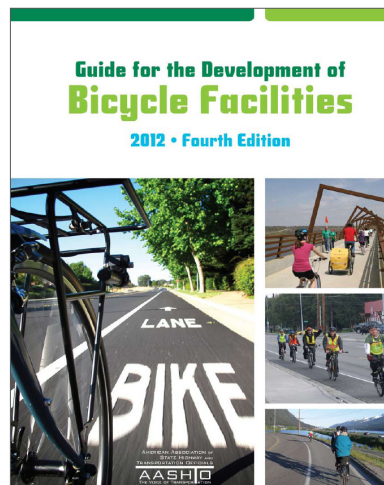
The following standards and guidelines are referred to in this guide:

- » The Federal Highway Administration's **Manual on Uniform Traffic Control Devices** (MUTCD) is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.
- » American Association of State Highway and Transportation Officials (AASHTO) **Guide for the Development of Bicycle Facilities**, updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities.
- » The National Association of City Transportation Officials' (NACTO) 2012 **Urban Bikeway Design Guide** is the newest publication of nationally recognized bicycle-specific design standards, and offers guidance on the current state of the practice designs. Most NACTO treatments are compatible within AASHTO/MUTCD guidance, though some NACTO endorsed designs may not be permitted on state roads at this time.

Should the national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions. A qualified engineer or landscape architect should be consulted for the most up to date and accurate cost estimates.



Nationally recognized bikeway standards such as NACTO, AASHTO, the MUTCD, along with guidance from the State of North Carolina have all informed the content of this appendix.



DESIGN NEEDS OF BICYCLISTS

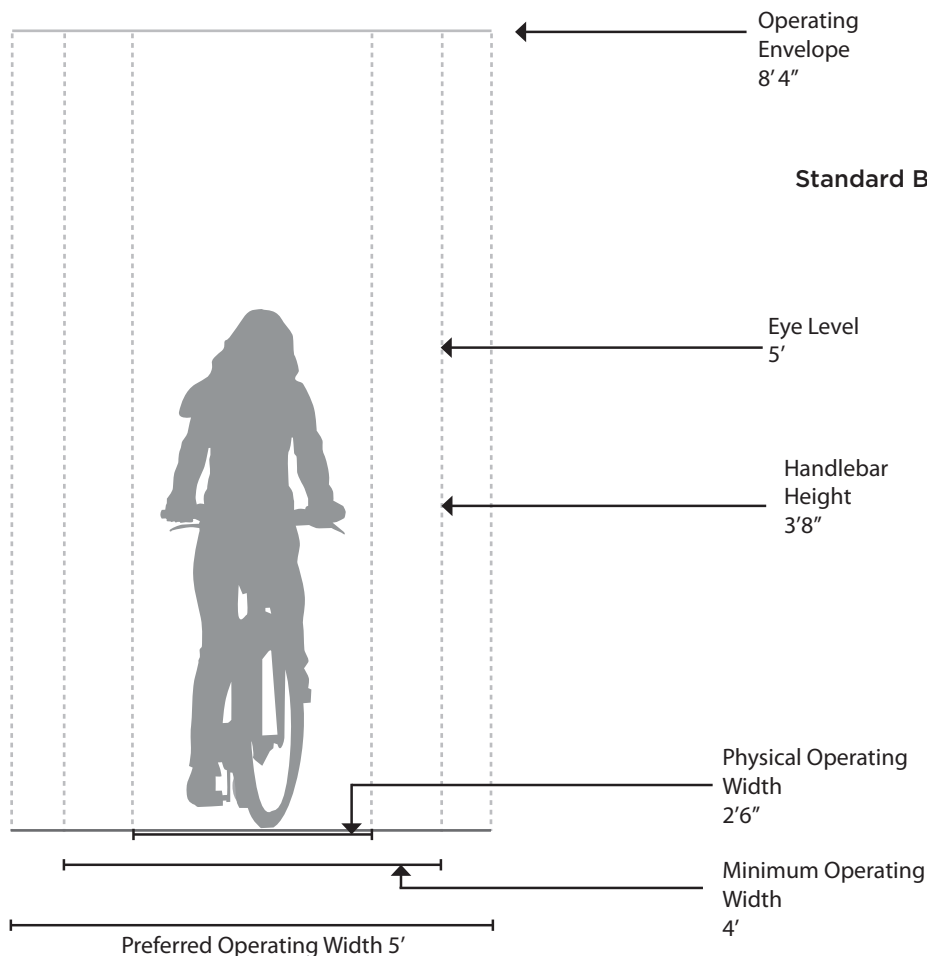
The purpose of this section is to provide the facility designer with an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction and maintenance practices than motor vehicle drivers. Bicyclists lack the protection from the elements and roadway hazards provided by an automobile's structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure below illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

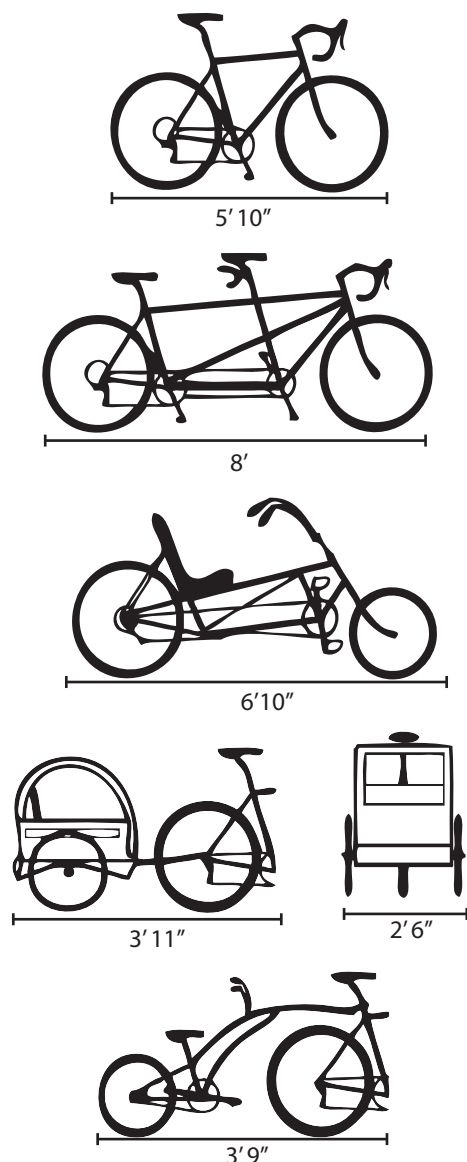
In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure and table below summarize the typical dimensions for bicycle types.



Source: AASHTO Guide for the Development of Bicycle Facilities, 4th Edition. 2012.

Design Speed Expectations

The expected speed that different types of bicyclists can maintain under various conditions also influence the design of facilities such as shared use paved trails. The table to the right provides typical bicyclist speeds for a variety of conditions.



Bicycle as Design Vehicle - Typical Dimensions

Source: AASHTO *Guide for the Development of Bicycle Facilities*, 3rd Edition *AASHTO does not provide typical dimensions for tricycles.

Bicycle as Design Vehicle - Typical Dimensions

Bicycle Type	Feature	Typical Dimensions
Upright Adult Bicyclist	Physical width	2 ft 6 in
	Operating width (Minimum)	4 ft
	Operating width (Preferred)	5 ft
	Physical length	5 ft 10 in
	Physical height of handlebars	3 ft 8 in
	Operating height	8 ft 4 in
	Eye height	5 ft
	Vertical clearance to obstructions (tunnel height, lighting, etc)	10 ft
	Approximate center of gravity	2 ft 9 in - 3 ft 4 in
Recumbent Bicyclist	Physical length	6 ft 10 in
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	9 ft 9 in
	Physical width	2 ft 6 in

Bicycle as Design Vehicle - Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Paved level surfacing	8-15 mph
	Downhill	20-30+ mph
	Uphill	5 -12 mph
Recumbent	Paved level surfacing	11-18 mph

*Tandem bicycles and bicyclists with trailers have typical speeds equal to or less than upright adult bicyclists.

SHARED USE PATHS (GREENWAY TRAILS)

A shared use path (also known as a greenway) allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Trail facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

Key features of shared use paved trails include:

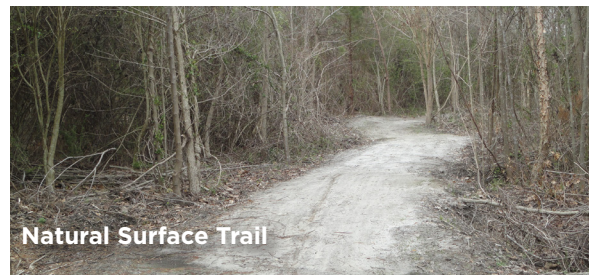
- » Frequent access points from the local road network.
- » Directional signs to direct users to and from the trail.
- » A limited number of at-grade crossings with streets or driveways.
- » Terminating the trail where it is easily accessible to and from the street system.
- » Separate treads for pedestrians and bicyclists when heavy use is expected.



General Design Practices



Trails Along Roadways



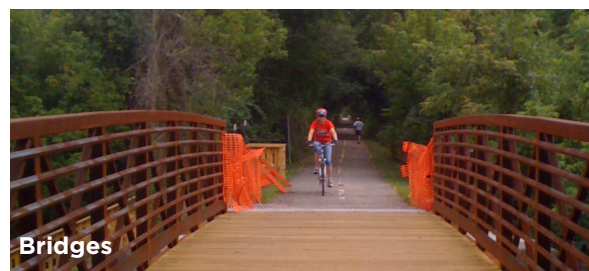
Natural Surface Trail



Boardwalks



Trail/Roadway Crossings



Bridges

SHARED USE PATHS

Description

Shared use paths can provide a desirable facility, particularly for recreation, and users of all skill levels preferring separation from traffic. Bicycle trails should generally provide directional travel opportunities not provided by existing roadways.

Guidance

Width

- » 8 feet is the minimum allowed for a two-way bicycle trail and is only recommended for low traffic situations.
- » 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- » 12 feet is recommended for heavy use situations with high concentrations of multiple users. A separate track (5' minimum) can be provided for pedestrian use.

Lateral Clearance

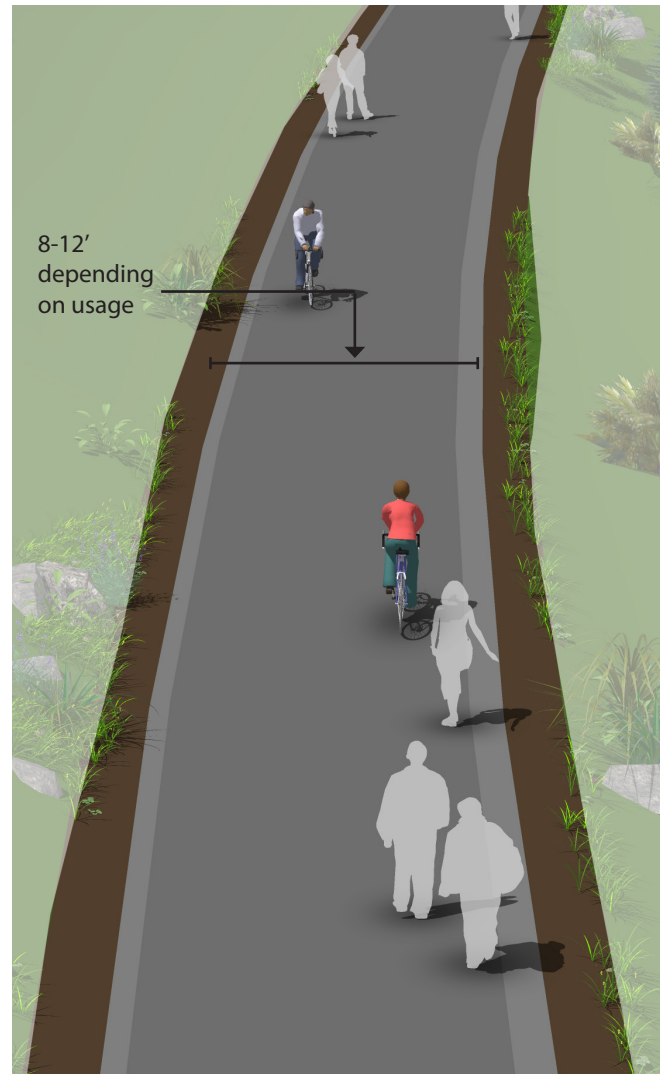
- » A 2 foot or greater shoulder on both sides of the trail should be provided. An additional foot of lateral clearance (total of 3') is required by the MUTCD for the installation of signage or other furnishings.
- » If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night.

Overhead Clearance

- » Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

Striping

- » When striping is required, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines.
- » Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.



Discussion

Terminate the trail where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Manual on Uniform Traffic Control Devices*. 2009.
 Flink, C. *Greenways: A Guide To Planning Design And Development*. 1993.

Materials and Maintenance

Asphalt is the most common surface for bicycle trails. The use of concrete for trails has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of trail users.

SHARED USE PATHS ALONG ROADWAYS (SIDEPATHS)

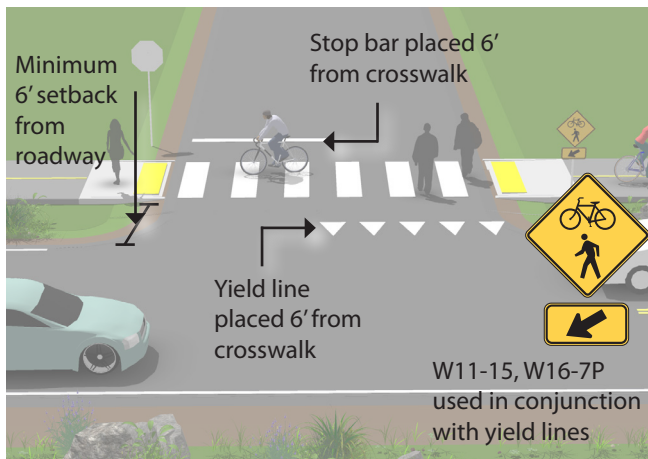
Description

Shared use paths along roadways, also called Sidepaths, are a type of trail that run adjacent to a street.

- » Because of operational concerns it is generally preferable to place trails within independent rights-of-way away from roadways. However, there are situations where existing roads provide the only corridors available.
- » Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the trail.
- » The AASHTO Guide for the Development of Bicycle Facilities cautions practitioners of the use of two-way sidepaths on urban or suburban streets with many driveways and street crossings.

In general, there are two approaches to crossings: adjacent crossings and setback crossings, illustrated below.

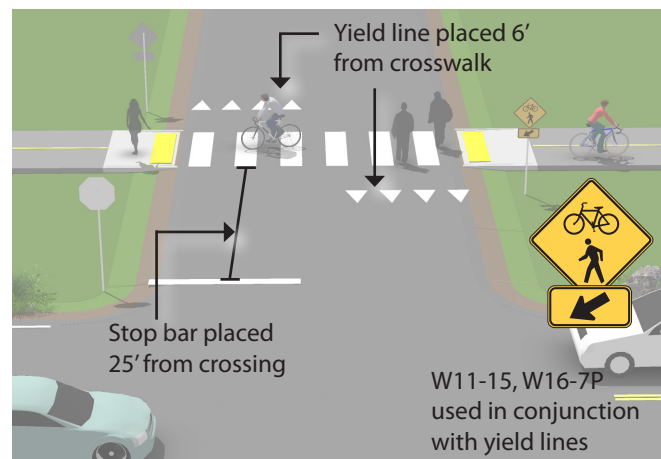
Adjacent Crossing - A separation of 6 feet emphasizes the conspicuity of riders at the approach to the crossing.



Guidance

- » Guidance for sidepaths should follow that for general design practices of shared use trails.
- » A high number of driveway crossings and intersections create potential conflicts with turning traffic. Consider alternatives to sidepaths on streets with a high frequency of intersections or heavily used driveways.
- » Where a sidepath terminates special consideration should be given to transitions so as not to encourage unsafe wrong-way riding by bicyclists.
- » Crossing design should emphasize visibility of users and clarity of expected yielding behavior. Crossings may be STOP or YIELD controlled depending on sight lines and bicycle motor vehicle volumes and speeds.

Setback Crossing - A set back of 25 feet separates the trail crossing from merging/turning movements that may be competing for a driver's attention.



Discussion

The provision of a shared use paved trail adjacent to a road is not a substitute for the provision of on-road accommodation such as paved shoulders or bike lanes, but may be considered in some locations in addition to on-road bicycle facilities. To reduce potential conflicts in some situations, it may be better to place one-way sidepaths on both sides of the street.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
NACTO. *Urban Bikeway Design Guide*. See entry on Raised Cycle Tracks. 2012.

Materials and Maintenance

Asphalt is the most common surface for bicycle trails. The use of concrete for trails has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of trail users.

