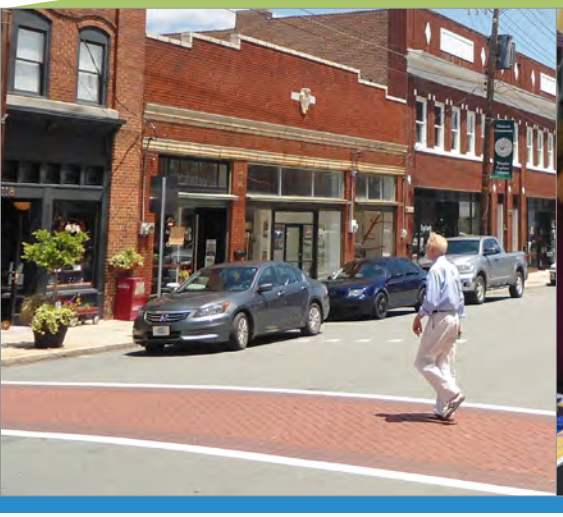
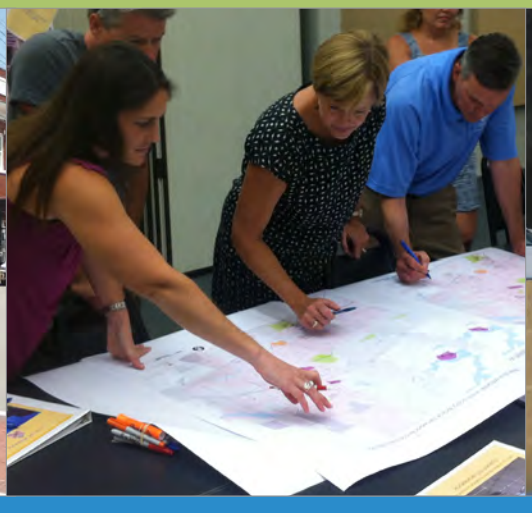
CITY of MEBANE





BICYCLE AND PEDESTRIAN TRANSPORTATION PLAN

January 2015

Prepared for the City of Mebane, North Carolina
Prepared by Alta Planning + Design

ACKNOWLEDGEMENTS

Thanks to the over 200 local residents that participated in the development of this plan through meetings, events, comment forms, and plan review. Special thanks to the local residents, government staff, and community and business leaders who participated as steering committee members, listed below.

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This project was made possible with funding from the Burlington-Graham MPO, City of Mebane, and NCDOT.

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CHAPTER ONE

INTRODUCTION

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Introduction

The City of Mebane's Bicycle and Pedestrian Transportation Plan communicates the blueprint for making bicycling and walking an integral part of daily life in Mebane. Funded by the City of Mebane, Burlington Graham MPO, and NCDOT, the plan advances an agenda of better mobility, improved health, economic development, environmental stewardship, and improved safety impacts by recommending connected infrastructure, policies, and programs for bicycle and pedestrian transportation and recreation.

Purpose

This Bicycle and Pedestrian Transportation Plan provides a broad vision, strategies and actions for the improvement of the bicycling and walking environments in Mebane. The purpose of this plan is to expand the existing network, complete network gaps, provide greater connectivity, educate and encourage the public, and maximize funding sources.

Vision and Goals

The Vision and Goals of the City of Mebane's Bicycle and Pedestrian Transportation Plan will guide the development and implementation of the City's bicycle and pedestrian networks and programming for years to come. The vision is a broad inspirational statement that presents a desired future state. Goals are statements of what the City and its residents hope to achieve over time and that ultimately add up to the stated vision. The plan vision and goals were established through a visioning input session with the Steering Committee at the April 23, 2014 kick-off meeting. The vision and goals serve to guide the analysis and recommendations found in this plan.

Vision Statement

The City of Mebane will be a clean, connected, healthy, and active community where residents and visitors can experience nature, enjoy exercising, and travel safely by foot or by bicycle to local businesses, services, and schools.

Goals of the Bicycle and Pedestrian Transportation Plan

- Create recurring annual community events to educate and encourage residents to bike and walk to school and to local businesses and services.
- Raise awareness and educate decision-makers, stakeholders, interest groups, and the public on the benefits of bikeways, walkways, greenway trails, and active, healthy lifestyles.
- Identify consistent funding streams for bicycle and pedestrian improvements.
- Build high priority bicycle and pedestrian facilities as part of a comprehensive network to better connect neighborhoods to the downtown, public spaces, and other important destinations.
- Increase pedestrian and bicyclist safety by reducing the number of bicycle and pedestrian-related accidents each year.
- Improve pedestrian connectivity by filling sidewalk gaps and providing crosswalks at intersections.

Planning Process

The planning process began in April 2014 and lasted eight months, featuring robust stakeholder and public engagement. A steering committee was formed of key stakeholders and guided the planning process, meeting at key milestones during the project timeline. A strategic public outreach effort that included a project website was implemented to reach and engage the residents of Mebane. A draft plan was completed in September 2014 and was reviewed by local government staff, the steering committee, and the general public. The final plan was adopted by the City of Mebane in January 2015. Over 200 residents participated and contributed to the outcomes of this study.

Study Area

The study area includes everything within the boundaries of the Mebane city limits. A variety of landscapes can be found ranging from urban to rural and from a developed downtown core to agricultural uses. The plan provides specific, appropriate, and context-sensitive infrastructure, policy, and programmatic recommendations for each land use type, roadway, and corridor.

Why this Plan is Important

Coming at the heels of a successful statewide bicycle and pedestrian planning initiative WalkBikeNC, this plan addresses the specific needs and interests of the City of Mebane. The WalkBikeNC Plan emphasized the importance of providing North Carolina citizens with multi-modal transportation options and addressed the positive impact to statewide economic, health, and safety issues. The City of Mebane faces many of the same challenges as the rest of the State. This plan is an extension of the WalkBikeNC effort and is catered towards the specific and unique needs of the Mebane community.

The steering committee reviewed base maps and provided feedback during the kickoff meeting.

The steering committee developed the vision statement and goals for the Bicycle and Pedestrian Transportation plan during the kick off meeting.

The health and economic benefits of walkable and bikable communities are well-documented and serve to inform the importance of implementing this Plan. People and businesses are choosing to live and relocate in communities that offer high quality of life amenities including greenways and bikeways. Changes in the built environment offer more opportunities to increase physical activity. An economic impact analysis and health impact assessment (HIA), which were conducted as part of the WalkBikeNC Plan, predicted staggering positive impacts to the economy and resident health with the implementation of bicycle and pedestrian infrastructure such as greenways and sidewalks.

Benefits of a Walk- and Bicycle-Friendly Community

When considering the level of dedication in time and valuable resources that it takes to create a walk- and bicycle-friendly community, it is also important to assess the immense value of active transportation. Better walking and bicycling facilities improve safety and encourage more people to walk and ride, which in turn improves health, provides a boost to the local economy, creates a cleaner environment, reduces congestion and fuel costs, and contributes to a better quality of life and sense of community.

Communities across the country are experiencing the benefits of providing a supportive environment for walking and bicycling. With a better active transportation network, Mebane can create a stronger, more vibrant community and take advantage of the many types of benefits described below.

Increased Health and Physical Activity

A growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects our level of physical activity. Regular physical activity is recognized as an important contributor to good health; the Centers for Disease Control and Prevention (CDC) recommend 30 minutes of moderate physical activity each day for adults and 60 minutes each day for children.[1] Unfortunately, many people do not meet these recommendations because they lack environments where they can be physically active. The CDC reports that "physical inactivity causes numerous physical and mental health problems, is responsible for an estimated 200,000 deaths per year, and contributes to the obesity epidemic."[2] These conditions also increase families' medical expenses; each year North Carolinians spend over $24 billion on health care costs associated with a lack of physical activity, excess weight, type II diabetes, and poor nutrition.[3]

Having accessible pedestrian and bicycle facilities available, such as sidewalks, bike lanes, and paths, can help people incorporate physical activity into their daily lives. Sixty percent of North Carolinians say they would increase their level of physical activity if they had better access to walking and bicycling facilities, such as sidewalks and trails.[4] Regular physical activity is shown to have numerous health benefits:[5]

- Reduces the risk and severity of heart disease and diabetes
- Reduces the risk of some types of cancer
- Improves mood
- Controls weight
- Reduces the risk of premature death

The American Public Health Association also recognizes the health benefits of walk- and bike-friendly communities. According to its 2010 report, "Investments in transit, walking and bicycling facilities support transit use, walking and bicycling directly; they also support the formation of compact, walkable, transit-oriented neighborhoods that in turn support more walking, bicycling and transit and less

The Cost of Transportation-Related Health Outcomes

The National Health Costs of…	$$ (Billions)	Estimate Includes	Source
Obesity and overweight	$142	• Healthcare costs • Lost wages due to illness & disability • Future earnings lost by premature death	National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Statistics Related to Overweight and Obesity: The Economic Costs. Available at: http://win.niddk.nih.gov/statistics/index.htm
Air pollution from traffic	$50-80	• Health care costs • Premature death	Federal Highway Administration. 2000. Addendum to the 1997 Federal Highway Cost Allocation Study Final Report, May 2000. Available at: www.fhwa.dot.gov/policy/hcas/addendum.htm
Traffic crashes	$180	• Healthcare costs • Lost wages • Property damage • Travel delay • Legal/administrative costs • Pain & suffering • Lost quality of life	AAA. Crashes vs. Congestion? What's the Cost to Society? Cambridge, MD: Cambridge Systematics, Inc.; 2008. Available at: www.aaanewsroom.net/assets/files/20083591910.crashesVscongestionfullreport2.28.08.pdf

Source: The American Public Health Association, 2010, The Hidden Health Costs of Transportation

driving. These built environments have repeatedly been associated with more walking, bicycling and transit use, more overall physical activity, and lower body weights; lower rates of traffic injuries and fatalities, particularly for pedestrians; lower rates of air pollution and greenhouse gas emissions; and better mobility for non-driving populations."[6]

The CDC determined that creating and improving places to be active could result in a 25 percent increase in the number of people who exercise at least three times a week.[7] This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. The establishment of a safe and reliable network of sidewalks, bikeways, and trails can have a positive impact on the health of nearby residents. The Rails-to-Trails Conservancy puts it simply: "Individuals must choose to exercise, but communities can make that choice easier."[8]

Economic Benefits

Transportation Savings

When it comes to transportation costs, walking and bicycling are the two most affordable forms of transportation available. 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.[9] Owning and operating a bicycle costs just $120 per year, according to the League of American Bicyclists.[10] 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."

Bicycling and walking become even more attractive from an economic standpoint when the unstable price of gasoline is factored into the equation. Oil prices more than quadrupled between 2000 and 2008, when gasoline prices topped $4 a gallon.[11] The unreliable cost of fuel reinforces the idea that local communities should be built to accommodate people-powered transportation, such as walking and biking. Many older North Carolina communities already have traditional mixed-use and generally compact land development patterns; when combined with new strategies for improving bicycle and pedestrian transportation, many such communities could foster local reductions in auto- and oil-dependency.

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. American Automobile Association, Your Driving Costs Report: 2013 Edition.

Property Values

Pedestrian and bicycle facilities such as sidewalks, bike lanes, and greenway trails are popular community amenities that add value to properties nearby. According to a 2002 survey by the National Association of Realtors and the National Association of Homebuilders, homebuyers rank trails as the second-most important community amenity out of 18 choices, above golf courses, ball fields, parks, security, and others.[12] This preference for trails is reflected in property values around the country. In the Shepard's Vineyard residential development in Apex, North Carolina, homes along the regional greenway were priced $5,000 higher than other residences in the development – and these homes were still the first to sell.[13] A study of home values along the Little Miami Scenic Trail in Ohio found that single-family home values increased by $7.05 for every foot closer a home is to the trail.[13] These higher prices reflect how trails and greenways add to the desirability of a community, attracting homebuyers and visitors alike.

Environmental Improvements

Air Quality

Providing the option of walking or bicycling as an alternative to driving can reduce the volume of gasoline consumed and resulting car-related emissions, which in turn improves air quality. Cleaner air reduces the risk and complications of asthma, particularly for children, the elderly, and people with heart conditions or respiratory illnesses.[14] Lower automobile traffic volumes also help to reduce neighborhood noise levels and improve local water quality by reducing automobile-related discharges that are washed into local rivers, streams, and lakes. Furthermore, every car trip replaced with a walking or bicycling trip reduces U.S. dependency on fossil fuels, which is a national goal. According to a survey by the National Association of Realtors and Transportation

for America, 89 percent of Americans agree that transportation investments should support the goal of reducing energy use.[15]

Environmental Services of Greenways

Greenways and trails are a key component of any pedestrian and bicycle network and carry environmental benefits as well. Greenways protect and link fragmented habitat and provide opportunities for protecting plant and animal species. By conserving plant cover, greenways also preserve the natural air filtration processes provided by plants, filtering out harmful pollutants, such as ozone, sulfur dioxide, carbon monoxide, and airborne heavy metal particles. Finally, greenways improve water quality by creating a natural buffer zone that protects streams, rivers and lakes, preventing soil erosion and filtering pollution caused by agricultural and road runoff. Greenways also act as a line of defense against natural hazards such as flooding.

Transportation Benefits

Many North Carolinians do not have access to a vehicle or are unable to drive. According to the 2001 National Household Travel Survey, 12 percent of persons age 15 or older do not drive, and 8 percent of U.S. households do not own an automobile. Providing a well-connected pedestrian and bicycle network provides those who are unable or unwilling to drive with a safe transportation option. These improvements can increase access to important destinations for the young, the elderly, low-income families, and others who may be unable to drive or do not have a motor vehicle.

Investing in pedestrian and bicycle facilities can also help to reduce congestion and the pollution, gas costs, wasted time, and stress that comes with it. Each person who makes a trip by foot or by bicycle is one less car on the road or in the parking lot. A network of sidewalks, on-road bikeways, and paths gives people the option of making a trip by walking or bicycling, which helps to alleviate congestion for everyone. Pedestrian and bicycle facilities can also help to substantially reduce transportation costs by providing a way of getting around without a car for some trips. About half of all trips taken by car are three miles or less, equivalent to a 15-minute bike ride.[16] With a safe, convenient network

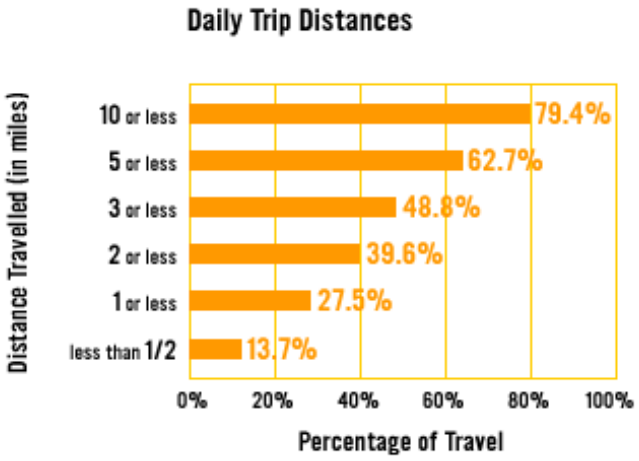
During the planning process, it was important to consider all users, abilities, and modes of transportation.

for walking and bicycling, some of these shorter trips could be comfortably made without needing a car, saving money on gas, parking costs, and vehicle wear and tear over time.

Quality of Life

Many factors go into determining quality of life for the citizens of a community: the local education system, prevalence of quality employment opportunities, and affordability of housing are all items that are commonly cited. Increasingly though, citizens are demanding a cleaner, safer, more enjoyable community that provides amenities for adults and children alike. Communities with quality greenways, sidewalks, and bicycle routes attract new residents as well as new businesses and industries. Getting outdoors and being physically active also helps to relieve stress, improve mood, and foster social connections between residents.

Transportation and recreation options will be especially important for older Americans in the coming years. According to the Brookings Institution, the number of older Americans is expected to double between 2000 and 2025.[17] Seniors who find themselves unable to drive or who become uncomfortable with driving will find that their mobility is severely limited if another transportation option isn't available. Trails and paths will provide seniors with a place to take a low-intensity bike ride or a stroll around the neighborhood, or a way to get to nearby shops and services. Paths and trails are also valuable transportation connections for the elderly because they accommodate motorized wheelchairs, which can provide many seniors with the independent mobility that they would not have otherwise.



Almost 50 percent of all trips are 3 miles or less, or less than a 15-minute bike ride. Source: Pedestrian and Bicycle Information Center, www.pedbikeinfo.org

Children under 16 are another important subset of our society who deserve access to safe mobility and a higher quality of life. In recent years, increased traffic and a lack of pedestrian and bicycle facilities have made it less safe for children to travel to school or to a friend's house. In 1969, 48 percent of students walked or biked to school, but by 2001, less than 16 percent of students walked or biked to or from school.

In a 2004 Centers for Disease Control and Prevention survey, 1,588 adults answered questions about barriers to walking to school for their youngest children aged 5 to 18 years.[18] The main reasons cited by parents included distance to school, at 62%, and traffic-related danger, at 30%. Strategic additions to the bicycle and pedestrian network could shorten the distance from homes to schools, and overall pedestrian and bicycle improvements can improve the safety of our roadways so that children within Mebane could once again safely bike in their communities. According to the National Center for Safe Routes to School, "Walking or biking to school gives children time for physical activity and a sense of responsibility and independence; allows them to enjoy being outside; and provides them with time to socialize with their parents and friends and

to get to know their neighborhoods."[19] Ensuring that children have safe connections to their schools and throughout their neighborhoods can encourage them to spend time outdoors, get the physical activity they need for good health, and enjoy a higher quality of life.

Endnotes

1. Centers for Disease Control and Prevention. http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html
2. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. (1996). Physical Activity and Health: A Report of the Surgeon General
3. Be Active North Carolina. (2005). The Economic Cost of Unhealthy Lifestyles in North Carolina. Retrieved from www.beactivenc.org/mediacenter/Summary%20Report.pdf.
4. North Carolina State Center for Health Statistics. (2007). Behavioral Risk Factor Surveillance System (BRFSS), Calendar Year 2007 Results, www.schs.state.nc.us/SCHS/brfss/2007/index.html.
5. National Prevention Council. (2011). National Prevention Strategy: America's plan for better health and wellness. Retrieved from http://www.healthcare.gov/prevention/nphpphc/strategy/report.pdf
6. American Public Health Association. (2010) The Hidden Health Costs of Transportation.
7. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). Guide to Community Preventive Services.
8. Rails-to-Trails Conservancy. (2006) Health and Wellness Benefits.
9. American Automobile Association. (2013). Your Driving Costs: How Much are You Really Paying to Drive? 2013 Edition.
10. The League of American Bicyclists. www.bikeleague.org
11. King, Neil. The Wall Street Journal: Another Peek at the Plateau. (2/27/08)
12. National Association of Homebuilders. (2008). www.nahb.com
13. Rails to Trails Conservancy. (2005). Economic Benefits of Trails and Greenways.
14. Health Effects Institute (2010). Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects. Special Report 17.
15. National Association of Realtors and Transportation for America. (2009). 2009 Growth and Transportation Survey. www.t4america.org/docs/011609_pr_nart4poll.pdf
16. U.S. Department of Transportation and Federal Highway Administration. (2009). National Household Travel Survey.
17. Brookings Institution. 2003. The Mobility Needs of Older Americans: Implications for Transportation Reauthorization.
18. Centers for Disease Control and Prevention. The Importance of Regular Physical Activity for Children. Accessed in 2005 from www.cdc.gov/nccdphp/dnpao/index.html
19. National Center for Safe Routes to School. (2006). National Center for Safe Routes to School Talking Points.

CHAPTER TWO

EXISTING CONDITIONS

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Overview

The City of Mebane has a number of features to attract people to walk and bike in the community, and a large portion of the population already walks or bikes at least some of the time for recreation, exercise, or utilitarian trips. This chapter discusses the current bicycle and pedestrian network, the many opportunities that exist as starting points for improvement, the constraints that the City must address to become more walk- and bicycle-friendly, and the demand for safer, better-connected facilities throughout Mebane. The observations presented in this chapter help to inform this plan's recommendations and implementation strategy.

Photographic Summary of Existing Conditions

An analysis of Mebane's existing bicycling and pedestrian environments identified a number of elements that are considered opportunities and challenges for creating a bikeable, walkable, and active community. An opportunity represents a situation or condition that is favorable to bicycle or pedestrian travel, either today or in the future. A challenge represents a situation or condition that is a potential limitation or restriction to bicycle or pedestrian access. This section identifies the opportunities and challenges associated with the existing environment in Mebane, as noted by the consultant team's field review and input from the public, City staff, the steering committee, and key stakeholders.

Opportunities

1. Existing sidewalk network
2. Quiet neighborhood streets
3. Greenway corridors and easements
4. Key destinations clustered in and adjacent to downtown Mebane

Existing Sidewalk Network

Many roads in Mebane offer sidewalks on at least one side of the street. Sidewalks downtown are wide and some have attractive street furniture and restaurant seating. Recently, Mebane has implemented projects in downtown to construct crosswalks with attractive pavers, ADA ramps, and high-visibility crossings.

The Fifth Street sidewalk bridge is a clear sign of the dedication of the City to creating places to walk.

Sidewalk is found on one side along a substantial portion of Third Street, providing connectivity for residents to destinations such as parks and schools.

Sidewalk is found along 5th Street from Downtown to Mebane Oaks Road.

Quiet Neighborhood Streets

Many roads in Mebane are favorable for walking and bicycling because they have low automobile traffic volumes and speeds. In Mebane, many neighborhood streets provide access to downtown and other popular destinations, giving pedestrians and bicyclists safer, quieter alternatives to busy streets.

The roadway system in the core of Mebane is a grid network, creating calmer roads like here at Second Street and Jackson Street.

Even though there is no sidewalk at Crawford Street and Second Street, traffic volumes are low and walking is a comfortable option.

Greenway Corridors and Easements

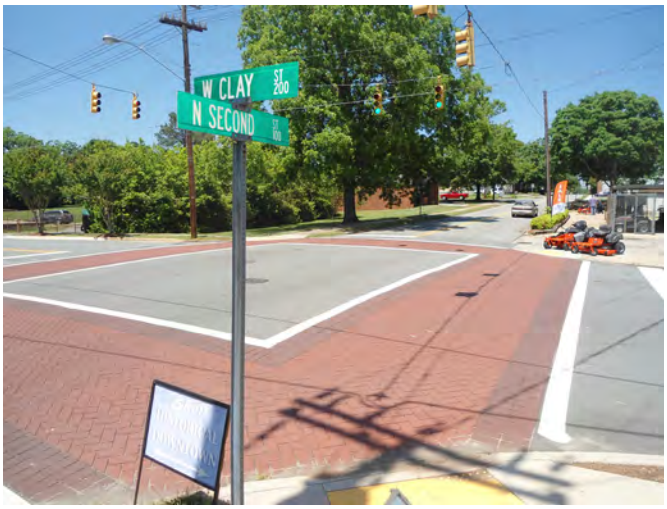
The City of Mebane maintains numerous miles of sewer and utility easements that currently serve as greenway corridors and can be used for routing trails. Sewer easements throughout the city serve as ideal corridors for future trails because they are relatively flat and regularly maintained.

Easement roadway off W. Lebanon Road that offers an opportunity for a greenway trail.

Sewer easement near First Street and Roosevelt Street provides an opportunity for a greenway on publicly-owned land that would connect adjacent neighborhoods to each other and to South Mebane Elementary School.

Downtown Core

Downtown Mebane is a bustling hub of activity with key destinations such as shops, restaurants, and services that attract pedestrians and bicyclists to the area.



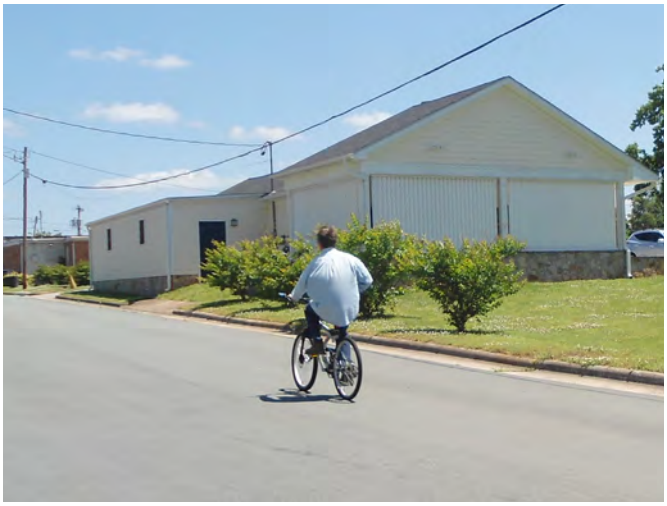
Clay Street marked crosswalks with pavers are high-quality and high-visibility in the Downtown core.

Marked crosswalks at Clay Street and Fifth Street.

Observed Walking and Bicycling Activity

Many pedestrians and bicyclists can be found throughout Mebane on an average day. Many walk for exercise; some walk to destinations such as restaurants; others bike simply as an alternative to driving their car.

A bicyclist picks up breakfast at 5th Street and Mebane-Oaks Road. There was no bike rack to park his bicycle.



A bicyclist at Clay Street and Wilba Street.

Pedestrians walking for exercise and to conduct work tasks at 3rd Street and Washington Street.

A pedestrian utilizing the midblock crossing of Clay Street.

Constraints

1. Lack of connectivity
2. Lack of bicycle facilities and greenways
3. Railroad crossings
4. Lack of pedestrian crossings
5. Major roadway barriers
6. Maintenance issues

Lack of Connectivity

Compared with other similar North Carolina communities, the City of Mebane has done well to extend its sidewalk network along its major arterial and collector roads (Examples - Third Street and Fifth Street). However, there are still gaps that break down connectivity of the sidewalk network. These gaps may be very short sections (less than a block) and other gaps may be for multiple blocks.

A gap in the sidewalk along Second Street at the Mebane Historical Museum and tennis court area.

As the sidewalk changes sides of road, here at Fifth Street and Kit Street, there is no marked crosswalk connecting the two. This highlights a pedestrian crossing issue but can also be considered a gap to a connected pedestrian network.

Lack of Bicycle Facilities and Greenways

Other than mapped regional bike routes, the City of Mebane does not have bicycle facilities such as bike lanes, sharrows, or paved shoulders.

A consultant measures roadway dimensions, here at Fifth Street. Roadways in Mebane lack separated facilities, and in this case, lack the existing pavement width necessary to fit them easily.

Railroad Crossings

Railroad crossings are often a physical barrier for bicyclists and pedestrians. Uneven crossings, gaps between the pavement and the rail, and collected debris all make it difficult for pedestrians and bicyclists to safely cross, especially those individuals with disabilities who may be using a wheelchair or a walker for mobility.

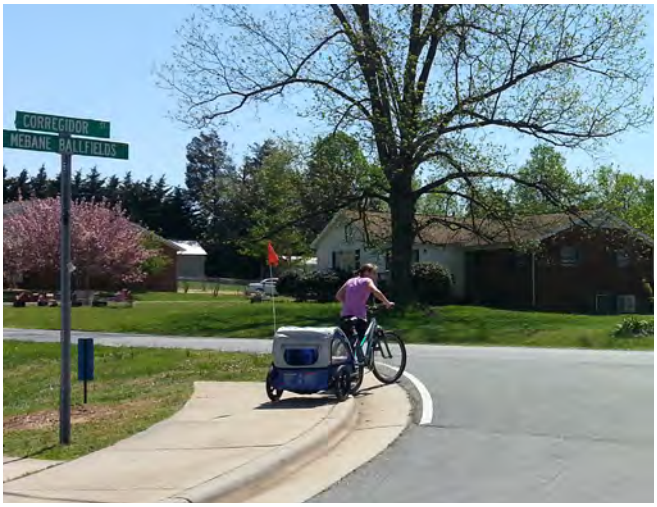
Railroad crossing at Fifth Street lacks a safe place for pedestrians to cross. Pedestrians must either cross the tracks or walk into the roadway.

Lack of Pedestrian Crossings

Many intersections lack needed pedestrian crossing treatments such as crosswalks, curb ramps, and countdown signals.

Pedestrians cross Center Street at Fifth Street without a marked crosswalk.

Pedestrians cross at Fifth Street and Jackson Street. While some crosswalks are present, they are missing for other legs.



Many pedestrians and bicyclists were observed crossing Third Street at Corregidor Street during fieldwork observations. The sidewalk changes sides of Third Street without any crosswalk feature or signage.

Major Roadway Barriers

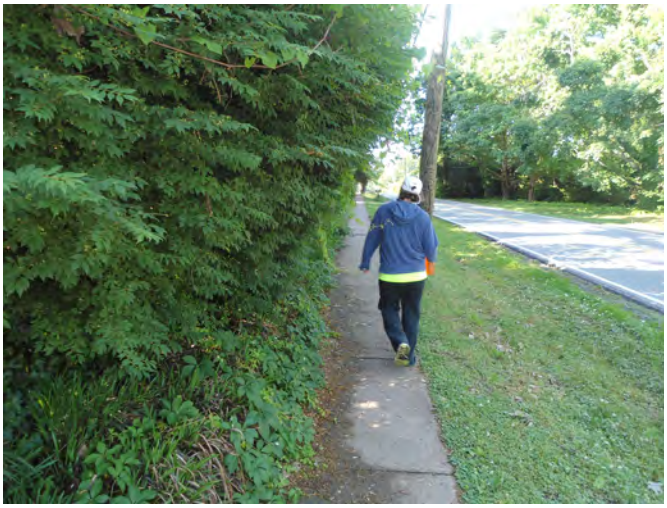
Highways and other major roads with higher posted speeds and traffic volumes are especially uncomfortable for pedestrians and bicyclists. Roads such as Mebane-Oaks Road and Fifth Street can be uncomfortable to walk along and across. I-40 is a large barrier to the southern extent of Mebane as its existing bridges are not safe for walking or bicycling.

The long crossing of Mebane Oaks Road at the Fifth Street intersection is foreboding, especially without a crosswalk, signal, or refuges.

With approximately 1.5 foot paved shoulder across I-40 on Mebane Oaks Road, there is virtually no safe place for walking and bicycling.

Maintenance Issues

Some sidewalks and marked crossings are in need of more regular maintenance and repair. In some cases, policy and enforcement is needed to keep sidewalks clear. Examples include debris in sidewalks, heavily worn crosswalk markings, and cracked and overgrown sidewalks.



Overgrown vegetation forces this pedestrian to lean to the side when walking along Fifth Street.

Yard waste debris on First Street, near the Food Lion, can cause a pedestrian to alter his or her path.

Existing Conditions Maps

The next several pages feature existing condition summary maps. The maps show existing facilities and demographic analyses.

Map 2.1 show existing sidewalks, bike routes, and destinations in the Mebane area. A dense network of sidewalk exists in sections of central Mebane, including downtown, but there are several gaps between neighborhoods and destinations. There are no true bike facilities (other than state/regional bike routes) and there are no greenways at the time of this study.

Map 2.2 highlights pedestrian and bicycle crashes that have occurred in Mebane between 2007-2011 (according to NCDOT crash databases). Accidents appear to be randomly distributed in the area. These crash sites were studied during fieldwork analysis to identify potential issues.