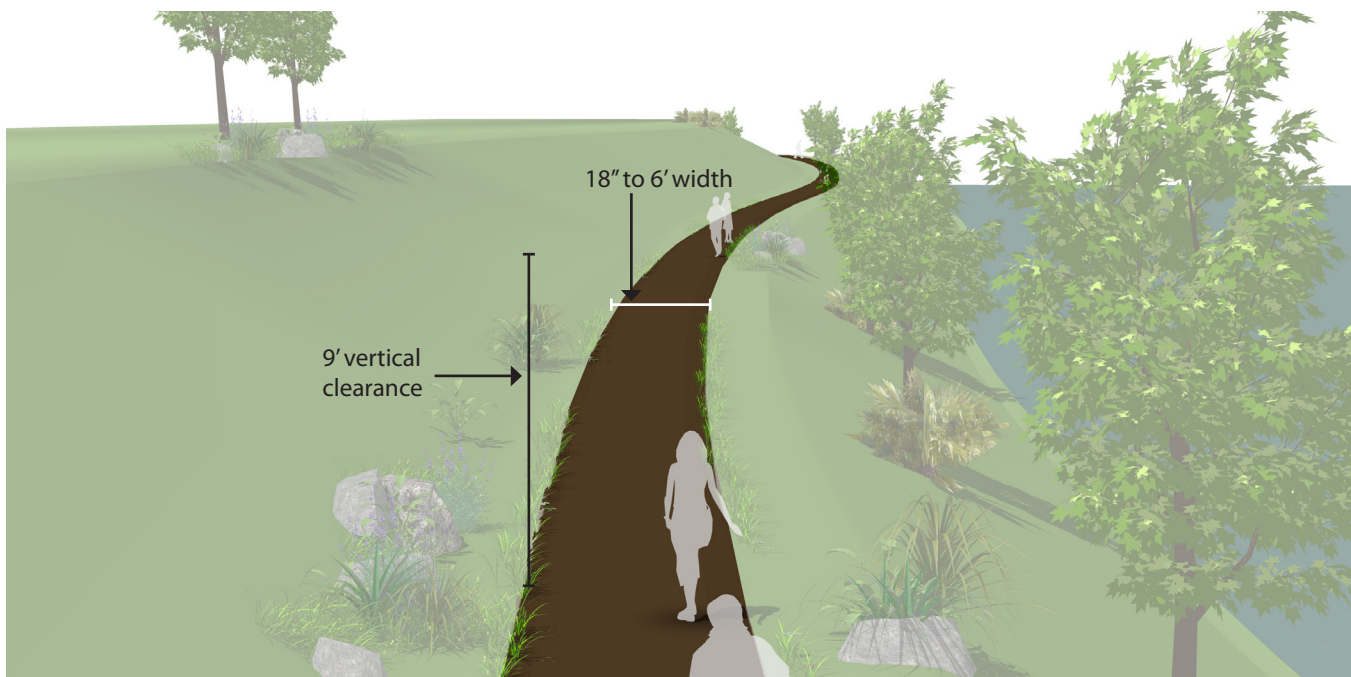
NATURAL SURFACE TRAIL

Description

Sometimes referred to as footpaths, hiking trails or single track trails, the soft surface shared use trail is used along corridors that are environmentally-sensitive but can support bare earth, wood chip, or boardwalk trails. Natural surface trails are a low-impact solution and found in areas with limited development or where a more primitive experience is desired.

Guidance

- » Trails can vary in width from 18 inches to 6 feet or greater; vertical clearance should be maintained at nine-feet above grade.
- » Mountain bike trails are typically 18-24 inches wide and have compacted bare earth or leaf litter surfacing.
- » Base preparation varies from machine-worked surfaces to those worn only by usage.
- » Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (a.k.a. “crush and run”) that contains about 4% fines by weight, and compacts with use.
- » Provide positive drainage for trail tread without extensive removal of existing vegetation; maximum slope is five percent (typical).



Discussion

Trail erosion control measures include edging along the low side of the trail, steps and terraces to contain surface material, and water bars to direct surface water off the trail; use bedrock surface where possible to reduce erosion. Due to their narrow width and ability to contour with the natural topography, single-track mountain bike trails typically require the least amount of disturbance and support features of all types of trails.

Additional References

IMBA. *Managing Mountain Biking*. 2007.
 IMBA. *Trail Solutions*. 2004.
 Flink, C. *Greenways: A Guide To Planning Design And Development*. 1993.

Materials and Maintenance

Consider implications for accessibility when weighing options for surface treatments.

BOARDWALKS

Description

Boardwalks are typically required when crossing wetlands or other poorly drained areas. They are usually constructed of wooden planks or recycled material planks that form the top layer of the boardwalk. The recycled material has gained popularity in recent years since it lasts much longer than wood, especially in wet conditions. A number of low-impact support systems are also available that reduce the disturbance within wetland areas to the greatest extent possible.

Guidance

- » Boardwalk width should be a minimum of 10 feet when no rail is used. A 12 foot width is preferred in areas with average anticipated use and whenever rails are used.
- » When the height of a boardwalk exceeds 30", railings are required.
- » If access by vehicles is desired, boardwalks should be designed to structurally support the weight of a small truck or a light-weight vehicle.



Discussion

In general, building in wetlands is subject to regulations and should be avoided.

The foundation normally consists of wooden posts or auger piers (screw anchors). Screw anchors provide greater support and last much longer.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
FHWA. *Wetland Trail Design and Construction*. 2007.

Materials and Maintenance

Decking should be either non-toxic treated wood or recycled plastic. Cable rails are attractive and more visually transparent but may require maintenance to tighten the cables if the trail has snow storage requirements.

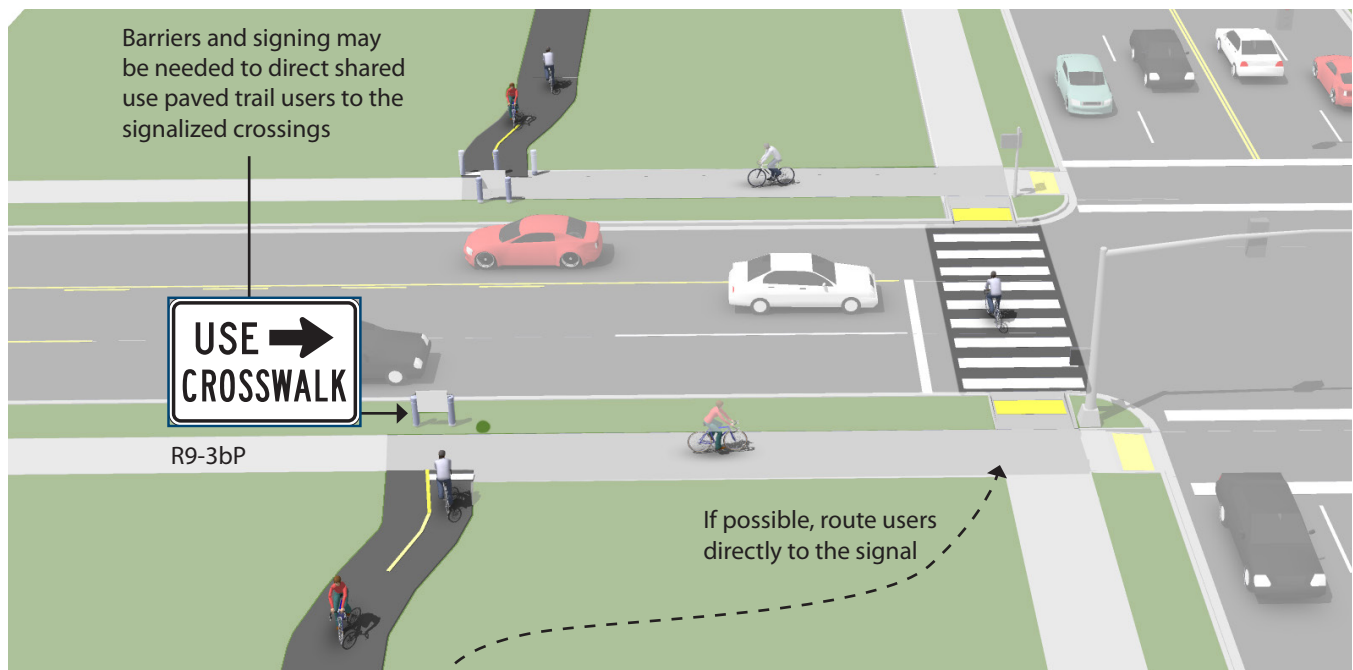
TRAIL/ROADWAY CROSSINGS: ROUTE USERS TO SIGNALIZED CROSSINGS

Description

Trail crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal. For this restriction to be effective, barriers and signing may be needed to direct trail users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.

Guidance

- » Trail crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route trail directly to the signal.



Discussion

In the US, the minimum distance a marked crossing can be from an existing signalized intersection varies from approximately 250 to 660 feet. Engineering judgement and the context of the location should be taken into account when choosing the appropriate allowable setback. Pedestrians are particularly sensitive to out of direction travel and jaywalking may become prevalent if the distance is too great.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. 2004.

Materials and Maintenance

If a sidewalk is used for crossing access, it should be kept clear of snow and debris and the surface should be level for wheeled users.

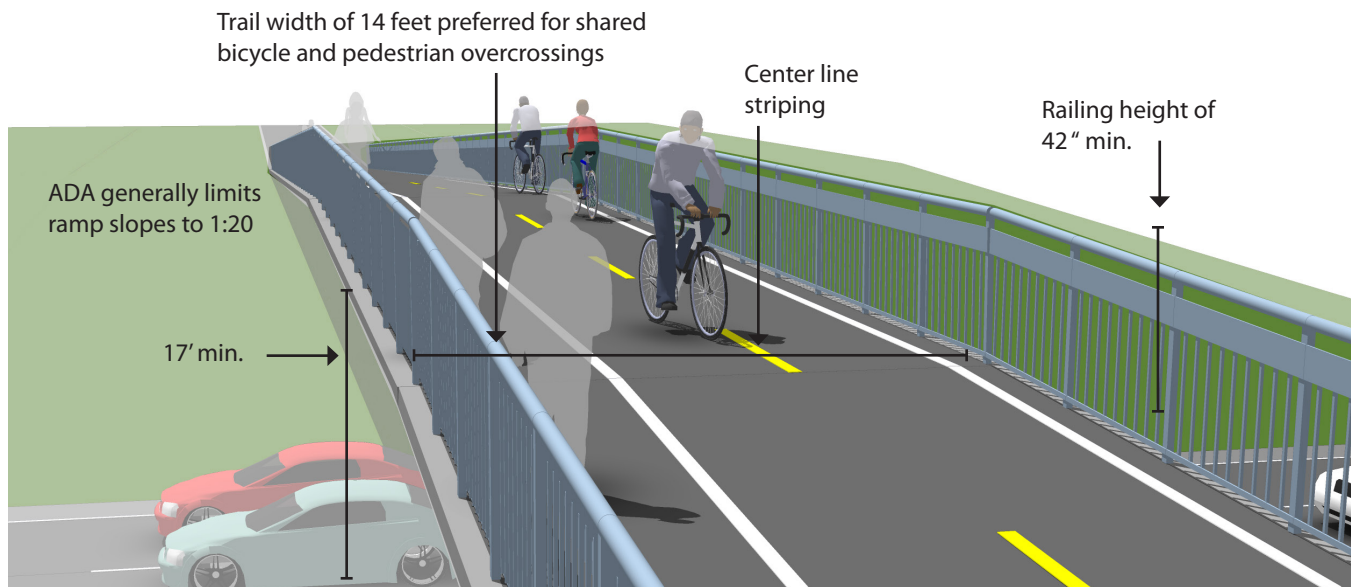
TRAIL/ROADWAY CROSSINGS: OVERCROSSINGS

Description

Bicycle/pedestrian overcrossings provide critical non-motorized system links by joining areas separated by barriers such as deep canyons, waterways or major transportation corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist. There are no minimum roadway characteristics for considering grade separation. Depending on the type of facility or the desired user group grade separation may be considered in many types of projects. Overcrossings require a minimum of 17 feet of vertical clearance to the roadway below versus a minimum elevation differential of around 12 feet for an undercrossing. This results in potentially greater elevation differences and much longer ramps for bicycles and pedestrians to negotiate.

Guidance

- » 8 foot minimum width, 14 feet preferred. If overcrossing has any scenic vistas additional width should be provided to allow for stopping. A separate 5 foot pedestrian area may be provided for facilities with high bicycle and pedestrian use.
- » 10 foot headroom on overcrossing; clearance below will vary depending on feature being crossed.
- » Roadway: 17 feet
Freeway: 18.5 feet
Heavy Rail Line: 23 feet
- » The overcrossing should have a centerline stripe even if the rest of the trail does not have one.



Discussion

Overcrossings for bicycles and pedestrians typically fall under the Americans with Disabilities Act (ADA), which strictly limits ramp slopes to 5% (1:20) with landings at 400 foot intervals, or 8.33% (1:12) with landings every 30 feet. Overcrossings pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA guidelines for slope.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. 2004.

Materials and Maintenance

Potential issues with vandalism.

Overcrossings can be more difficult to clear of snow than undercrossings.

BRIDGES

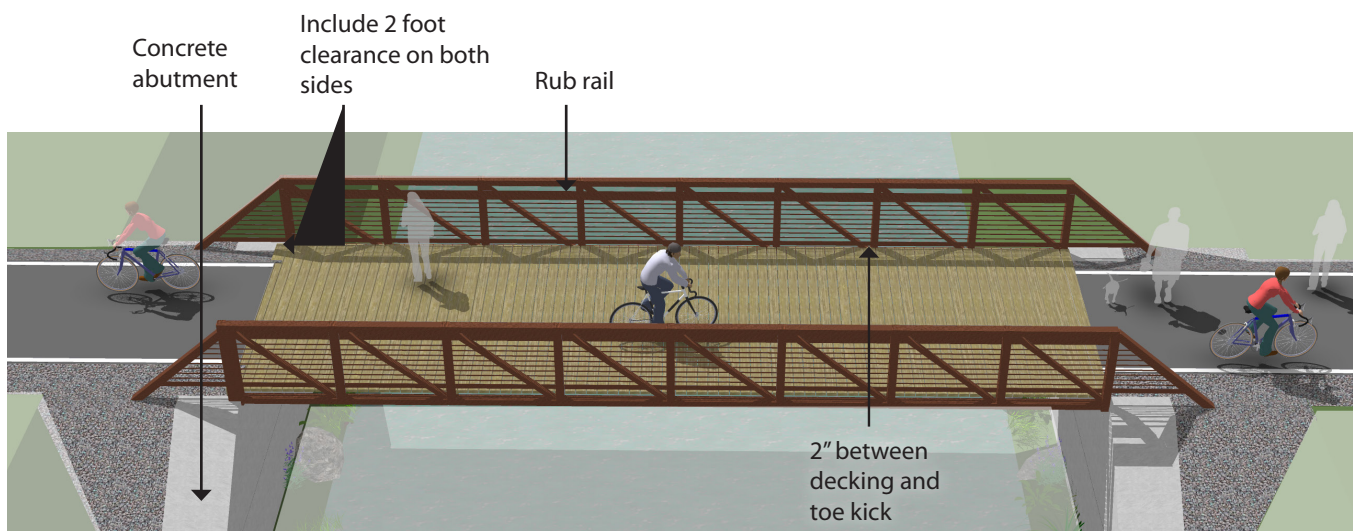
Description

Greenway trail bridges are most often used to provide user access over natural features such as streams and rivers, where a culvert is not an option or the span length exceeds 20 feet. The type and size of bridges can vary widely depending on the greenway trail and specific site requirements. Bridges often used for greenway trails include suspension bridges and prefabricated clear span bridges. When determining a bridge design for greenway trails, it is important to consider emergency and maintenance vehicle access.

Greenway trails that are poorly designed through water features can impact wetlands and streams, and become conduits for delivering sediments, nutrients, and pathogens to the watershed. Greenway trails that cross streams can exhibit bank and streambed erosion if not properly constructed.

Guidance

- » The clear span width of the bridge should include 2 feet of clearance on both ends of the bridge approach for the shoulder.
- » Bridge deck grade should be flush with adjacent greenway trail tread elevation to provide a smooth transition.
- » Railing heights on bridges should include a 42 inch minimum guard rail, and 48 inches where hazardous conditions exist.
- » A minimum overhead clearance of 10 feet is desirable for emergency vehicle access. Maximum opening between railing posts is 4 inches.
- » A greenway trail bridge should support 10 tons for 10 foot wide greenway trails, and 20 tons for wider than 10 feet for emergency vehicle access.
- » Bridges along greenway trails that allow equestrian use should be designed for mounted unit loadings.
- » When crossing small headwater streams, align the crossing as far upstream as possible in the narrowest section of stream channel to minimize impact.
- » Greenway trail drainage features should be constructed to manage stormwater before the greenway trail crosses the watercourse.
- » All abutment and foundation design should be completed and sealed by a professional structural engineer licensed in the State of North Carolina.
- » All greenway trail bridges will require local building permits, stormwater and land disturbance permits, floodplain development permits, and FEMA approval. Length and height of the bridge cords are governed by the width of the floodway and impacts to the base flood elevation of streams.



BICYCLE FACILITIES

Shared Roadway

On shared roadways, bicyclists and motor vehicles use the same roadway space. Sharing may include side-by-side operation, or single lane in-line operation depending on the configuration.

These facilities are typically used on roads with low speeds and traffic volumes, however they can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage and traffic calming devices to reduce vehicle speeds or volumes.

Separated Bikeways

Designated exclusively for bicycle travel, separated bikeways are segregated from vehicle travel lanes by striping, and can include pavement stencils and other treatments. Separated bikeways are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.

Separated bikeways can increase safety and promote proper riding by:

- » Defining road space for bicyclists and motorists, reducing the possibility that motorists will stray into the bicyclists' path.
- » Discouraging bicyclists from riding on the sidewalk.
- » Reducing the incidence of wrong way riding.
- » Reminding motorists that bicyclists have a right to the road.