Map 2.3 shows households with no vehicle. This information is valuable as it identifies areas of need for alternative forms of transportation. As a whole, there are 7.7% of households without access to vehicle in Mebane.

Maps 2.4 and 2.5 show the proportion of working commuters in each block group who walk or bike to work. Overall, Mebane has a walk to work rate of 0.9% and a bike to work rate of 0%. These are both lower than the State of North Carolina (walk to work rate - 1.8%; bike to work rate - 0.2%). The highest share of pedestrian commuters is located on the south and western portions of Mebane. These rates are important for understanding where people are already walking and biking, the conditions that they face on their commute, and how conditions can be improved to encourage more people to walk and bike, particularly in dense, mixed-use portions of town.

Map 2.6 is a population density map highlighting those places that have the most density. These areas typically have multi-family housing. Connected bicycle and pedestrian facilities through these areas would impact more people directly.

Map 2.7 portrays median family income. This map, similar to Map 2.3, highlights areas that may have more need for alternative transportation options.

Maps 2.8 and 2.9 show Minority Population and Hispanic Populations by block group in the City of Mebane. These groups are typically underrepresented. These demographic analyses were considered in this study to ensure equity is achieved in bicycle and pedestrian recommendations.

Map 2.1

Existing Bicycle and Pedestrian Facilities

0 0.5 1 Miles

N

Existing Facilities

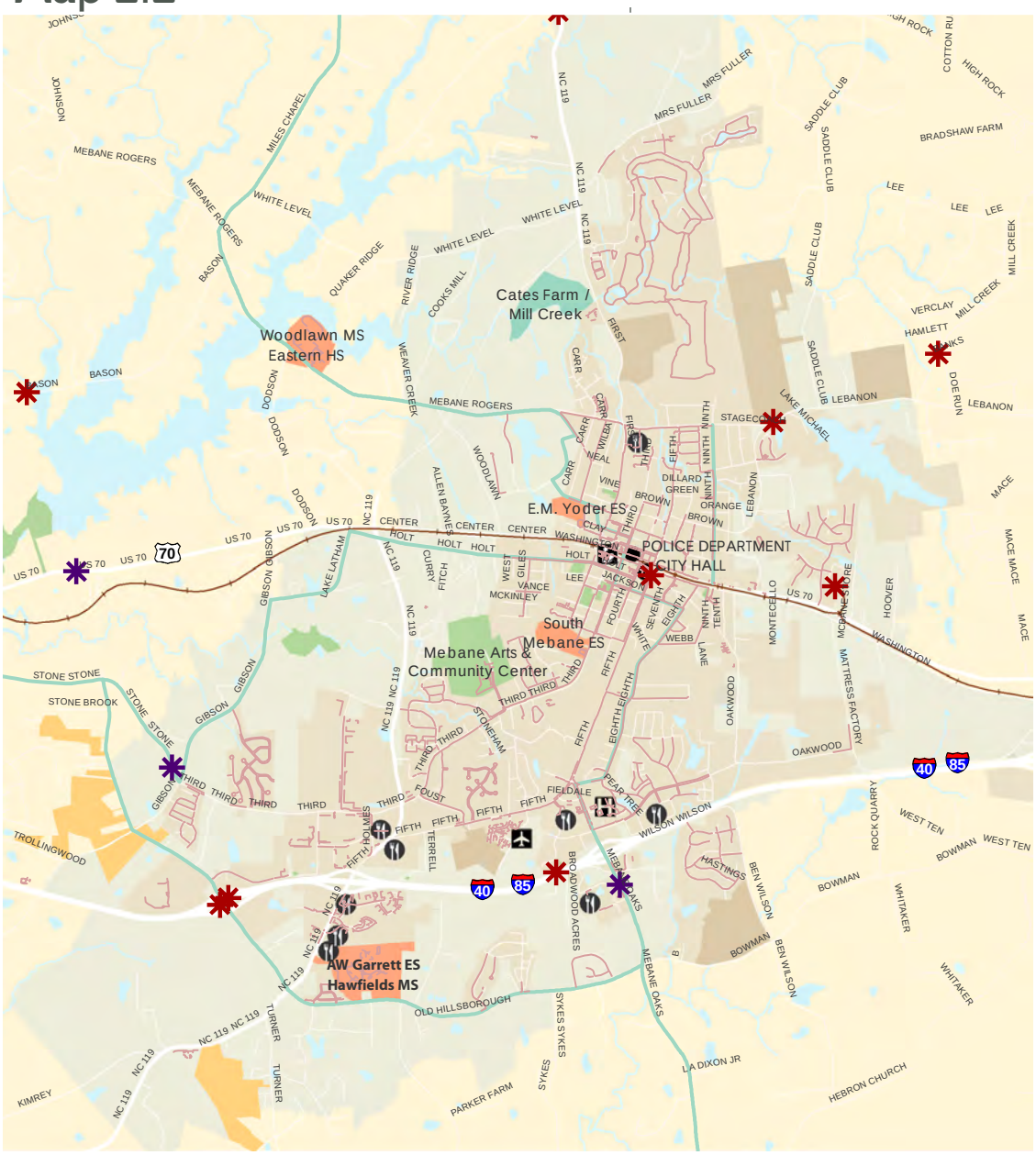
- Existing Sidewalks
- Existing Bike Routes

- Shopping Center
- Library
- Hospital
- Airport
- Municipal Building

- Parks
- Schools
- Low Income Housing
- Future Housing Areas

- Railroad
- Hydrology
- Mebane City Limits
- Mebane ETJ

Map 2.2

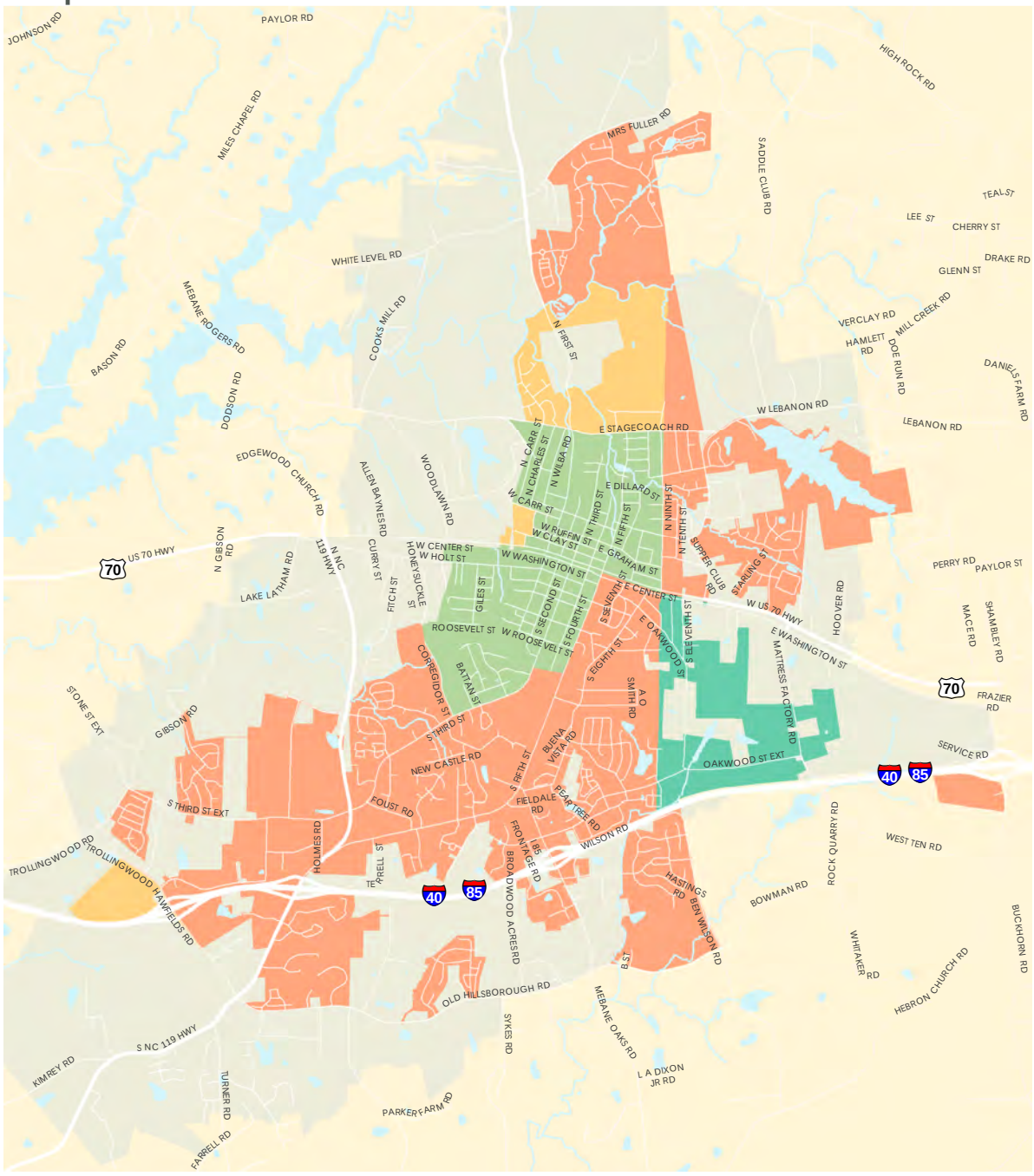


Bicycle and Pedestrian Crashes

Crashes 2007-2011

- Pedestrian Crash
- Bicycle Crash
- Existing Sidewalks
- Existing Bike Routes
- Shopping Center
- Library
- Hospital
- Airport
- Municipal Building
- Parks
- Potential Conservaion Lands
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- Mebane City Limits
- Mebane ETJ

Map 2.3



Households with No Access to a Vehicle

0 0.5 1 Miles

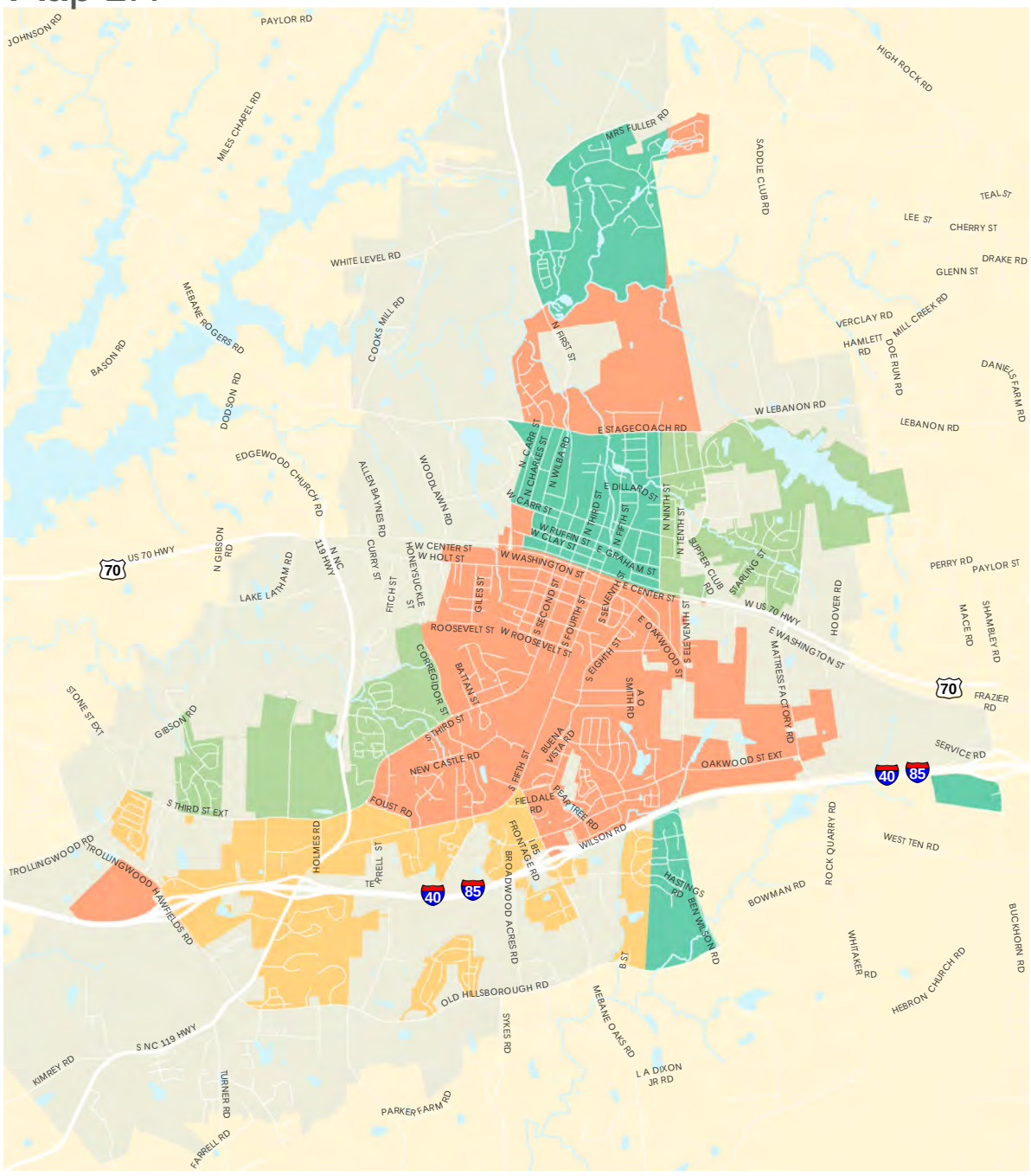
N

% Zero Car Households

- Less than 5%
- 5% to 20%
- 20% - 30%
- 30%- 50%

- Water Features
- Mebane ETJ

Map 2.4



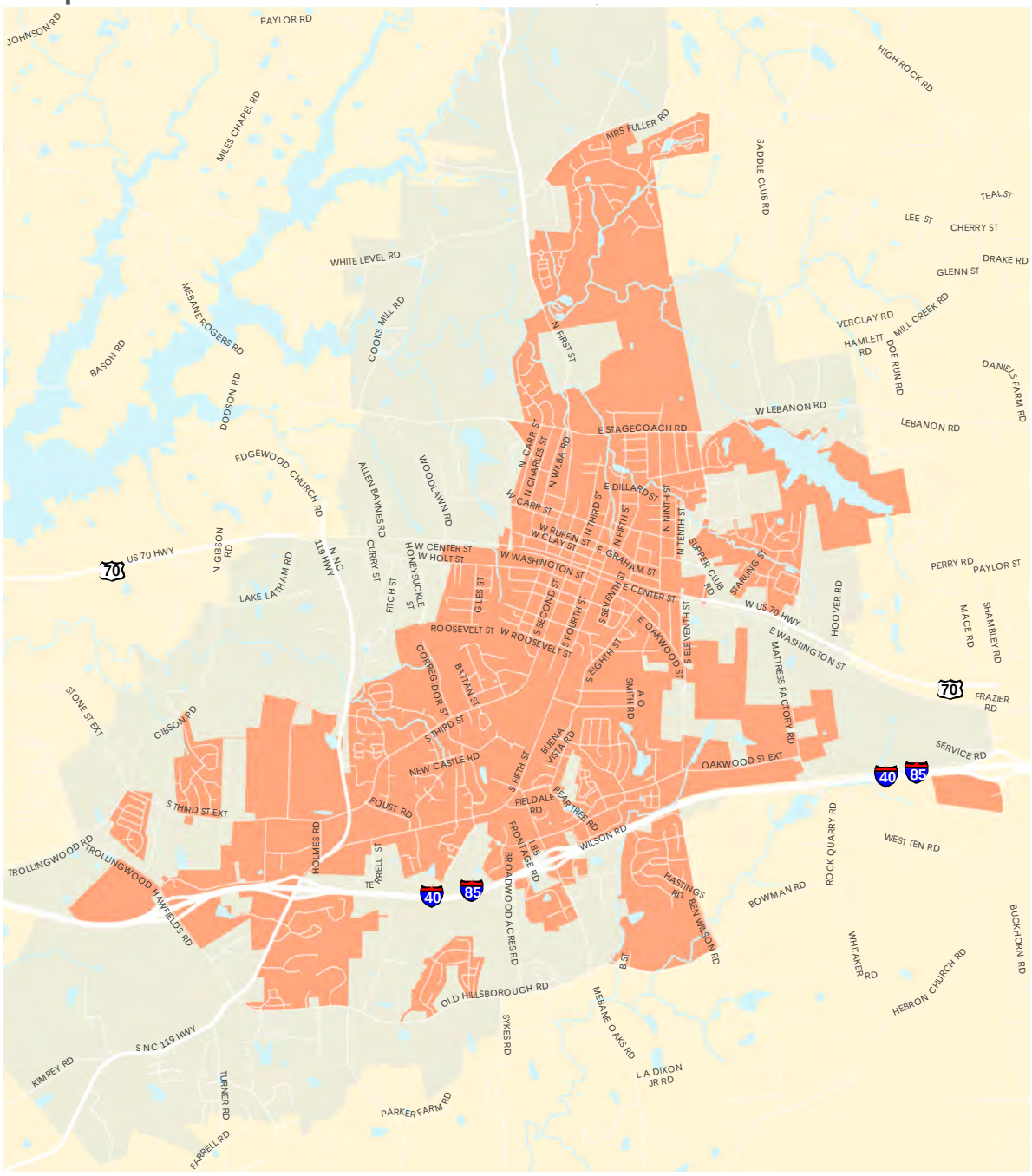
Pedestrian Commuters

0 0.5 1 Miles

N

% Who Walk to Work	
0 - 0.5%	Water Features
0.6 - 1.0%	Mebane ETJ
1.1 - 2.0%	
2.1 - 3.0%	

Map 2.5



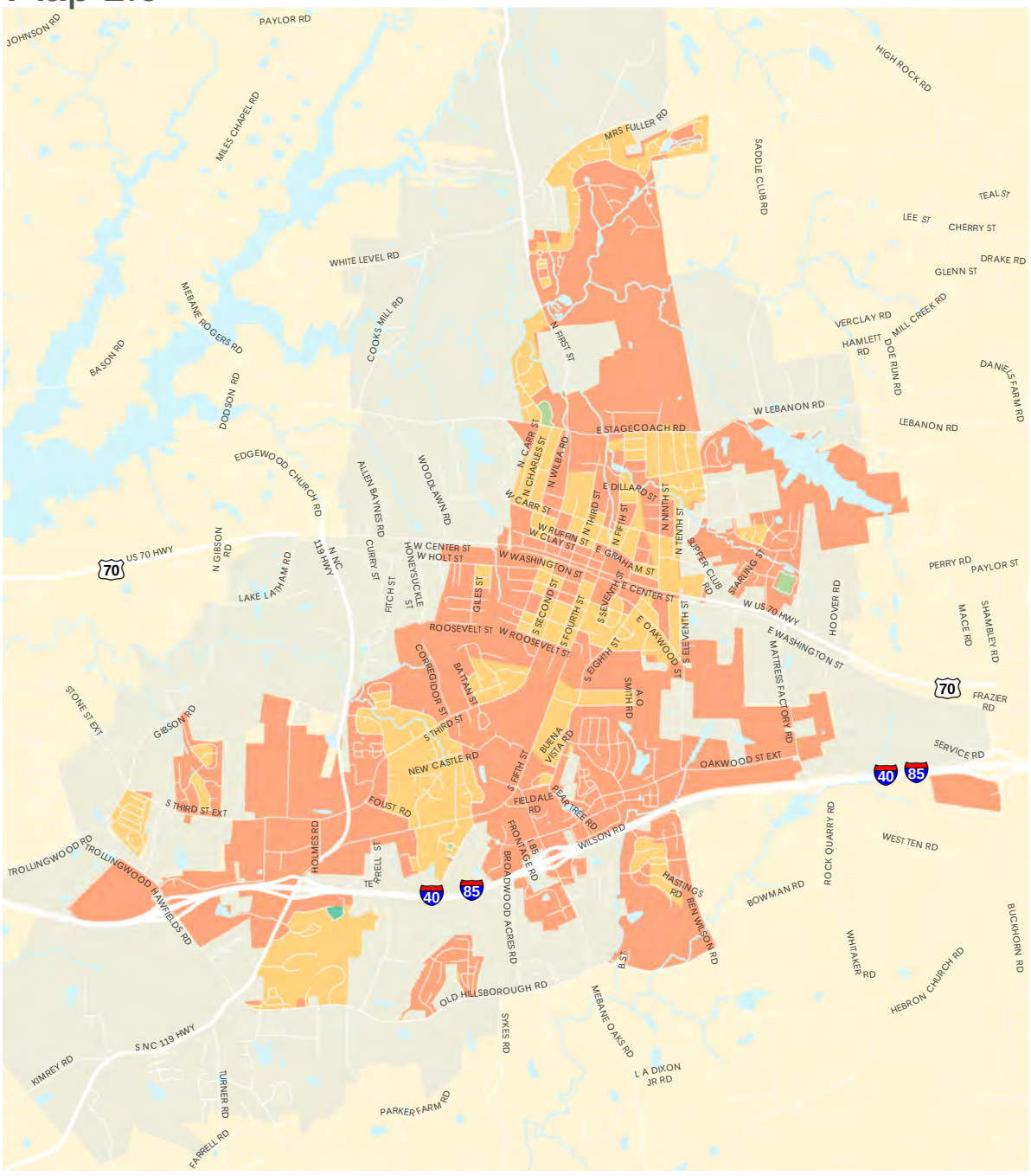
Bicycle Commuters

0 0.5 1 Miles

N

% Who Bike to Work	
0%	Water Features
0.01% - 0.1%	Mebane ETJ
0.11% - 0.5%	
0.51% - 1%	

Map 2.6



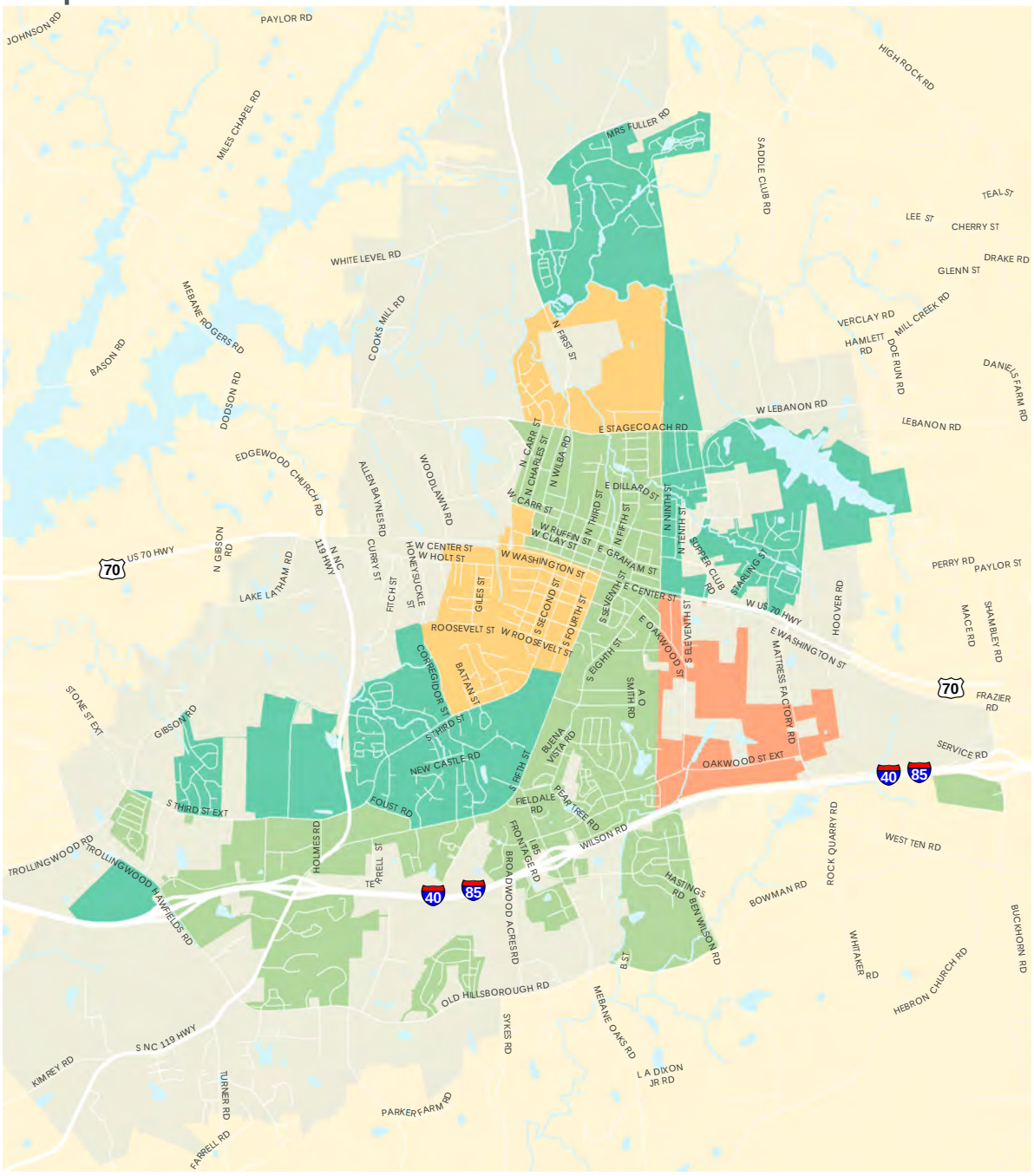
Population Density

0 0.5 1 Miles

N

# People / Acre	
0 - 3	Water Features
3-20	Mebane ETJ
20 - 50	
Above 50	

Map 2.7



Median Household Income

0 0.5 1 Miles

N

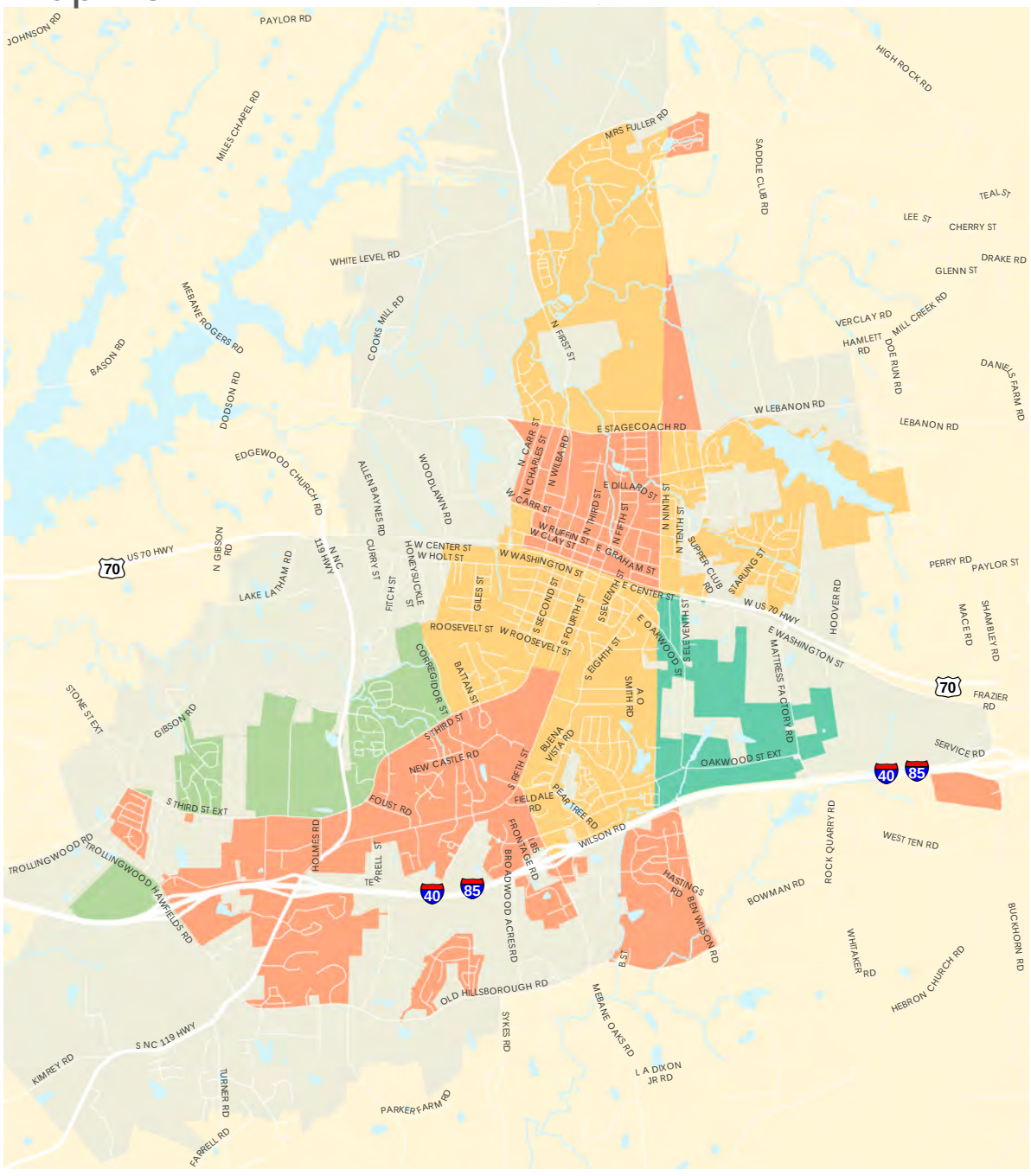
Median Household Income

- Less than $20,000
- $20,000 - $40,000
- $40,001 - $60,000
- $60,001 - $100,000

Water Features

Mebane ETJ

Map 2.8



Minority Population

0 0.5 1 Miles

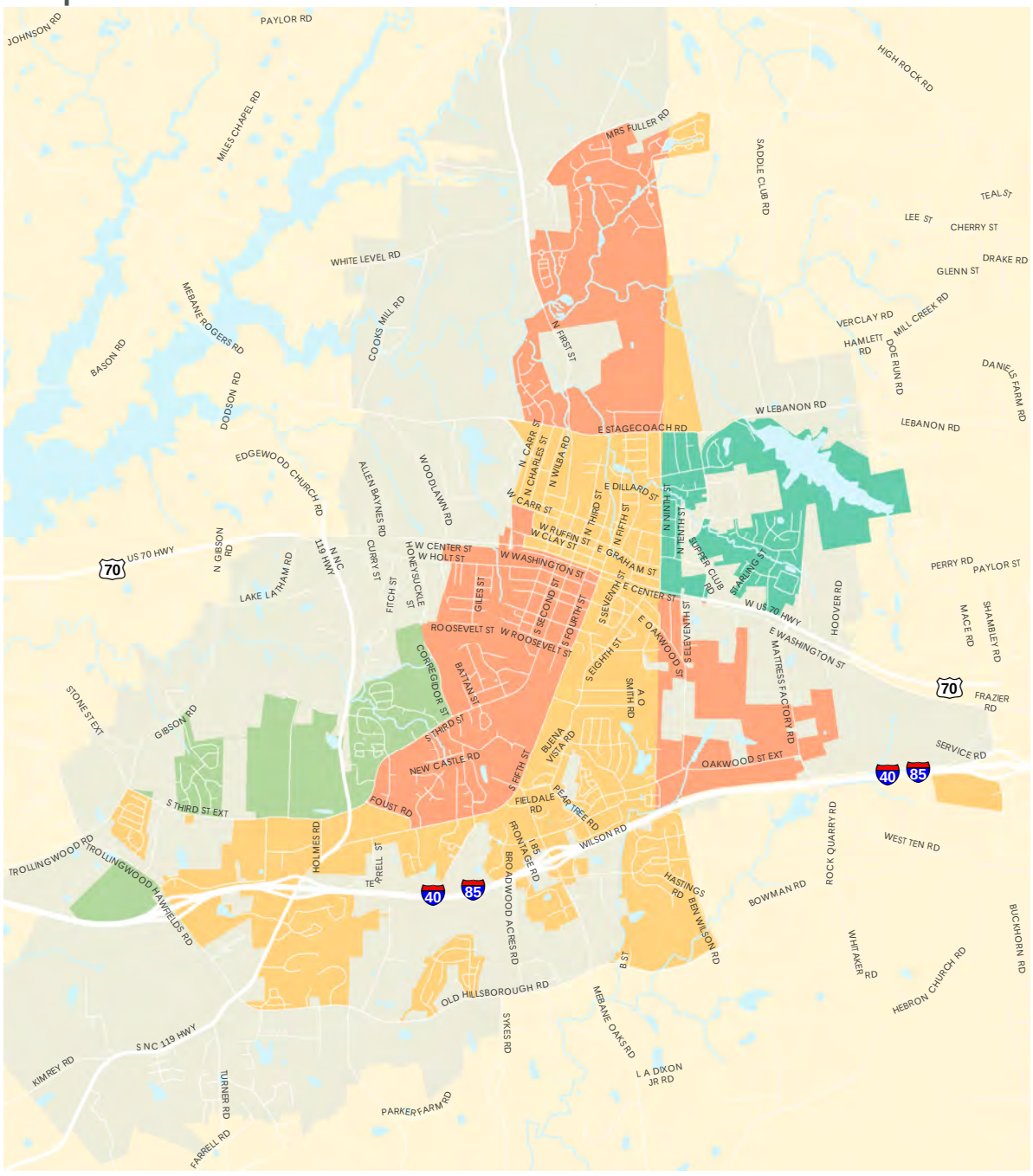
N

% Non-White Population

- Less than 20%
- 20.1 - 30%
- 30.1 - 50%
- More than 50%

- Water Features
- Mebane ETJ

Map 2.9



Hispanic Population

0 0.5 1 Miles

N

% Hispanic Population	
0%	Water Features
0.1 - 1.0%	Mebane ETJ
1.1 - 2.0%	
2.1 - 5.0%	

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CHAPTER THREE

PEDESTRIAN NETWORK

Chapter Contents

Overview 3-1
Types of Pedestrians 3-1
Methodology for Pedestrian Network Design 3-3
Pedestrian Facility Types 3-4
Pedestrian Network Maps 3-6
Project Cutsheets 3-8
Sidewalk Network Table 3-32
Intersection Improvement Table 3-34
Greenway Network Table 3-38

Overview

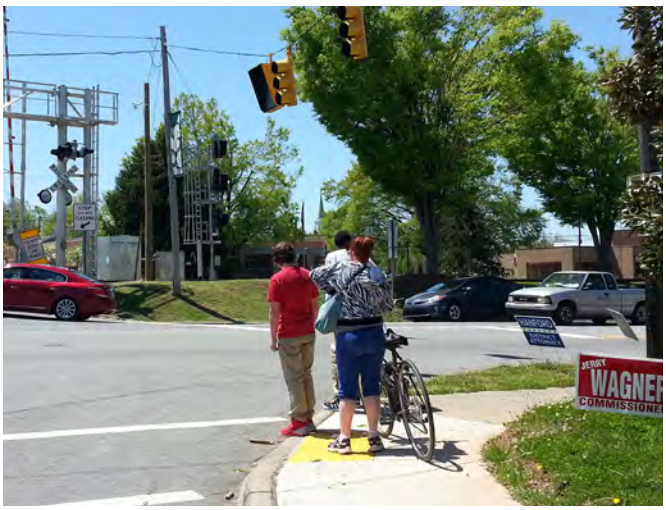
For the purposes of this Plan, the pedestrian network refers to improvements within the roadway right-of-way as well as off-road greenways. The pedestrian network includes a series of recommended changes that will create a more safe, accessible, and connected walkway system. The pedestrian network types include sidewalks and roadway crossing improvements such as marked crosswalks, countdown signals, curb ramps, and curb extensions. The off-road greenway network is an important component of the pedestrian network and supports bicycle travel as well. This chapter describes pedestrian types, methodology, and facility types. It also includes pedestrian network maps and features project cutsheets with maps, photo renderings, and cost estimates.

Types of Pedestrians

Everyone is a pedestrian at some stage in their daily travel. This means pedestrians are a highly diverse road user group which includes children, adults, senior citizens, teenagers, joggers, the disabled and mobility impaired, and transit riders.

Pedestrians exhibit a variety of characteristics so the transportation network should accommodate different needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults walk. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistance devices for walking stability, sight, and hearing.

Adapted from the WalkBikeNC Plan, the table on the following page summarizes common pedestrian characteristics for various age groups and anticipated portions of the state's population by 2030. According to the US Census, the median age of Mebane's population increased from 34.0 in 2000 to 35.8 in 2010, while North Carolina's median age increased from 35.3 to 37.4, suggesting a younger and less rapidly aging community in Mebane than the state as a whole.



Teenagers waiting to cross at 5th Street and Center Street.

Three generations crossing together at 3rd Street and Corregidor Street.

Pedestrian Characteristics by Age and NC Population	% Mebane Urbanized Area Population, 2010	% NC Population, 2010	% NC Population, 2030
Ages 1-4			
• Learning to walk • Requires constant adult supervision • Developing peripheral vision and depth perception	7.7% (under 5)	6.6% (under 5)	25.2% (under 18)
Ages 5-8			
• Increasing independence, but still requires supervision • Poor depth perception	7.5% (5-9)	6.7% (5-9)	25.2% (under 18)
Ages 9-13			
• Susceptible to "dart out" intersection dash • Poor judgment • Sense of invulnerability • Improved awareness of traffic environment	7.3% (10-14)	6.6% (10-14)	25.2% (under 18)
Ages 14-18			
• Poor judgment	6.2% (15-19)	6.9% (15-19)	25.2% (under 18)
Ages 19-40			
• Active, fully aware of traffic environment	28.5% (20-39)	26.9% (20-39)	34.6% (18-44)
Ages 41-65			
• Slowing of reflexes	32.1% (40-64)	33.2% (40-64)	22.4% (45-64)
Ages 65+			
• Difficulty crossing street • Vision loss • Difficulty hearing vehicles approaching from behind	10.8% (65+)	12.8% (65+)	17.8% (65+)

Sources: AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (July 2004), Exhibit 2-1, US Census Bureau 2010, and the US Census Bureau, Interim State Population Projections, 2005.

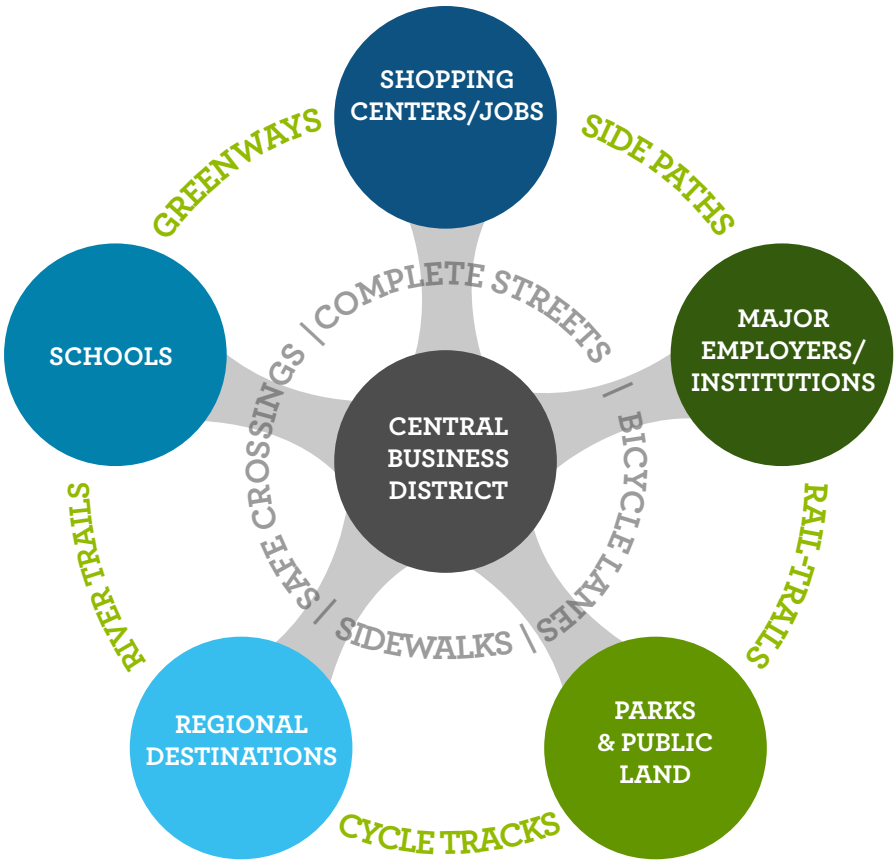
Methodology for Pedestrian Network Design

The recommended pedestrian network was designed in mind for all types of pedestrians with a special focus of **providing a connected network** that safely creates separation from the roadway via sidewalk and greenway with highly-visible and appropriate intersection and crossing improvements. The network was developed based on Steering Committee input, public input, NCDOT Division input, existing conditions analysis, recommendations from previous studies, noted destinations, presence of existing local and regional greenway projects, and field analyses. The network identifies important projects, but, in the long term, sidewalks and appropriate crossing facilities should be implemented on all streets (see Chapter 6).

The Hub + Spokes Model

The image below shows some of the key components for the overall pedestrian, bicycle, and greenway network based on a model of hubs (destinations) and spokes (walking and bicycling corridors).

The image below *conceptually* shows how this model of hubs and spokes could be applied in Mebane NC, with a network of complete streets (in grey) and greenways (in green) connecting key destinations throughout the city. **Keep in mind the model below only conceptually shows these linkages. See Maps 3.1 and 3.2 on the following pages for actual pedestrian network recommendations.**



Pedestrian Facility Types

Sidewalks

Sidewalks are the primary mode of pedestrian travel in most areas and are a crucial element in any pedestrian network. Typically, a sidewalk is at least five feet wide and ideally features a buffer between it and the roadway.

Marked Crosswalks

Crosswalks are used to alert motorists to locations where they should expect pedestrians and to identify a designed crossing location for pedestrians. A crosswalk may be marked or unmarked since, legally, crosswalks exist at all intersections, unless specifically prohibited. ***Marked crosswalks reduce pedestrian crashes by 25% according to the 2008 FHWA Desktop Reference for Crash Reduction Factors.***

Countdown Signals

Pedestrian signal heads indicate to pedestrians when they should cross a street. Countdown signals that indicate the amount of time pedestrians have remaining to cross the street should be installed with all new or replacement signals. Pedestrian signal indications should be used at traffic signals wherever warranted, according to the MUTCD.

Curb Ramps

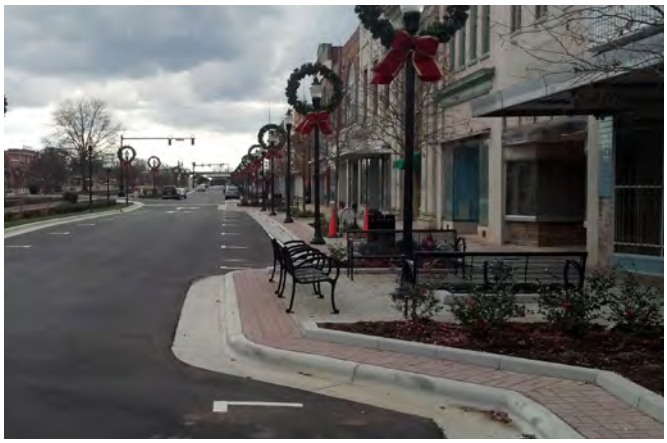
Curb ramps provide access between the sidewalk and roadway for people using wheelchairs, strollers, walkers, crutches, handcarts, bicycles, and also for pedestrians with mobility impairments who have trouble stepping up and down high curbs. Curb ramps must be installed at all intersections and midblock locations where pedestrian crossings exist, as mandated by federal legislation (1973 Rehabilitation Act and 1990 Americans with Disabilities Act). In most cases, separate curb ramps for each crosswalk at an intersection should be provided rather than having a single ramp at a corner for both crosswalks.

Median Islands

Median islands—also known as center islands, refuge islands, pedestrian islands, or median slow points—are raised islands placed in the center of the street at intersections or midblock to help protect crossing pedestrians from motor vehicles. Center crossing islands allow pedestrians to deal with only one direction of traffic at a time, and they enable them to stop partway across the street and wait for an adequate gap in traffic before crossing the second half of the street. **They are a proven crash reduction device for pedestrians (FHWA 56% crash reduction factor).**

Curb Extensions

Curb extensions (also called bulb-outs or bump-outs) are extensions of sidewalks that narrow the street, increase pedestrian visibility, and decrease pedestrian crossing distance. They are an element of traffic calming that prioritizes pedestrian safety, reduces vehicle speeds, and serves to protect on-street parking. Curb extensions should however not intrude into a bicycle lane.



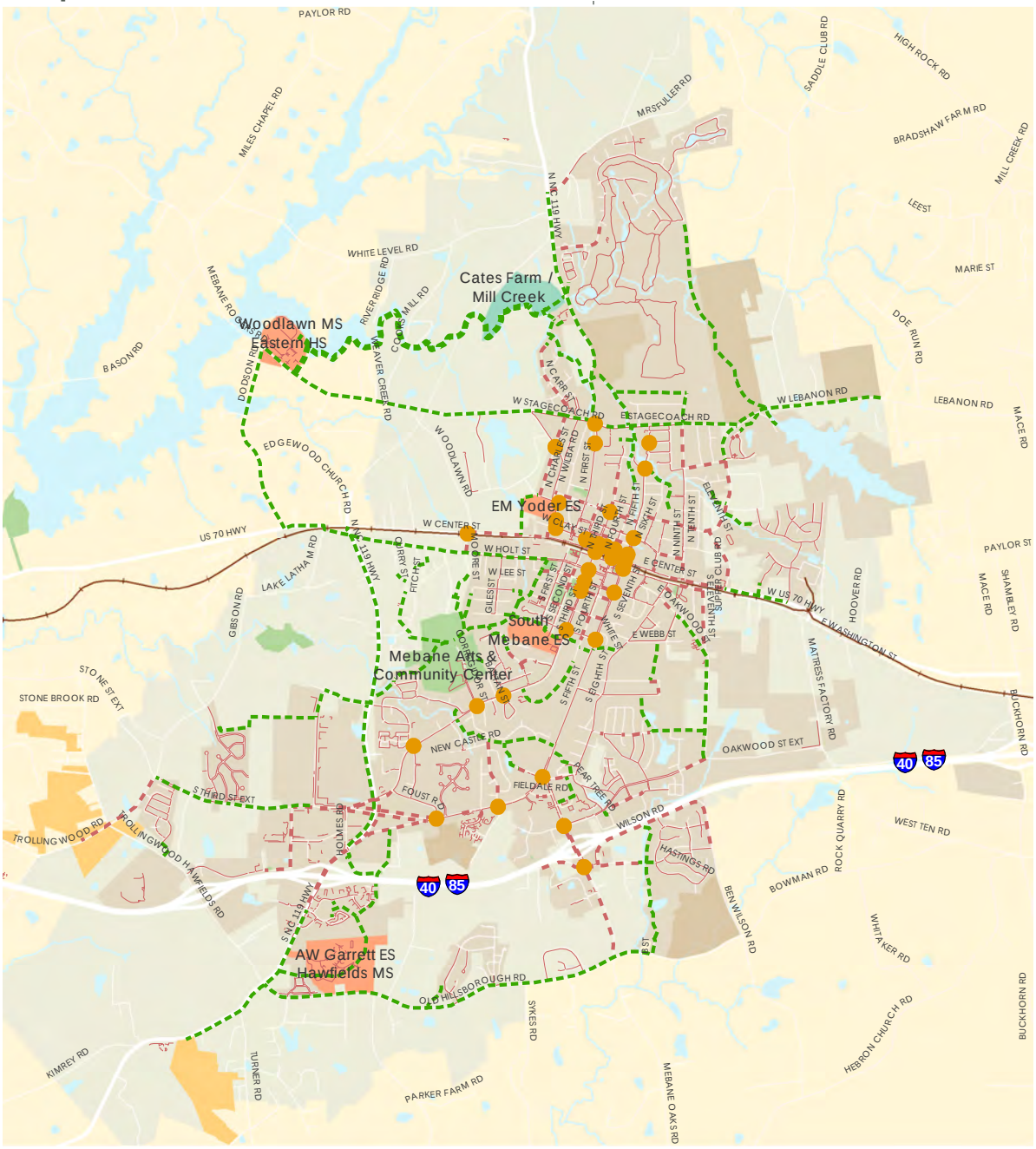
Pedestrian Signage

In-street pedestrian crossing signs reinforce the presence of crosswalks and remind motorists of their legal obligation to yield for pedestrians in marked or unmarked crosswalks. This signage is often placed at high-volume pedestrian crossings that are not signalized. Regular pedestrian warning signage is another type of common signage used to warn motorists of pedestrian crossings.

Greenways/Sidepaths

Greenways are an essential part of a comprehensive walking and biking network due to their attractiveness and desirability to a wide range of users, safety, and ease of use. Typically, these facilities are shared-use and paved, providing room for two-way travel. They may follow utility easements, streams, or even roadways (called sidepaths in this instance). In some cases, they may be a crushed, compact unpaved surface.

Map 3.1 Pedestrian Network



Pedestrian Recommendations

0 0.25 0.5 1 Miles

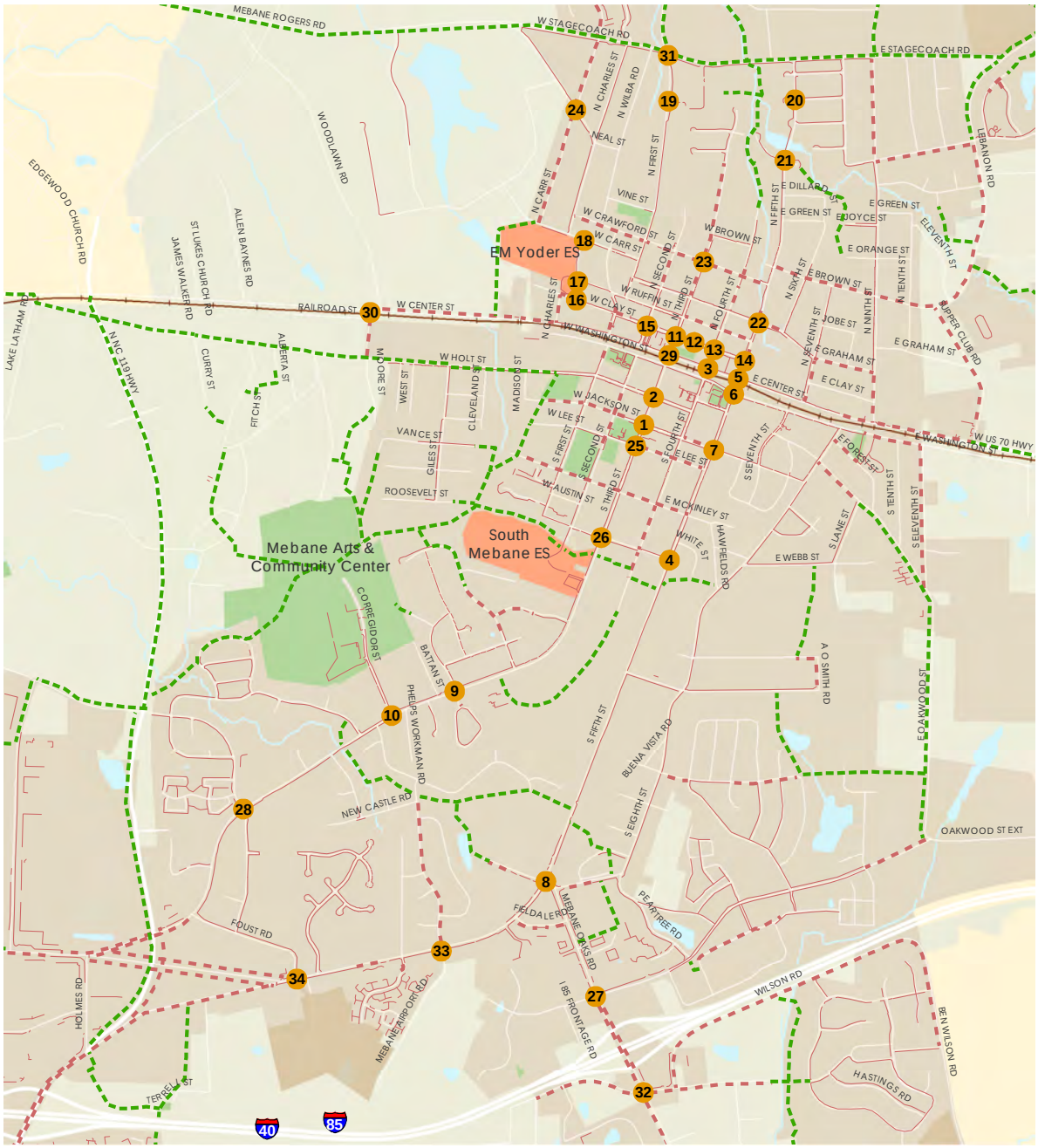
N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Potential Conservaion Lands
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Map 3.2 Pedestrian Network (Downtown)



Pedestrian Recommendations - Downtown

0 0.125 0.25 0.5 Miles

N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

Priority Project Cutsheets

*Top **Sidewalk** Projects > 1/8 mile in length*

South Second Street Sidewalk

From: W Holt

To: South to existing sidewalk

Distance: 846 feet (0.16 miles)

Side: West

Cost Estimate: $21,500*

**Planning level cost estimate for sidewalk and intersection improvements*

Prioritization score: 39.66 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to Downtown
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Fills an existing sidewalk gap

Recommendation

Construct a sidewalk at least 5 feet wide on the west side of South Second Street from West Holt Street south to the existing sidewalk. Provide curb ramps at intersections along this corridor as sidewalk is constructed. This sidewalk will fill a key sidewalk gap and provide pedestrian access to Walker Field, Mebane Historical Museum, and Old Mebane Recreation Center and tennis courts.

Second Street at Jackson Street, looking north

South Second Street Sidewalk

0 0.05 0.1 Miles

N

Proposed Facilities

- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities

- Sidewalk
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

North Third Street Sidewalk

From: Belle Court

To: West Graham Street

Distance: 1,798 feet (0.34 miles)

Side: West

Cost Estimate: $35,150*

**Planning level cost estimate for sidewalk and intersection improvements*

Prioritization score: 36.43 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Top 3 recommendation from 2014 public comments
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to Downtown
- Connects to low vehicle access areas
- Fills an existing sidewalk gap

Recommendation

Construct a sidewalk at least 5 feet wide on the west side of North Third Street from Belle Court south to West Graham Street. Provide curb ramps at intersections along this corridor as sidewalk is constructed. This sidewalk will fill a key sidewalk gap to provide residents along North Third Street with access to Downtown Mebane.

3rd Street near Belle Court, looking north

North Third Street Sidewalk

0 0.05 0.1 Miles

N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

Stonewall Drive Sidewalk

From: Stuart Drive

To: Fair Oaks Court (future)

Distance: 786 feet (0.15 miles)

Side: East

Cost Estimate: $17,700*

**Planning level cost estimate for sidewalk and intersection improvements*

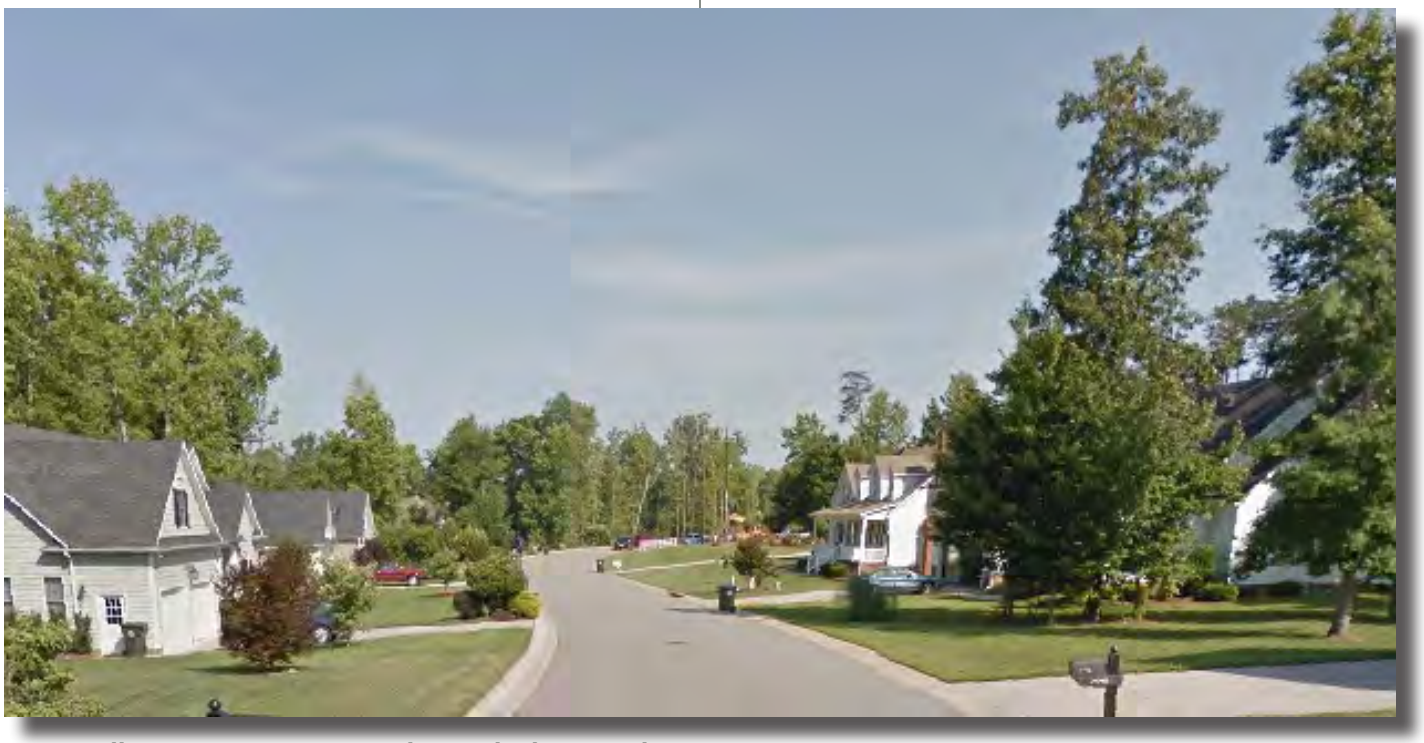
Prioritization score: 35.33 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Fills an existing sidewalk gap

Recommendation

Construct a sidewalk at least 5 feet wide on the east side of Stonewall Drive from Stuart Drive to Fair Oaks Court (a planned street near where Stonewall Drive currently dead ends). Provide curb ramps at intersections along this corridor as sidewalk is constructed. This sidewalk will link the neighborhood to the proposed shared use trail with connections to the Mebane Arts & Community Center and South Mebane Elementary School.



Stonewall Drive near Beauregard Lane, looking north

Stonewall Drive Sidewalk

0 0.05 0.1 Miles

N

Proposed Facilities

- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities

- Sidewalk

- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

West Center Street Sidewalk

From: Moore Street

To: North Charles Street

Distance: 1,924 feet (0.36 miles)

Side: North

Cost Estimate: $38,700*

**Planning level cost estimate for sidewalk and intersection improvements*

Prioritization score: 35.33 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Fills an existing sidewalk gap

Recommendation

Construct a sidewalk at least 5 feet wide on the north side of West Center Street from Moore Street to North Charles. Provide curb ramps at intersections along this corridor as sidewalk is constructed. This sidewalk will provide residents on the west side of town with a link into downtown and to EM Yoder Elementary School.

West Center Street near Moore Street, looking west

West Center Street Sidewalk

0 0.05 0.1 Miles

N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

East Ruffin Street Sidewalk

From: North Third Street

To: North Fifth Street

Distance: 932 feet (0.18 miles)

Side: North

Cost Estimate: $21,600*

**Planning level cost estimate for sidewalk and intersection improvements*

Prioritization score: 32.10 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to Downtown
- Connects to low vehicle access areas
- Fills an existing sidewalk gap

Recommendation

Construct a sidewalk at least 5 feet wide on the north side of East Ruffin Street from North Third Street to North Fifth Street. Provide curb ramps at intersections along this corridor as sidewalk is constructed. This sidewalk will fill a key sidewalk gap in the downtown area.