Marked Shared Roadway



Bicycle Lanes



Buffered Bike Lanes



Paved Shoulder

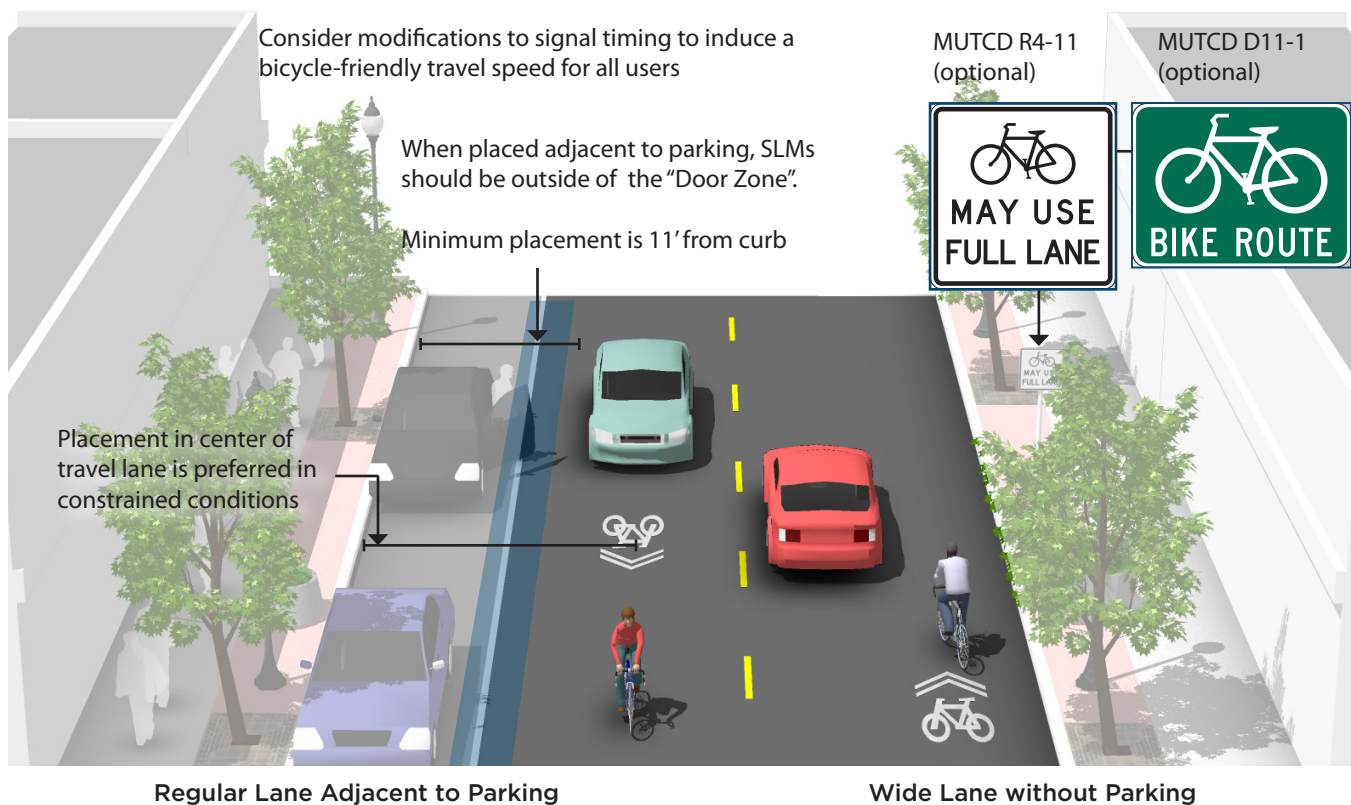
MARKED SHARED ROADWAY

Description

A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane. In constrained conditions, the SLMs are placed in the middle of the lane to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles. In all conditions, SLMs should be placed outside of the door zone of parked cars.

Guidance

- » May be used on streets with a speed limit of 35 mph or under. Lower than 30 mph speed limit preferred.
- » In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- » Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.



Discussion

If collector or arterial, this should not be a substitute for dedicated bicycle facilities if space is available. Bike Lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. SLMs shall not be used on shoulders, in designated bike lanes, or to designate bicycle detection at signalized intersections. (MUTCD 9C.07)

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Manual on Uniform Traffic Control Devices*. 2009.
 NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

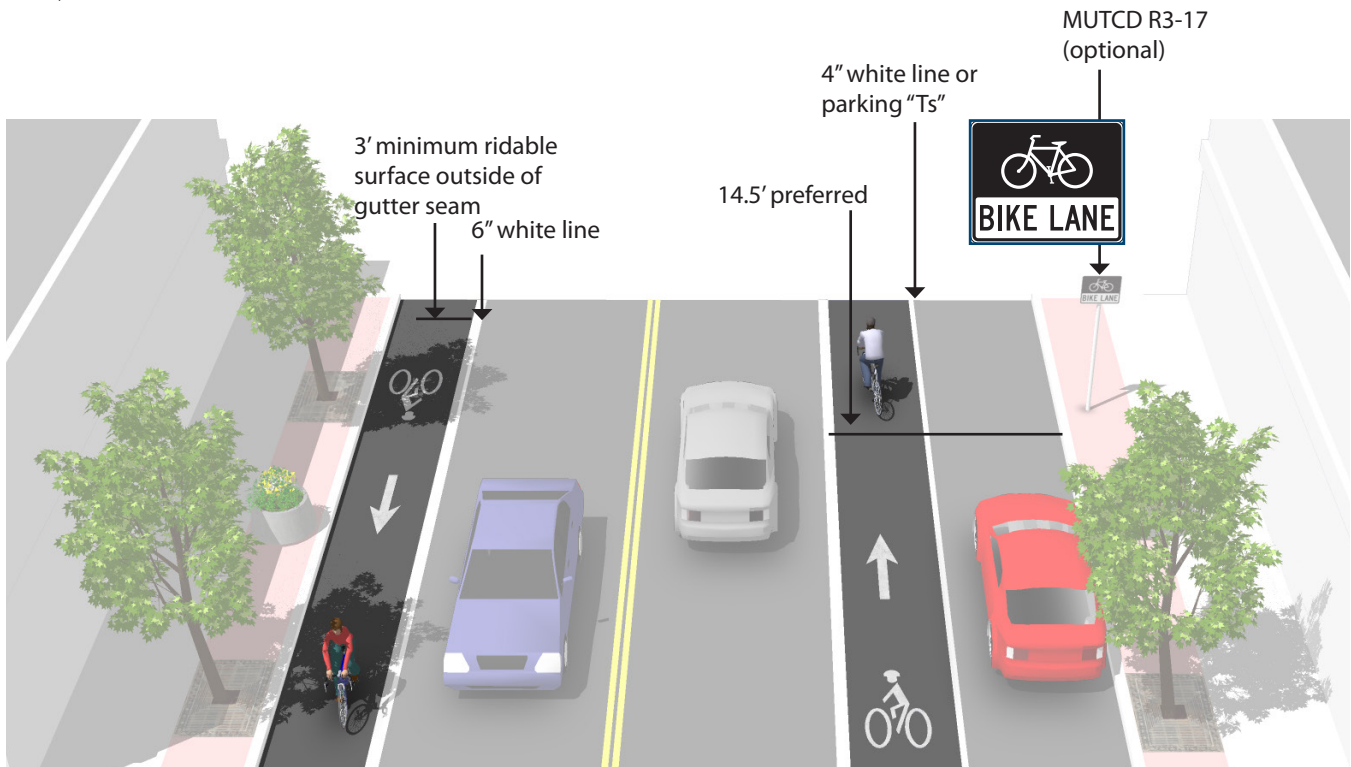
BICYCLE LANE

Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane. Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

Guidance

- » 4 foot minimum when no curb and gutter is present.
- » 5 foot minimum when adjacent to curb and gutter or 3 feet more than the gutter pan width if the gutter pan is wider than 2 feet.
- » 14.5 foot preferred from curb face to edge of bike lane. (12 foot minimum).
- » 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane.



Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane. Consider buffered bike lanes when further separation is desired.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Manual on Uniform Traffic Control Devices*. 2009.
 NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

BUFFERED BIKE LANE

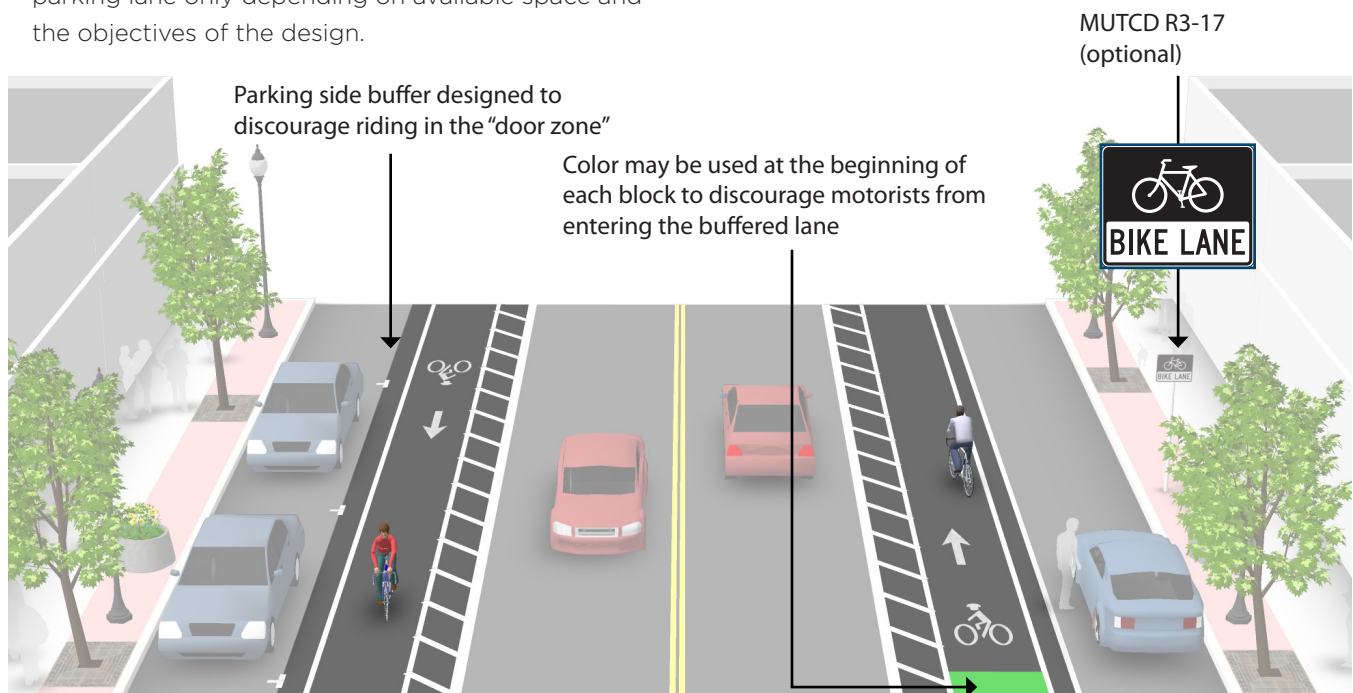
Description

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Buffered bike lanes follow general guidance for buffered preferential vehicle lanes as per MUTCD guidelines (section 3D-01).

Buffered bike lanes are designed to increase the space between the bike lane and the travel lane and/or parked cars. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speed, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic. Buffered bike lanes can buffer the travel lane only, or parking lane only depending on available space and the objectives of the design.

Guidance

- » The minimum bicycle travel area is 5 feet wide.
- » Buffers should be at least 2 feet wide. If 3 feet or wider, mark with diagonal or chevron hatching. For clarity at driveways or minor street crossings, consider a dotted line for the inside buffer boundary where cars are expected to cross.



Discussion

Frequency of right turns by motor vehicles at major intersections should determine whether continuous or truncated buffer striping should be used approaching the intersection. Commonly configured as a buffer between the bicycle lane and motor vehicle travel lane, a parking side buffer may also be provided to help bicyclists avoid the 'door zone' of parked cars.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Manual on Uniform Traffic Control Devices*. (3D-01). 2009.
 NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

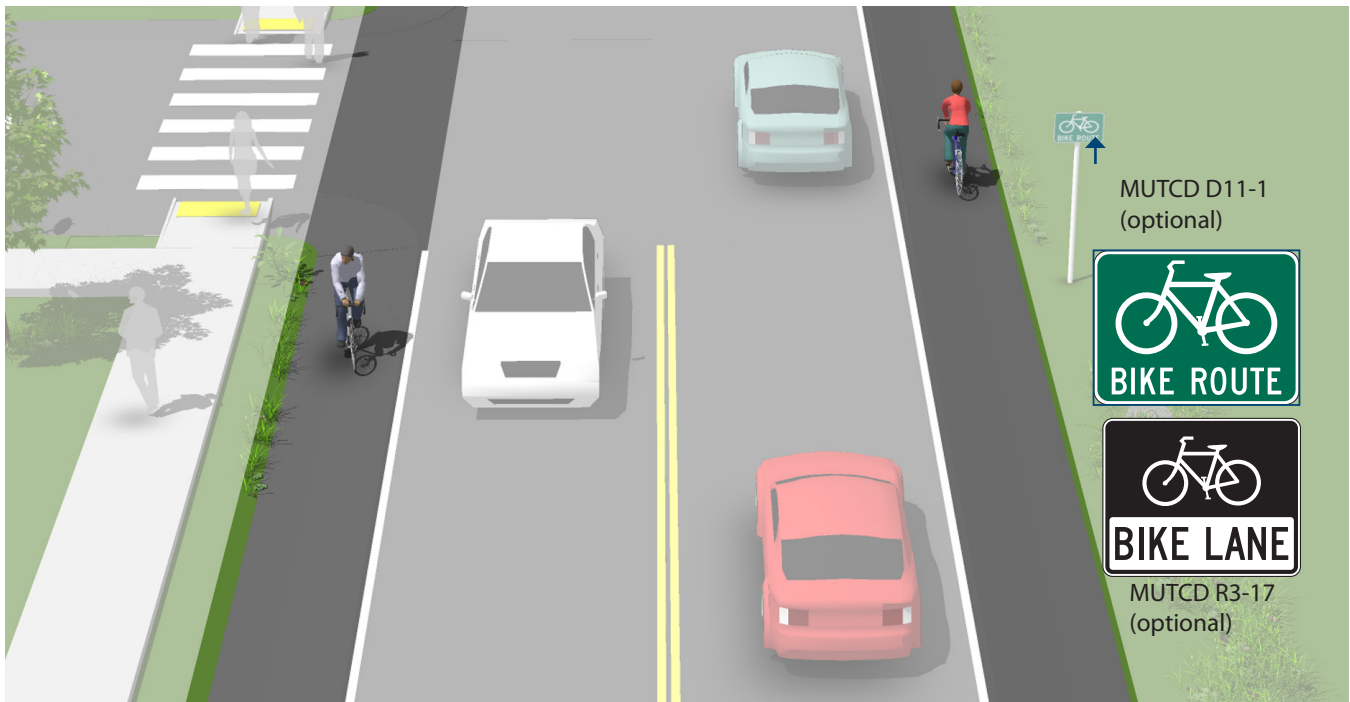
SHOULDER BIKEWAYS (PAVED SHOULDER)

Description

Typically found in less-dense areas, shoulder bikeways are paved roadways with striped shoulders (4'+) wide enough for bicycle travel. Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle travel along the roadway. Shoulder bikeways should be considered a temporary treatment, with full bike lanes planned for construction when the roadway is widened or completed with curb and gutter. This type of treatment is not typical in urban areas and should only be used where constraints exist.

Guidance

- » If 4 feet or more is available for bicycle travel, the full bike lane treatment of signs, legends, and an 8" bike lane line would be provided.
- » If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.
- » Rumble strips are not recommended on shoulders used by bicyclists unless there is a minimum 4 foot clear path. 12 foot gaps every 40-60 feet should be provided to allow access as needed.



Discussion

A wide outside lane may be sufficient accommodation for bicyclists on streets with insufficient width for bike lanes but which do have space available to provide a wider (14'-16') outside travel lane. Consider configuring as a marked shared roadway in these locations. Where feasible, roadway widening should be performed with pavement resurfacing jobs.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
FHWA. *Manual on Uniform Traffic Control Devices*. 2009.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Shoulder bikeways should be cleared of snow through routine snow removal operations.

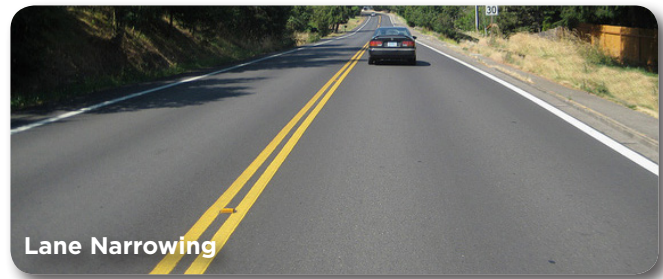


Court Street

RETROFITTING EXISTING STREETS TO ADD BIKEWAYS

Most major streets are characterized by conditions (e.g., high vehicle speeds and/or volumes) for which dedicated bike lanes are the most appropriate facility to accommodate safe and comfortable riding. Although opportunities to add bike lanes through roadway widening may exist in some locations, many major streets have physical and other constraints that would require street retrofit measures within existing curb-to-curb widths. As a result, much of the guidance provided in this section focuses on effectively reallocating existing street width through striping modifications to accommodate dedicated bike lanes.

Although largely intended for major streets, these measures may be appropriate for any roadway where bike lanes would be the best accommodation for bicyclists.



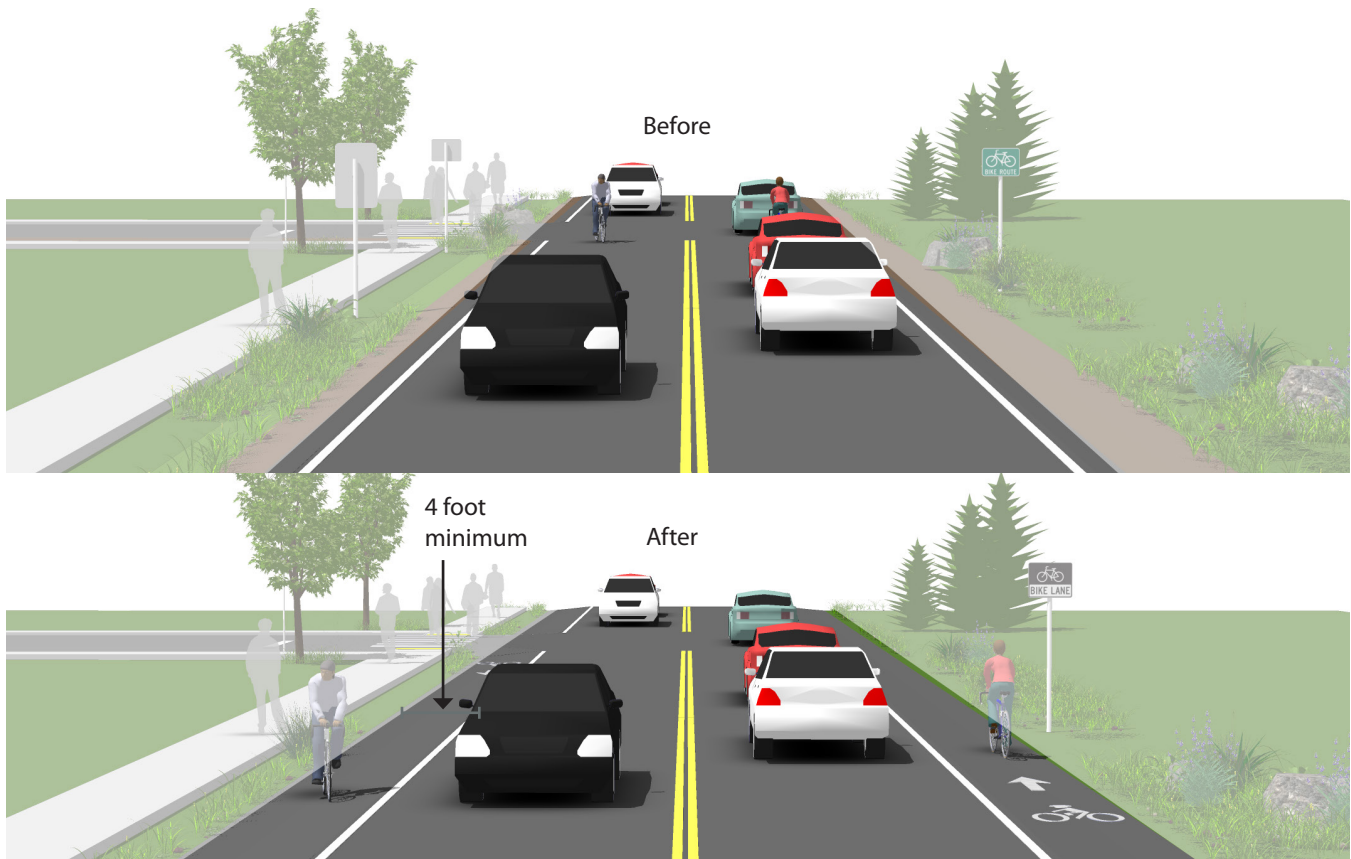
ROADWAY WIDENING

Description

Bike lanes can be accommodated on streets with excess right-of-way through shoulder widening. Although roadway widening incurs higher expenses compared with re-stripping projects, bike lanes can be added to streets currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction.

Guidance

- » Guidance on bicycle lanes applies to this treatment.
- » 4 foot minimum width when no curb and gutter is present.
- » 6 foot width preferred.



Discussion

Roadway widening is most appropriate on roads lacking curbs, gutters and sidewalks. If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.

Materials and Maintenance

The extended bicycle area should not contain any rough joints where bicyclists ride. Saw or grind a clean cut at the edge of the travel lane, or feather with a fine mix in a non-ridable area of the roadway.

LANE NARROWING

Description

Lane narrowing utilizes roadway space that exceeds minimum standards to provide the needed space for bike lanes. Many roadways have existing travel lanes that are wider than those prescribed in local and national roadway design standards, or which are not marked. Most standards allow for the use of 11 foot and sometimes 10 foot wide travel lanes to create space for bike lanes.

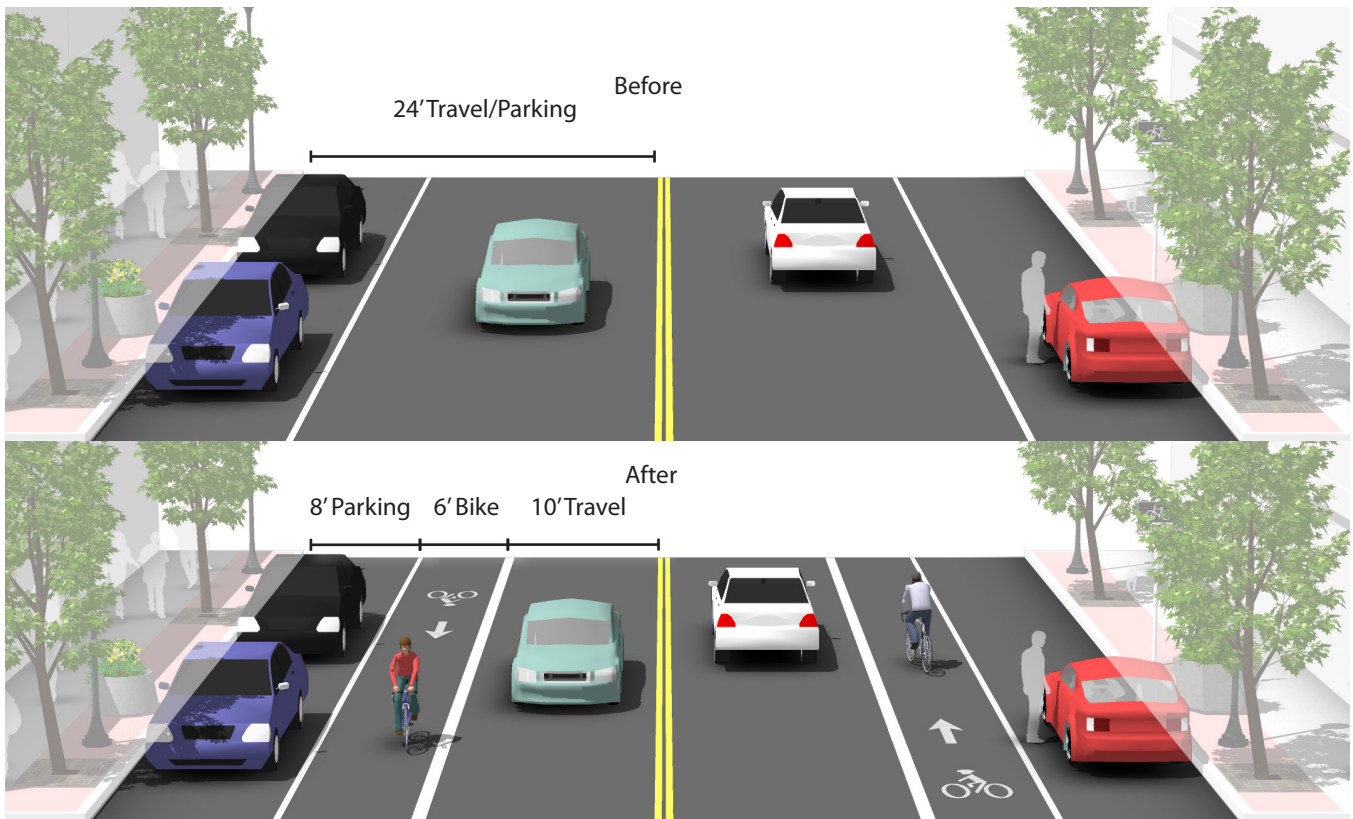
Guidance

Vehicle lane width:

- » Before: 10-15 feet
- » After: 10-11 feet

Bicycle lane width:

- » Guidance on Bicycle Lanes applies to this treatment.



Discussion

Special consideration should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in some situations to free up pavement space for bike lanes. AASHTO supports reduced width lanes in A Policy on Geometric Design of Highways and Streets: "On interrupted-flow operation conditions at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages."

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 AASHTO. *Guide for the Planning, Design, and Operation of Pedestrian Facilities*. 2004.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.

LANE RECONFIGURATION

Description

The removal of a single travel lane will generally provide sufficient space for bike lanes on both sides of a street. Streets with excess vehicle capacity provide opportunities for bike lane retrofit projects.

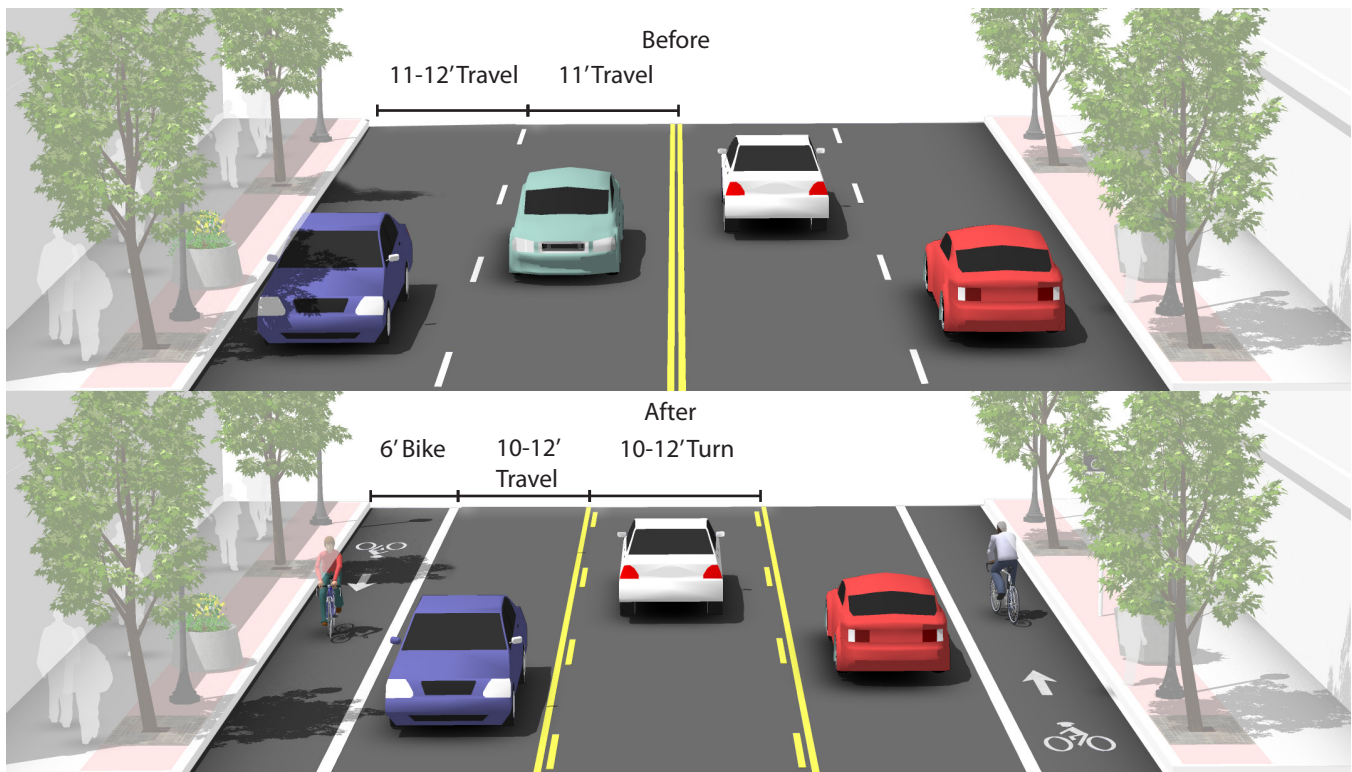
Guidance

Vehicle lane width:

- » Width depends on project. No narrowing may be needed if a lane is removed.

Bicycle lane width:

- » Guidance on Bicycle Lanes applies to this treatment.



Discussion

Depending on a street's existing configuration, traffic operations, user needs and safety concerns, various lane reduction configurations may apply. For instance, a four-lane street (with two travel lanes in each direction) could be modified to provide one travel lane in each direction, a center turn lane, and bike lanes. Prior to implementing this measure, a traffic analysis should identify potential impacts.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Evaluation of Lane Reduction "Road Diet" Measures on Crashes*. Publication Number: FHWA-HRT-10-053. 2010.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.

INTERSECTIONS

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and other modes in order to advance traffic flow in a safe and efficient manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way and facilitating eye contact and awareness with other modes. Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals.

The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.



Bike Lanes at Right Turn Only Lanes



Combined Bike Lane/Turn Lane



Intersection Crossing Markings



Rectangular Rapid Flash Beacons

BIKE LANES AT RIGHT TURN ONLY LANES

Description

The appropriate treatment at right-turn lanes is to place the bike lane between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to use a shared bike lane/turn lane.

The design (right) illustrates a bike lane pocket, with signage indicating that motorists should yield to bicyclists through the conflict area.

Guidance

At auxiliary right turn only lanes (add lane):

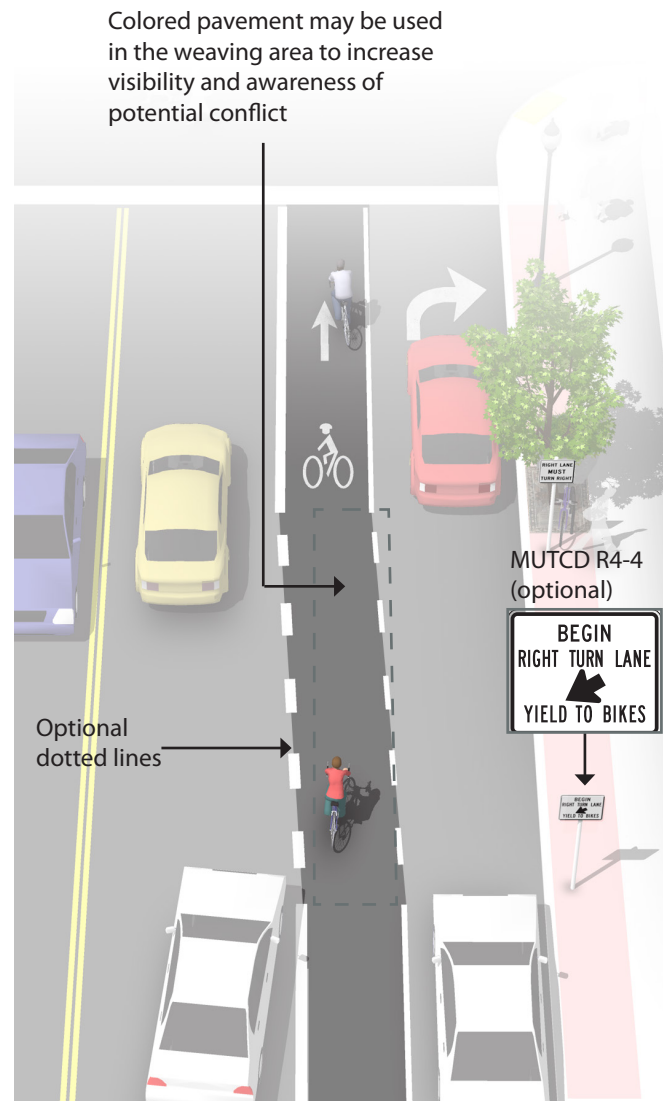
- » Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- » Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- » Consider using colored conflict areas to promote visibility of the mixing zone.

Where a through lane becomes a right turn only lane:

- » Do not define a dotted line merging path for bicyclists.
- » Drop the bicycle lane in advance of the merge area.
- » Use shared lane markings to indicate shared use of the lane in the merging zone.

Discussion

For other potential approaches to providing accommodations for bicyclists at intersections with turn lanes, please see Combined Bike Lane/Turn Lane on the following page.



Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
FHWA. *Manual on Uniform Traffic Control Devices*. (3D-01).
2009.
NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

COMBINED BIKE LANE/TURN LANE

Description

The combined bicycle/right turn lane places a standard-width bike lane on the left side of a dedicated right turn lane. A dotted line delineates the space for bicyclists and motorists within the shared lane. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane.

This treatment is recommended at intersections lacking sufficient space to accommodate both a standard through bike lane and right turn lane.

Guidance

- » Maximum shared turn lane width is 13 feet; narrower is preferable.
- » Bike Lane pocket should have a minimum width of 4 feet with 5 feet preferred.
- » A dotted 4 inch line and bicycle lane marking should be used to clarify bicyclist positioning within the combined lane, without excluding cars from the suggested bicycle area.
- » A “Right Turn Only” sign with an “Except Bicycles” plaque may be needed to make it legal for through bicyclists to use a right turn lane.

Discussion

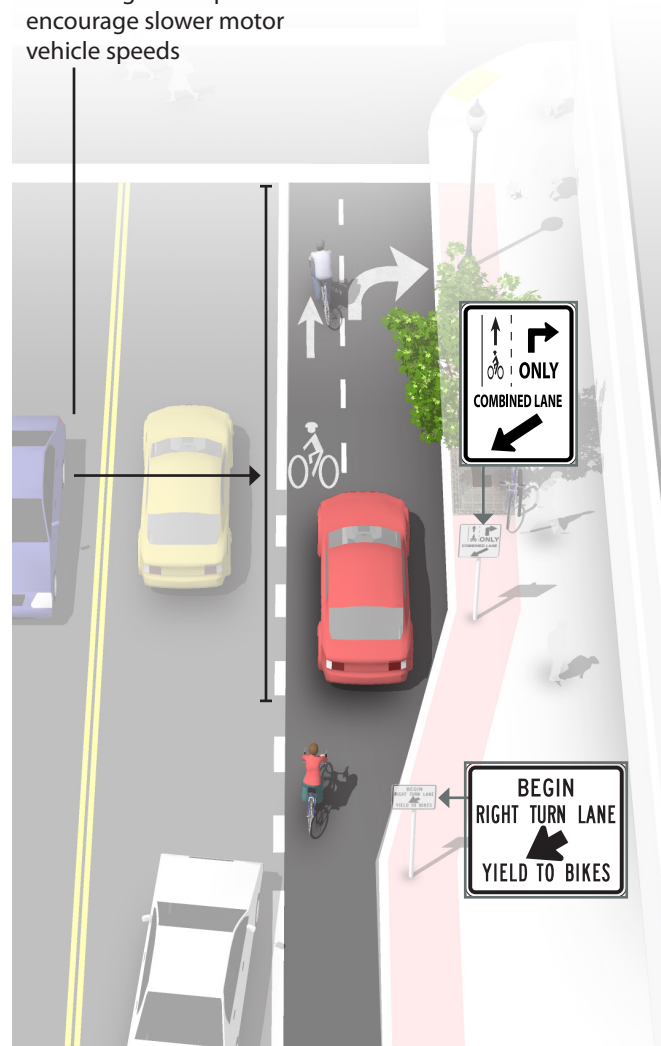
Case studies cited by the Pedestrian and Bicycle Information Center indicate that this treatment works best on streets with lower posted speeds (30 MPH or less) and with lower traffic volumes (10,000 ADT or less). May not be appropriate for high-speed arterials or intersections with long right turn lanes. May not be appropriate for intersections with large percentages of right-turning heavy vehicles.