Ruffin Street near Fifth Street, looking west

East Ruffin Street Sidewalk

0 0.05 0.1 Miles

N

Proposed Facilities

- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities

- Sidewalk

- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

Priority Project Cutsheets

Intersections

Fifth Street at Center Street/Business 70 and Railroad Crossing

Corridor 1: South Fifth Street

Corridor 2: East Center Street/Business 70

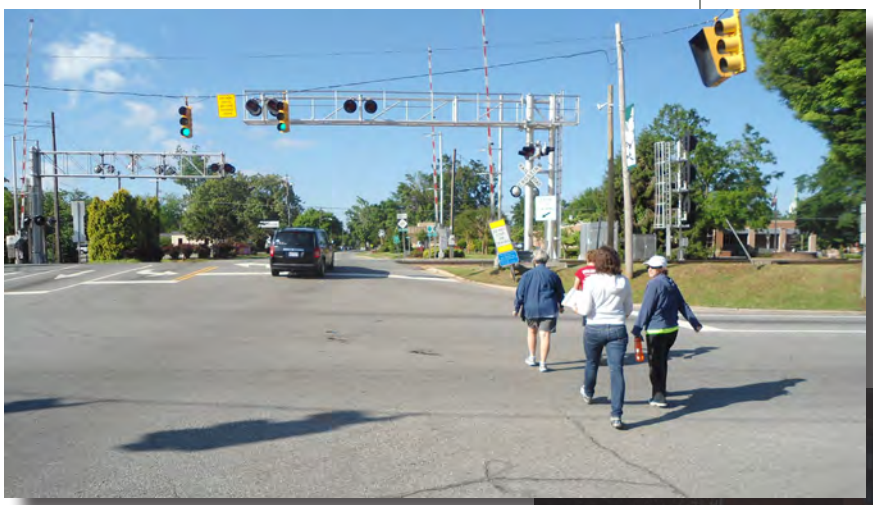
Corridor 3: Railroad

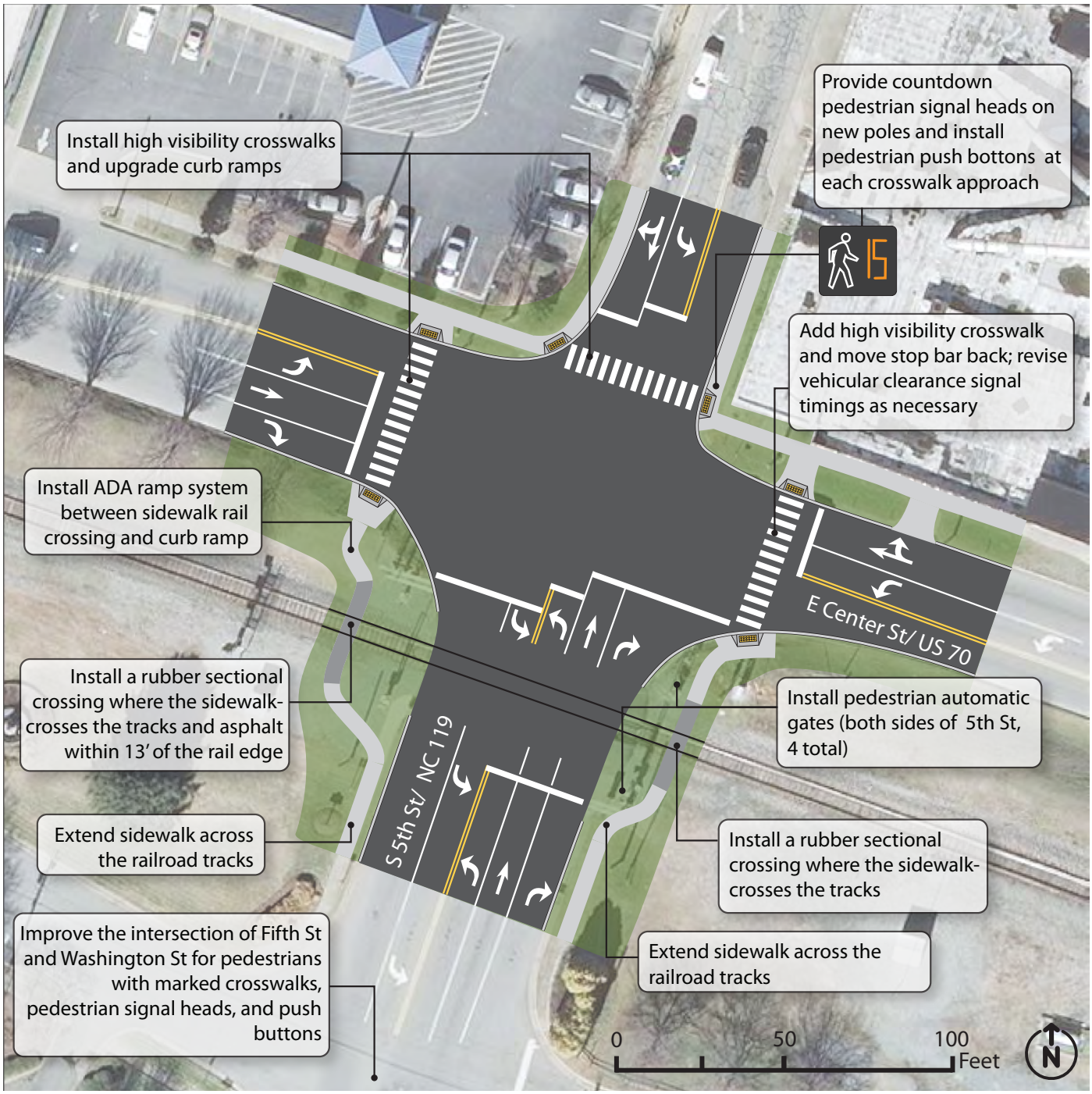
Description

This intersection was identified in the 2014 public comment form, at public workshops, and by Mebane on the Move members as one of the most difficult intersections for pedestrians in Mebane. Fifth Street is a major pedestrian gateway into downtown, but lacks pedestrian facilities to provide a comfortable crossing at Center Street.

Recommendation

Install intersection improvements, including high visibility crosswalks, upgraded curb ramps, and countdown pedestrian signals at the intersection of South Fifth Street and East Center Street/Business 70. Extend the sidewalk on both sides of South Fifth Street from East Center Street across the railroad tracks. Add pedestrian safety features at the railroad crossing, including a rubber sectional crossing and pedestrian automatic gates. Improve the intersection of South Fifth Street and Washington Street for pedestrians with high visibility crosswalks and upgraded curb ramps.




Install high visibility crosswalks and upgrade curb ramps
Provide countdown pedestrian signal heads on new poles and install pedestrian push bottons at each crosswalk approach
Add high visibility crosswalk and move stop bar back; revise vehicular clearance signal timings as necessary
Install ADA ramp system between sidewalk rail crossing and curb ramp
Install a rubber sectional crossing where the sidewalk-crosses the tracks and asphalt within 13' of the rail edge
Install pedestrian automatic gates (both sides of 5th St, 4 total)
Extend sidewalk across the railroad tracks
Install a rubber sectional crossing where the sidewalk-crosses the tracks
Improve the intersection of Fifth St and Washington St for pedestrians with marked crosswalks, pedestrian signal heads, and push buttons
Extend sidewalk across the railroad tracks
E Center St/ US 70
S 5th St/ NC 119
15
0
50
100
Feet
N

Fifth Street at Mebane Oaks Road and Falcon Lane

Corridor 1: South Fifth Street

Corridor 2: Mebane Oaks Road

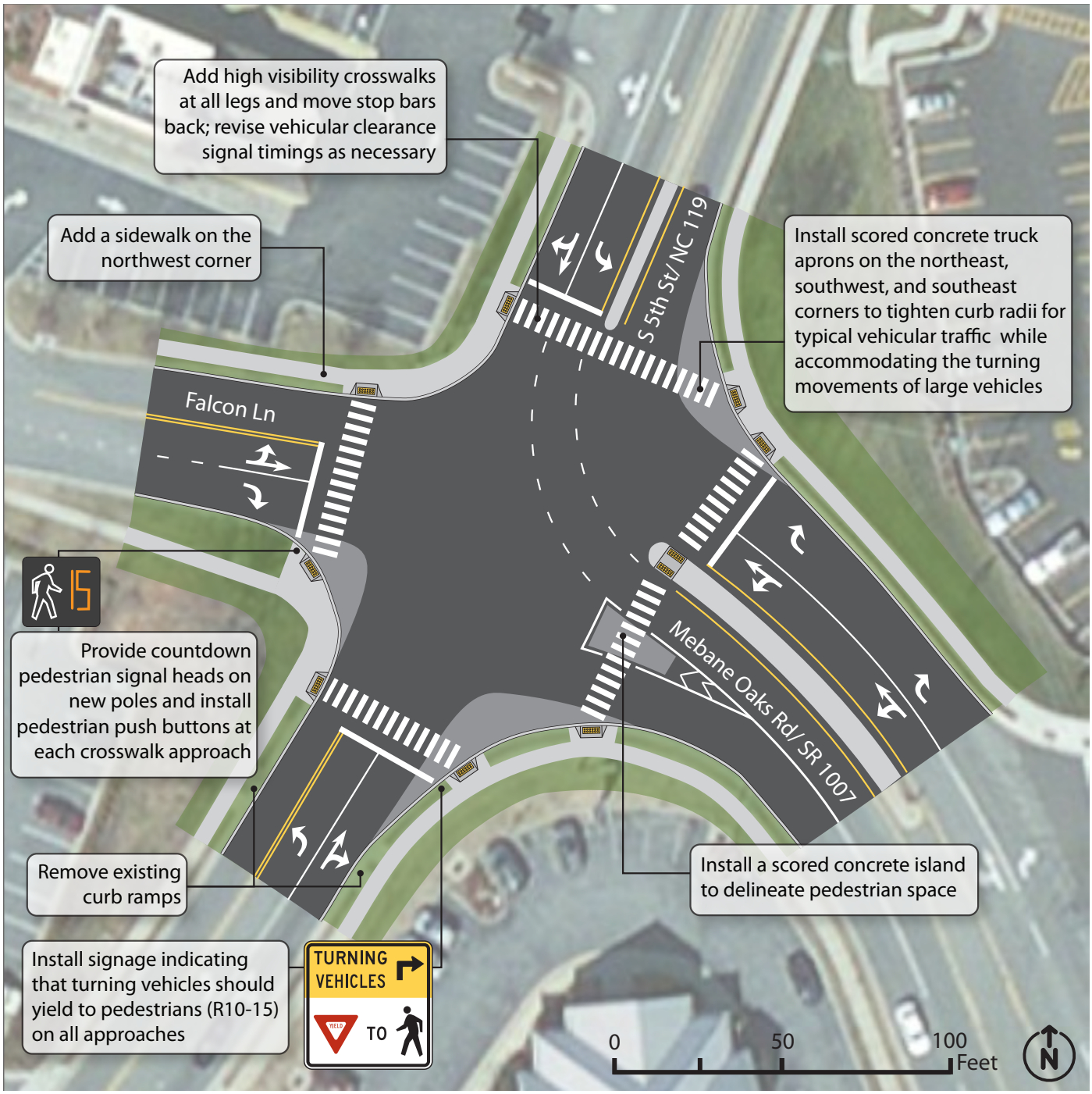
Corridor 3: Falcon Lane

Description

This intersection was identified in the 2014 public comment form, at public workshops, and by Mebane on the Move members as one of the most difficult intersections for pedestrians in Mebane. Long crossings and a lack of crosswalks, countdown timers, and signage make this intersection a major barrier to walking.

Recommendation

Improve all crossings with high visibility crosswalks, upgraded curb ramps, and countdown pedestrian signals. Install scored concrete truck aprons and a concrete island to tighten the curb radii while providing sufficient roadway width for the turning movements of large vehicles. Install "Turning Vehicles Yield to Pedestrians" signage at crosswalks to remind drivers to look for and yield to pedestrians before turning.



The following items will need to be addressed in more detail at the time of design: revised signal design and timing plans, evaluation of need for high-visibility crosswalks at all locations, and evaluation of need for the proposed mountable truck aprons.

Priority Project Cutsheets

*Top **Trail** Projects*

Arts & Community Center to Jackson Street Trail

From: Mebane Arts & Community Center Property

To: West Jackson Street

Distance: 1.00 miles

Cost Estimate: $500,000*

**Planning level cost estimate based on $500,000 per mile of paved shared use trail*

Prioritization score: 30.34 / 51.11

Description

This trail will connect several neighborhoods in central Mebane to the Mebane Arts & Community Center, South Mebane Elementary School, and to each other. The trail will also facilitate access to Holt Street Park, the library, and downtown.

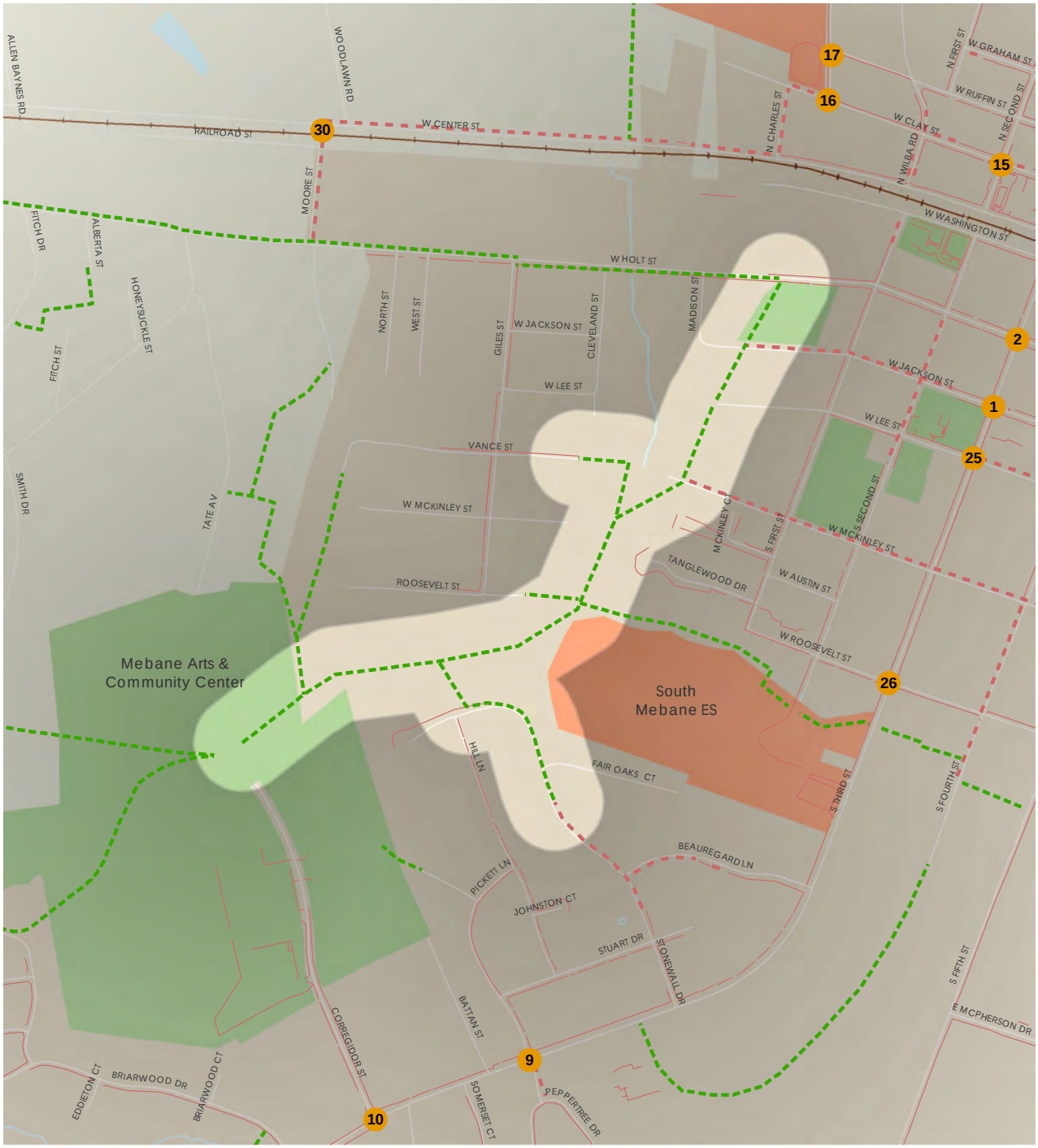
Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population

Recommendation

Construct a minimum 10-foot wide paved shared use trail along the sewer easement from the Mebane Arts & Community Center property northeast to connect to West Jackson Street. Include trail spurs to connect the trail to Vance Street, West Lee Street, West McKinley Street, and Stonewall Drive.

Power corridor near the Mebane Arts & Community Center soccer fields



Arts & Community Center to Jackson Street

0 0.05 0.1 0.2 Miles

N

Proposed Facilities

- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities

- Sidewalk
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

Roosevelt Street to Hawfields Road Trail

From: Roosevelt Street

To: Hawfields Road

Distance: 0.66 miles

Cost Estimate: $330,000*

**Planning level cost estimate based on $500,000 per mile of paved shared use trail*

Prioritization score: 30.34 / 51.11

Description

This east-west trail will provide an important off-street bicycle and pedestrian connection between neighborhood streets, South Mebane Elementary School, and the recommended shared use trail to the Mebane Arts & Community Center.

Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population

Recommendation

Construct a minimum 10-foot wide paved shared use trail along the sewer easement from Roosevelt Street, east along the north side of South Mebane Elementary School property, to Hawfields Road. High visibility crosswalks and signage should be provided at all road crossings along the trail.

Current conditions

Sewer easement near Roosevelt Street and First Street - Future

Roosevelt Street to Hawfields Road

0 0.05 0.1 0.2 Miles

N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

West Holt Street Sidepath

From: Dodson Road

To: South First Street

Distance: 1.61 miles

Cost Estimate: $805,000*

**Planning level cost estimate based on $500,000 per mile of paved shared use trail*

Prioritization score: 30.34 / 51.11

Description

The West Holt Street sidepath will connect neighborhoods on the west side of town, particularly neighborhoods with high proportions of low-income residents, minority residents, and residents who do not have regular access to a car. Residents will be able to more easily access Holt Street Park, Downtown Mebane, and recommended trails to the Mebane Arts & Community Center and South Mebane Elementary School on foot or by bike.

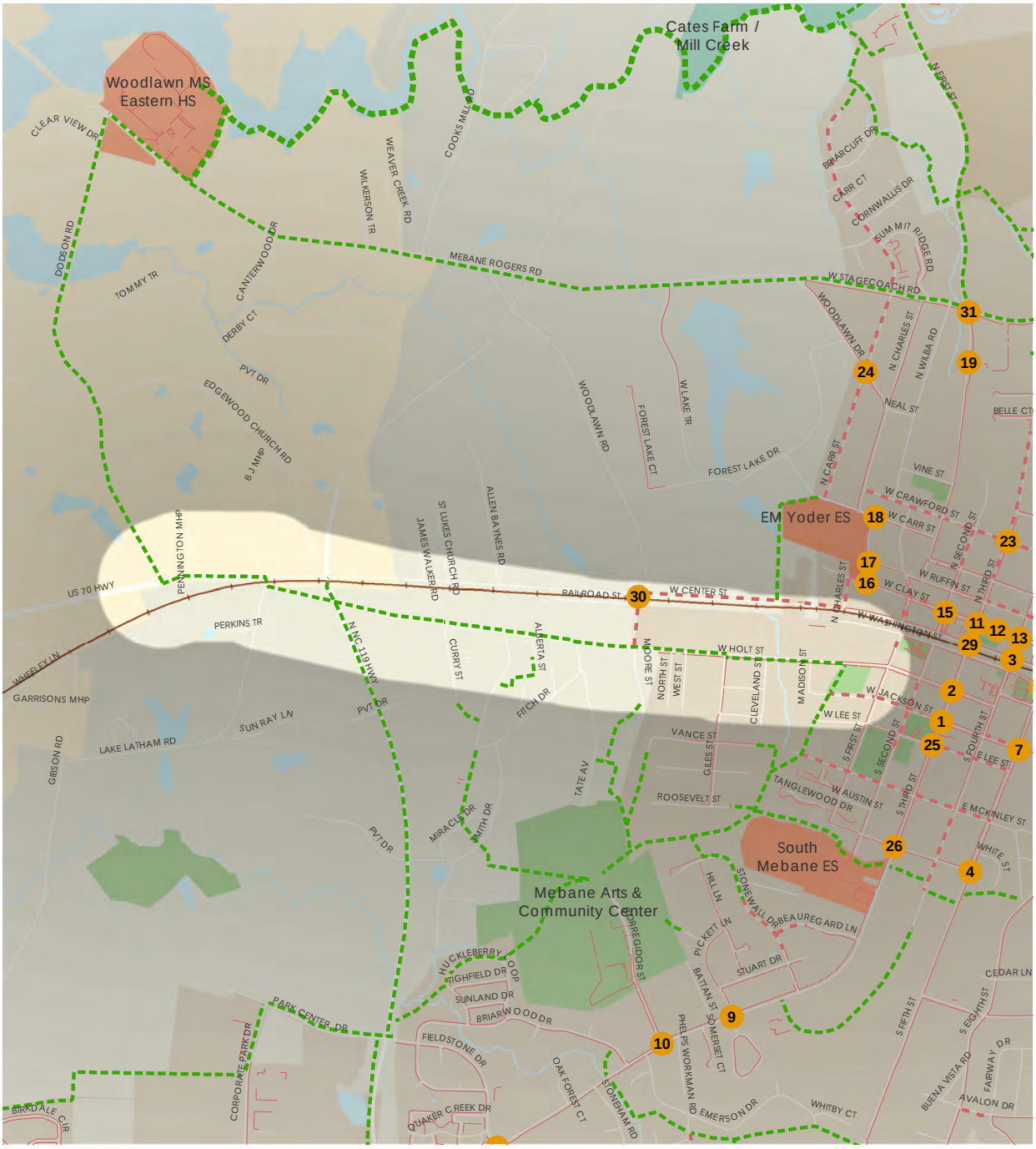
Reasons for priority ranking:

- Direct access to or from an existing trail, walking route, or sidewalk
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population

Recommendation

Construct a minimum 10-foot wide paved sidepath along West Holt Street from Dodson Road to South First Street. Crosswalks and signage should be provided at all road crossings along the trail.

West Holt Street near Fitch Drive, looking east



West Holt Street Sidepath

0 0.125 0.25 0.5 Miles

N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Potential Conservaion Lands
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

Mill Creek Shared Use Trail

From: Hawfields Middle School

To: NC Highway 119

Distance: 2.51 miles

Cost Estimate: $1,255,000*

**Planning level cost estimate based on $500,000 per mile of paved shared use trail*

Prioritization score: 21.23 / 51.11

Description

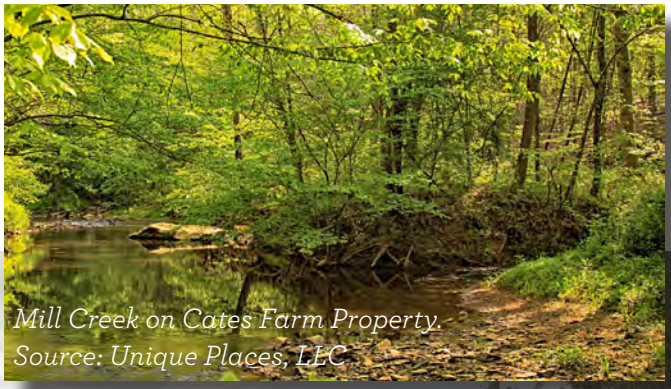
The Mill Creek Shared Use Trail will run along Mill Creek and through the Cates Farm Property to connect Hawfields Middle School, Eastern High School, Graham Mebane Lake, the Mebane Oaks/ Stagecoach Road sidepath, and the Cates Farm Property and potential future park. The trail will link with recommended trails to the east that together will provide an uninterrupted off-street bicycle and pedestrian route between Graham Mebane Lake and Lake Michael.

Reasons for priority ranking:

- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low-income areas
- Connects to areas with a higher minority population

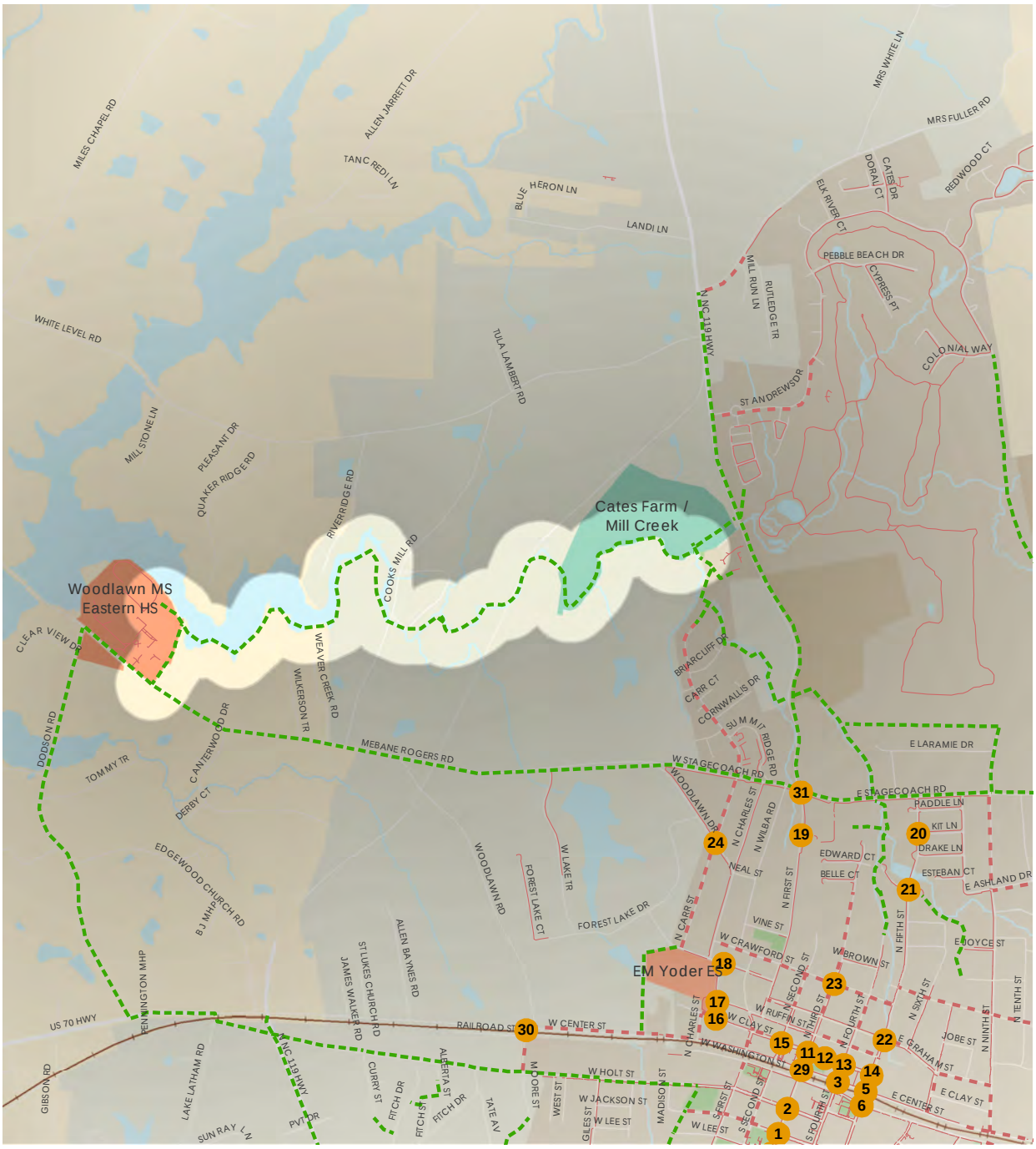
Recommendation

Construct a shared use trail that extends from Hawfields Middle School to NC Highway 119, using the Mill Creek corridor and Cates Farm Property. Work with Alamance-Burlington Schools, Cates Farm Property heirs and stakeholders, and other landowners to develop a trail corridor and trail. Provide high-visibility crosswalks and signage at all roadway-trail crossings.



Mill Creek on Cates Farm Property. Source: Unique Places, LLC

Cates Farm Property. Source: Unique Places, LLC



Mill Creek Shared Use Trail

0 0.125 0.25 0.5 Miles

N

Proposed Facilities
- Sidewalk
- Shared Use Trail
- Intersection Improvements

Existing Facilities
- Sidewalk

- Parks & Open Space
- Potential Conservaion Lands
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Number labels match with table on page 3-32.