Additional References

NACTO. *Urban Bikeway Design Guide*. 2012.

This treatment is currently slated for inclusion in the next edition of the AASHTO Guide for the Development of Bicycle Facilities.

Short length turn pockets encourage slower motor vehicle speeds



Materials and Maintenance

Locate markings out of tire tread to minimize wear. Because the effectiveness of markings depends on their visibility, maintaining markings should be a high priority.

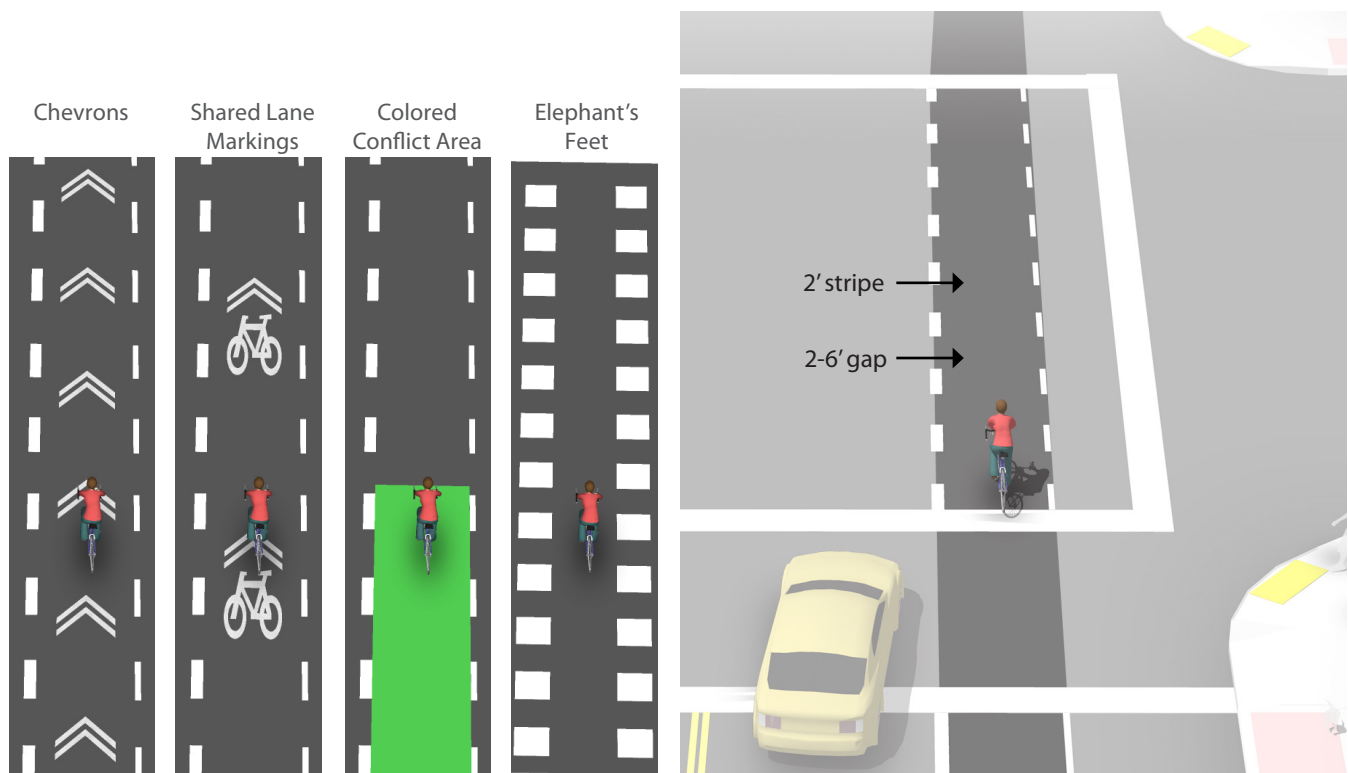
INTERSECTION CROSSING MARKINGS

Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

Guidance

- » See MUTCD Section 3B.08: “dotted line extensions”
- » Crossing striping shall be at least six inches wide when adjacent to motor vehicle travel lanes. Dotted lines should be two-foot lines spaced two to six feet apart.
- » Chevrons, shared lane markings, or colored bike lanes may be used to increase visibility within conflict areas or across entire intersections. Elephant's Feet markings are common in Canada, and in use in Chicago, IL.



Discussion

Additional markings such as chevrons, shared lane markings, or colored bike lanes in conflict areas are strategies currently in use in the United States and Canada. Cities considering the implementation of markings through intersections should standardize future designs to avoid confusion.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Manual on Uniform Traffic Control Devices*. (3D-01). 2009.
 NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

RECTANGULAR RAPID FLASH BEACONS

Description

Enhanced marked crossings are unsignalized crossings with additional treatments designed to increase motor vehicle yielding compliance on multi-lane or high volume roadways.

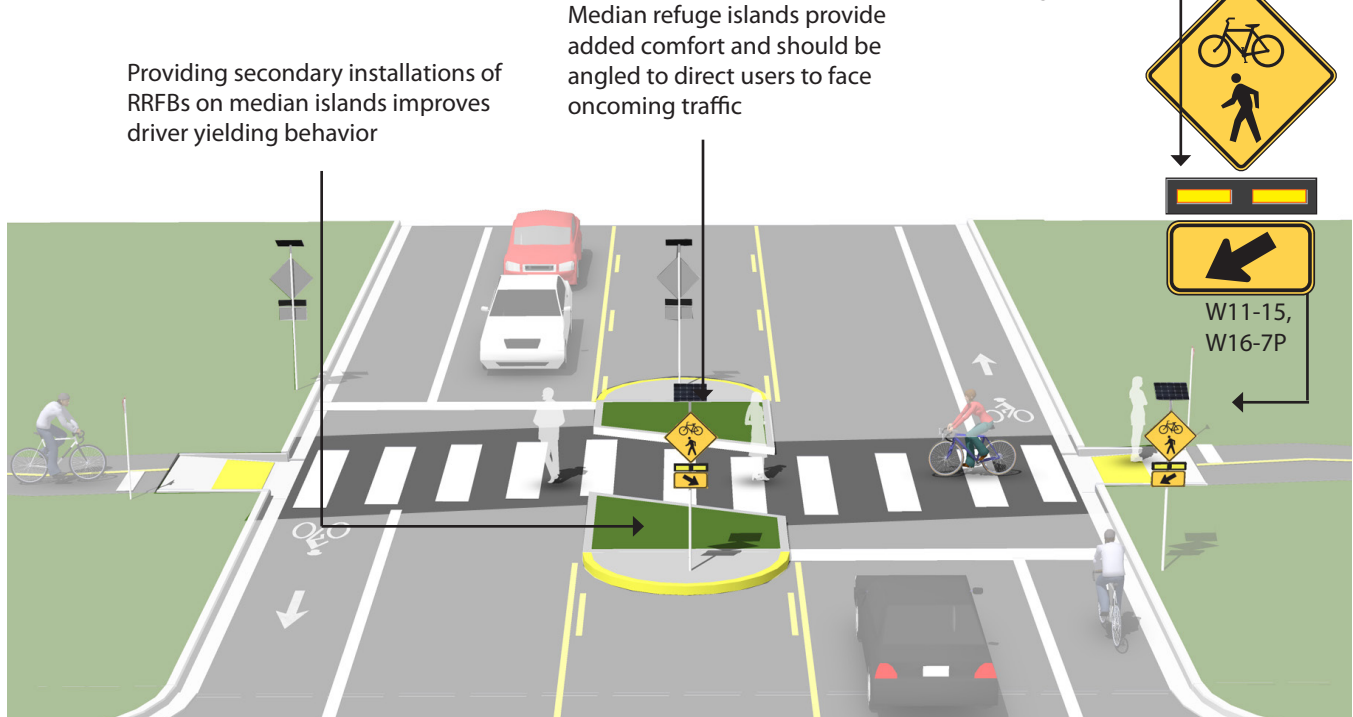
- » These enhancements include trail user or sensor actuated warning beacons, Rectangular Rapid Flash Beacons (RRFB) shown below, or in-roadway warning lights.
- » Rectangular rapid flash beacons show the most increased compliance of all the warning beacon enhancement options.

Guidance

Guidance for marked/unsignalized crossings applies.

- » Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.
- » Warning beacons shall initiate operation based on user actuation and shall cease operation at a predetermined time after the user actuation or, with passive detection, after the user clears the crosswalk.

Rectangular Rapid Flash Beacons (RRFB) dramatically increase compliance over conventional warning beacons



Discussion

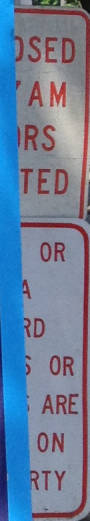
An FHWA report presented study results showing of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent. A four-beacon arrangement raised compliance to 88%. Additional studies of long term installations show little to no decrease in yielding behavior over time. Additional studies in Oregon reported compliance rates as high as 99% when actuated.

Additional References

FHWA. *Manual on Uniform Traffic Control Devices*. 2009.
 FHWA. *MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (1A-11)*. 2008.
 FHWA. *Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crosswalks*. 2010.
 Alhajri, F., Carlso, K., Foster, N., Georje, D. *A Study on Driver's Compliance to Rectangular Rapid Flashing Beacons*. 2013.

Materials and Maintenance

Locate markings out of wheel tread when possible to minimize wear and maintenance costs. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.



BICYCLE SUPPORT FACILITIES AND MAINTENANCE

Support facilities such as bicycle parking and repair stations can significantly enhance the bicyclist experience across Elizabethtown. Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. Along with increased use and connectivity, bicycle repair stations will complement not only infrastructure improvements, but a cultural shift that will allow faculty, staff, students, and visitors to engage simple bicycle maintenance and functionality.

Wayfinding

The ability to navigate through Elizabethtown is informed by landmarks, natural features and other visual cues. Signs throughout Town should indicate to bicyclists:

- » Direction of travel
- » Location of destinations
- » Travel time/distance to those destinations

These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

- » Helping to familiarize users with the network
- » Helping users identify the best routes to destinations
- » Helping to address misconceptions about time and distance
- » Helping overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., "interested but concerned" bicyclists)

A community-wide wayfinding signage plan would identify:

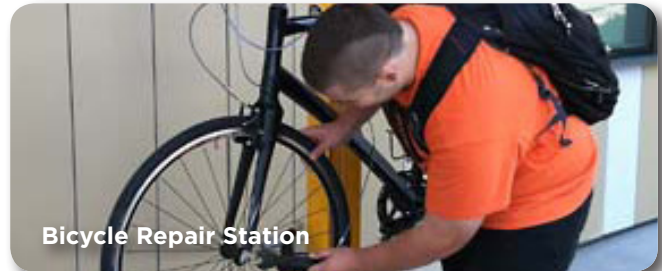
- » Sign locations
- » Sign type – what information should be included and design features
- » Destinations to be highlighted on each sign – key destinations for bicyclists



Bicycle Parking



Sweeping



Bicycle Repair Station



Wayfinding Signage

- » Approximate distance and travel time to each destination

Wayfinding signs also visually cue motorists that they are driving along a bicycle/pedestrian route and should use caution. Signs are typically placed at key locations leading to and along routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists and pedestrians rather than per vehicle signage standards.

BICYCLE PARKING

Description

Short-term bicycle parking is meant to accommodate visitors, customers, and others expected to depart within two hours. It should have an approved standard rack, appropriate location and placement, and weather protection. Racks should:

- » Support the bicycle in at least two places, preventing it from falling over.
- » Allow locking of the frame and one or both wheels with a U-lock.
- » Is securely anchored to ground.
- » Resists cutting, rusting and bending or deformation.

Guidance

- » 2' minimum from the curb face to avoid 'dooring.'
- » Close to destinations; 50' maximum distance from main building entrance.
- » Minimum clear distance of 6' should be provided between the bicycle rack and the property line.
- » Locate racks in areas that cyclists are most likely to travel.



SWEEPING

Description

Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, potentially causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept.



Guidance

- » Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- » Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- » In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- » Pave gravel driveway approaches to minimize loose gravel on paved roadway shoulders.
- » Perform additional sweeping in the Spring to remove debris from the Winter.
- » Perform additional sweeping in the Fall in areas where leaves accumulate.

BICYCLE REPAIR STATION

Description

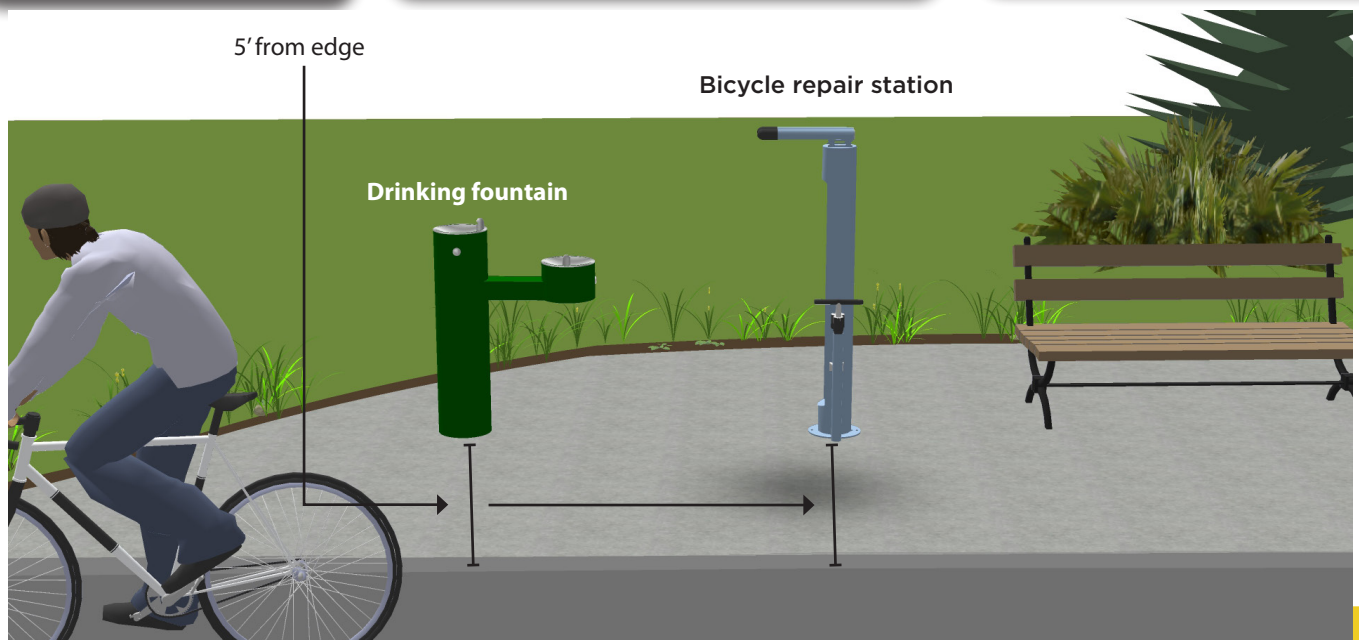
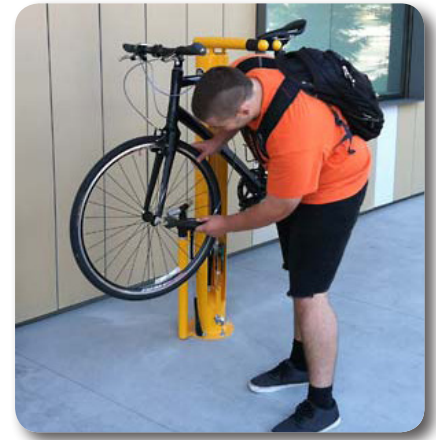
Bicycle repair stations are small kiosks designed to offer a complete set of tools necessary for routine bicycle maintenance. Bicycle repair stations have become a popular amenity in bicycle friendly places because they provide bicyclists with access to tools on-the-go and encourage people to teach and learn bicycle maintenance in an informal setting. They can also help to reduce the number of abandoned or trashed bikes in a community; bikes are often abandoned by their owners when they have a minor mechanical issue that they do not have the tools or knowledge to fix. Bicycle repair stations encourage people to learn bicycling skills from one another and send a message to residents and visitors that bicycling is supported in the community. These fixtures can be placed in a park or in another public place and require little upkeep or oversight, since the tools and stand are designed to be self-contained and theft-resistant.

Guidance

- » Bicycle repair station tools are secured by high security cables, but will still be an attractive target for theft. Proper placement of kiosks in areas of high activity is one key strategy to reduce potential vandalism.
- » Consider grouping repair stations together with other amenities such as bicycle parking, seating, and drinking fountains.



Public bicycle maintenance and tool stand examples.



WAYFINDING SIGNAGE

Description

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. There are three general types of wayfinding signs:

Guidance

Confirmation Signs

Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route. This signage can include destinations and distance/time, but does not include arrows.

Turn Signs

Indicate where a bikeway turns from one street onto another street. This signage can be used with pavement markings, and does include destinations and arrows.

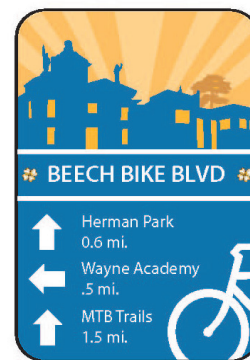
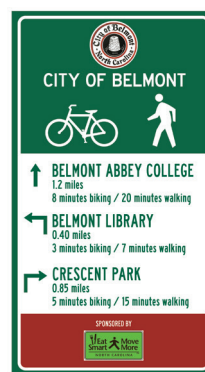
Decision Signs

Mark the junction of two or more bikeways and informs bicyclists of the designated bike route to access key destinations. Destinations and arrows, distances and travel times are optional but recommended.



Alternative Designs

A customized alternative design may be used to include travel times, local town logos, and sponsorship branding. See examples to the right.