Sidewalk Network Table

Roadway	From	To	Side	Length (Ft)
APPLECROSS	AVALON	ARROWHEAD	South	2,091
ARROWHEAD	MEBANE OAKS	East to existing sidewalk	North	367
ARROWHEAD	TANGER (PRIVATE)	PEAR TREE	North	293
ARROWHEAD	PEAR TREE	CARDEN PLACE	North	985
ARROWHEAD	CARDEN PLACE	PRIVATE DRIVE (TANGER OUTLETS)	North	1,738
ARROWHEAD	PRIVATE (TANGER OUTLETS)	E OAKWOOD	North	919
AVALON	S EIGHTH	APPLECROSS	South	316
BEAUREGARD	STONEWALL	East to existing sidewalk	South	394
BEAUREGARD	STONEWALL	S THIRD (sidewalk gaps)	South	68
BRUNDAGE	GARRETT CROSSING	MEBANE OAKS	South	1,076
BRUNDAGE	BROADWOOD ACRES	GARRETT CROSSING	South	384
CLAY	N SECOND	East to existing sidewalk	North	145
CLAY	N SECOND	West to existing sidewalk	South	82
CLAY	N CHARLES	N CHARLES	North	207
E ASHLAND	N NINTH	LEBANON	South	1,360
E BROWN	N FIFTH	N NINTH	North	1,403
E CENTER	N NINTH	SUPPER CLUB	North	1,344
E CENTER	N NINTH	West to existing sidewalk	North	450
E CRAWFORD	N THIRD	N FIFTH	South	872
E FOREST	S EIGHTH	East to existing sidewalk	North	437
E GRAHAM	N SEVENTH	N NINTH	South	824
E GRAHAM	N FIFTH	N SIXTH	North	327
E JACKSON	S FOURTH	S FIFTH	North	399
E LEE	S THIRD	S FIFTH	North	914
E OAKWOOD	S EIGHTH	S LANE	South	735
E RUFFIN	N THIRD	N FIFTH	North	932
FIRST	W WASHINGTON	South to existing sidewalk	West	161
FOREST OAKS	MEBANE OAKS	COLLINGTON	South	2,185
FOURTH	W WASHINGTON	W CENTER	West	122
FOURTH	E WASHINGTON	E CENTER	East	116
LEBANON	N NINTH	E ASHLAND	West	3,265
MCKINLEY	S FIFTH	West to dead end	North	2,437
MEBANE OAKS	ARROWHEAD/CAMERON	FOREST OAKS	East	1,076
MEBANE OAKS	ARROWHEAD/CAMERON	FOREST	West	2,120
MOORE	CENTER	HOLT	East	625
N CARR	W CARR	STAGECOACH	West	2,563
N CHARLES	W CENTER	W CLAY	East	382
N FIFTH	E CENTER	E RUFFIN	East	516
N FIFTH	E GRAHAM	North to existing sidewalk	West	90

Roadway	From	To	Side	Length (Ft)
N FOURTH	E CRAWFORD	North to existing sidewalk	East	94
N FOURTH	E GRAHAM	E CRAWFORD	East	348
N NINTH	E CENTER	E GRAHAM	West	649
N NINTH	E STAGECOACH	E ASHLAND	West	1,365
N SECOND	W GRAHAM	W CRAWFORD	West	494
N SEVENTH	E CLAY	E GRAHAM	East	321
N SEVENTH	E CENTER	North to existing sidewalk	East	113
N THIRD	W GRAHAM	BELLE	West	1,798
NEW NC 119	S FIFTH	S THIRD	East	1,317
PEPPERTREE	S THIRD	PEPPERTREE	East	207
S EIGHTH	MEBANE OAKS	East to existing sidewalk	South	369
S FIFTH	E JACKSON	North to existing sidewalk	West	253
S FIFTH	E DOGWOOD	West to existing sidewalk	South	341
S FIFTH	HOLMES	FOUST	South	2,719
S FIFTH	E WASHINGTON	E CENTER	East	183
S FOURTH	W ROOSEVELT	W MCKINLEY	West	634
S FOURTH	W ROOSEVELT	South to proposed trail	West	226
S FOURTH	E ROOSEVELT	South to proposed trail	East	354
S NC 119	LOWES	HOLMES	West	2,189
S NC 119	I-40 RAMP - SOUTH SIDE	HOLMES	East	1,574
S SECOND	W HOLT	South to existing sidewalk	West	846
S THIRD	HOLMES	FOUST	South	1,513
S THIRD	MAPLE	HOLMES	South	1,174
S THIRD	CORPORATE PARK	NC 119	North	1,417
S THIRD EXT (Future)	S THIRD EXT (Existing)	S FIFTH	Both	2,504
STONEWALL	STUART	FAIR OAKS	East	786
SUPPER CLUB	LEBANON	E CENTER	West	1,727
TANGER (PRIVATE)	Proposed trail at Tanger Outlets	Proposed trail at Tanger Outlets	North	1,367
W CENTER	N CHARLES	West to proposed trail	North	449
W CRAWFORD	N CHARLES	N FIRST	South	990
W CRAWFORD	N FIRST	Existing sidewalk	South	144
W CRAWFORD	Existing sidewalk	N THIRD	South	553
W GRAHAM	N FIRST	East to existing sidewalk	South	119
W JACKSON	S THIRD	East to existing sidewalk	North	96
W JACKSON	S FIRST	S THIRD	North	539
W JACKSON	S FIRST	West to proposed trail	North	549
W LEE	S FIRST	S SECOND	North	376
WASHINGTON	S ELEVENTH	West to existing sidewalk	South	783
WILBA	W CENTER	North to existing sidewalk	East	119
WILBA	W CENTER	North to existing sidewalk	West	168
WILBA	W CLAY	North to existing sidewalk	East	127

Intersection Improvement Table

ID	Road 1	Road 2	Nearby Destinations	Est. Traffic Vol. (High-Med-Low)	Speed Limit	Sides of Street with Sidewalk	Marked Crosswalk Present?	Number and Location of Crosswalks Adequate (Y/N)	
1	3rd	Jackson	Rec center, church	Med	35	Both south, 1 north	No	N	
2	3rd	Holt	Rec center, pre-school, church	Med	35	West side only	No	N	
3	4th	70/Center	Downtown	High	35	North side	Yes, parallel	N	
4	5th	Roosevelt	Residential	High	35	East side, North side	No	N	
5	5th	70/Center	Downtown	High	35	North side	No	N	
6	5th	Washing-ton	Downtown	High	35	South side	No	N	
7	5th	Jackson	Downtown	High	35	East, West, North	Yes, parallel	N	
8	5th	Falcon	Walgreens, fast food, CVS, pool	High	35	North, South, East	No	N	
9	3rd	Pickett	Residential	High	45	West	No	N	
10	3rd	Corregidor	Ballfields, soccer complex, com-munity center	High	45	West to north, East to south	No	N	
11	3rd	Clay	Downtown	Low	35	All	Yes, pavers	Y	
12	Clay	Midblock between 3rd and 4th	Downtown	Low	35	Both	Yes, pavers	Y	
13	Clay	4th	Downtown	Low	35	All	Yes, pavers	Y	
14	Clay	5th	Downtown	Med	35	All	Yes, pavers	Y	
15	Clay	2nd	Downtown	Low	35	North, West, East	Yes, pavers	Y	
16	Clay	Charles	Elementary school	Low	35	West, North	No	N	
17	Ruffin	Charles	Elementary school	Low	35	West, South	No	N	

	Pedestrian Countdown Signal Present? (Y/N)	Curb Ramps Present? Complete/ Incomplete/None	Notes	Recommendation
	N	Yes, complete	Opportunity for Chicanes on Jackson east side	High-visibility crosswalks all-way, chicanes w/ bike rack on east side of Jackson, bike boulevard on Jackson
	N	Yes, complete		High-visibility crosswalks all-way
	N	Yes, complete, except SE corner		Countdown timers all-way, paver crosswalks all-way, bulbouts across 70 on west side
	N	Yes, NW side		High-visibility crosswalk across 5th, signage, RRFB, square off NW corner with bulbout
	N	Yes, complete		Extend curb, tighten radius on SW corner, add delineated ped space to RR, paver crosswalks all-way, add 2-3' of pavement on west side
	N	Yes, complete		High-visibility crosswalk across west side, south side
	N	Yes but need replacement		High-visibility crosswalks all-waywith signage on 5th
	N	Yes, but upgrade	High traffic, truck traffic	High-visibility crosswalks and ped countdown timers all-way, porkchop island on SE corner, wider median on east and north sides, upgrade curb ramps
	N	No		Add high-visibility crosswalk and signage across 3rd Street
	N	Yes but need replacement		Add high-visibility crosswalk and signage across 3rd, curb extension on NW corner to tighten curb radius
	N	Yes, ok		Add bulbouts across Clay, advanced stop lines before crosswalks, ped countdown timers all-way
	N	Y, ok		Add bulbouts on either side of Clay at midblock crossing
	N	Y, ok		Add bulbouts across Clay, advanced stop lines before crosswalks, ped countdown timers all-way
	N	Y on west side		Add advanced stop line, add either a stoplight with ped countdown timers, a 3-way stop, or a raised crosswalk
	N	Y, ok		Add ped countdown timers
	N	No		Add high-visibility crosswalks all-way, curb ramps
	N	No		Add raised crosswalk across Ruffin to school, signage, curb ramps

ID	Road 1	Road 2	Nearby Destinations	Est. Traffic Vol. (High-Med-Low)	Speed Limit	Sides of Street with Sidewalk	Marked Crosswalk Present?	Number and Location of Crosswalks Adequate (Y/N)	
18	Carr	Charles	Elementary school	Low	35	South	No	N	
19	1st	Food Lion	Food Lion, shops	High	35	East	No	N	
20	5th	Kit	Residential	Med	35	East to North, West to South	No	N	
21	5th	Sebastian	Residential	Med	35	West	No	N	
22	5th	Graham	Downtown	Med	30	West, North, East	No	N	
23	3rd	Crawford	Residential	Low	35	South	No	Y	
24	Carr	Woodlawn	Residential	Low	35	North to West, South to East	No	N	
25	3rd	Lee	Community Center	Med	35	North, West, East	No	N	
26	3rd	Roosevelt	School, residential	Med	35	South, East, West	Yes, parallel	N	
27	Mebane Oaks	Arrowhead	Outlets, commercial	HIGH		Mebane Oaks (2), Arrowhead (1)	No	N	
28	3rd	Fieldstone	Apartments	High	45	South, East	No	N	
29	3rd	Center	Downtown, shopping, restaurants	High	35	North	Yes, parallel	N	
30	Center	Moore	Residential, shopping	High	35	None	No	N	
31	Stagecoach	NC 119	Residential, Food Lion, shops	High	35	South side of Stagecoach	No	N	
32	Mebane Oaks	Forest Oaks	Residential, Wal-Mart, shops	High	35	NE corner	No	N	
33	NC 119	London	Residential, grocery, shopping	High	35	South side of NC 119	No	N	
34	NC 119	Foust	Residential, grocery, shopping	High	35	South side of NC 119	No	N	

	Pedestrian Countdown Signal Present? (Y/N)	Curb Ramps Present? Complete/ Incom-plete/None	Notes	Recommendation
	N	No		Add high-visibility crosswalk, fill sidewalk gap on SW corner to connect to school, curb ramps
	N	No		Add high-visibility crosswalk across 1st at Food Lion driveway, curb ramps
	N	No		Add raised crosswalk with signage where sidewalk changes sides
	N	No		Add mini traffic circle and chicanes to slow traffic
	N	Yes, but upgrade		Add marked crosswalk on north side of 5th, maybe raised crosswalk to slow the traffic in this area
	N	Incomplete - missing curb ramp on SE side		Add curb ramp on SE side
	N	No		Add high-visibility crosswalks since sidewalk changes sides, add curb extension on SE and NE side of intersection, curb ramps
	N	Yes, but upgrade		Add high-visibility crosswalk on north side, upgrade curb ramps
	N	Yes		Add high-visibility crosswalk across south side of 3rd and across Roosevelt on east side
	N	Yes but upgrade	Very high traffic	High-visibility crosswalks from the Hess to the Bojangles, and from Bojangles to the McDonalds, add ped countdown timers to these crossings and curb ramps
	N	No	High traffic	Add curb extension and high-visibility crosswalk across Field-stone, add a high-visibility crosswalk and signage on north side of 3rd. Consider stoplight at this location.
	N	Yes on north side	High traffic. Need improved facilities to cross Center and RR.	Countdown timers all-way, paver crosswalks all-way, curb extensions on north side of Center/70 to provide visibility over on-street parking
	N	N	Frequent cross-ings	Add high-visibility crosswalk, curb ramps, and signage
	N	N	High traffic, con-nects to shops	Add curb ramps, high-visibility crosswalks, and pedestrian count-down timers on all sides
	N	N	Unsignalized, high traffic	Add high-visibility crosswalk across south side of Mebane Oaks to connect to Wal-Mart site. Add crosswalk signage, curb ramps at all corners, and a median refuge island for crossing
	N	N	Unsignalized, high traffic	Add high-visibility crosswalk across NC 119 on the east side of the intersection. Add curb ramps to NE, SE, and SW corners.
	N	N	Unsignalized, high traffic	Add high-visibility crosswalk across NC 119 on the east side of the intersection. Add curb ramps to NE and SE corners and cross-walk signage.

Greenway Network Table

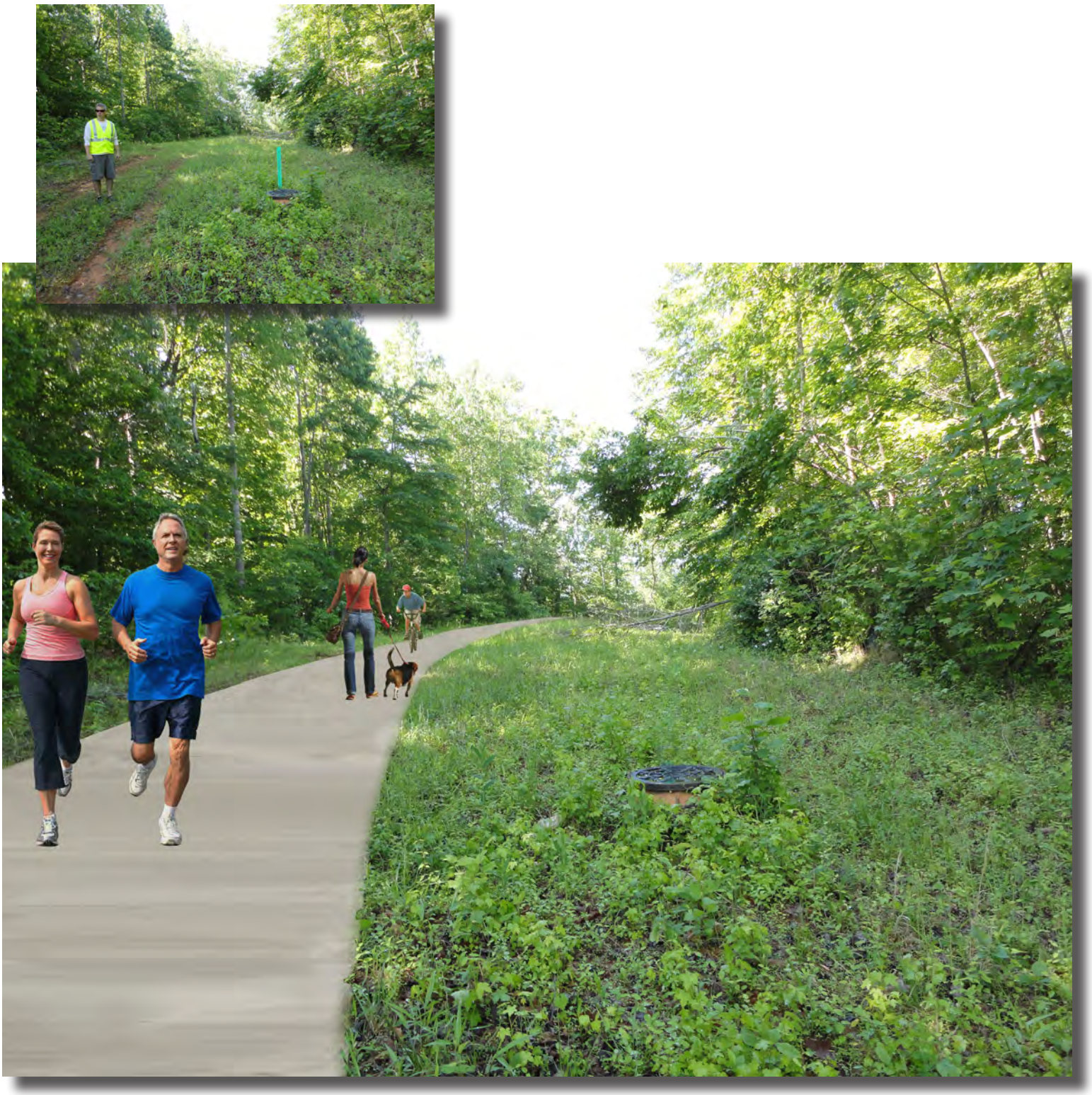
From	To	Length (Miles)	Description
Lebanon	Mockingbird	0.18	Follows sewer easement to connect to end of Mockingbird Ln
Lebanon	Creeks Edge	0.16	Follows sewer easement to connect to end of Creeks Edge Ct
Lake Michael	Village Lake	0.15	Follows sewer easement to connect to end of Village Lake Dr
Lebanon	Mill Creek Golf Course	1.91	Follows sewer easement from Lebanon Rd to backside of golf course
Sewer easement between N Third and N Fifth	Food Lion	0.09	Follows sewer easement to the backside of the Food Lion
N First	Sam Snead	0.08	Follows sewer easement for short trail connection northeast from N First to Sam Snead
N First	N First	0.83	Follows sewer easement along Swift Creek south, to east end of Briarcliff, then SE back to N First
N First	E Stagecoach	0.41	Follows sewer easement from N First southeast to E Stagecoach. Spur to north end of Ninth
E Stagecoach	N Fourth	0.42	Follows sewer easement north-south between N Third and N Fifth
E Sebastian	E Orange	0.29	Sewer easement southeast from east end of E Sebastian to west end of E Orange
Moore	Mebane Arts & Community Center property	0.37	Sewer easement from south end of Moore to northern edge of Mebane Arts & Community Center property
Vance	Mebane Arts & Community Center property	0.23	Sewer easement from south end of Vance to northern edge of Mebane Arts & Community Center property
Fitch	Mebane Arts & Community Center property	0.52	Sewer easement south from Fitch to north end of Corregidor
Mebane Arts & Community Center property	W Jackson	0.90	Sewer easement north to W Jackson. Connects Vance, W Lee, W McKinley, and Stonewall
E Webb	Cedar	0.23	North-south sewer easement found to the west of S Lane
E McPherson	Oakwood	0.22	Sewer easement from McPherson south to Avalon and east to Oakwood
Wilson	B	0.78	North-south sewer easement from Wilson, across Forest Oaks, to north end of B St. Spur to Connolly

From	To	Length (Miles)	Description
Arrowhead	I-40	0.22	Sewer easement south from Arrowhead into Tanger Outlets, southwest to I-40 crossing (future bridge)
Briarwood	S Fifth	0.06	Sewer easement from Briarwood south across S Third and London Ln to S Fifth. Spurto Falcon Ln.
S Fifth	Mebane Oaks	0.19	Sewer easement from S Fifth, across Arrowhead Ln and S Eighth, then south and west to Mebane Oaks
Longleaf Pine	Old Hillsborough	0.17	Sewer easement traveling southwest from Longleaf Pine to Old Hillsborough
Copper	Trollingwood Hawfields	0.11	Short sewer easement connection
S Fifth at NC 119	I-40	0.29	Short sewer easement connection (Future bridge location)
S Fifth	I-40	0.31	Short sewer easement connection near Terrell St
I-40	NC 119	0.86	Sewer easement south through Hawfields MS, west to NC 119. Spur trail to Spring Forest & Deerfield
Sargents Path	Mattress Factory	0.82	Short sewer easement from south end of Sargents Path to Mattress Factory
Birkdale	Corporate Park	0.66	East-west sewer easement
NC 119	Mebane Arts & Community Center property	0.58	Sewer easement from NC 119 east along Huckleberry Loop to north end of Corregidor
Fitch	Alberta	0.14	Sewer easement from Fitch to south end of Alberta
Curry	Fitch	0.07	Short sewer easement connection from south end of Curry to Fitch
Roosevelt	Hawfields	0.05	East-west sewer easement from Roosevelt, along South Mebane ES property, to Hawfields
Arrowhead at Pear Tree	Private (Tanger Outlets)	0.04	Short trail connection to Tanger Outlets
Gibson	Corporate Park	0.96	Sidepath along S Third St
S Fifth	W Center	0.90	Sidepath along NC 119
Corporate Park sewer easement	NC 119	0.30	Sidepath along Corporate Park from sewer easement, north to Park Center, east to NC 119
Dodson	S First	0.27	Sidepath along W Holt
Mebane Rogers	US 70	1.15	Sidepath along Dodson

From	To	Length (Miles)	Description
Supper Club	Ashbury	0.38	Sidepath along US 70
Deerfield	South of White Ct	1.10	Sidepath along NC 119
NC 119	B	1.01	Sidepath along Old Hillsborough Rd
Ashland	Stagecoach	0.23	Sidepath along Lebanon
S Lane	Mattress Factory	1.61	Sidepath along Oakwood
Bob White	US 70	0.0	Short trail connection from south end of Bob White to US 70
W Carr	W Holt	0.46	Trail from W Carr along EM Yoder ES property, south across Center St to W Holt
N Carr	N Ninth	0.73	Sidepath along Stagecoach Rd
Mrs White	Stagecoach	1.44	Sidepath along NC 119
Woodlawn	N Carr	0.93	Sidepath along Stagecoach Rd
N Ninth	Mill Creek	1.23	Sidepath along Stagecoach and Lebanon
Dodson	Woodlawn	1.40	Sidepath along Stagecoach Rd
Lebanon	St Andrews	1.34	Sewer easement between Lebanon Rd and St Andrews Dr
Forest Oaks	Sutton	0.11	Forest Oaks-Sutton Place connector

Left: 5th Street at Kit existing conditions

Below: 5th Street at Kit proposed crosswalk improvement where sidewalk switches sides of the street



Proposed multi-use trail near West Lebanon Road

CHAPTER FOUR

BICYCLE NETWORK

Chapter Contents

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Overview

For the purposes of this Plan, the bicycle network refers to on-road and within roadway right-of-way recommendations. Of course, the greenway network (described in Chapter 3) is also an important component of a comprehensive bicycle network. The bicycle network types include bicycle lanes, sharrows, paved shoulders, and bicycle boulevards. This chapter describes the bicyclist types and bike facility types, includes bike network maps, and features project cutsheets with maps, photo renderings, and cost estimates.

Types of Bicyclists

It is important to consider bicyclists of all skill levels when creating a city-wide bikeway network. Bicyclist skill and comfort level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. 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. A framework for understanding the characteristics, attitudes, and infrastructure preferences of different bicyclists in the US population as a whole is illustrated on the following page.

A bicyclist using the sidewalk along Fifth Street.

A youngster with his bicycle on Giles Street.

HIGHLY EXPERIENCED (APPROXIMATELY 1% OF POPULATION)

Characterized by bicyclists who 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 multi-use paths 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 multi-use 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 "Enthused & 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.

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

Methodology for Bicycle Network Design

The recommended bicycle network was designed in mind for all types of bicyclists described on the previous page, with a special focus on the "Interested but Concerned" population that makes up the majority of Mebane area residents. The network was developed based on Steering Committee input, public input, NCDOT Division input, recommendations from previous studies, existing conditions analysis, noted destinations, presence of existing greenway projects, and field analyses.

The Hub + Spokes Model

The image below shows some of the key components for the overall bicycle, pedestrian and trail network based on a model of hubs (destinations) and spokes (walking and bicycling corridors).

The image below *conceptually* shows how this model of hubs and spokes could be applied in Mebane, NC, with a network of complete streets (in grey) and greenways (in green) connecting key destinations throughout the city. **Keep in mind the map below only conceptually shows these linkages. See Maps 4.1 and 4.2 on the following pages for actual bicycle network recommendations.**

Bicycle Facility Types

Bicycle Lanes

A bicycle lane is defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. 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. The buffer allows for a safer and more comfortable ride for more types of bicyclists.

Bike Lane Safety Benefits

36% bicycle crash reduction factor (FHWA) when adding bike lanes to a roadway

Paved Shoulders

In many rural areas, 4- to 6-foot-wide paved shoulders are a typical treatment for accommodating bicyclists. Paved shoulders allow bicyclists to travel on a paved surface adjacent to through traffic, if desired.

Paved Shoulder Benefits

According to the 2008 FHWA Desktop Reference for Crash Reduction Factors, paved shoulders also provide a benefit to pedestrians. Providing a paved shoulder of at least four feet to avoid walking in the roadway resulted in a 71% crash reduction factor.

Shared Lane Markings (Sharrows)

Shared lane markings (also known as "sharrows") have become more popular as a pavement marking treatment to help align cyclists properly within more complex, urban landscapes that may feature on-street parking, a variety of lane widths, and other factors.

Bicycle Boulevards/Neighborhood Greenways

Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.

Comparison of Bike Facility Use, Portland, Oregon

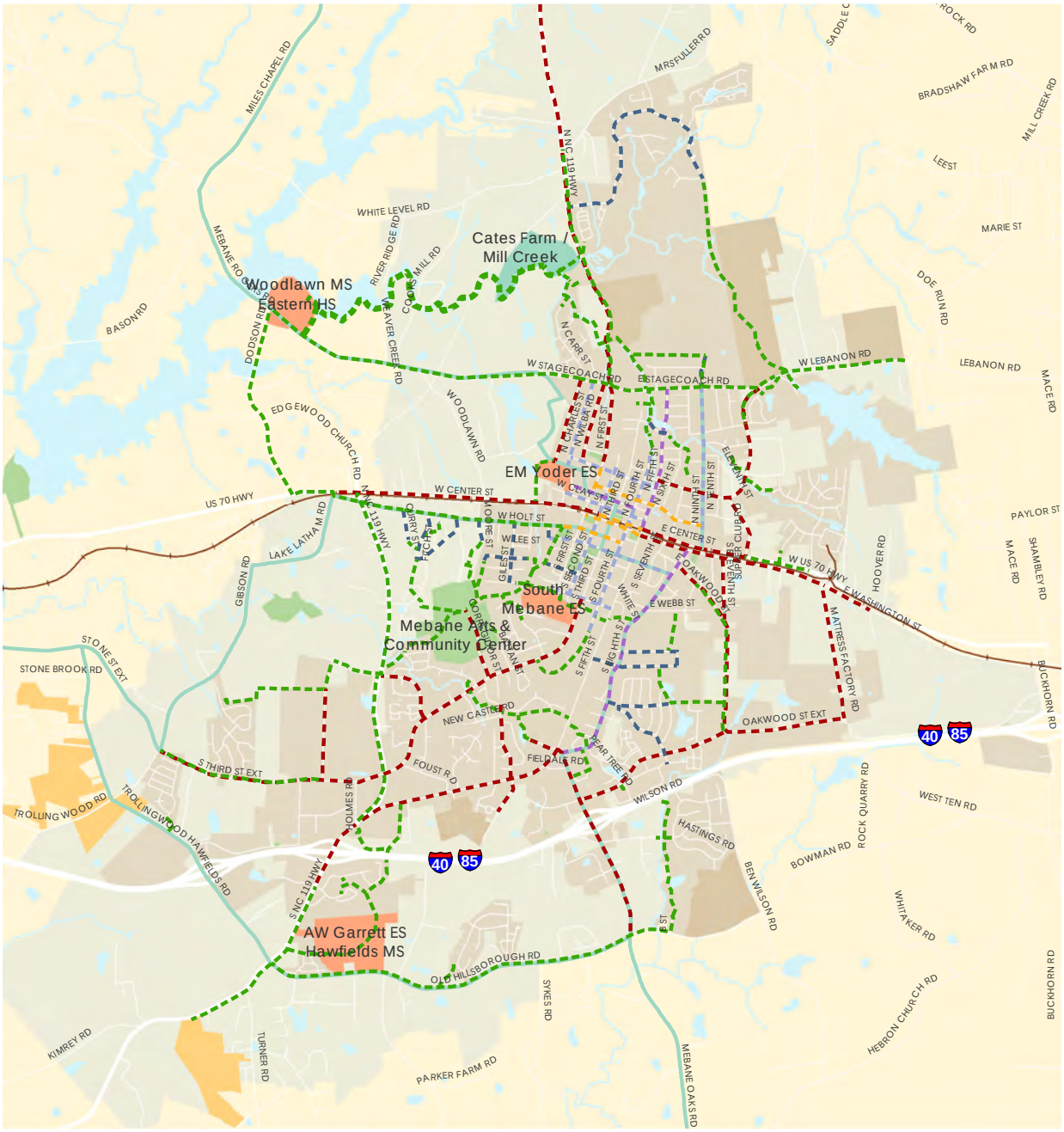
Bicycle Boulevard: 3,000 bicycles /day (average)

Arterial with Bicycle Lane: 450 bicycles/day (average)

Signed Routes

Signed bike routes help bicyclists to navigate lower-volume street networks. Bicycle signage is an important element of bike routes that alerts motorists to the presence of bicycle traffic while providing information to bicyclists. Signage may also be used for regional and state bike routes. A signed route does not necessarily include separated space for bicyclists and should be considered on a case-by-case basis.

Map 4.1 Bicycle Network



Bicycle Recommendations

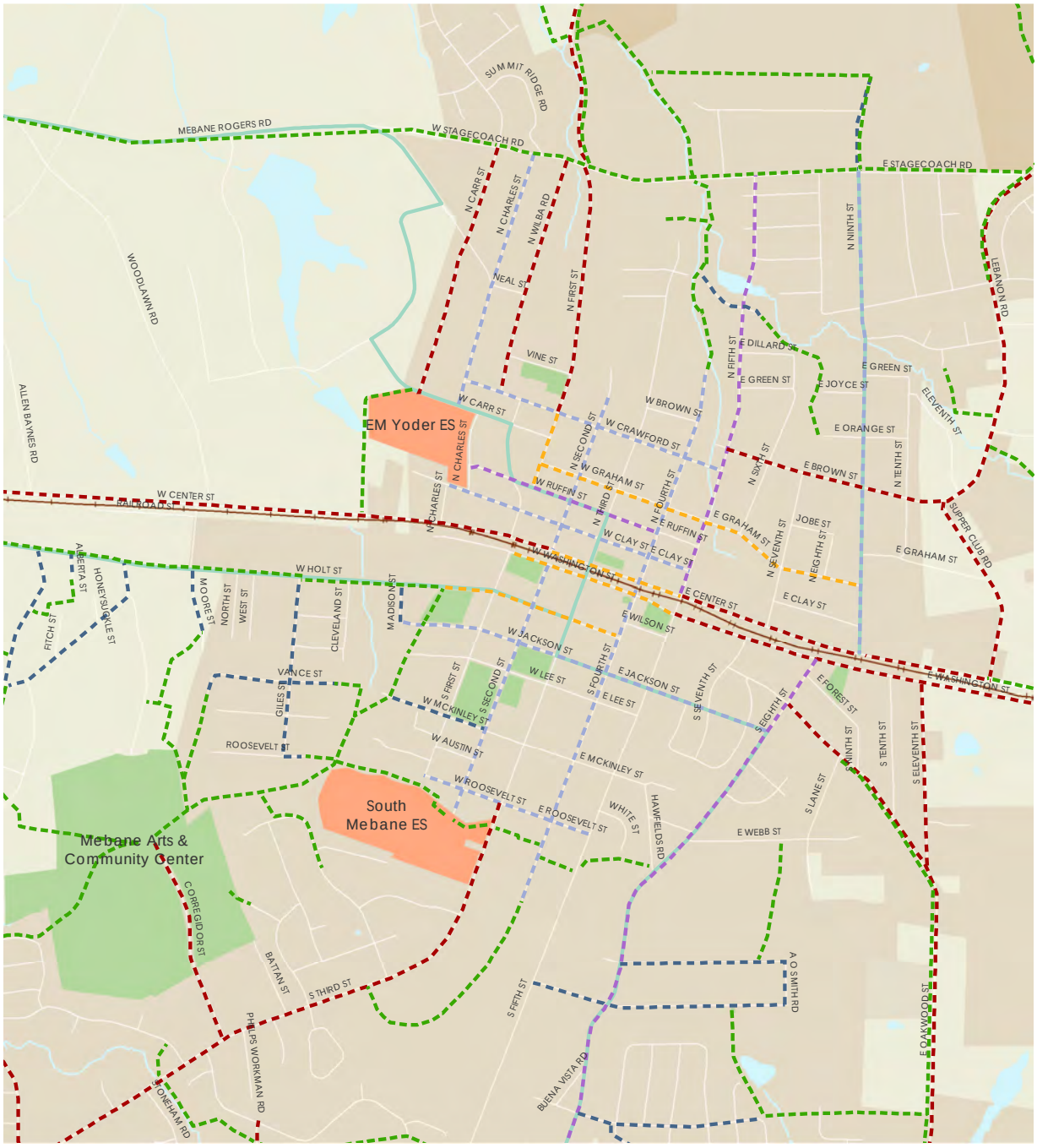
0 0.75 1.5 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Potential Conservaion Lands
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Map 4.2 Bicycle Network (Downtown)



Bicycle Recommendations - Downtown

0 0.125 0.25 0.5 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Priority Project Cutsheets

Top On-Road Bicycle Projects

North Fifth Street Bike Lanes & Traffic Calming

From: Stagecoach Road

To: West Center Street

Distance: 4,385 feet (0.83 miles)

Speed Limit: 30 MPH

Cost Estimate: $27,800*

**Planning level cost estimate for bike lane striping and marking*

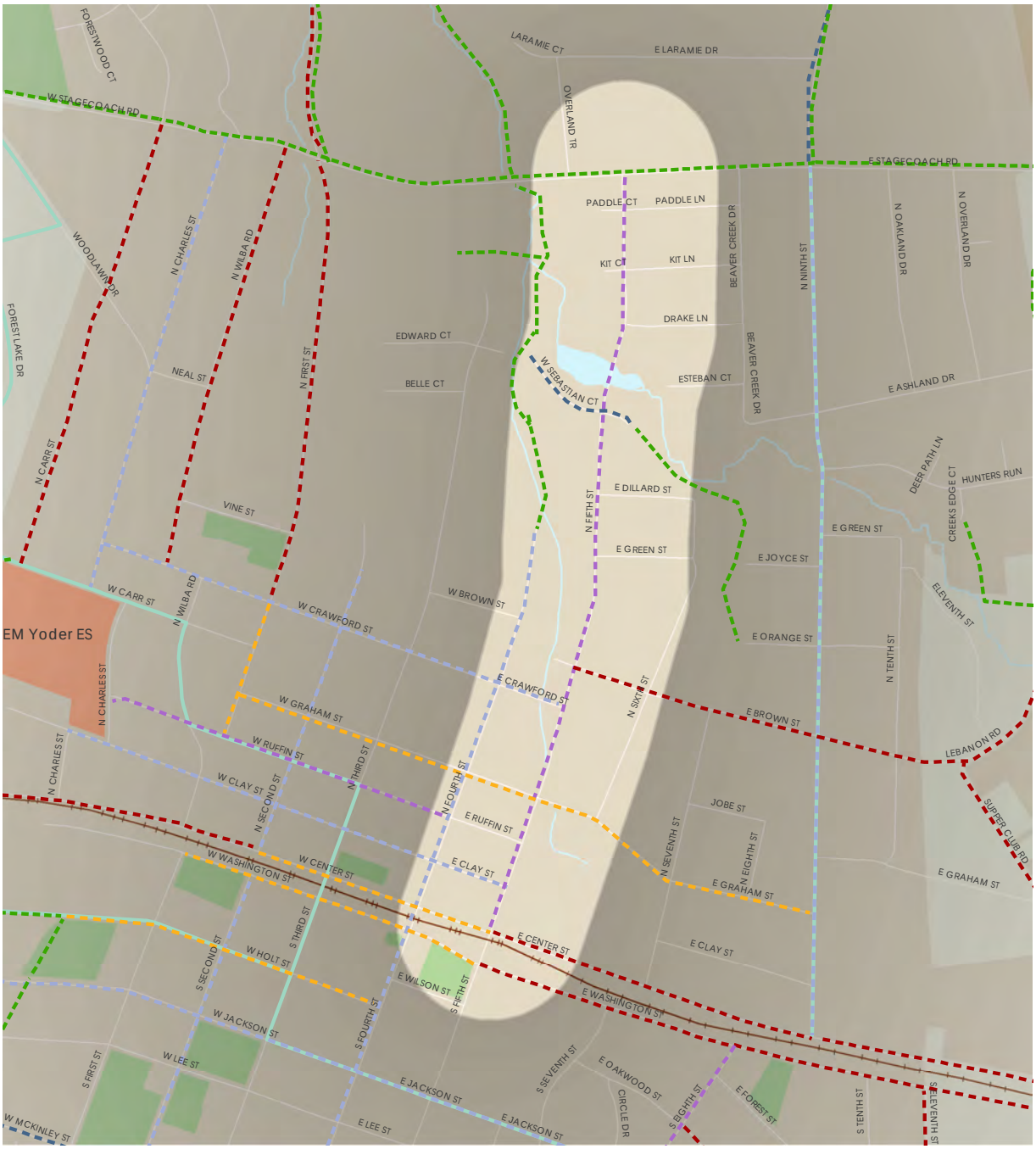
Prioritization score: 44.00 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail or bicycle route
- Connects to proposed facilities
- Top 3 recommendation from 2014 public comments
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to Downtown
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Separation from high motor vehicle traffic volumes

Recommendation

Stripe bike lanes on North Fifth Street from Stagecoach Road to West Center Street. Provide bike lane signage along the route and wayfinding signage to downtown and key destinations. In sections that are too narrow, sharrow markings should be applied in place of bicycle lanes. Consider traffic calming features as well, such as narrowing travel lanes to fit bike lanes and mini-circles.



North Fifth Street Bike Lanes

0 0.125 0.25 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Fourth Street Bike Boulevard

From: North end

To: South end

Distance: 5,268 feet (1.00 mile)

Speed Limit: 30 MPH

Cost Estimate: Varies*

**Project cost estimate will be contingent upon the number and types of treatments chosen during project design*

Prioritization score: 39.67 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail or bicycle route
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to Downtown
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Separation from high motor vehicle traffic volumes

Recommendation

Designate the entire length of Fourth Street as a bike boulevard with signage, pavement markings, and traffic calming treatments. Traffic calming treatments may include chicanes, curb extensions, mini traffic circles, or speed tables. Provide wayfinding signage to downtown and key destinations along the route.

Fourth Street Bike Boulevard

0 0.125 0.25 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Second Street Bike Boulevard

From: West Washington Street

To: South Mebane Elementary School

Distance: 2,717 feet (0.51 miles)

Speed Limit: 30 MPH

Cost Estimate: Varies*

**Project cost estimate will be contingent upon the number and types of treatments chosen during project design*

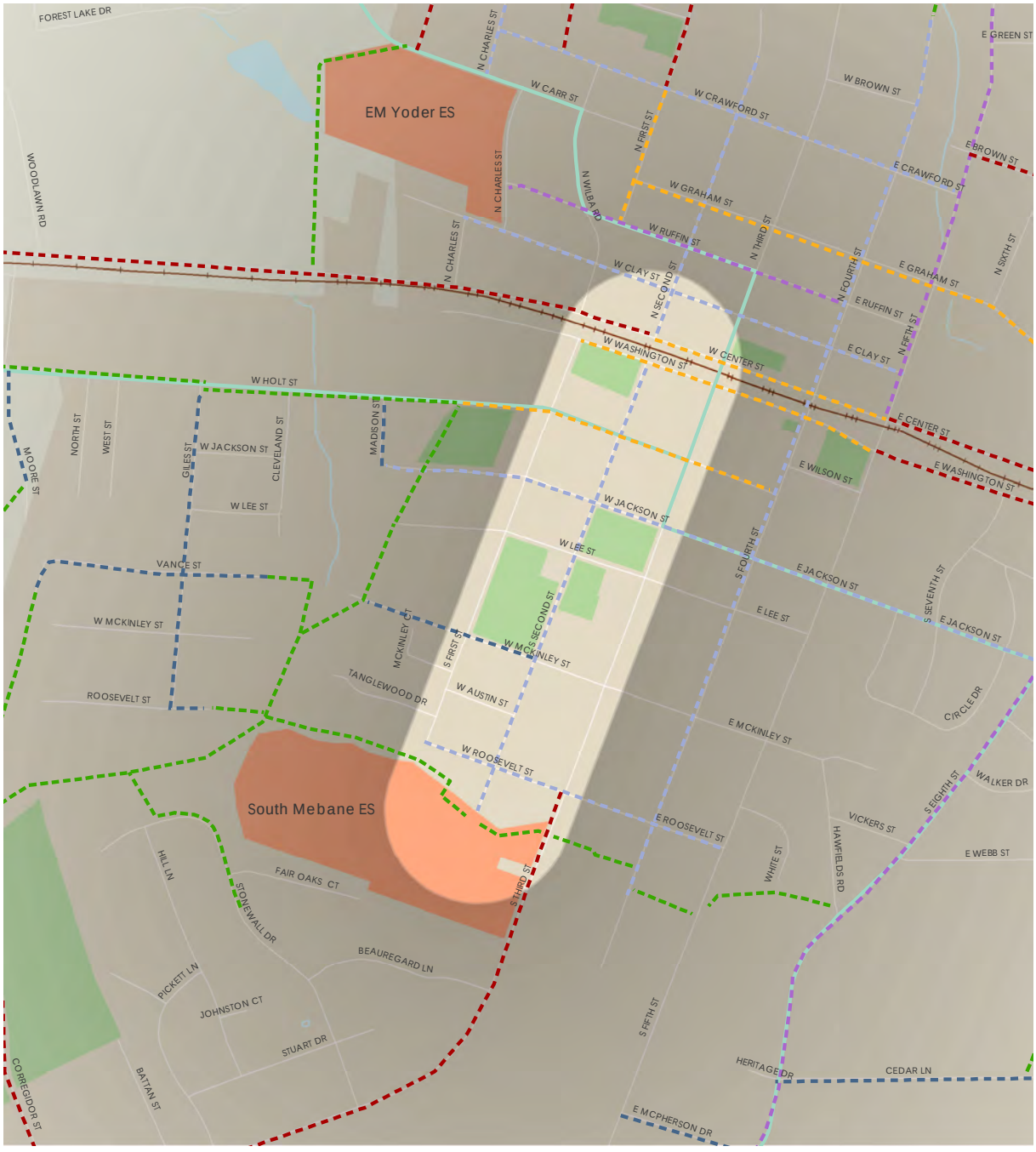
Prioritization score: 39.67 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail or bicycle route
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to Downtown
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Separation from high motor vehicle traffic volumes

Recommendation

Designate Second Street from West Washington Street to South Mebane Elementary School as a bike boulevard with signage, pavement markings, and traffic calming treatments. Traffic calming treatments may include chicanes, curb extensions, mini traffic circles, or speed tables. Provide wayfinding signage to downtown and key destinations along the route.



Second Street Bike Boulevard

0 0.125 0.25 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Eighth Street Bike Lanes

From: East Washington Street

To: Mebane Oaks Road

Distance: 7,772 feet (1.47 miles)

Speed Limit: 35 MPH

Cost Estimate: $48,800*

**Planning level cost estimate for bike lane striping and marking*

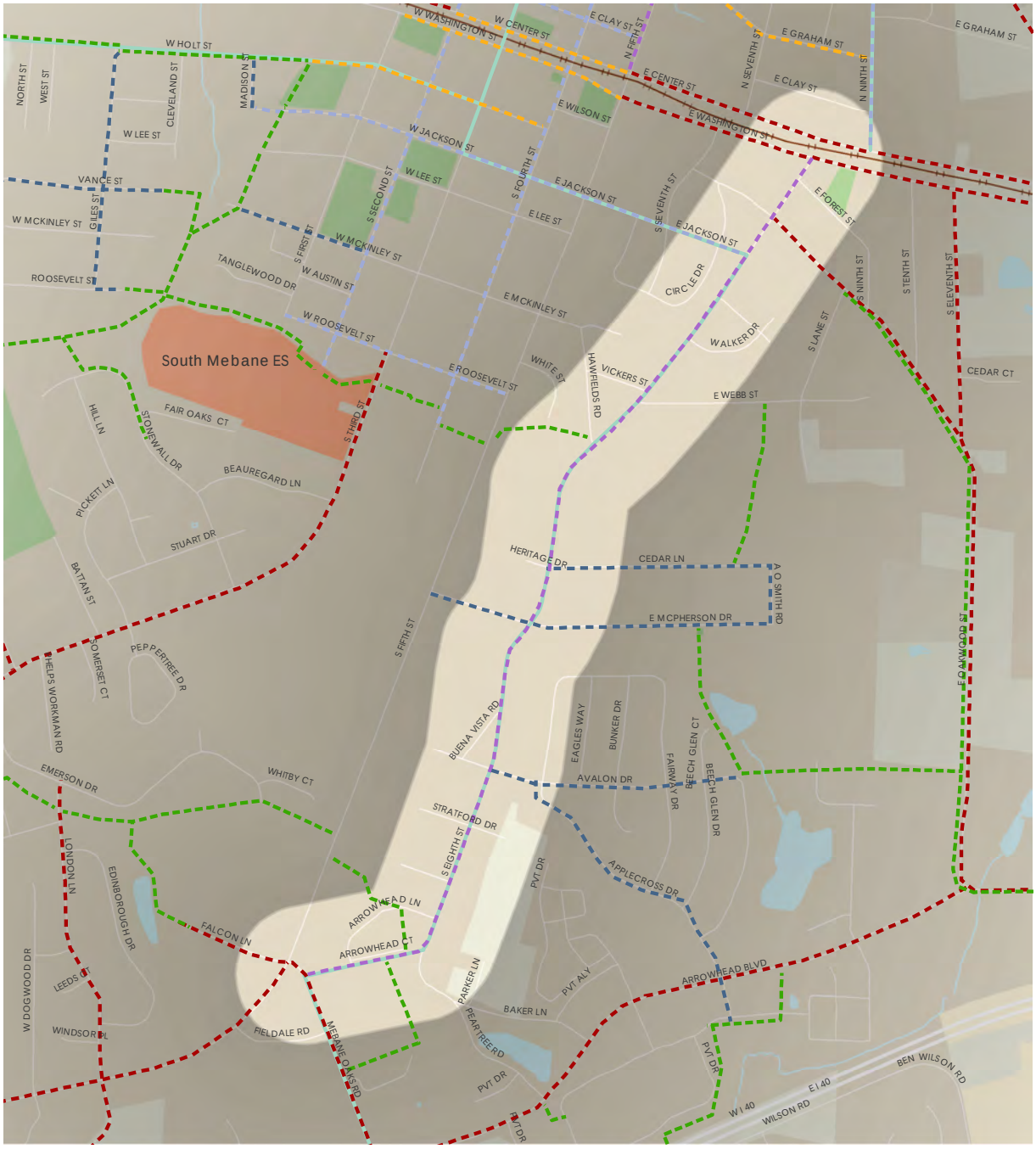
Prioritization score: 38.90 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail or bicycle route
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Direct access to major shopping centers/business areas
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Separation from high motor vehicle traffic volumes

Recommendation

Widen the roadway during repaving and stripe bike lanes on Eighth Street from East Washington Street to Mebane Oaks Road. Provide bike lane signage along the route and wayfinding signage to downtown, Tanger Outlets, and key destinations.



Eighth Street Bike Lanes

0 0.125 0.25 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Jackson Street Bike Boulevard

From: Madison Street

To: South Eighth Street

Distance: 3,910 feet (0.74 miles)

Speed Limit: 30 MPH

Cost Estimate: Varies*

**Project cost estimate will be contingent upon the number and types of treatments chosen during project design*

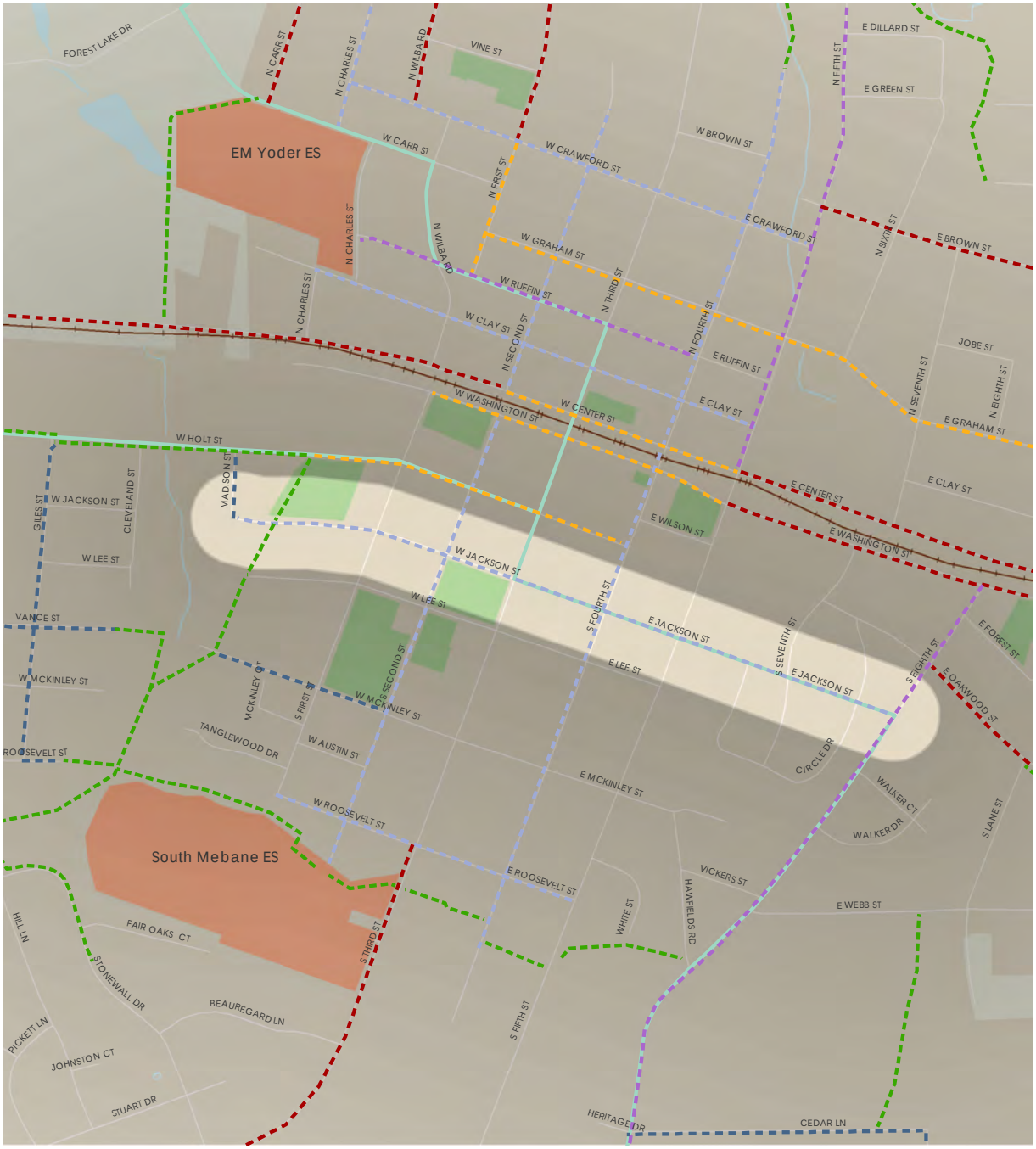
Prioritization score: 35.34 / 56.11

Reasons for priority ranking:

- Direct access to or from an existing trail or bicycle route
- Connects to proposed facilities
- Park, library, or recreation center within 1/2 mile
- Elementary, middle, or high school within 1/2 mile
- Connects to low vehicle access areas
- Connects to low-income areas
- Connects to areas with a higher minority population
- Separation from high motor vehicle traffic volumes

Recommendation

Designate Jackson Street from Madison Street to South Eighth Street as a bike boulevard with signage, pavement markings, and traffic calming treatments. Traffic calming treatments may include chicanes, curb extensions, mini traffic circles, or speed tables. Provide wayfinding signage to downtown and key destinations along the route.



Jackson Street Bike Boulevard

0 0.125 0.25 Miles

N

Proposed Facility Type

- Bike Lane
- Signed Bike Route
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Shared Use Trail
- Signed Bike Route
- Parks & Open Space
- Schools
- Low Income Housing
- Future Housing Areas
- Railroad
- Hydrology
- City Limits
- Mebane ETJ

Bicycle Network Table

Roadway	From	To	Facility Type*	Implementation Method	Length (Feet)
ALBERTA ST	W HOLT	South to proposed trail	S	Signage	226
ARROWHEAD BLVD	MEBANE OAKS	OAKWOOD	PS	Roadway widening, restriping	5,107
AVALON	S EIGHTH	East end	S	Signage	1,879
CARR ST	W STAGECOACH	W CARR	PS	Roadway widening, restriping	2,648
CENTER ST	N FIFTH	N NINTH	PS	Roadway widening, restriping	1,910
CENTER ST	WOODLAWN	N SECOND	PS	Roadway widening, restriping	3,514
CENTER ST	WOODLAWN	West to proposed trail	PS	Roadway widening, restriping	4,620
CENTER ST	N SECOND	N FIFTH	SLM	Pavement marking	1,390
CLAY ST	N CHARLES	N FIFTH	BB	Marking, signage, traffic calming	2,653
CORPORATE PARK DR	S THIRD	PARK CENTER	PS	Roadway widening, restriping	2,803
CORREGIDOR ST	S THIRD	North dead end	PS	Roadway widening, restriping	2,201
CRAWFORD ST	N CHARLES	N FIFTH	BB	Marking, signage, traffic calming	2,743
CURRY ST	W HOLT	Dead end	S	Signage	890
E BROWN/LEBANON RD	N FIFTH	E STAGECOACH	PS	Roadway widening, restriping	6,094
E WASHINGTON	MATTRESS FACTORY	SARGENTS PATH	PS	Roadway widening, restriping	1,605
EIGHTH ST	MEBANE OAKS	E WASHINGTON	PS	Roadway widening, restriping	7,772
ELEVENTH ST	E WASHINGTON	OAKWOOD	PS	Roadway widening, restriping	1,859
FIELDSTONE DR	NC 119	S THIRD	PS	Roadway widening, restriping	2,235
FIFTH ST	STAGECOACH	CENTER	BL	Restriping	4,385
FIRST ST	W CRAWFORD	W RUFFIN	SLM	Pavement marking	781
FIRST ST	STAGECOACH	W CRAWFORD	PS	Roadway widening, restriping	2,534
FITCH DR	W HOLT	FITCH DR	S	Signage	1,884
FITCH DR	W HOLT	FITCH DR	S	Signage	1,480
FOURTH ST	North dead end	South dead end	BB	Marking, signage, traffic calming	5,268
GILES ST	W HOLT	ROOSEVELT	S	Signage	2,003
GRAHAM ST	N FIRST	N NINTH	SLM	Pavement marking	3,515
JACKSON ST	MADISON ST	S EIGHTH	BB	Marking, signage, traffic calming	3,910
LONDON LN	EMERSON	MCGREGOR	PS	Roadway widening, restriping	3,511
MADISON ST	W HOLT	W JACKSON	S	Signage	369
MATTRESS FACTORY	E WASHINGTON	OAKWOOD	PS	Roadway widening, restriping	4,123
MCKINLEY	S SECOND	West to dead end	S	Signage	589
MCPHERSON	S FIFTH	AO SMITH	S	Signage	2,618

**S = Signage, PS = Paved Shoulders, SLM = Shared Lane Markings, BB = Bike Boulevard, BL = Bike Lane*

Roadway	From	To	Facility Type*	Implementation Method	Length (Feet)
MEBANE OAKS/FALCON	North end of Falcon Ln	OLD HILLSBOROUGH	PS	Roadway widening, restriping	7,121
MOORE ST	W HOLT	South to proposed trail	S	Signage	641
N CHARLES ST	W STAGECOACH	W CARR	BB	Marking, signage, traffic calming	2,680
N WILBA RD	W STAGECOACH	W CRAWFORD	PS	Roadway widening, restriping	2,450
NC 119	LANDI	E STAGECOACH	PS	Roadway widening, restriping	8,266
NINTH ST	E STAGECOACH	North dead end	S	Signage	957
NINTH ST	E CENTER	E STAGECOACH	BB	Marking, signage, traffic calming	4,933
OAKWOOD ST	S EIGHTH	MATTRESS FACTORY	PS	Roadway widening, restriping	9,276
ROOSEVELT ST	S FIRST	S FIFTH	BB	Marking, signage, traffic calming	1,788
RUFFIN ST	N CHARLES	N FOURTH	BL	Restriping	1,993
S FIFTH ST	HOLMES	FALCON	PS	Roadway widening, restriping	6,688
S NC 119	LOWES	HOLMES	PS	Roadway widening, restriping	2,309
S THIRD ST	GIBSON	South Mebane Elementary School	PS	Roadway widening, restriping	13,027
SEBASTIAN CT	West dead end	East dead end	S	Signage	749
SECOND ST	W CENTER	North dead end	BB	Marking, signage, traffic calming	1,680
SECOND ST	W WASHINGTON	South Mebane Elementary School	BB	Marking, signage, traffic calming	2,717
ST ANDREWS DR	N NC 119	COLONIAL WAY	S	Signage	8,018
SUPPER CLUB	LEBANON	US 70/CENTER	PS	Roadway widening, restriping	1,966
US 70/CENTER	N NINTH	SUPPER CLUB	PS	Roadway widening, restriping	1,310
VANCE ST	West dead end	East dead end	S	Signage	1,424
W HOLT ST	S FOURTH	MADISON	SLM	Pavement marking	1,824
WASHINGTON ST	S FIRST	S FIFTH	SLM	Pavement marking	1,793
WASHINGTON ST	S FIFTH	S EIGHTH	PS	Roadway widening, restriping	1,517
WASHINGTON ST	S EIGHTH	MATTRESS FACTORY	PS	Roadway widening, restriping	4,271

**S = Signage, PS = Paved Shoulders, SLM = Shared Lane Markings, BB = Bike Boulevard, BL = Bike Lane*

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CHAPTER FIVE

PROGRAMS

Chapter Contents

Introduction 5-1
Existing Partners and Programs 5-1
Key Findings and Action Steps 5-4
Program Toolbox 5-5

Introduction

This chapter provides a review of existing programs in Mebane and a toolbox of program resources that can be used to improve upon and launch new bicycle and pedestrian programs. These initiatives complement the infrastructure recommendations that are presented in Chapters 3 through 4. While improving pedestrian and bicycle infrastructure is critical to increasing walking and bicycling rates and safety, program efforts play an equally important role in developing a more bike- and walk-friendly culture. Programs are generally categorized by the Five "E"'s (Education, Encouragement, Enforcement, Evaluation, and Equity). The first four of these "E"'s are discussed in detail, with the fifth "E" (Equity) considered an essential element throughout this Plan. These programs can ensure that more residents learn bicycle and pedestrian safety, understand the benefits of walking and biking, and receive guidance on why and how to integrate walking and bicycling into their everyday lives. In essence, these efforts market active transportation to the general public and ensure the maximum "return on investment" in the form of more residents walking and bicycling and a higher degree of safety and awareness.

The following sections contain information on current and potential program partners, existing programs, and new program ideas to pursue, with a description of the basic approach and links to model programs and resources. Recommendations were informed and prioritized by the Steering Committee and are based on national best practices.

Existing Partners and Programs

A number of initiatives are already in place at the state, regional and local level to promote walking and bicycling in Mebane. The program priorities range from active transportation to trail development, and from healthcare to injury prevention. The City of Mebane Bicycle and Pedestrian Transportation Plan recognizes these efforts as part of the existing walking and bicycling environment of Mebane and as an important starting point for future initiatives.

Partners

This section identifies existing and potential partners for bicycling and walking programs in Mebane. Agencies like NCDOT, Alamance County, Orange County, the Piedmont Triad Regional Council, Burlington Graham MPO, and county public health departments are recognized as existing partners. Some already offer resources related to health or safety education, plan for and promote active transportation, or host community events, while others are potential partners for future collaboration. While some of the community partners listed below serve an area larger than Mebane, such as county or regional groups, they are stakeholders in and potential contributors to Mebane's bicycle and pedestrian planning and programs.

Be Active North Carolina

Be Active North Carolina, Inc. is the statewide initiative committed to empowering North Carolinians to live healthy, physically active lives. Education and encouragement are key strategies in fulfilling the mission of Be Active. The nonprofit organization works to establish policies that make physical activity and good health convenient and accessible for all North Carolina residents.
URL: http://www.beactivenc.org/

Carolina Tarwheels Cycling Club
The Tarwheels are a group of bicycle enthusiasts who organize social rides in Orange, Durham, Wake, Alamance, and Chatham counties of North Carolina. The group promotes the fun and challenge of cycling and advocates for cycling safety and bike-friendly policies in local communities. The Tarwheels are affiliated with the League of American Bicyclists (LAB).
URL: http://www.tarwheels.org

Eat Smart Move More NC
Eat Smart Move More NC is a statewide coalition that promotes increase opportunities for healthy eating and physical activity in North Carolina. The group provides resources for local communities related to best practices and health statistics, as well as funding opportunities.
URL: http://www.eatsmartmovemorenc.com/index.html

Friends of the Mountains to Sea Trail
The proposed route of the statewide Mountains to Sea Trail borders the Mebane community. A group of citizens and volunteers who support the Mountains to Sea Trail established a coalition called Friends of the Mountains to Sea Trail. This group works to encourage trail development along the route and facilitate volunteer workdays to help build and maintain sections of trail.
URL: http://www.ncmst.org/

Healthy Alamance
Healthy Alamance is a local public health non-profit organization affiliated with Alamance County Health Department and Alamance Regional Medical Center. The group is dedicated to identifying health needs and mobilizing resources to address crucial issues in order to improve the quality of life of Alamance County.
URL: http://healthyalamance.com/

Mebane on the Move
The Mebane on the Move coalition is comprised of city leaders, educators, health professionals, citizens, and business leaders working toward the broad goals of increasing the health and wellness of the Mebane community. The group completed a Community Health Assessment in 2011 and continues to conduct ongoing data analysis and needs assessments for Mebane. Additionally, the coalition administers a Mini-Grant Program to support local healthy eating and physical activity programs.
URL: http://www.mebaneonthemove.org/

Mebane Running Club
The Mebane Running Club is a group of friends and neighbors, both new and experienced runners, who meet for a run and coffee at various times throughout the week. The group offers both morning and evening runs each week. Membership to the club is not a requirement to participate.
URL: http://mebanerunningclub.com/

North Carolina Active Transportation Alliance
The North Carolina Active Transportation Alliance (NCATA) is a membership-based advocacy organization promoting active transportation opportunities throughout the state of North Carolina. Information related to statewide policy, biking and walking transportation programs in NC cities, and biking and walking events is posted on their website.
URL: https://sites.google.com/site/ncactive/

Safe Kids Alamance County/Orange County
Safe Kids of Alamance County and Orange County are organizations that serve as the local coalition of the international Safe Kids organization. The organization is dedicated to the prevention of childhood injury and offers bicycle safety rodeos. The local program has a direct link to the bicycle and helmet safety resources provided by the national coalition.
URL: http://www.safekids.org/coalition/safe-kids-alamance-county and http://www.safekidsorangenc.org/

Programs

Mebane's existing bicycling and walking-related programs range from weekly family-friendly walks to a webpage with tips for bike commuters. The list below is not intended to be comprehensive of all existing or past events that relate to biking or walking as an activity; however it provides a useful representation of existing resources, which new programs can build upon.

Bicycling Orange County
Bicycling Orange County is a brochure and route map to encourage bicycling in the Orange County region. The brochure and map are available online and 20,000 copies were printed and distributed in 2010. Mebane is a featured stop on the bicycling routes and is highlighted as an inset map on the brochure. Orange County Planning Department developed the materials with funding from the NCDOT Transportation Improvement Program and in partnership with the NCDOT Division of Bicycle and Pedestrian Transportation.
URL: http://www.co.orange.nc.us/planning/PDFs/transportation/Bicycle%20Brochure/OrangeCoMap_FINALforWeb.pdf

Mebane on the Move Walks, Rides, and Events
Mebane on the Move offers several programs and events that are key elements of Mebane's bicycling and walking environment, including an annual Family Fitness Festival. Mebane Walks and Mebane Rides are seasonal, weekly group walks and group rides that are promoted broadly to encourage residents of all ages, abilities, and skill levels to participate in low-intensity physical activity. The Mebane Walks Challenge, an off-shoot of this program, promotes walking groups within local churches. The Elementary School Running Clubs are an afterschool activity for children that encourages non-competitive running as a positive form of regular physical activity.
URL: http://www.mebaneonthemove.org/projects

PARC Passport
Healthy Alamance established the PARC (Parks & Recreation Challenge) Passport program to promote local trails and recreational amenities and encourage area residents to develop more active lifestyles. The program is funded in part by the United Way.
URL: http://parcpassport.weebly.com/index.html

Ped Power
Ped Power is a program of the Piedmont Triad Regional Council. The website provides helpful tips and links to online resources for both cycling and walking in the region. The site also promotes bicycling routes within the area and Safe Routes to School efforts.
URL: www.pedpower.org

Safe Routes to School
Safe Routes to School Programs (SRTS) provide funding for school-based programs which encourage bicycling and walking to school. This typically involves examining conditions around public schools and providing programs to improve bicycle/pedestrian safety, accessibility and use. Managed by the North Carolina Department of Transportation (NCDOT), Transportation Mobility and Safety Division, SRTS is the source for federal SRTS funding amounts, SRTS applications and guidelines, and state SRTS program information.

North Carolina's SRTS funding from FY2005-2011 totaled $25,981,930. The NCDOT also seeks requests for SRTS Division Fund projects on a rolling basis. Each Division has been allocated up to $430,000 of SRTS funds for eligible projects along or intersecting with state-maintained roads. Projects must be within two miles of a school serving grades K-8. These funds are primarily intended for small safety improvements, as project requests can range from $10,000 to $100,000.
URL: http://www.ncdot.gov/programs/safety/

Key Findings and Action Steps

The City of Mebane is making important progress towards meeting the overarching goals of the Bicycle Friendly Community (BFC) and Walk Friendly Community (WFC) programs and creating a friendlier environment for both biking and walking. Mebane on the Move, in particular, is a critical partner in applying national best practices to creating a healthier, more active community. Mebane on the Move is successfully forging partnerships among sectors of the community (from schools to churches to businesses) and is providing low-intensity and family-friendly bicycling and walking programs.