Discussion

There is no standard color for bicycle wayfinding signage. Section 1A.12 of the MUTCD establishes the general meaning for signage colors. Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
FHWA. *Manual on Uniform Traffic Control Devices*. (3D-01). 2009.
NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Maintenance needs for wayfinding signs are similar to other signs and will need periodic replacement due to wear.

WAYFINDING: SIGN PLACEMENT

Description

Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

Guidance

Confirmation Signs

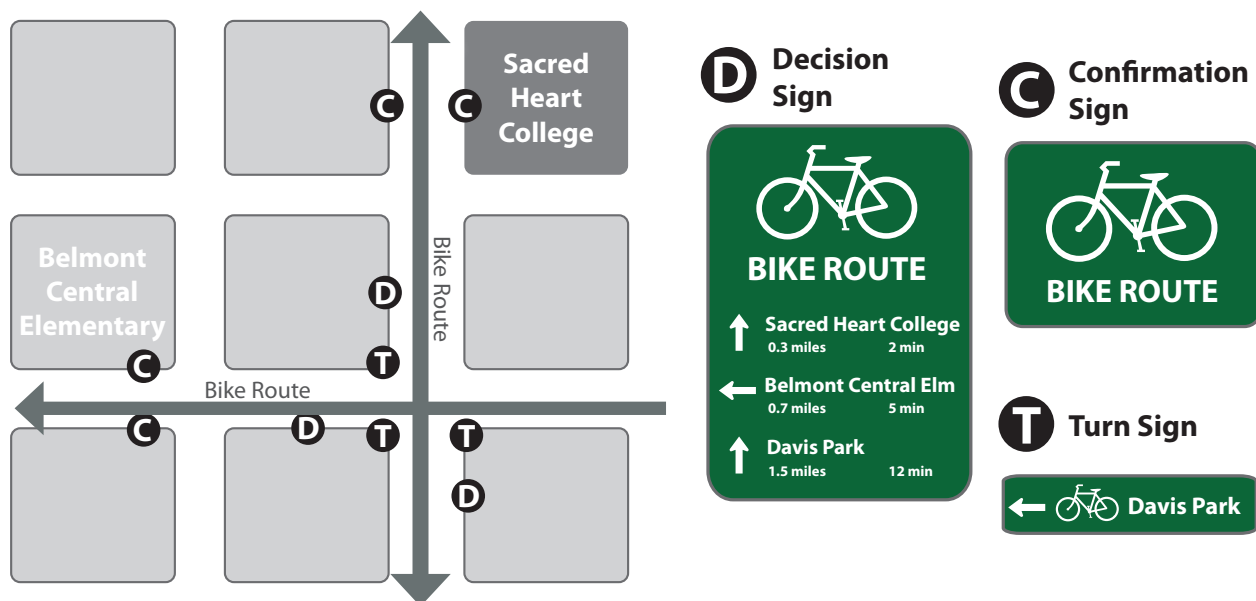
- » Every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 ft of a turn or decision sign).
- » Should be placed soon after turns to confirm destination(s). Pavement markings can also confirm that a bicyclist is on a preferred route.

Decision Signs

- » Near-side of intersections in advance of a junction with another bicycle route.
- » Along a route to indicate a nearby destination.

Turn Signs

- » Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through).
- » Pavement markings can also indicate the need to turn to the bicyclist.



Discussion

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to five miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park) may be included on signage up to one mile away.

Additional References

AASHTO. *Guide for the Development of Bicycle Facilities*. 2012.
 FHWA. *Manual on Uniform Traffic Control Devices*. (3D-01). 2009.
 NACTO. *Urban Bikeway Design Guide*. 2012.

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

APPENDIX B: FUNDING SOURCES

[Overview](#) | [Federal - MAP-21](#) | [Federal - Other](#) | [State](#) |
[Local](#) | [Private](#) | [Trail Partnership Case Studies](#)

OVERVIEW

When considering possible funding sources for bicycle and pedestrian projects, it is important to remember that not all construction activities or programs will be accomplished with a single funding source. It will be necessary to consider several sources of funding that together will support full project completion. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. This appendix outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors. Note that this reflects the funding available at the time of writing. Funding amounts, cycles, and the programs themselves may change over time.

FEDERAL FUNDING SOURCES

Federal funding is typically directed through state agencies to local governments either in the form of grants or direct appropriations. Federal funding typically requires a local match of five percent to 50 percent, but there are sometimes exceptions. The following is a list of possible Federal funding sources that could be used to support construction of pedestrian and bicycle improvements.

MOVING AHEAD FOR PROGRESS IN THE TWENTY-FIRST CENTURY (MAP-21)

The largest source of federal funding for pedestrian and bicycle projects is the USDOT's Federal-Aid Highway Program, which Congress has reauthorized roughly every six years since the passage of the Federal-Aid Road Act of 1916. The latest act, Moving Ahead for Progress in the Twenty-First Century (MAP- 21) was enacted in July 2012, and is set to expire in October 29, 2015.

At the time of this writing (October 2015), the most likely scenario is a short-term extension

towards the end of 2015, with a similar structure to MAP-21, but with higher local matches required for projects. Therefore, it is not possible to guarantee the continued availability of any listed MAP-21 programs, or to predict their future funding levels or policy guidance. Nevertheless, many of these programs have been included in some form since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, and thus may continue to provide capital for active transportation projects and programs.

In North Carolina, federal monies are administered through the North Carolina Department of Transportation (NCDOT) and Metropolitan Planning Organizations (MPOs). Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system. For more information, visit: <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

TRANSPORTATION ALTERNATIVES

Transportation Alternatives (TA) is a funding source under MAP-21 that consolidates three formerly separate programs under SAFETEA-LU: Transportation Enhancements (TE), Safe Routes to School (SRTS), and the Recreational Trails Program (RTP). These funds may be used for a variety of pedestrian, bicycle, and streetscape projects including sidewalks, bike-ways, multi-use paths, and rail-trails. TA funds may also be used for selected education and encouragement programming such as Safe Routes to School, despite the fact that TA does not provide a guaranteed set-aside for this activity as SAFETEA-LU did.

Average annual funds available through TA over the life of MAP-21 equal \$814 million nationally, which is based on a two percent

set-aside of total MAP-21 allocations. Note that state DOT's may elect to transfer up to 50 percent of TA funds to other highway programs, so the amount listed on the website represents the maximum potential funding. Remaining TA funds (those monies not re-directed to other highway programs) are disbursed through a separate competitive grant program administered by NC-DOT. Local governments, school districts, tribal governments, and public lands agencies are permitted to compete for these funds.

Each state governor is given the opportunity to "opt out" of the Recreational Trails Program. However, as of the writing of this plan, only Florida and Kansas have "opted out" of the RTP. For all other states, dedicated funds for recreational trails continue to be provided as a subset of TA. MAP-21 provides \$85 million nationally for the RTP. As part of MAP-21, this program expires October 29, 2015. For the complete list of eligible activities, visit: http://www.fhwa.dot.gov/environment/transportation_enhancements/legislation/map21.cfm For funding levels, visit: <http://www.fhwa.dot.gov/MAP21/funding.cfm> Funding Resources B-5

SURFACE TRANSPORTATION PROGRAM

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of pedestrian improvements are eligible, including trails, sidewalks, crosswalks, pedestrian signals, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STP-funded pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. 50 percent of each state's STP funds are allocated by population to the MPOs; the remaining 50 percent may be spent in any area of the state. As part of MAP-21, this program expires October 29, 2015. For more information: <http://www.fhwa.dot.gov/map21/stp.cfm>

HIGHWAY SAFETY IMPROVEMENT PROGRAM

MAP-21 doubles the amount of funding available through the Highway Safety Improvement Program (HSIP) relative to SAFETEA-LU. HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. MAP-21 preserves the Railway-Highway Crossings Program within HSIP but discontinues the High-Risk Rural roads set-aside unless safety statistics demonstrate that fatalities are increasing on these roads. Bicycle and pedestrian safety improvements, enforcement activities, traffic calming projects, and crossing treatments for non-motorized users in school zones are eligible for these funds. As part of MAP-21, this program expires October 29, 2015. For more information: <http://www.fhwa.dot.gov/map21/hsip.cfm>

FEDERAL TRANSIT ADMINISTRATION ENHANCED MOBILITY OF SENIORS AND INDIVIDUALS WITH DISABILITIES

This program can be used for capital expenses that support transportation to meet the special needs of older adults and persons with disabilities, including providing access to an eligible public transportation facility when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. As part of MAP-21, this program expires October 29, 2015. For more information: http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Enhanced_Mobility_of_Seniors_and_Individuals_with_Disabilities.pdf

SAFE ROUTES TO SCHOOL (SRTS) PROGRAM

SRTS enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

The North Carolina Safe Routes to School Program is supported by federal funds through SAFETEA-LU and MAP-21 legislation. Please note that all SRTS projects “shall be treated as projects on a Federal-aid system under chapter 1 of title 23, United States Code.” Although no local match is required and all SRTS projects are 100% federally funded under the SAFETEA-LU, agencies are encouraged to leverage other funding sources that may be available to them, including grant awards, local, state, or other federal funding. SRTS funds can be used for proposed projects that are within 2 miles of a school public or private, K-8, in a municipality or in the county jurisdiction. In response to the Strategic Transportation Investments law of June 2013, proposed SRTS projects will be considered as part of the Bicycle and Pedestrian project input with Strategic Prioritization Office for funding consideration. Most of the types of eligible SRTS projects include sidewalks or a shared-use path. However, intersection improvements (i.e. signalization, marking/upgrading crosswalks, etc.), on street bicycle facilities (bike lanes, wide paved shoulders, etc.) or off-street shared-use paths are also eligible for SRTS funds. As part of MAP-21, this program expires October 29, 2015. For a more inclusive list, please visit the FHWA SRTS program at: http://www.fhwa.dot.gov/environment/safe_routes_to_school/overview/ Or contact DBPT/NCDOT at 919.707.2604.

OTHER FEDERAL FUNDING SOURCES

PARTNERSHIP FOR SUSTAINABLE COMMUNITIES

Founded in 2009, the Partnership for Sustainable Communities (PSC) is a joint project of the Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (USDOT). The partnership aims to “improve access to affordable housing, more transportation options, and lower transporta-

tion costs while protecting the environment in communities nationwide.”

The Partnership is based on five Livability Principles, one of which explicitly addresses the need for bicycle and pedestrian infrastructure (“Provide more transportation choices: Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health”). The Partnership is not a formal agency with a regular annual grant program. Nevertheless, it is an important effort that has already led to some new grant opportunities (including both TIGER I and TIGER II grants). North Carolina jurisdictions should track Partnership communications and be prepared to respond proactively to announcements of new grant programs. Initiatives that speak to multiple livability goals are more likely to score well than initiatives that are narrowly limited in scope to pedestrian improvement efforts. PSC 2015 Priorities include: using PSC agency resources to advance Ladders of Opportunity for every American and every community; helping communities adapt to a changing climate, while mitigating future disaster losses; and supporting implementation of community-based development priorities. For more information:

<http://www.sustainablecommunities.gov/>

<http://www2.epa.gov/smart-growth/hud-dot-epa-partnership-sustainable-communities>

Resource for Rural Communities: http://www.sustainablecommunities.gov/sites/sustainable-communities.gov/files/docs/federal_resources_rural.pdf

FEDERAL LAND AND WATER CONSERVATION FUND

The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. The program is administered by the Department of Environment and Natural Resources as a grant program for states and local governments. Maximum annual grant awards for county governments, incorporated municipalities, public authorities, and federally recognized Indian tribes are \$250,000. The local match may be provided with in-kind services or cash. For more information: http://www.ncparks.gov/About/grants/lwcf_main.php

RIVERS, TRAILS, AND CONSERVATION ASSISTANCE PROGRAM

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation funds available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in North Carolina locales indirectly through technical assistance, particularly for community organizations, but is not a capital funding source. Annual application deadline is August 1st. For more information: <http://www.nps.gov/ncrc/programs/rtca/> or contact the Southeast Region RTCA Program Manager Deirdre “Dee” Hewitt at (404) 507- 5691

NATIONAL SCENIC BYWAYS DISCRETIONARY GRANT PROGRAM

The National Scenic Byways Discretionary Grants program provides merit-based funding for byway-related projects each year, utilizing one or more of eight specific activities for roads designated as National Scenic Byways, All-American Roads, State scenic byways, or Indian tribe scenic byways. The activities are described in 23 USC 162(c). This is a discretionary program; all projects are selected by the US Secretary of Transportation.

Eligible projects include construction along a scenic byway of a facility for pedestrians and bicyclists and improvements to a scenic byway that will enhance access to an area for the purpose of recreation. Construction includes the development of the environmental documents, design, engineering, purchase of right-of-way, land, or property, as well as supervising, inspecting, and actual construction. For more information: <http://www.bywaysonline.org/grants/>

FEDERAL LANDS TRANSPORTATION PROGRAM (FLTP)

The FLTP funds projects that improve access within federal lands (including national forests, national parks, national wildlife refuges, national recreation areas, and other Federal public lands) on federally owned and maintained transportation facilities. \$300 million per fiscal year has been allocated to the program for 2013 and 2014. As part of MAP-21, this program expires October 29, 2015. For more information: <http://www.fhwa.dot.gov/map21/factsheets/fltp.cfm>

ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANTS

The Department of Energy’s Energy Efficiency and Conservation Block Grants (EECBG) may be used to reduce energy consumptions and fossil fuel emissions and for improvements in energy efficiency. Section 7 of the funding announcement states that these grants provide opportunities for the development and implementation

of transportation programs to conserve energy used in transportation including development of infrastructure such as bike lanes and pathways and pedestrian walkways. Although the current grant period has passed, more opportunities may arise in the future. For more information: <http://www1.eere.energy.gov/wip/eecbg.html>

TIGER DISCRETIONARY GRANTS

The U.S. Department of Transportation's (DOT) Transportation Investment Generating Economic Recovery (TIGER) discretionary grants are intended to fund capital investments in surface transportation infrastructure. The grant program focuses on "capital projects that generate economic development and improve access to reliable, safe, and affordable transportation for disconnected both urban and rural, while emphasizing improved connection to employment, education, services and other opportunities, workforce development, or community revitalization." Infrastructure improvement projects such as recreational trails and greenways with an emphasis on multi-modal transit qualify for this grant. Pre-Application deadlines are typically in May, with final application deadlines in June. For more information: <http://www.dot.gov/tiger>

ECONOMIC DEVELOPMENT ADMINISTRATION

Under Economic Development Administration's (EDA) Public Works and Economic Adjustment Assistance programs, grant applications are accepted for construction, non-construction, technical assistance, and revolving loan fund projects. "Grants and cooperative agreements made under these programs are designed to leverage existing regional assets and support the implementation of economic development strategies that advance new ideas and creative approaches to advance economic prosperity in distressed communities." Application deadlines are typically in March and June.

For more information: <http://www.eda.gov/funding-opportunities/files/2015-EDAP-FFO-Fact-Sheet.pdf>

HISTORIC PRESERVATION FUND GRANTS

The State, Tribal, and Local Plans & Grants (STLPG) division manages several grant programs to assist with a variety of historic preservation and community projects focused on heritage preservation. For more information on the different grant programs visit: <http://www.nps.gov/preservation-grants/>

ENVIRONMENTAL CONTAMINATION CLEANUP FUNDING SOURCES

EPA's Brownfields Program provides direct funding for brownfields assessment, cleanup, revolving loans, and environmental job training. EPA's Brownfields Program collaborates with other EPA programs, other federal partners, and state agencies to identify and leverage more resources for brownfields activities. Technical assistance relating to brownfields financing is an additional service provided. For more information: http://epa.gov/brownfields/grant_info/index.htm

NATIONAL COASTAL WETLANDS CONSERVATION GRANT PROGRAM

Under the National Coastal Wetlands Conservation Grant Program, U.S. Fish and Wildlife Service will provide over \$21 million to 25 projects in 13 coastal and Great Lakes states with the aim to protect, restore or enhance more than 11,000 acres of coastal wetlands and adjacent upland habitats. "The Service awards grants of up to \$1 million to states based on a national competition, which enables states to determine and address their highest conservation priorities in coastal areas. Since 1992, the Service has awarded over \$357 million in grants under the program." For more information: <http://www.fws.gov/coastal/CoastalGrants/>

NATIONAL FISH AND WILDLIFE FOUNDATION: FIVE STAR & URBAN WATERS RESTORATION GRANT PROGRAM

The Five Star & Urban Waters Restoration Grant Program seeks to develop community capacity to sustain local natural resources for future generations by providing modest financial assistance to diverse local partnerships for wetland, riparian, forest and coastal habitat restoration, urban wildlife conservation, stormwater management as well as outreach, education and stewardship. Projects should focus on water quality, watersheds and the habitats they support. NFWF may use a mix of public and private funding sources to support any grant made through this program. Request for proposals application are typically due in late January/early February. For more information: http://www.nfwf.org/fivestar/Pages/home.aspx#.VS_eq_nF-Bw

ENVIRONMENTAL SOLUTIONS FOR COMMUNITIES GRANT PROGRAM

The National Fish and Wildlife Foundation (NFWF) and Wells Fargo seek to promote sustainable communities through Environmental Solutions for Communities by supporting highly-visible projects that link economic development and community well-being to the stewardship and health of the environment. Priority for grants to projects that successfully address one or more of the following:

- » Support innovative, cost-effective programs that enhance stewardship on private agricultural lands to enhance water quality and quantity and/or improve wildlife habitat for species of concern, while maintaining or increasing agricultural productivity.
- » Support community-based conservation projects that protect and restore local habitats and natural areas, enhance water quality, promote urban forestry, educate and train community leaders on sustainable practices, promote related job creation and

training, and engage diverse partners and volunteers.

- » Support visible and accessible demonstration projects that showcase innovative, cost-effective and environmentally-friendly approaches to improve environmental conditions within urban communities by 'greening' traditional infrastructure and public projects such as storm water management and flood control, public park enhancements, and renovations to public facilities.
- » Support projects that increase the resiliency of the Nation's coastal communities and ecosystems by restoring coastal habitats, living resources, and water quality to enhance livelihoods and quality of life in these communities.
- » In North Carolina, strong preference will be given to projects located in the regions of Charlotte, Raleigh, or Winston Salem.

For more information: <http://www.nfwf.org/environmentalsolutions/Pages/2015rfp.aspx#.VS-8SPnF-Bw>

STATE FUNDING SOURCES

There are multiple sources for state funding of bicycle and pedestrian transportation projects. However, beginning July 1, 2015, state transportation funds cannot be used to match federally-funded transportation projects, according to a law passed by the North Carolina Legislature.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STRATEGIC TRANSPORTATION INVESTMENTS (STI)

The NCDOT's State Transportation Improvement Program is based on the Strategic Transportation Investments Bill, signed into law in 2013. The Strategic Transportation Investments (STI) Initiative introduces the Strategic Mobility Formula, a new way to fund and prioritize transportation projects.

The new Strategic Transportation Investments Initiative is scheduled to be fully implemented by July 1, 2015. Projects scheduled for construction before then will proceed as scheduled under the current Equity Formula. Projects slated for construction after that time will be ranked and programmed according to the new formula. The new Strategic mobility formula assigns projects for all modes into one of three categories: 1) Statewide Mobility, 2) Regional Impact, and 3) Division Needs.

All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are ranked based on 50% data (safety, access, demand, connectivity, and cost effective-

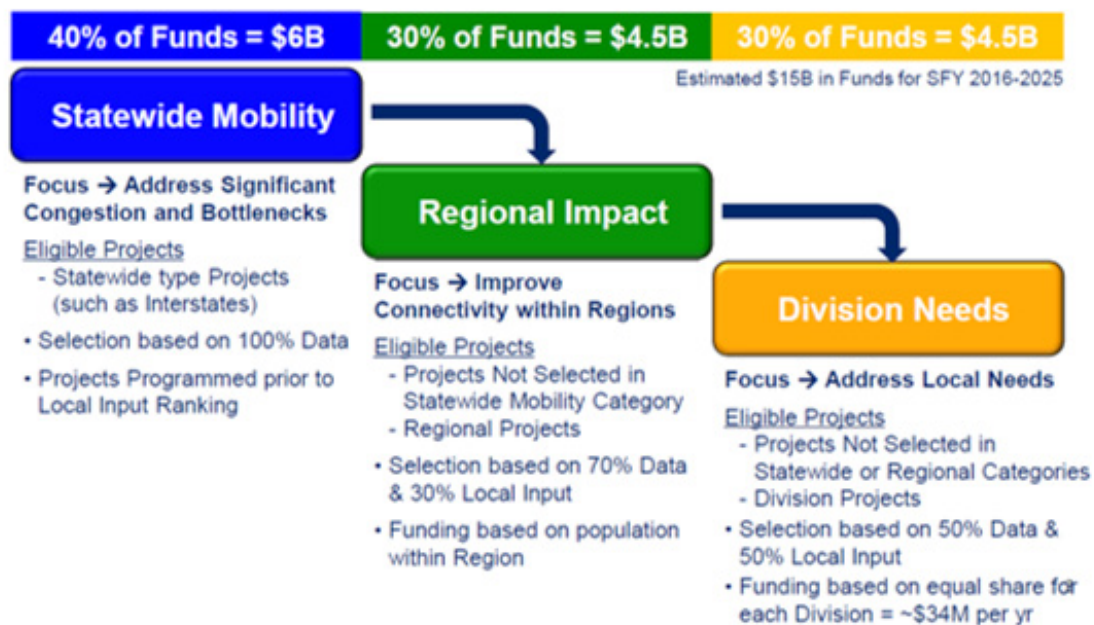
ness) and 50% local input, with a breakdown as follows:

SAFETY 15%

- » Definition: Projects or improvements where bicycle or pedestrian accommodations are non-existent or inadequate for safety of users
- » How it's measured: Crash history, posted speed limits, and estimated safety benefit
- » Calculation:
 - » Bicycle/pedestrian crashes along the corridor within last five years: 40% weight
 - » Posted speed limits, with higher points for higher limits: 40% weight
 - » Project safety benefit, measured by each specific improvement: 20% weight

HOW THE STI WORKS

(Source: NCDOT Bicycle and Pedestrian Prioritization, June 2015)



ACCESS 10%

- » Definition: Projects that are in close proximity to destinations that draw or generate high volumes of users
- » How it's measured: Type of and distance to destination

DEMAND 10%

- » Definition: Projects serving large resident or employee user groups
- » How it's measured: # of households and employees per square mile within 1 ½ mile bicycle or ½ mile pedestrian facility + factor for unoccupied housing units (second homes)

CONNECTIVITY 10%

- » Definition: Measure impact of project on reliability and quality of network
- » How it's measured: Creates score per each SIT based on degree of bike/ped separation from roadway and connectivity to similar or better project type

COST EFFECTIVENESS 5%

- » Definition: Ratio of calculated user benefit divided by NCDOT project cost
- » How it's measured: (Safety + Demand + Access + Connectivity)/Estimated Project Cost to NCDOT

LOCAL INPUT 50%

- » Definition: Input from MPO/RPOs and NCDOT Divisions, which comes in the form of points assigned to projects.
- » How it is measured: Base points + points for population size. A given project is more likely to get funded if it is assigned base points from both the MPO/RPO and the Division, making the need for communicating the importance of projects to these groups critical. Further, projects that have a local match will score higher.

ADDITIONAL BICYCLE AND PEDESTRIAN PROJECT REQUIREMENTS:

- » Federal funding typically requires a 20% non-federal match
- » State law prohibits state match for bicycle and pedestrian projects (except for Powell Bill)
- » Limited number of project submittals per MPO/RPO/Division
- » Minimum project cost requirement is \$100,000
- » Bike/Ped projects typically include: bicycle lanes, multi-use path/greenway, paved shoulders, sidewalks, pedestrian signals, SRTS infrastructure projects, and other streetscape/multi-site improvements (such as median refuge, signage, etc.)

These rankings largely determine which projects will be included in NCDOT's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation planning improvements prioritized by the stakeholders for inclusion in NCDOT's Work Program over the next 10 years. "More than 900 non-highway construction projects were prioritized for years 2015-2020, totaling an estimated \$9 billion. NCDOT will only have an estimated \$1.5 billion to spend during this time period." The STIP is updated every 2 years. The STIP contains funding information for various transportation divisions of NCDOT, including, highways, rail, bicycle and pedestrian, public transportation and aviation.

For more information on STI: www.ncdot.gov/strategictransportationinvestments/

To access the STIP: <https://connect.ncdot.gov/projects/planning/Pages/State-Transportation-Improvement-Program.aspx>

INCIDENTAL PROJECTS

Bicycle and Pedestrian accommodations such as; bike lanes, wide paved shoulders, sidewalks, intersection improvements, bicycle and pedestrian safe bridge design, etc. are frequently included as “incidental” features of larger highway/roadway projects. This is increasingly common with the adoption of NCDOT’s “Complete Streets” Policy.

In addition, bicycle safe drainage grates and handicapped accessible sidewalk ramps are now a standard feature of all NCDOT highway construction. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds, and usually with a local match. On-road bicycle accommodations, if warranted, typically do not require a local match.

“Incidental Projects” are often constructed as part of a larger transportation project, when they are justified by local plans that show these improvements as part of a larger, multi-modal transportation system. Having a local bicycle or pedestrian plan is important, because it allows NCDOT to identify where bike and pedestrian improvements are needed, and can be included as part of highway or street improvement project. It also helps local government identify what their priorities are and how they might be able to pay for these projects. Under “Complete Streets” local governments may be responsible for a portion of the costs for bicycle and pedestrian projects. For more information: <http://www.ncdot.gov/bikeped/funding/process/>

DUKE ENERGY WATER RESOURCES FUND

Duke Energy is investing \$10 million in a fund for projects that benefit waterways in the Carolinas. The fund includes a \$1.5 million designation for projects in the Dan River Basin Region

(north of Greensboro and Winston-Salem). The fund supports science-based, research-supported projects and programs that provide direct benefit to at least one of the following focus areas:

- » Improve water quality, quantity and conservation;
- » Enhance fish and wildlife habitats;
- » Expand public use and access to waterways; and
- » Increase citizens’ awareness about their roles in protecting these resources.

For more information: <http://www.duke-energy.com/community/foundation/water-resources-fund.asp>

CLEAN WATER MANAGEMENT TRUST FUND

The Clean Water Management Trust Fund is available to any state agency, local government, or non-profit whose primary purpose is the conservation, preservation, and restoration of North Carolina’s environmental and natural resources. Grant assistance is provided to conservation projects that:

- » enhance or restore degraded waters;
- » protect unpolluted waters, and/or
- » contribute toward a network of riparian buffers and greenways for environmental, educational, and recreational benefits;
- » provide buffers around military bases to protect the military mission;
- » acquire land that represents the ecological diversity of North Carolina; and
- » acquire land that contributes to the development of a balanced State program of historic properties.

The application deadline is typically in February. For more information: <http://www.cwmtf.net/#appmain.htm>

SPOT SAFETY PROGRAM

The Spot Safety Program is a state funded public safety investment and improvement program that provides highly effective low cost safety improvements for intersections, and sections of North Carolina's 79,000 miles of state maintained roads in all 100 counties of North Carolina. The Spot Safety Program is used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program is funded with state funds and currently receives approximately \$9 million per state fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is \$250,000.

The Spot Safety Program targets hazardous locations for expedited low cost safety improvements such as traffic signals, turn lanes, improved shoulders, intersection upgrades, positive guidance enhancements (rumble strips, improved channelization, raised pavement markers, long life highly visible pavement markings), improved warning and regulatory signing, roadside safety improvements, school safety improvements, and safety appurtenances (like guardrail and crash attenuators).

A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest. For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

POWELL BILL FUNDS

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bike-ways or sidewalks along public streets and highways. Beginning July 1, 2015 under the Strategic Transportation Investments initiative, Powell Bill funds may no longer be used to provide a match for federal transportation funds such as Transportation Alternatives. Certified Statement, street listing, add/delete sheet and certified map from all municipalities are due between July 1st and July 21st of each year. Additional documentation is due shortly after. More information: <https://connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx>

HIGHWAY HAZARD ELIMINATION PROGRAM

The Hazard Elimination Program is used to develop larger improvement projects to address safety and potential safety issues. The program is funded with 90 percent federal funds and 10 percent state funds. The cost of Hazard Elimination Program projects typically ranges between \$400,000 and \$1 million. A Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects to the Board of Transportation (BOT) for approval and funding. These projects are prioritized for funding according to a safety benefit to cost (B/C) ratio, with the safety benefit being based on crash reduction. Once approved and funded by the BOT, these projects become part of the department's State Transportation Improvement Program (STIP). For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

GOVERNOR'S HIGHWAY SAFETY PROGRAM

The Governor's Highway Safety Program (GHSP) funds safety improvement projects on state highways throughout North Carolina. All funding is performance-based. Substantial progress in reducing crashes, injuries, and fatalities is required as a condition of continued funding. This funding source is considered to be "seed money" to get programs started. The grantee is expected to provide a portion of the project costs and is expected to continue the program after GHSP funding ends. State Highway Applicants must use the web-based grant system to submit applications. For more information: <http://www.ncdot.org/programs/ghsp/>

EAT SMART, MOVE MORE NORTH CAROLINA COMMUNITY GRANTS

The Eat Smart, Move More (ESMM) NC Community Grants program provides funding to local communities to support their efforts to develop community-based interventions that encourage, promote, and facilitate physical activity. The current focus of the funds is for projects addressing youth physical activity. Funds have been used to construct trails and conduct educational programs. For more information: <http://www.eatsmartmovemorenc.com/Funding/Funding.html>

THE NORTH CAROLINA DIVISION OF PARKS AND RECREATION - RECREATIONAL TRAILS AND ADOPT-A-TRAIL GRANTS

The North Carolina Division of Parks and Recreation and the State Trails Program offer funds to help citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking, and horseback riding to river trails and off-highway vehicle trails. "The Adopt-a-Trail Grant Program (AAT) awards \$108,000 annually to government agencies, nonprofit organiza-

tions and private trail groups for trail projects. The Recreational Trails Program (RTP) is a \$1.3 million grant program funded by Congress with money from the federal gas taxes paid on fuel used by off-highway vehicles. Grant applicants must be able to contribute 20% of the project cost or in-kind contributions. Both grant applications are typically due in January or February. For more information: http://www.ncparks.gov/About/trails_grants.php

NC PARKS AND RECREATION TRUST FUND (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities, and public authorities, as defined by G.S. 159-7, are eligible applicants. A local government can request a maximum of \$500,000 with each application. An applicant must match the grant dollar-for-dollar, 50 percent of the total cost of the project, and may contribute more than 50 percent. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match. Grant applications are typically due in February. For more information: http://www.ncparks.gov/About/grants/partf_main.php

COMMUNITY DEVELOPMENT BLOCK GRANT FUNDS

Community Development Block Grant (CDBG) funds are available to local municipal or county governments that qualify for projects to enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low and moderate income. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. Some urban counties and cities in North Carolina receive CDBG funding directly from

HUD. Each year, CDBG provides funding to local governments for hundreds of critically-needed community improvement projects throughout the state. These community improvement projects are administered by the Division of Community Assistance and the Commerce Finance Center under eight grant categories. Two categories might be of support to pedestrian and bicycle projects in 'entitlement communities': Infrastructure and Community Revitalization. More information: http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

CLEAN WATER MANAGEMENT TRUST FUND (CWMTF)

This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection, eligible for application by a state agency, local government, or non-profit. At the end of each year, a minimum of \$30 million is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. Funds may be used for planning and land acquisition to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits. Deadlines are typically in February. For more information: <http://www.cwmtf.net/#appmain.htm>

SAFE ROUTES TO SCHOOL (SRTS)

SRTS is managed by NCDOT, but is federally funded; See Federal Funding Sources above for more information.

URBAN AND COMMUNITY FORESTRY GRANT

The North Carolina Division of Forest Resources Urban and Community Forestry grant can provide funding for a variety of projects that will help toward planning and establishing street trees as well as trees for urban open space. The

goal is to improve public understanding of the benefits of preserving existing tree cover in communities and assist local governments with projects which will lead to a more effective and efficient management of urban and community forests. Grant requests should range between \$1,000 and \$15,000 and must be matched equally with non-federal funds. Grant funds may be awarded to any unit of local or state government, public educational institutions, approved non-profit 501(c)(3) organizations, and other tax-exempt organizations. First time municipal applicant and municipalities seeking Tree City USA status are given priority for funding. Grant applications are due by March 31 at 5:00 pm and recipients are notified by mid-July each year. For more about Tree City USA status, including application instructions, visit: http://ncforestservice.gov/Urban/urban_grant_overview.htm

LOCAL GOVERNMENT FUNDING SOURCES

Municipalities often plan for the funding of pedestrian and bicycle facilities or improvements through development of Capital Improvement Projects (CIP) or occasionally, through their annual Operating Budgets. In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from \$100,000 to \$500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each category is described below. A variety of possible funding options available to North Carolina jurisdictions

for implementing pedestrian and bicycle projects are also described below. However, many will require specific local action as a means of establishing a program, if not already in place.

CAPITAL RESERVE FUND

Municipalities have statutory authority to create capital reserve funds for any capital purpose, including pedestrian facilities. The reserve fund must be created through ordinance or resolution that states the purpose of the fund, the duration of the fund, the approximate amount of the fund, and the source of revenue for the fund. Sources of revenue can include general fund allocations, fund balance allocations, grants, and donations for the specified use.

CAPITAL PROJECT ORDINANCES

Municipalities can pass Capital Project Ordinances that are project specific. The ordinance identifies and makes appropriations for the project.

LOCAL IMPROVEMENT DISTRICT (LID)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation.

MUNICIPAL SERVICE DISTRICT

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the town-wide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts, and can include projects such as street, sidewalk, or bikeway improvements within the downtown taxing district.

TAX INCREMENT FINANCING

Project Development Financing bonds, also known as Tax Increment Financing (TIF) is a relatively new tool in North Carolina, allowing localities to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., sidewalk improvements) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to finance the debt created by the original public improvement project. Streets, streetscapes, and sidewalk improvements are specifically authorized for TIF funding in North Carolina. Tax Increment Financing typically occurs within designated development financing districts that meet certain economic criteria that are approved by a local governing body. TIF funds are generally spent inside the boundaries of the TIF district, but they can also be spent outside the district if necessary to encourage development within it.

OTHER LOCAL FUNDING OPTIONS

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Installment purchase financing
- In-lieu-of fees
- Partnerships

PRIVATE AND NON-PROFIT FUNDING SOURCES

Many communities have solicited greenway funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available.