Though the focus on increasing physical activity is positively impacting the bicycling and walking environment in Mebane, it is primarily directed toward recreational and leisure activity rather than active transportation as part of daily routine. The next phase of Mebane's programming efforts should center on extending the existing group walks and rides so that they also include social walks to dinner or organized bike rides to the farmers' market.

Overall, there are untapped opportunities to partner with agencies and organizations outside of Mebane's city limits that can contribute to broader goals of a more bike- and walk-friendly region and benefit Mebane's local efforts. For example, Healthy Alamance is a lead partner in the City of Burlington's Active Streets event, which is modeled after the popular concept and national best practice of "Open Streets" events. The opportunity may exist for the City of Mebane to capitalize on the energy and resources invested into Burlington's event and to partner with Healthy Alamance for a similar event in Mebane.

The following is a summary of key findings and recommended action steps based on the review of existing and potential partners and existing programs in Mebane.

- **Mebane has an extensive list of existing and potential partners** that currently are or have the capacity to lead, sponsor, or assist with bicycling and walking related programs.

Action Step: The City should establish a work plan of priority programs for implementation over the next three years and strategically engage existing and new partners to serve as sponsors, promoters, lead organizers, or technical assistance providers for programs that best overlap their mission.

- **The City is host to several competitive or semi-competitive races,** such as the Dogwood Festival 5K and the North Carolina Freedom Run 5K. Although these events contribute to physical activity in the community, they are not essential components to creating an environment that supports active living as a part of residents' daily life.

Action Step: The City and its partners should identify opportunities to incorporate low-intensity walks and bike rides into the existing annual 5K and 10K races.

- **The City has not yet established momentum around SRTS goals and objectives.** However, Mebane on the Move has established a working relationship with schools and students through the Elementary School Running Clubs program.

Action Step: In partnership with the school district, local PTOs, and NCDOT, SRTS should be a priority moving forward. The existing Elementary School Running Clubs program serves as a natural starting point for establishing new bicycling and walking opportunities at schools, including Walk to School Day, Bike to School Day, and organized walking/biking school buses.

- **The existing effort by Mebane on the Move to document and assess health challenges is an important evaluation strategy**. This can be expanded further to document trends related to bicycling and walking and to correlate to the designation criteria of BFC and WFC.

Action Step: The City should establish an Evaluation Task Force including Mebane on the Move, regional planning organizations, and Healthy Alamance among others. The group can identify strategies for expanding evaluation of bicycling, walking, and health metrics in Mebane. Additionally, the group can identify means of incorporating the results of the expanded evaluation methods into local and regional planning processes.

Program Toolbox

The following includes a toolbox of education, encouragement, enforcement, and evaluation programs that have been applied across the country in the most successful communities. The Mebane Steering Committee ranked these programs and the highest ranking are described below.

Media Campaign to Educate Motorists, Bicyclists, and Pedestrians

Purpose: *Educate all road users on traffic laws and safety tips to reduce crashes and make roadways more comfortable for all users*

Audience: *General public*

Partners: *City of Mebane (including Police Department and Recreation and Parks Department)*

Watch for Me NC is a comprehensive traffic safety campaign launched through NCDOT to reduce the number of pedestrian and bicyclists involved in crashes with motor vehicles. The campaign consists of educational messaging directed individually towards drivers, bicyclists, and pedestrians in order to teach people traffic laws and safety tips

unique to each mode. Public outreach is conducted through bus advertisements and banners, brochures, bumper stickers, gas pump stickers, TV and radio advertisements, and a police enforcement effort.

The pilot program was launched in the Triangle communities of Raleigh, Durham, Chapel Hill, and Carrboro and will be expanding statewide. The City of Mebane and its police department should work with NCDOT to launch a local Watch for Me NC Campaign.

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

Safe Routes to School (SRTS) Program

Purpose: *Provide opportunities for children to safely walk and bike to school; improve traffic safety around schools through investments in bicycle and pedestrian infrastructure and programs*

Audience: *School-aged children and their parents; school administrators, faculty, and staff*

Partners: *Alamance-Burlington Public Schools; Parent-Teacher Associations (PTAs); Mebane Police Department; Mebane Public Works staff; community volunteers*

Safe Routes to School (SRTS) is a program that 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. SRTS programs should be implemented in every elementary and middle school within Burlington-Alamance Public Schools.

An important first step for SRTS programs in Burlington-Alamance Public Schools would be to host a Safe Routes to School Community Workshop. Designed to help communities develop sound SRTS programs based on their unique local context, this is a one-day event that provides information on best practices, useful strategies, and available resources. NCDOT's Safe Routes to School Program offers a customized version of the "Safe Routes to School National Course," developed by the National Center for Safe Routes to School and the Pedestrian and Bicycle Information Center. Next steps would include developing leaders and key contacts at each school, developing SRTS action plans, and prioritizing projects around each school.

SRTS RESOURCES AND SAMPLE PROGRAMS

NATIONAL CENTER FOR SAFE ROUTES TO SCHOOL:

http://www.saferoutesinfo.org/

MARIN COUNTY, CA:

http://www.saferoutestoschools.org/

GREENVILLE, NC:

http://www.saferoutesinfo.org/data-central/success-stories/greenville-north-carolina-community-comes-together-pedestrian-safety

OTHER NC SUCCESS STORIES:

http://www.saferoutesinfo.org/data-central/success-stories/north-carolina

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 public or private school, 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. The most common types of eligible SRTS projects are sidewalks or a shared-use path. However, intersection improvements (e.g., marking/upgrading crosswalks), on-street bicycle facilities (e.g., bike lanes), or off-street shared-use paths are also eligible for SRTS funds.

For more information and a comprehensive list of eligible projects, please visit the FHWA SRTS program: http://www.fhwa.dot.gov/environment/safe_routes_to_school/overview/

Speeding Enforcement & Speed Feedback Signs

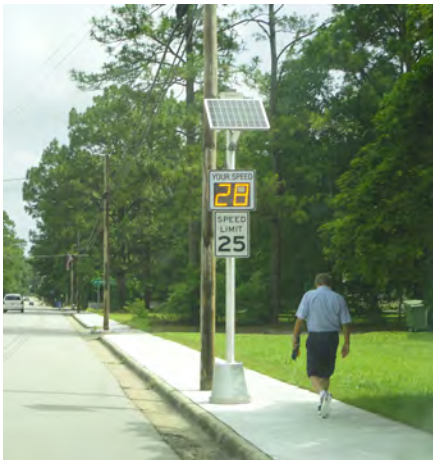
Purpose: *Reduce speeding throughout Mebane to lower the risk and severity of bicycle and pedestrian crashes*

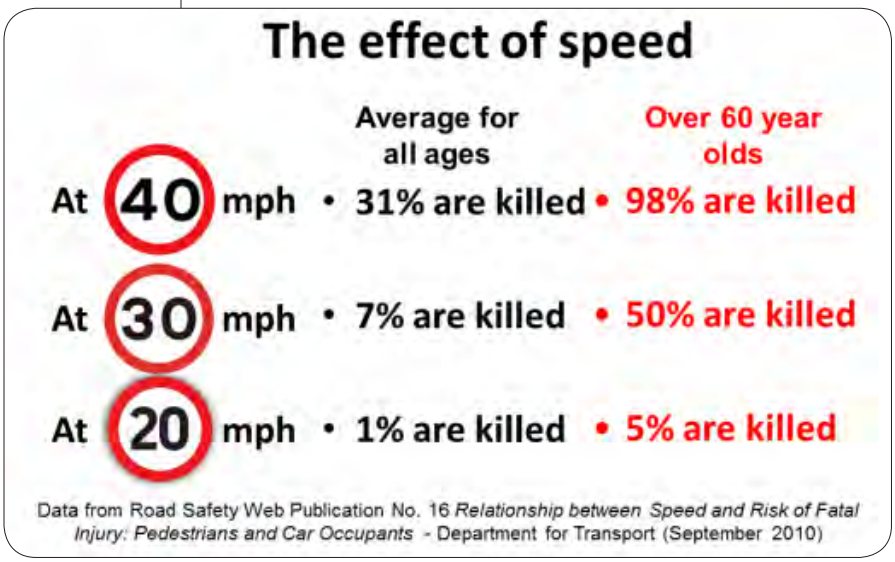
Audience: *Motorists*

Partners: *City of Mebane Police Department; Public Works Department*

Speeding vehicles endanger all road users, including pedestrians and bicyclists. High-speed driving results in more frequent crashes and crashes that are more likely to result in serious injury or death. Targeted speed enforcement activities are a proven way to improve road safety and make walking and bicycling more comfortable.

Law enforcement officials should enforce speed near schools and parks, in downtown, and at locations that are known to have speeding problems (as identified by police officers and resident complaints). These campaigns are ideal for a Safe Routes to School Program; many towns hold an annual "Back to School Blitz" to enforce speed limits in school zones.





As part of ongoing enforcement against speeding, the City of Mebane should also consider creating a speed feedback sign request program to deploy speed feedback signs at the request of neighborhood associations and schools. The signs serve as a traffic calming device when used temporarily at strategic roadway locations. The town should also use speed feedback signs on streets with new pedestrian and bicycle facilities. The signs should be mounted temporarily (e.g., for two weeks) and then be moved to another location to keep motorists from becoming inured to the speed feedback sign effect.

Example speed feedback sign request program:

- Toronto, Canada: http://www.toronto.ca/transportation/walking/wysp/

Bicycle and Walk Friendly Community Programs

Purpose: *Provide recognition of accomplishments and valuable feedback for improving the walkability and bikability of your community.*

Audience: *City staff and residents*

Partners: *City and stakeholders*

The Bicycle Friendly Community (BFC) and Walk Friendly Community (WFC) programs are two North American initiatives intended to encourage U.S communities to improve their bicycling and pedestrian environments and to recognize communities who are successfully doing this. The programs provide communities with valuable resources related to bicycle and pedestrian planning and offer four levels of recognition - Bronze, Silver, Gold, and Platinum – as well as a fifth level for the BFC program, designated as Diamond.

The evaluation criteria for each program is based on five categories often referred as the Five Es of bicycle and pedestrian planning. These categories are: Engineering, Education, Encouragement, Enforcement, and Evaluation. The Engineering category refers to infrastructure-related elements, such as sidewalks, bicycle lanes, bicycle parking, pedestrian lighting, etc. The other four Es refer to non-infrastructure efforts, such as community bicycle rides, walking audits, media campaigns, etc. Research has shown that a comprehensive approach to bicycle- and walk-friendliness is more effective than a singular approach that would address infrastructure issues only.

The BFC program was launched nearly a decade ago and is administered by the League of American Bicyclists, a national bicycling advocacy organization based in Washington, D.C. In 2011, the Pedestrian and Bicycle Information Center, based in Chapel Hill, NC (USA), announced the development of the WFC Program. Similar to the goals of the BFC program, a designated Walk-Friendly Community is described as "a city or town that has shown a commitment to improving walkability and pedestrian safety through comprehensive programs, plans and policies." A community seeking status as a WFC must make pedestrian-related advances in each of the Five Es.

Walk or Bike to School Days

Purpose: *Encourage schoolchildren and their parents to walk and/or bike to school.*

Audience: *Schoolchildren and their parents; neighborhood*

Partners: *Alamance-Burlington Schools; City of Mebane*

International Walk to School Day is held annually in the month of October. The local elementary and middle schools can celebrate with organized activities and an organized parent / student walk to school. Some communities plan participation events for a day, some for a week and some for the entire month. There are readily available guidelines for planning, promoting and implementing Walk to School Day events.

The community could establish additonal Walk and Bicycle to School Days throughout the year. Rewards, competitions and incentives are used to combine education, healthy life choices and entertaining activities that help bond the community together and champion a common cause.

Pedestrian and Bicycling Curriculum

Purpose: *Educate about safe walking and bicycling; rules of the road*

Audience: *Schoolchildren and their parents*

Partners: *Alamance-Burlington Schools; City of Mebane*

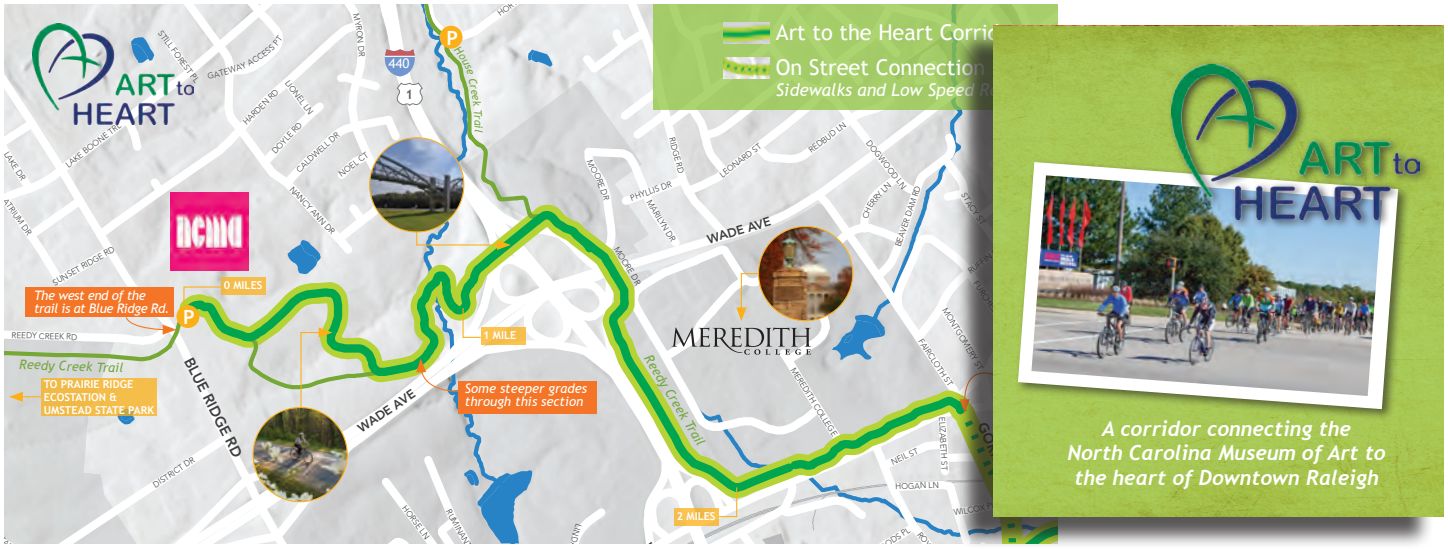
Let's Go NC is a bicycle and pedestrian safety skills program for children in North Carolina. The pedestrian component is based on the National Traffic and Safety Highway Administration (NHTSA) pedestrian curriculum. Both components are modified for North Carolina to instruct children in grades K-5. The program encourages children to be healthy and active by teaching the skills necessary for safe walking. The curriculum includes Safe Routes to School Components, classroom curriculum materials, and videos and exercises.

Website: http://www.ncdot.gov/bikeped/safetyeducation/letsgonc/ Pedestrian and Bicycling Curriculum

Additional Program List

- Car-free Street Events
- Facility Inspection and Maintenance
- Crosswalk "Sting"
- Weekend Walkabouts
- Crossing Guard Program
- Walking/Bicycling Maps
- Bike to Work Day and Bike Month Activities
- Wayfinding Signage
- Business Discounts for Bicyclists
- Professional Development Courses
- One Stop Website
- Adult Education

Examples of other programs for Mebane to consider. Above: Bull City Play Streets open streets event; Below: Art to Heart brochure map from the City of Raleigh that encourages walking and bicycling between destinations.



CHAPTER SIX

POLICIES

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Introduction

One of the most cost-effective implementation strategies for Mebane, Alamance County, and other regional communities is to establish land development regulations and street design policies that promote walkable and bikeable new development and capital projects. As part of a comprehensive approach to developing recommendations for a more walkable and bikeable Mebane, development standards and policies were reviewed to identify general issues and opportunities impacting the bicycle and pedestrian environments. Regulatory standards and policies were analyzed through the lens of the project visions and goals, specifically, the vision of making the Mebane area "**a clean, connected, healthy, and active community where residents and visitors can experience nature, enjoy exercising, and travel safely by foot or by bicycle to local businesses, services, and schools**."

Model regulatory and policy language from around North Carolina and the U.S. was identified for elements including land use/transportation integration, connectivity, Complete Streets, and bicycle parking, enabling the City to maximize bicycle/pedestrian and greenway improvements in conjunction with new development, redevelopment, and corridor improvement projects. In addition, recommended policy language additions to enhance greenway development are included.

Complete Streets Policy

There is a growing national trend towards integrating bicycling, walking, and transit as a routine element in highway and transit projects. This movement has developed under the name of "Complete Streets," which is defined by the Complete the Streets Coalition as follows:

"Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and bus riders of all ages and abilities are able to safely move along and across a complete street."

The Safe Routes to School National Partnership can assist the City's efforts in writing Complete Streets policy. Technical assistance can range from providing resources to assistance in creating marketing campaigns and Complete Streets language.

Pages 6-1--6-3 outline a draft Complete Streets resolution for consideration by the City of Mebane. By adopting a "Complete Streets" policy, the City would be committing to developing new roadways and reconstructing existing roadways to accommodate all users.

DRAFT Complete Streets Resolution

A Resolution of the City of Mebane Expressing Support for the Complete Streets Concept and Requesting that a Complete Streets Ordinance be drafted as a component of the Unified Development Ordinance.

WHEREAS, the "Complete Streets" concept promotes streets that are safe and convenient for all users including pedestrians, bicyclists, and transit riders;

WHEREAS, the North Carolina Board of Transportation adopted a "Complete Streets Policy" for the state;

WHEREAS, streets constitute a large portion of the public space and should be corridors for all modes of transportation including pedestrians, bicyclists, and transit riders;

WHEREAS, Streets that support and invite multiple uses that include safe, active and ample space for pedestrians, bicycles, and transit are more conducive to the efficient movement of people than streets designed primarily to move automobiles and trucks;

WHEREAS, the City of Mebane and Mebane on the Move work to advance Mebane as a bicycle and

pedestrian friendly community and encourages bicycling and walking among its citizens and visitors;

WHEREAS, trends in public health, energy and transportation costs, and air quality necessitate a more comprehensive approach to mobility within communities to offer a greater variety of mobility choices that are not strictly automobile based;

WHEREAS, there are practical limits to roadway expansion as a response to traffic congestion;

WHEREAS, promoting pedestrian, bicycle and transit travel as an alternative to automobiles promotes healthy living, is less costly to the commuter, may delay the need to widen some streets, and reduces negative environmental impacts;

WHEREAS, the development of a more complete transportation network or "Complete Streets" can improve pedestrian safety, facilitate improvements in public health, increase the transportation network's capacity, and reduce climate change effects;

WHEREAS, the Federal Highway Administration has confirmed that designing streets with pedestrians in mind significantly reduces pedestrian risk. About one-third of Americans do not drive, including low-wealth Americans who cannot afford cars, school-age children, and an increasing number of older adults. Whether they walk or bicycle directly to their destinations, or to public transportation, these individuals require safe access to get to work, school, shops and medical visits, and to take part in social, civic and volunteer activities. Over the past decade, 5 motor vehicle crashes involving bicyclists or pedestrians were reported in Mebane.

WHEREAS, obesity threatens the healthy future of one-third of all American children. For the first time in American history, our children's life expectancy may be shorter than their parents;

WHEREAS, forty percent of American adults age fifty and older reported inadequate sidewalks in their neighborhoods. Nearly fifty percent reported they cannot cross main roads close to their home safely. Half of those who reported such problems said they would walk, bicycle, or take the bus more according to a 2008 American Association of Retired Persons (AARP) study;

WHEREAS, transportation expenses can be reduced if local infrastructure encourages active transportation, which helps families replace car trips with bicycling, walking, or taking public transit. When roads are re-designed and maintained to attract pedestrians, the local economy improves and diversifies from increased buyers, which creates job growth and increased investment in the area, including surrounding property values;

WHEREAS, studies have found that providing more travel options, including public transportation, bicycling and walking facilities, is an important element in reducing congestion. When roads are better designed for bicycling, walking, and taking transit, more people do so;

WHEREAS, the construction of "Complete Streets" can be an essential component in reducing automobile trips since nearly fifty percent of all trips in metropolitan areas are three miles or less and twenty-eight percent are one mile or less – distances easily covered by foot or bicycle. Sixty-five percent of trips under one mile are now made by automobile, in part because of incomplete streets that make it dangerous or unpleasant to walk, bicycle, or take transit;

WHEREAS, other jurisdictions and agencies nationwide have adopted "Complete Streets" legislation, including the United States Department of Transportation, numerous state transportation agencies including North Carolina, regions including the Capitol Area (Austin) Metropolitan Planning Organization (MPO) and the San Antonio-Bexar County MPO, and cities such as North Little Rock, Miami, Chicago, San Diego, and Seattle;

WHEREAS, the "Complete Streets" concept is supported by the Institute of Traffic Engineers,

American Planning Association and the National Association of Local Boards of Health many other transportation, planning and public health professionals; and

NOW, THEREFORE, BE IT RESOLVED by the Mebane City Council that the Council requests that staff partner with community organizations and assess current street standards and land use and transportation plans, policies and programs with regard to the "Complete Streets" concept; identify relevant elements within the town's existing plans, regulations and operational standards that support the implementation of "Complete Streets" within the town; and identify the gaps and opportunities to supplement and fund said plans, regulations and standards in order to achieve the implementation of "Complete Streets" throughout the town and provide council with guidance towards the creation of a complete streets ordinance.

ADOPTED BY THE CITY COUNCIL ON _____, 2015

_____

City Clerk

Approved as to form:

_____

City Attorney

Mebane Unified Development Ordinance Policy Review Table

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Appendix A	Street data Illustrating/ Existing and proposed streets showing	Require sidewalk and driveway widths, including furnishing, pedestrian through, and frontage zones, and illustration of any permanent streetscape elements/fixtures located within.
Article 2-11A.	Plot Plan Required	Specifies "single-family or two-family dwellings." Does this not apply to multi-family dwellings or commercial development?
Article 2-11B.	Site Plan Required. "Neither a new nor amended site plan shall be required if an adequate site plan is already on file, there is no change in the parking requirements, or there is not increase in impervious surface area."	Consider adding: *"or there is no change or reduction in pedestrian access/egress, circulation, dimensions for walkways, hallways, common areas, parking lot aisles, curb ramps, landings, lighting, and/or landscaping."*
Article 2-32	Development Agreements - "The property subject to a development agreement must be at least 25 acres in size."	Why must the property have a minimum size? Why 25 acres? Land use, FAR, trip generation, and pedestrian activity would be more appropriate triggers. Also, consider tying this section to development and disposition agreements involving land value write-downs, permitting/fee/system development charge waivers or reductions, easements, or other public contributions or development incentives.
Article 3-1.A.8.	O&I Office and Institutional District - "The office and institutional district is established to provide for business and professional office use, service occupations and light commercials uses, as well as higher density residential uses."	The latter half of this description describes residential densities, but this is not clear from the introduction. Consider emphasizing the mixed-use nature of this primarily commercial development districts. Allow for both mixed-use buildings and mixed-use blocks. Also consider language about institutional spaces, e.g. "Because of the larger scale of public and institutional districts, designs should incorporate a greater degree of pedestrian-oriented improvements including wide sidewalks, and well-lit indoor and outdoor public spaces. Walkways must be designed for peak pedestrian volumes typical of events such as classes, sporting events, or other large gatherings." Visibility and personal safety/security are also concerns in larger institutional settings during non-peak periods.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 3A.9.	B-1 Central Business District	See Article 3A.8. Define "appropriate appearance" and "ample parking." As the most intense land use and zoning designation, this district should further define the bike and pedestrian environment, especially to address the "intensity of land uses and the capacity of utilities and streets." For example: include such things as wide sidewalks, sitting areas, bike parking, mixed-use office/residential buildings with ground floor retail, street trees and landscaping, etc. What about surface parking lots vs. structured parking lots?
Article 3-1.A.10.	B-2 General Business District	See Article 3A.8 and Article 3A.9.
Article 3-1. C.2. (e)	HCO, Highway Corridor Overlay District - "The manner in which land uses impact interchanges, intersections, and feeder roads is of particular concern in this overlay district."	This must also consider, "the manner in which highway transportation infrastructure, including interchanges, intersections, and feeder roads impact land uses (i.e. pedestrians and bicyclists), especially residential land uses."
Article 4-3.D.4	Easement and Right-of-Way Encroachment - "Public Street and Sidewalk Rights-of-Way: No structure or landscaping plantings may be placed within a public street or sidewalk right-of-way without the express approval of the public entity having jurisdiction over the right-of-way. "	
Article 4-4. B.3.	Cluster and Planned Development: "provided the development ~~as a whole abuts and~~ has direct access to ~~a~~ publicly maintained street and the private streets comply with the requirements of Section 7-6.5.H and Section 7-6.6"	Consider adding language, that specifies the number of access points to public streets, for example: "*all cluster and planned developments and private streets abutting, or within 200 feet of publicly maintained streets, must provide direct pedestrian and bicycle connections to the public street. Access points to public streets shall be provided at a minimum of every 600 feet.*"
Article 4-4. B.4.	Townhouse and Condominium Developments: …comply with the requirements of Sections 7-6.5.H and Section 7-6.6."	

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 4-4.C.3.	Group Development-Uniform Design Plan	Group development provides an opportunity to coordinate multiple pedestrian connections and access points, and shared community space
Article 4-7.2.A.3.	Outdoor Lighting - "…shall be located, angled, shielded, or limited in intensity in accordance with so as to provide appropriate illumination for pedestrians and/or roadway users, cast no direct light upon adjacent property and to avoid the creation of a visual safety hazard to passing motorists."	Include pedestrian-scale lighting.
Article 4-7.3.C.4.(a)(7)	"Description of signage and parking areas. Parking shall be provided at a ration of two spaces per dwelling unit."	Parking ratios should be informed by transportation demand management goals, proximity to local destinations/trip generators, relate to the provision of bicycle parking and on street parking, and should at the very least be scaled according to residential density and unit mix. Fixed parking minimums do not support walking/biking. More parking translates to higher development (and maintenance) costs.
Article 4-7.3.D.3.(a)(2)	"Locations of existing and platted property lines, streets, sidewalks, pathways, buildings, water courses, railroads…"	
Article 4-7.3.D.3.(a)(4)	"When deemed necessary by the City, profiles of all proposed streets, sidewalks, curbs, curb ramps, landings, and gutters showing natural and finished grades drawn…	
Article 4-7.3.D.4.(d)	Street lighting requirements: "…spaced at intervals of not more than 300 feet.	Consider "Pedestrian-scaled lighting fixtures should be spaced at intervals of 30-50 feet. "

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 4-7.3.D.5.(e)	"At least one entrance from a public road shall be provided to the manufactured home park for each 50 manufactured home spaces or fraction thereof.	Is the entrance-to-home space ratio based on distance? driving/ walking/biking distance? Consider reducing distance for pedestrians and bikes. Include provision of sidewalks. Ex. *"All driveways and interior streets shall have paved sidewalks of a minimum width of 5 feet on both sides of the street and provide direct access to public streets." (Per AASHTO Design Standards and NCDOT Pedestrian Policy).* Consider language similar to Article 4-4. B.3. for access to public streets.
Article 4-7.3.E.3.(d)	"These drives shall be constructed to the same standards as public streets and sidewalks…"	
Article 4-7.3.E.3.(f)	"...spaced 350 feet apart.."	Consider "Pedestrian-scaled lighting fixtures should be spaced at intervals of 30-50 feet. "
Article 4-7.3.F.4(d)	"...spaced 350 feet apart.."	Consider "Pedestrian-scaled lighting fixtures should be spaced at intervals of 30-50 feet. "
Article 4-7.3.F.4(f)	"These drives shall be constructed to the same standards as public streets and sidewalks…"	
Article 4-7.3.H	Family Care Home	Consider wider sidewalk requirements for people in wheelchairs, or people who may need assistance walking. Example: *"Sidewalks should be a minimum of 8 feet wide to accommodate wheel chair use, walking 2 abreast, and passing."*
Article 4-7.3.I	Group Care Facility	Consider wider sidewalk requirements for people in wheelchairs, or people who may need assistance walking. Example: *"Sidewalks should be a minimum of 8 feet wide to accommodate wheel chair use, walking two-abreast, and passing."*
Article 4-7.3.M.4.	Access	Include provision of sidewalks. Ex. *"All driveways and interior streets shall have paved sidewalks of a minimum width of 5 feet on both sides of the street and provide direct access to public streets."* Consider language similar to Article 4-4. B.3. for access to public streets.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 4-7.3.M.5.	Parking	Specify the number of parking spaces, and/or minimum number of bike parking spaces per land use/trip generation rate. Consult APBP Bicycle Parking Guidelines, 2nd Edition for guidance on short-term and long-term bike parking minimums and design and installation guidance.
Article 4-7.3.N.2. (d)	Density and Minimum Lot Area Requirements: "Individual lot sizes may be reduced below the minimum specified in Table 4-2-1…"	This is not conducive to walking and biking. Is this to account for non-residential uses?
Article 4-7.3.P.2e	Street patterns are interconnected and blocks are short	Specify standard "short" block length. e.g. 600 feet, 800 feet, etc. Add specific language about the degree of connectivity and how it relates to street-block orientation. For example "Block lengths shall not exceed 1000 feet. Streets and sidewalks in the TND should be oriented on an orthogonal grid to provide a higher level of connectivity. Block lengths shall not exceed 800 feet on a grid. Where a grid orientation is not possible, a pedestrian and bicycle connector to adjacent streets and sidewalks must be provided every 500 feet, at a minimum. Cul-de-sacs shall not exceed a length of 400 feet. A pedestrian/bicycle connection or cut-through must be provided at the end of cul-de-sacs to the nearest adjacent public street." Consult NCDOT Traditional Neighborhood Development Street Design Guidelines, and NACTO Urban Bikeway Design Guide for recommended pedestrian and bicycle facilities.
Article 4-7.3.P.7.	Permissible Nonresidential Uses within a TND: "the following commercial uses are permitted provided that no more than 15 percent of the total land area of a TND shall be used for such commercial uses."	The amount of land dedicated to commercial use should be based on building densities (FAR) rather than limited to total land area, to encourage higher density development and a more active pedestrian environment. For example, higher residential densities might enable/necessitate greater ground-floor retail area in mixed-use buildings.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 4-7.5.	General Requirements for all (A-N)	Add Pedestrian access : "Pedestrian access in the form of 5 foot wide sidewalks shall be provided between the recreational facility/ facility grounds and adjacent public streets, including through vehicle parking areas, and driveways. Pedestrian-scale lighting shall be provided along all walkways. " Add bike parking requirements based on existing and projected demand.
Article 4-7.5.D.2(a)	Campground/RV Park	Require minimum number of "Hiker/Biker" camp sites.
Article 4-7.5.D.4	Access and Street Requirements	Specify reduced speed limit on private interior road/driveway. Add Pedestrian access : "Pedestrian access in the form of 5 foot wide sidewalks shall be provided on the recreational facility grounds and adjacent public streets, including through vehicle parking areas, and driveways. Pedestrian-scale lighting shall be provided along all walkways. "
Article 4-7.6	General Requirements for all (A-M)	Add Pedestrian access : *"Pedestrian access in the form of 5 foot wide sidewalks shall be provided between the educational and institutional facility/facility grounds and adjacent public streets, including through vehicle parking areas, and driveways. Pedestrian-scale lighting shall be provided along all walkways. "* Add bike parking requirements based on existing and projected demand.
Article 4-7.7	General Requirements for all (A-E)	Add Pedestrian access : *"Pedestrian access in the form of 5 foot wide sidewalks shall be provided between the business/professional/ personal use facility/facility grounds and adjacent public streets, including through vehicle parking areas, and driveways. Pedestrian-scale lighting shall be provided along all walkways. "* Add bike parking requirements based on existing and projected demand.
Article 4-7.8	General Requirements for all (A-K)	Add Pedestrian access : *"Pedestrian access in the form of 5 foot wide sidewalks shall be provided between the retail trade use facility/ facility grounds and adjacent public streets, including through vehicle parking areas, and driveways. Pedestrian-scale lighting shall be provided along all walkways. "* Add bike parking requirements based on existing and projected demand.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 4-7.8	General Requirements for all (A-K)	Add Pedestrian access : *"Pedestrian access in the form of 5 foot wide sidewalks shall be provided between the retail trade use facility/ facility grounds and adjacent public streets, including through vehicle parking areas, and driveways. Pedestrian-scale lighting shall be provided along all walkways. "* Add bike parking requirements based on existing and projected demand.
Article 4-7.9	Site Plan Requirements for All (A-J)	Add: "A pedestrian and vehicle access and circulation site plan shall show the location of the buildings, streets, alleys, walkways, parking areas, numbered and dimensioned work sites and common areas accessible to personnel and the public, as well as restricted areas within the site and all existing buildings and structures within 100 feet in addition to public or private easements or rights-of-way adjoining or intersecting such property. Additionally, the site plan shall indicate…(compare to additional site plan requirements listed in chapter)."
Article 4-7.13.A.2.(e)	Parking	Provide bike parking requirement based on existing and projected demand. Consult APBP Bicycle Parking Guidelines, 2nd Edition for guidance on short-term and long-term bike parking minimums and design and installation guidance.
Article 4-7.13.A.2.(h)(1)	Site Plan: "Internal pedestrian and vehicle circulation patterns and provisions for parking"	
Article4-7.13.B.2.(e)	Parking	Provide bike parking requirement based on existing and projected demand. Consult APBP Bicycle Parking Guidelines, 2nd Edition for guidance on short-term and long-term bike parking minimums and design and installation guidance.
Article 4-7.13.B.2.		Add (h) *"Site Plan: "Internal pedestrian and vehicle circulation patterns and provisions for parking"*