LAND FOR TOMORROW CAMPAIGN

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals, and community groups committed to securing support from the public and General Assembly for

protecting land, water, and historic places. The campaign was successful in 2013 in asking the North Carolina General Assembly to continue to support conservation efforts in the state. The state budget bill includes about \$50 million in funds for key conservation efforts in North Carolina. Land for Tomorrow works to enable North Carolina to reach a goal of ensuring that working farms and forests, sanctuaries for wildlife, land bordering streams, parks, and greenways, land that helps strengthen communities and promotes job growth, and historic downtowns and neighborhoods will be there to enhance the quality of life for generations to come. For more information: <http://www.land4tomorrow.org/>

THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrated in four areas:

- » To ensure that all Americans have access to basic health care at a reasonable cost
- » To improve care and support for people with chronic health conditions
- » To promote healthy communities and lifestyles
- » To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

Projects considered for funding typically are innovative and aim to create meaningful, transformative change. Project examples include: service demonstrations; gathering and monitoring of health-related statistics; public education; training and fellowship programs; policy analysis; health services research; technical assistance; communications activities; and evaluations. For more specific information about what types of projects are funded and how to apply, visit

<http://www.rwjf.org/en/how-we-work/grants/what-we-fund.html>

NORTH CAROLINA COMMUNITY FOUNDATION

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for non-profit organizations and institutions throughout the state. Based in Raleigh, the foundation also manages a number of community affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide. For more information: <http://nccommunityfoundation.org/>

WALMART STATE GIVING PROGRAM

The Walmart Foundation financially supports projects that create opportunities for better living. Grants are awarded for projects that support and promote education, workforce development/economic opportunity, health and wellness, and environmental sustainability. Both programmatic and infrastructure projects are eligible for funding. State Giving Program provides grants to 501(c)(3) organizations, ranging from \$25,000 to \$250,000. The program grant application deadline is May 1st. Online resource: <http://foundation.walmart.com/apply-for-grants/state-giving>

RITE AID FOUNDATION GRANTS

The Rite Aid Foundation is a foundation that supports projects that promote health and wellness in the communities that Rite Aid serves. Award amounts vary and grants are awarded on a one year basis to communities in which Rite Aid operates. The Rite Aid Foundation focuses on three core areas for charitable giving: chil-

dren's health and well-being; special community health and wellness needs; and Ride Aid's own community of associates during times of special need. Online resource: <https://www.riteaid.com/about-us/rite-aid-foundation>

Z. SMITH REYNOLDS FOUNDATION

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. The Foundation focuses its grant making on five focus areas: Community Economic Development; Environment; Public Education; Social Justice and Equity; and Strengthening Democracy. Deadline to apply is typically in August. For more information: www.zsr.org

BANK OF AMERICA CHARITABLE FOUNDATION, INC.

The Bank of America Charitable Foundation is one of the largest in the nation. There are numerous different initiatives and grant programs, yet the ones most relevant to increased recreational opportunities and trails are the Revitalizing Neighborhoods and Environment Programs. Starting in 2013, a new 10-year, \$50 billion goal to be a catalyst for climate change was launched. This initiative aims to spark the "innovation economy and advance a transition to a low-carbon future." For more information: www.bankofamerica.com/foundation

DUKE ENERGY FOUNDATION

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- » An internal Duke Energy business "sponsor"
- » A clear business reason for making the contribution

The grant program has several investment priorities: Education; Environment; Economic and Workforce Development; and Community Impact and Cultural Enrichment. Related to this

project, the Foundation would support programs that support conservation, training, and research around environmental and energy efficiency initiatives. For more information: <http://www.duke-energy.com/community/foundation.asp>

AMERICAN GREENWAYS EASTMAN KODAK AWARDS

The Conservation Fund's American Greenways Program has teamed with the Eastman Kodak Corporation and the National Geographic Society to award small grants (\$250 to \$2,000) to stimulate the planning, design, and development of greenways. These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays, incorporating land trusts, and building trails. Grants cannot be used for academic research, institutional support, lobbying, or political activities. For more information: <http://www.rlch.org/funding/kodak-american-greenways-grants>

NATIONAL TRAILS FUND

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a \$200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. To date, American Hiking has granted more than \$588,000 to 192 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from \$500 to \$10,000 per project.

Projects the American Hiking Society will consider include:

- » Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.
- » Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.
- » Constituency building surrounding specific trail projects - including volunteer recruitment and support.

For more information: <http://www.americanhiking.org/national-trails-fund/>

THE CONSERVATION ALLIANCE

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. Grants are typically about \$35,000 each. Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to environmental groups across the nation, saving over 34 million acres of wild lands.

The Conservation Alliance Funding Criteria:

- » The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation.
- » The Alliance does not look for mainstream education or scientific research projects, but rather for active campaigns.
- » All projects should be quantifiable, with specific goals, objectives, and action plans and should include a measure for evaluating success.
- » The project should have a good chance for closure or significant measurable results over a fairly short term (within four years).

For more information: <http://www.conservationalliance.com/grants>

NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, non-profit, tax exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants, and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.

The Foundation provides grants through more than 70 diverse conservation grant programs. A few of the most relevant programs for bicycle and pedestrian projects include Acres for America, Conservation Partners Program, and Environmental Solutions for Communities. Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals.

For more information: <http://www.nfwf.org/whatwedo/grants/Pages/home.aspx>

THE TRUST FOR PUBLIC LAND

Land conservation is central to the mission of the Trust for Public Land (TPL).

Founded in 1972, the TPL is the only national non-profit working exclusively to protect land for human enjoyment and well-being. TPL helps acquire land and transfer it to public agencies, land trusts, or other groups that have intentions to conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

For more information: <http://www.tpl.org>

BLUE CROSS BLUE SHIELD OF NORTH CAROLINA FOUNDATION (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. Healthy Places grant concentrates on increased physical activity and active play through support of improved build environment such as sidewalks, and safe places to bike. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the non-profit, provide an audit. For more information: <http://www.bcbsncfoundation.org/>

ALLIANCE FOR BIKING & WALKING: ADVOCACY ADVANCE GRANTS

Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities. Rapid Response Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. Since 2011, Rapid Response grant recipients have won \$100 million in public funding for biking and walking. The Advocacy Advance Partnership with the League of American Bicyclists also provides necessary technical assistance, coaching, and training to supplement the grants. For more information, visit www.peoplepowered-movement.org

LOCAL TRAIL SPONSORS

A sponsorship program for trail amenities allows smaller donations to be received from both individuals and businesses. Cash donations could be placed into a trust fund to be accessed for certain construction or acquisition projects associated with the greenways and open space system. Some recognition of the donors is appropriate and can be accomplished through the placement of a plaque, the naming of a trail segment, and/or special recognition

at an opening ceremony. Types of gifts other than cash could include donations of services, equipment, labor, or reduced costs for supplies.

CORPORATE DONATIONS

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

PRIVATE INDIVIDUAL DONATIONS

Private individual donations can come in the form of liquid investments (i.e. cash, stock, bonds) or land. Municipalities typically create funds to facilitate and simplify a transaction from an individual's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

FUNDRAISING/CAMPAIGN DRIVES

Organizations and individuals can participate in a fundraiser or a campaign drive. It is essential to market the purpose of a fundraiser to rally support and financial backing. Often times fundraising satisfies the need for public awareness, public education, and financial support.

VOLUNTEER WORK

It is expected that many citizens will be excited about the development of a greenway corridor. Individual volunteers from the community can be brought together with groups of volunteers from church groups, civic groups, scout troops and environmental groups to work on greenway development on special community work-days. Volunteers can also be used for fund-raising, maintenance, and programming needs.

INNOVATIVE FUNDING OPTIONS

Crowdsourcing “is the process of obtaining needed services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers.”

For some success stories and ideas for innovative fundraising techniques: <http://www.americantrails.org/resources/funding/TipsFund.html>

TRAIL PARTNERSHIP CASE STUDIES IN THE CAROLINAS

WILMINGTON/NEW HANOVER COUNTY & BLUE CROSS BLUE SHIELD (BCBS)

BCBSNC and their GO NC! program donated funds to complete the final phase of the 15-mile Gary Shell CrossCity Trail from Wade Park to the drawbridge at Wrightsville Beach. In addition to completing the trail, other enhancements include mile markers along the 15-mile trail and five bicycle fix-it stations along the trail. This partnership came about during development of the WMPO’s Wilmington/New Hanover County Comprehensive Greenway Plan in 2012. Project contact: Amy Beatty, Superintendent, City of Wilmington Recreation & Downtown Services, 302 Willard Street, Wilmington, NC 28401; Phone: 910. 341.7855.

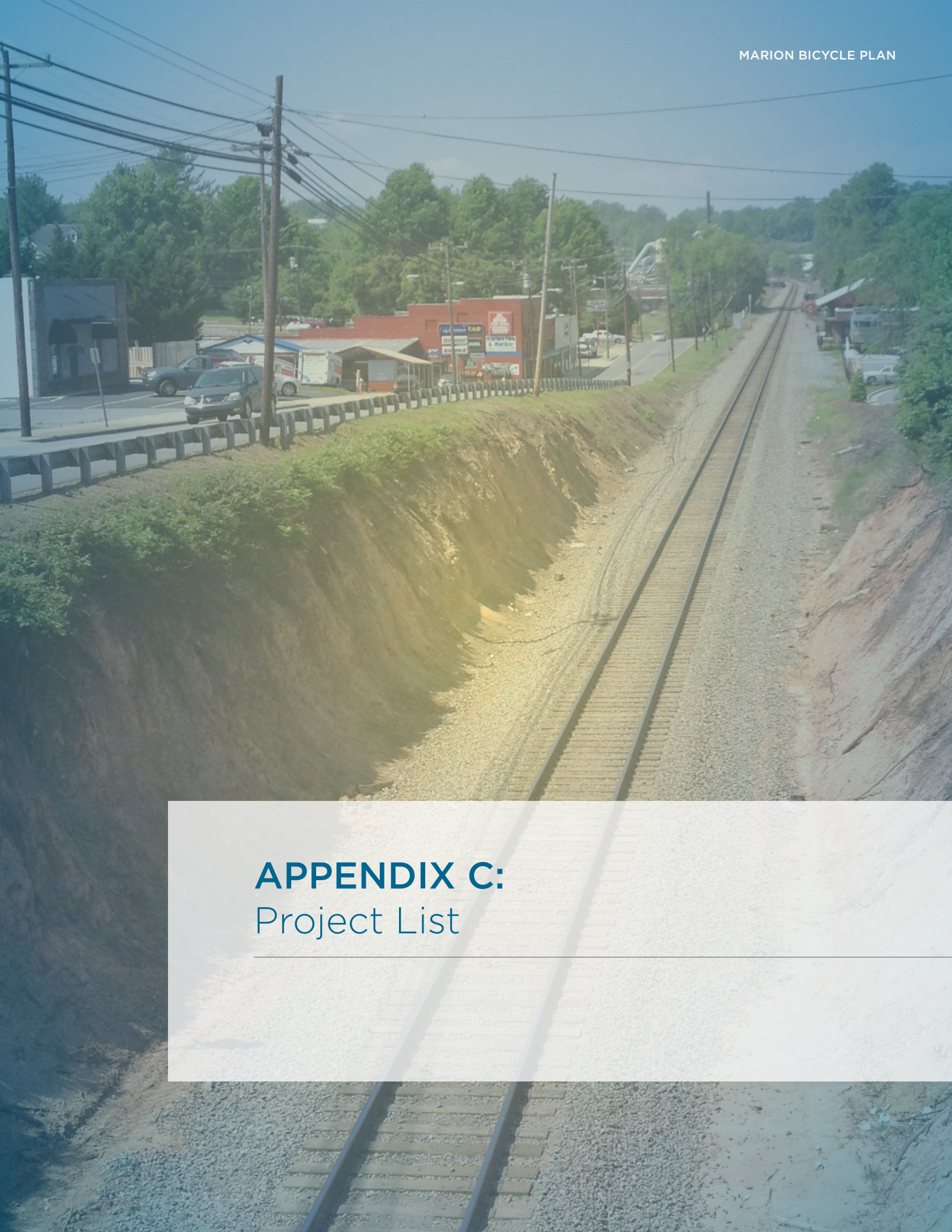
SPARTANBURG, SC & THE MARY BLACK FOUNDATION

The Mary Black Foundation Rail Trail was a collaboration between the Mary Black Foundation, Palmetto Conservation Foundation, City of Spartanburg, Partners for Active Living, SPATS, and local citizens. It extends from downtown Spartanburg at Henry Street, between Union and Pine Streets, and continues 2 miles to Country Club Road. Since its inception there has been buzz about redeveloping the Rail Trail corridor. The commuter and recreational trail brings together all walks of life, and connects neighbor-

hoods, businesses, restaurants, a school, a bike shop, the YMCA, a grocery store, and a skate park. As the Hub City Connector segment of the Palmetto Trail through Spartanburg County, the Rail Trail is an outdoor transportation spine for Spartanburg from which other projects are expected to spin off. One great example is the first phase of B-cycle bicycle-sharing program located at the Henry Street trailhead. Project contact: Lisa Bollinger, Spartanburg Area Transportation Study, 366 North Church Street, Suite 700, Spartanburg, SC 29303; Phone: 864-596-3570.

SWAMP RABBIT TRAIL AND GREENVILLE HEALTH SYSTEM, GREENVILLE, SC

The Greenville Health System Swamp Rabbit Trail is a shared-use-path that runs along the Reedy River through Greenville County, connecting parks, schools, and local businesses. The GHS Swamp Rabbit has become very popular among residents and visitors for recreational and transportation purposes. The Greenville Health System has become a private sponsor because of the health benefits offered by the trail as well as the branding opportunity achieved by having its name and logo on the trail’s signs. The GHS Swamp Rabbit Trail continues to increase in size and popularity, with communities in neighboring counties making plans to extend the trail into their towns. Project contact: Ty Houck, Director of Greenways, Natural and Historic Resources, Greenville County Parks, Recreation and Tourism. 4806 Old Spartanburg Road, Taylors, SC 29687. Phone: 864-676-2180 ext. 141.



APPENDIX C:

Project List

Appendix C: Project List

Roadway(s)	From	To	Length (Miles)	Recommended Facility Type	Destinations Served	Estimated Traffic Volume (High/ Medium/ Low)	Other Notes
US 70 West	City limits (Bryan Dr)	Bus 221 (Main St)	1.71	Bike Lanes	Restaurants, Retail, Mt. Mitchell, Catawba River Trail, West Junior High School	High	Proposed State Bike Route
McDowell High School Rd	US 70	Bus 221 (Main St)	0.84	Sharrows	West Junior High School	Medium	Narrow roadway, coordination during peak school hours needed
Bus 221 (Main St)	US 70	New St	1.9	Sidepath	Commercial, Residential area. Marion Elementary School, Marion Community Building & Splash Pad	High	Priority Investment #3 (page 3-14).
Main St	New St	Morganst	0.62	Sharrows	Downtown	Medium	Priority Project #5 (page 3-16).
New Street, Garden St, Fleming Ave, Robert St	Main St	N McDowell Ave	0.82	Neighborhood Bike Route	Residential, Marion Elementary School	Low	Narrow roadways. Could consider shared lane markings in the future, after wayfinding signage installed.
N. McDowell St	Maple Ave	Oak St	0.1	Sharrows	Residential, Connection between Marion Elementary School and East Junior High School	Low	
N. McDowell St	Oak St	State St	0.22	Road Diet	Residential, Commercial, Connection between Marion Elementary School and East Junior High School	Medium	Traffic analysis needed to determine feasibility of reducing the existing four lane section to three lanes with bike lanes.
N. McDowell St	State St	Woodland Dr	0.13	Sharrows	Residential, Connection between Marion Elementary School and East Junior High School	Low	
Oak St, Lamar St, 5th St, Hill St, Branch St	N. McDowell St	Court St	0.84	Neighborhood Bike Route	Residential area, proposed clinchfield greenway corridor	Low	Narrow roadways. Could consider shared lane markings in the future, after wayfinding signage installed.
Court St	Church St	City Limits	0.71	Rural Bike Route	Commercial retail, Lake James	High	"Bikes May Use Full Lane" signs should be installed.
Court St	Snipes St	Church St	1.4	Bike Lanes and Sharrows	Clinchfield Community Park and Greenway, Downtown, McDowell Public Library, Retail, Residential	High	Priority Project #6 (page 3-17)

Appendix C: Project List

Roadway(s)	From	To	Length (Miles)	Recommended Facility Type	Destinations Served	Estimated Traffic Volume (High/ Medium/ Low)	Other Notes
Yancey St, Perry St, Baldwin Ave, Morehead Rd	Court St	Peavine Corridor	1.98	Neighborhood Bike Route	Peavine Trail, Residential area, East McDowell Junior High School, Eastfield Community Park, Eastfield Global Magnet School, Oak Grove Cemetary	Low to Medium	Narrow roadways. Baldwin Ave carries more traffic, but provides a direct link from several neighborhoods to the Peavine Trail. Could consider shared lane markings in the future, after wayfinding signage installed.
Peavine Trail	State St	College Ave	3.12	Trail	Downtown, McDowell Technical Community College, Residential, Commercial Retail	Off-road; On-road sections along high volume roadways	Priority Investment #1 and #2 (page 3-12 and 3-13).
State St	Main St	McDowell St	0.66	Sharrows	Downtown, Peavine Trail Head, Residential	Low	Narrow roadway.
Georgia Ave	Rutherford Rd	Peavine Corridor	0.15	Sharrows	Downtown, Peavine Corridor, Oak Grove Cemetary, Residential	Medium	
Rutherford Rd	Main St	Georgia Ave	0.5	Bike Lanes/Sharrows Combo	Downtown, Residential, Gazebo, Oak Grove Cemetary	Medium	Priority Project #7 (page 3-18).
Crawford St, Morgan St, Railroad St	Henderson St	Main St	0.36	Sharrows	Downtown, Marion Trail Depot & Farmers Market	Low	
Henderson St	Rankin Dr	Main St	1.4	Road Diet/Corridor Study	Downtown, McDowell Senior Center, McDowell Hospital, YMCA, Bill Hendley Trail & George Hutchins Trail	High	Priority Investment #4 (page 3-15).
Veterans Dr, Nix Creek Rd, Tate St, Cross St, Carson St, Court St	Snipes St	Sugar Hill Rd	2.95	Neighborhood Bike Route	Downtown, Walmart, Residential, Commercial Retail	Low/Medium	Narrow roadways. Could consider shared lane markings in the future, after wayfinding signage installed.
Nix Creek Rd	Veterans Dr	City Limit/Planning Boundary	1.07	Rural Bike Route	Rural scenery	Low	Narrow roadway. "Bikes May Use Full Lane" signs should be installed.
Sugar Hill Rd	Worley Rd	Rankin Dr	1.4	Sidepath	Commercial retail, Walmart, McDowell Hospital, YMCA	High	Traffic analysis needed to determine if a five lane section is warranted. Preliminary design is necessary to determin what side of the road is the most feasible for sidepath construction.
Fleming Ave, Yancy Rd	Robert St	City Limits/Planning Boundary	1	Rural Bike Route	Rural scenery	Low/Medium	Narrow roadways. "Bikes May Use Full Lane" signs should be installed.