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 4-7.13.K.3c	Location: "Temporary portable storage containers shall not be located in a street right-of-way, in any required landscaped area or open space, on any sidewalk or trail, or in any location that blocks or interferes with any vehicular, bicycle and/or pedestrian circulation.	
Article 4-7.13.K.4c	Location: "Temporary portable storage containers shall not encroach on sidewalks, public rights-of-way, or adjacent properties or be placed in a location that blocks or interferes with any vehicular, bicycle and/or pedestrian circulation.	
Article 4-7.14.C.2.(b)(1)	"Site Plans: "The location of buildings, streets, sidewalks, walkways, vehicle and bicycle parking areas, easements or rights-of-way adjoining or intersecting the property."	
Article 4-7.14.C.2c	"Sidewalks shall be required on all perimeter street frontages and shall provide direct connections between all building entrances, common areas, and parking areas per Site Plan."	
Article 6-1.C		Similar to 6-1.C.6 and 6-1.F.2(a). Add 7. "Minimum window/door ratio," for street-facing surfaces to encourage a more "street-friendly" active design (instead of the more typical auto-oriented suburban design, i.e. the "Snout House"). Example: *"Front entrances must face the street, and combined with windows, shall comprise a minimum of 30% of the residence's front-facing facade."*

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 6-1.F.5(b)	Benches	Benches or other seating should be mandatory, i.e. *"Outdoor plazas shall contain at least two of the following features in addition to seating."*
Article 6-2.E.7	"Placement and illumination of outdoor vending machines, telephones, ATMs, signage, bike parking, and similar outdoor services, structures, and activities."	
Article 6-3.A.3.(e)	"Additions or expansions made to existing vehicular parking areas	Consider reducing 45% threshold.
Article 6-3.A.7.(a)(2)	"At least *75 percent of the required shrubs* shall be evergreen species locally adapted to the area."	Where is the required number of shrubs indicated?
Article 6-3.A.7.(b)(2)	"*Minimum* spacing shall generally be no wider than 40 feet between canopy tree trunks and no wider than 20 feet between ornamental tree trunks."	Is this a minimum or maximum spacing?
Article 6-3.D.	Streetscape Landscaping	Define "streetscape" in terms of street, medians, curb/gutter, landscaped/furnishing zone, sidewalk, frontages, and/or property line."
Article 6-3.D.11.	Ownership of Streetscape	Reference streetscape maintenance responsibility code requirements (6-3.M
Article 6-3.G.4	Design Standards	Add provision for pedestrian-scale lighting of sidewalks to insure sufficient visibility at night for pedestrian safety and security. For example: "Canopy and understory trees should be spaced distances of X and Y, respectively, from lighting fixtures illuminating sidewalks that provide ingress/egress to parking lots. Trees shall be maintained so as not to directly reduce illumination or otherwise cast shadows along the pedestrian walkway." Incorporate reference into Article 6-5 Outdoor Lighting

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 6-3.J.1	Mechanical and Utility Equipment in Nonresidential Developments: Heating, ventilation, air conditioning, and other mechanical and utility equipment, which is located on, beside, or adjacent to any building or development shall be fully screened from the view of streets, sidewalks and adjacent property."	
Article 6-3.J.2	Trash Containment Areas: " All trash containment devices, including compactors and dumpsters, shall be located and designed so as not to be visible from the view of adjacent streets, sidewalks, and properties."	
Article 6-4.1.D		
Article 6-4.1.E	Reduction of Minimum Requirements	Allow parking reductions based on actual demand/occupancy and transportation demand management goals. How does this take into account provision of on-street parking or daily/hourly parking rates? Parking minimum reductions can also serve as incentive for adding bike parking.
Article 6-4.1.G	"All parking, stacking and loading facilities shall have vehicular and pedestrian access to a public street or approved private street.	
Article 6-4.3.A		Apply to residential uses in addition to nonresidential uses.
Table 6-4-1		Establish minimum bike parking spaces required for new development including the number of bike parking spaces that can be substituted for vehicle parking spaces. Consult *APBP Bicycle Parking Guidelines, 2nd Edition* for guidance on short-term and long-term bike parking minimums and design and installation guidance.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Table 6-4-1	Multi-family dwellings (including condominiums), Accessory dwelling units	Eliminate parking minimum requirements for multi-family dwellings and accessory dwelling units, or changed to "recommended minimums"
Article 6-4.4.A.2	"minimize delay and interference with traffic on public streets and access drives, as well as pedestrian walkways and crossings.	
Article 6-4.4.A.4	"Allow off-street parking spaces in parking lots to have pedestrian access from parking lot driveways and not directly from streets."	
Article 6-4.4.C.9	Parking lots shall be designed and constructed such that walkways shall maintain a minimum unobstructed *width of four feet* (vehicle encroachment is calculated as two feet beyond curb)	Increase minimum walkway width to 5 feet.
Article 6-4.5.A.	Off-site parking Lots	This should not apply to bike parking.
Article 6-4.5.B	Parking in Nonresidential Districts	Specify parking maximums by land use/district.
Article 6-4.6.B	Shared Parking	How does shared parking factor hourly/daily parking rates, or peak pricing?
Article 6-4.6.C	Reassignment	Eliminate. Allowing parking to be leased under a shared agreement can maximize the use of the existing parking supply, especially where demand varies by use and time of day.
Article 6-4.7.C.3	"all off-street loading areas shall be arranged and marked to provide for orderly and safe unloading and loading, and shall not hinder the free movement or obstruct visibility of vehicles and pedestrians."	

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 7-1	Purpose and Intent: "… provide safe, convenient and economic circulation ~~of vehicular traffic~~ all travel modes including bicycling and walking;…"	
Article 7-1	"promote the eventual elimination of unsafe or unsanitary conditions because of undue concentration of population…"	Rephrase. Is Mebane's population density really the cause of unsafe and/or unsanitary conditions, or would these conditions be more appropriately attributed to inadequate infrastructure?
Article 7-4.5. B.1	Rights-of-Way and Easements: "Improvements within such rights-of-way or easements, such as utility lines, street paving, drainage facilities, or *sidewalks* may, however, be accepted for maintenance by the City…"	Definition of "Rights-of-way" should explicitly include "sidewalks"
Article 7-6.1.A.	Provide for suitable residential and nonresidential developments with adequate streets, sidewalks and utilities…"	
Article 7-6.1.B	"Provide for the distribution of population and traffic in a manner which shall avoid congestion and overcrowding including the provision of walking and bicycling facilities. "	
Article 7-6.1.C	"Provide for the coordination of streets and sidewalks within subdivisions with existing or planned streets and sidewalks and with other public facilities."	

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 7-6.2.D	Establishment of Private Deed Restrictions	This should not include bike parking.
Article 7-6.2.E	Lots on Streets with Capacity Deficiencies	This should also take into account pedestrian and bicycle connections between the subdivision and adjacent public roads.
Article 7-6.2.C	"Frontage roads may be permitted within the rights-of-way of existing streets subject to the approval of the City Engineer or the NCDOT, as applicable."	This is unclear. This should not come at the expense of bike and pedestrian facilities.
Article 7-6.5.B	Conformance with adjoining street systems: "The planned street and pedestrian network layout of a proposed subdivision shall be compatible with existing or proposed streets, pedestrian walkways and their classifications on adjoining or nearby tracts."	
Article 7-6.5.C.1	"…it is desirable to provide for street access to adjoining property, proposed subdivision streets and sidewalks shall be extended, dedicated, and where appropriate, constructed to the boundary of such property…"	
Article 7-6.5.C.2(c)	"the existing and proposed local ~~street~~ transportation system and traffic flows of the entire area surrounding the subdivided tract and adjoining properties."	
Article 7-6.5.C.3		Add (e): "And where the street extension will not cause an adverse impact on pedestrian and bicycle connectivity between the subdivision and public roads."

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 7-6.5.F.1	Minimum Right-of way Widths	Define "*right-of-way*." State explicitly, what comprises the right-of way, i.e. sidewalks, "streetscapes," and anything else it might include. Specify minimum widths of right-of-way elements.
Article 7-6.5.F.7(e)	"Where streets are offset, the centerlines shall be offset no less than 150 feet."	Consider requiring the addition of pedestrian crossing treatments where streets intersect. Example: "Where one (or two) residential street(s) intersect another street at two locations, with a centerline offset of 100 feet or greater, pedestrian crossing treatments must be provided at each intersection." Pedestrian crossing treatments include traffic control devices, crosswalk pavement markings, median refuge islands, curb extensions, etc.
Article 7-6.5.F.11.(a)	Cul-de-sac Streets	Consider adding provision for cul-de-sac connectivity: Example: *"Cul-de-sac streets shall provide a direct pedestrian and/or bicycle connection to all public streets within 600 feet of the cul-de-sac terminus."*
Article 7-6.5. F.18		See Article 7-6.F.11.a. Require provisions for pedestrian access/ egress, including sidewalk/pathway, pedestrian-scale lighting, pedestrian gate, etc.
Article 7-6.5.H.6	PRIVATE STREET DESIGN CRITERIA. "Sidewalks Where sidewalks are constructed, they shall comply with the standards of Section 7-6.6.	Consider sidewalks mandatory for all private streets that connect to public streets. Recommended minimum through pedestrian zone width of five feet (without furnishing or frontage zones) per AASHTO standards and NCDOT Pedestrian Policy.
Article 7-6.5.I	Street Design Standards to Accommodate ~~Certain Types of Nonmotorized Vehicles~~ Golf Carts	Change to "Golf Carts," or include bicycle design guidance. If the latter, consult NACTO Urban Bikeway Design Guide, and AASHTO Guide for the Development of Bicycle Facilities, 4th Edition.
Article 7-6.5.I		Depending on right-of-way volumes, speeds, geometry, and lane configurations, separate golf cart lanes may not be necessary.
Article 7-6.5.J.1	Blocks: "Intersecting streets shall be laid out at such intervals that block lengths are not more than *1,200 feet* nor less than 400 feet	Reduce maximum block length to 800 feet.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 7-6.5.J.3	"Pedestrian ways or sidewalks, walkways, and cross walks, not less than 10 feet in width, shall be provided, where deemed necessary by the City Council, to provide adequate pedestrian circulation or access to schools, shopping areas, community centers, parks, playgrounds, water access, transportation or other similar facilities."	Revise for consistency.
Article 7-6.6.B	"Sidewalks shall be constructed on both sides of all ~~thoroughfare and collector streets and on one side of all other~~ streets."	
Article 7-6.7.M	"As-built drawings shall be submitted to the Public Works and Utilities Director within 30 days of the completion or installation of required utility, stormwater, street, sidewalk, park, and recreational improvements."	
Article 7-6.8.A.5	"Sidewalks adjacent to both sides of all streets and~~/or~~ pedestrian walkways to provide access to internal or adjoining recreational areas and facilities, schools, commercial areas, and other pedestrian-oriented areas"	
Article 7-6.8.A.9	"A higher level of vehicular and pedestrian connectivity with adjoining tracts"	

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 7-6.8.D.2.	"Minimum street pavement widths should be increased by approximately ~~9~~ 7 feet to accommodate on-street parking. The Planning Board and City Council shall request the recommendation of the City Engineer and the NCDOT, if applicable, for specific pavement widths necessary to provide adequate on-street parking on public streets."	
Article 7-6.8.D.3.	"Off-street overflow and/ or visitor parking shall generally be provided at the standard of one parking space per three lots unless the City Council determines that the subdivision layout and density warrant a ~~higher~~ different standard."	
Article 7-6.8.D.7	"Developments of 50 or more residential units or additions to existing developments that increase the total number of residential units to 50 or more shall be required to provide vehicular and pedestrian access to at least two public streets unless the City Engineer determines that topography, natural features, or the pattern of existing adjacent development makes such provision impracticable."	

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 10-3.C.5	"The volume, intensity, or frequency of use of property where a nonconforming use exists *may be increased* and the equipment or processes used at a location where a nonconforming use exist may be changed if these or similar changes amount only to changes in the degree of activity rather than changes in kind or use, it has been determined that no adverse impact to pedestrian and bicycle environment would result from such a change in the degree of activity. and no violations of other Sections of this Ordinance occur. "	
Article 10-7.B	Violations of Nonconforming Signs Provisions. "If the owner or lessee fails to remove the sign within ~~ninety~~ thirty days after the ninety-day written notice has been given…"	Consider reducing the timeframe for removal. The owner or lessee should not need 6 months to address a nonconforming sign violation.
Article 12-4	"PEDESTRIAN WAY. A right-of-way or easement dedicated to public use to facilitate pedestrian access to adjacent streets and properties, including sidewalks, walkways, and trails located within streetscapes, lots, easements, buffer areas, and/or open space in the public or private domain."	Consider expanding definition of pedestrian walkways for consistency with other terminology used throughout the UDO.

Ordinance	Existing Ordinance Text (Abridged). Suggested additions shown in red.	Comments/Suggested Language
Article 12-4	"STREET (ROAD). A right-of-way for vehicular and/or non-motorized traffic, including bicyclists, which affords the principal means of access to abutting properties"	Expand definition of street to include bicycle use.

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CHAPTER SEVEN

IMPLEMENTATION

Chapter Contents

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Introduction

This chapter defines a structure for managing the implementation of the Mebane Bicycle and Pedestrian Plan. Implementing the recommendations of this plan will require leadership and dedication to bikeway, walkway, and trail 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 of Mebane and Burlington-Graham MPO need not accomplish the recommendations of this Plan by acting alone; success will be realized through collaboration with state and federal agencies, the private sector, and other non-profit organizations.

Given the present day 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 to implement this plan. However, there are still important actions to take in advance of major investments, including key organizational steps and the development of strategic lower-cost bikeway and walkway projects. Following through on the action steps described in this chapter will allow the key stakeholders to implement this Plan over time while taking advantage of strategic opportunities, both now and as new, unexpected opportunities arise.

The chapter is organized into five main components:

- Action Steps for Implementation
- Organizational Chart and Stakeholder Roles
- Infrastructure Action Steps
- Maintenance
- Evaluation and Benchmarking

Action Steps for Implementation

The following is a recommended organizational framework for managing implementation of the bicycle and pedestrian plan. The structure is based on input from the project Steering Committee, the public and evidence of successful implementation strategies from around the southeast and the country. Suggested roles for the core types of stakeholders involved in implementation are described below. Actual roles may vary depending on how this Plan is implemented over time and the ongoing level of interest and involvement by specific stakeholders.

Form a Bicycle and Pedestrian Advisory Committee

Leadership from key stakeholders is essential to move this Plan from concept to reality. These individuals will help advocate for the Plan, and in their professional and personal capacity, they will seek out opportunities to utilize synergies with other projects, individuals, and organizations to keep this plan a priority in the ever-present competition for resources.

Bicycle and Pedestrian Advisory Committee (BPAC) members should be chosen based on representation of key partner groups and community leaders who value biking, walking, and greenways facilities. Members should expect to contribute time, expertise, and resources towards accomplishing the tasks that lie ahead. Board members or key staff of partner non-profits, members of this project's Steering

Committee, and active citizens are good candidates to serve on the BPAC. The BPAC should be a forum for leaders to convene periodically to discuss progress, share resources and tools, and otherwise coordinate planning and development activities for the recommended network.

Advance Programmatic and Communication Efforts

A subgroup of the BPAC should focus on the programmatic and communications elements of this Plan's implementation. Representatives from Mebane on the Move would be ideal for championing this important element of plan implementation. This involves celebrating successes in new construction and otherwise raising awareness of the bicycle, pedestrian, and greenway network and its benefits. A key first task of this group is to work with local partners to implement the recommendations found in Chapter 5. These recommendations focus on educational, encouragement, and enforcement strategies for increasing awareness of the network and its benefits, and increasing overall usage.

Within the first 2-3 years of implementation, the City should apply for Bike and/or Walk-Friendly Community designation. This program recognizes municipalities that actively support bicycling and walking activities. Becoming designated as a Bicycle- and Walk-Friendly Community signals to current residents, potential residents, and visitors that the city is a safe and welcoming place for individuals and families. The development and implementation of this plan is an essential first step toward becoming a Walk- and Bicycle Friendly Community.

Build Bicycle and Pedestrian Projects

The City of Mebane should move forward with the design and construction of priority projects and ***immediately work to fill short sidewalk gaps and add marked crosswalks identified in Chapter 3***. This will require identifying funding, designing, constructing, and maintaining bicycle and pedestrian facilities. The "Infrastructure Action Steps" section provides detailed steps to address this important action step.

Establish Stakeholder Roles

The organizational framework described in the following section is presented visually in the chart on page 7-3, as discussed by the project Steering Committee. The BPAC, already discussed in this chapter, plays a leading role in this process with the City of Mebane and Burlington-Graham MPO, serving the function of staff support. Other stakeholders, such as Alamance County and nonprofit organizations, are identified as partners.

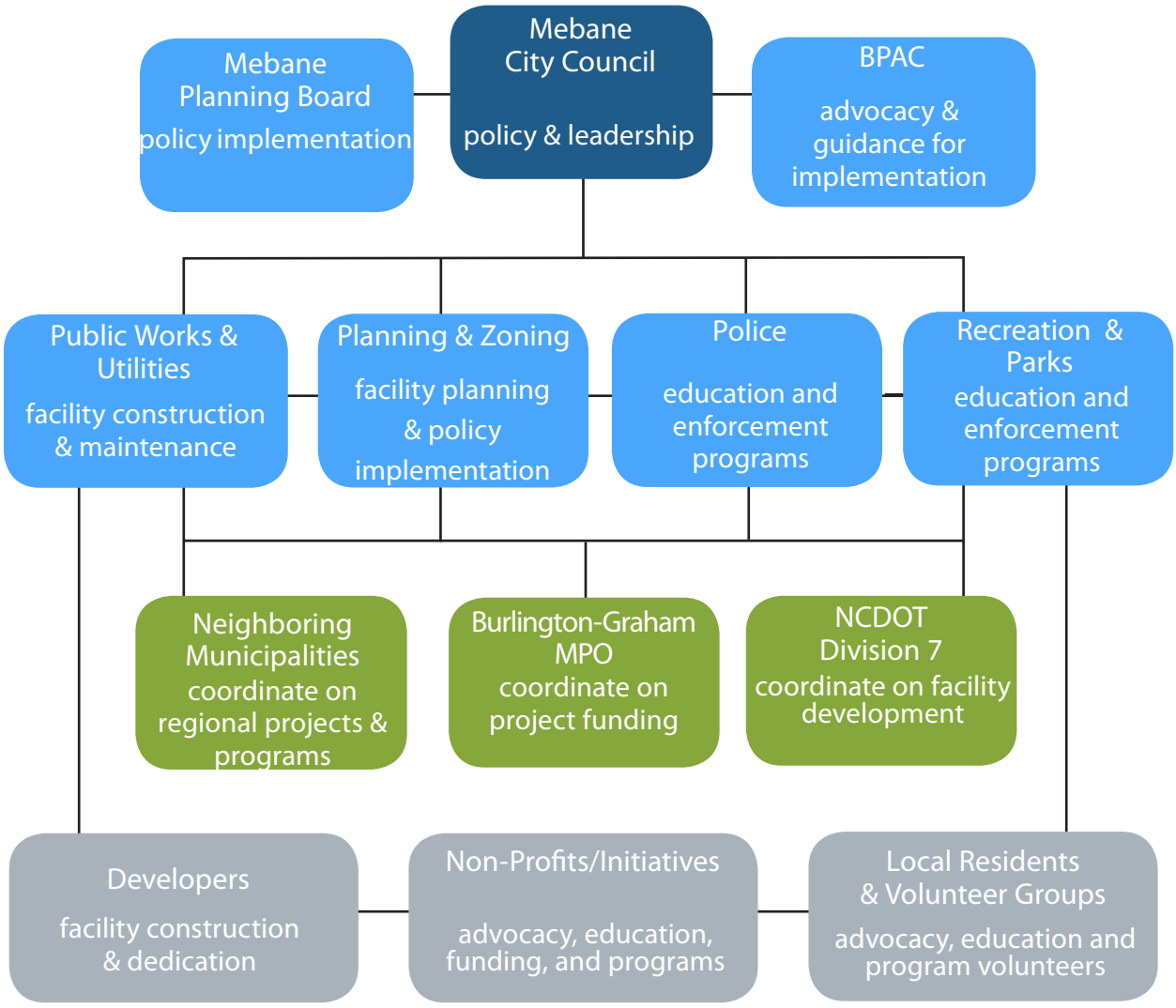
Organizational Framework and Stakeholder Roles

City of Mebane 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. 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. The City Council should be prepared to:

- Adopt a set-aside budget for expenditures of funding that supports the bicycle, pedestrian, and greenways program. Local City staff should be prepared to provide supporting materials for the budget process, including any bicycling, walking, and trail-related reports, user estimates, and benchmarking statistics.
- Consider a bond referendum to fund projects from this Plan.
- Be aware of the health, economic, and quality-of-life benefits of a more walkable and bikable Mebane.

Organizational Framework for Implementation



City of Mebane Planning Board

The City of Mebane 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, especially those related to policy updates, and support its implementation.
- Learn about pedestrian- and bicycle-related policies in North Carolina. (see: www.ncdot.gov/bikeped/lawspolicies/policies/)

Bicycle and Pedestrian Advisory Committee

As mentioned previously, this committee will play a major role in championing the implementation of this Plan. Members of the BPAC should be prepared to:

- Advocate for implementing the bicycle and pedestrian program.
- Facilitate cooperation among government agencies and nonprofit partners for network development.
- Define and recommend sources of funding for network development.
- Meet quarterly with an agenda that includes: A) Implementation progress updates B) Confirmation of specific tasks to be completed by specific members before the next meeting, and C) Discussion of new opportunities and constraints and identification of ways to address them.
- Pursue funding including the solicitation of major donors and corporate sponsors.
- Build partnerships with land owners for greenway trail development, with special attention given to owners of large or contiguous tracts of land.
- Be engaged actively with education, encouragement, and enforcement programs, providing promotional materials to the public.
- Keep local leaders informed about bicycle, pedestrian, and greenway-related issues and developments through direct dialogue and personal e-mail; promote facility development among local leaders through creative approaches, such as organized tours of existing trails or proposed trail corridors.
- Rally public support for key public hearings and coordinate mass e-mail campaigns for special votes.
- Continue communication and build positive relationships with organizations such as utility companies, public and private schools, and others that can assist with issues related to potential bicycle and pedestrian facility right-of-way and trail development.

Burlington Graham MPO

One of 18 North Carolina MPOs, the Burlington-Graham MPO is responsible for leading regional transportation initiatives by bringing together representatives from multiple counties and municipalities, including Mebane. The MPO should be prepared to:

- Assist City of Mebane with implementation of on-road bicycle and pedestrian projects, working closely with NCDOT. Work actively to ensure bicycle and pedestrian projects are funded through the State prioritization process (STIP).
- Remain up-to-date on opportunities for facility development that coincide with other capital or maintenance projects, such as road resurfacing, new commercial or residential developments, new road construction, etc.
- Work with network development partners to ensure a coordinated approach to operations and maintenance. Operations and maintenance tasks need to be supported by adequate funding and staff levels.

City of Mebane Planning and Zoning

The Planning and Zoning staff will take primary responsibility for the contact with new development to implement the plan. 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.
- Assist the Public Works and Utilities Department in communicating with NCDOT and regional partners.
- Become experts on pedestrian-related policies in North Carolina. (see: www. ncdot.gov/bikeped/lawspolicies/policies/)
- Refine the Mebane UDO with recommendations from this Plan.

City of Mebane Recreation and Parks

The Mebane Recreation and Parks Department mission is "to provide the best recreation and park services and facilities for its residents in accordance with the existing statutory authority, to preserve open space, provide quality leisure services, maintain park facilities and programs that are available to all our residents and to provide wholesome recreation for the entire family of all races and creeds." The staff should be prepared to:

- Play leadership role in greenway development and maintenance.
- Coordinate among adjacent county and municipal planners to ensure greenway network connectivity between jurisdiction borders.
- Ensure that the greenway trail design guidelines of this plan are used in the design of greenway facilities and aim for uniform standards in greenway facilities, such as with signage and wayfinding.
- Lead greenway programmatic activities to encourage use.
- Conduct evaluation activities along greenways such as recording trail user counts.

City of Mebane Public Works and Utilities

The Public Works and Utilities maintains water, sewer, and transportation facilities. The staff should be prepared to:

- Work with the City of Mebane and NCDOT to implement the infrastructure recommendations of this Plan using the Design Guidelines from this Plan.
- Communicate and coordinate with other town 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.
- Communicate and coordinate with NCDOT Division 7 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.
- Work with NCDOT Division 7 to ensure that when NCDOT-owned and maintained roadways in Mebane 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.
- Ensure sidewalks are maintained.

City of Mebane Police Department

The Mebane Police Department is committed to providing excellent law enforcement services to make Mebane a safety and friendly community. The staff should be prepared to:

- Become experts on pedestrian-related laws in North Carolina. (see: www. ncdot.gov/bikeped/lawspolicies/laws/)
- 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 Utilities Department as projects are implemented.

NCDOT Division 7

NCDOT's mission is to "connect people and places safely and efficiently, with accountability and environmental sensitivity to enhance the economy, health and well-being of North Carolina." Division 7 of the NCDOT is responsible for the construction and maintenance of pedestrian and bicycle facilities on NCDOT-owned and maintained roadways in the City of Mebane OR is expected to allow for the City to do so with encroachment agreements. NCDOT Division 7 staff should be prepared to:

- Become familiar with the bicycle and pedestrian facility recommendations for NCDOT roadways in this plan; take initiative in incorporating this plan's recommendations into the Division's schedule of improvements whenever possible.
- Provide guidance and technical support for implementing on-street bikeway and walkway facilities, as well as related greenway trail facilities such as shared-use paths in roadway corridors, trail-roadway crossings, and improvements that increase safety for bicyclists and pedestrians crossing bridges on state roadways.
- Continue working with City of Mebane and Burlington-Graham MPO on coordination of upcoming and future roadway projects that involve bikeway and walkway recommendations. Communication with City of Mebane and Burlington Graham MPO regarding scheduled road maintenance and road construction projects is crucial to network development.

Role of Non-Profits

Non-profit organizations or initiatives, such as Mebane on the Move and Destination Downtown Mebane, can serve a variety of purposes and are already leading many programmatic-related activities across the Mebane community. Roles related to this Plan include:

- Lead education, encouragement, and enforcement programmatic efforts.
- Participate in the activities of the BPAC and, as needed, provide representation on the committee.
- Maintain open dialogue with the BPAC and the City of Mebane to promote resource- and information-sharing and reduce duplications of effort.
- Advocate, promote, and encourage the development of the bicycle, pedestrian, and greenway network throughout the community.
- Educate citizens as to the benefits of biking and walking and trails and greenways.
- Play an active role in raising funds for network development in concert with the BPAC.
- When possible, fund programs or bicycling/walking amenities such as bicycle racks.
- Help to organize volunteers to assist with implementation and management.
- Sponsor or co-sponsor biking, walking, and greenway events.

Infrastructure Action Steps

While establishing the administrative structure described, the City and its stakeholders should move forward with infrastructure development by proceeding with the design and construction of priority projects. They should also work to identify funding for longer-term, higher-cost projects.

Estimate Costs

Cost estimates for the priority projects of the Plan are provided in Chapters 3 and 4. Costs for developing additional network segments can be estimated using unit-level cost estimates listed below. Table 7-1 offers a summary of the fully burdened costs of the facility types recommended in this Plan. The paved greenway estimates assume a 10 foot wide asphalt path. All costs are total installed costs that include: planning and engineering, environmental, and contingency. Land acquisition costs are not included.

Table 7.1 Cost Estimates

Facility Type	Per Mile Cost
Paved Greenway	$600,000-$1,000,000
Paved Shoulder	$400,000-$600,000
Natural Greenway	$100,000-$275,000
Bicycle Route/ Bicycle Boulevard	$10,000-$114,000
Bicycle Lane	$16,000-$60,000
Shared-Lane Marking	$8,000-$14,000
Sidewalk with curb and gutter (one-side)	$844,800 ($160/LF)

Identify Funding

Achieving the vision defined within this Plan requires, among other things, a stable and recurring source of funding. Communities across the country that have successfully engaged in bicycle, pedestrian, and trail development 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 a wide range of private sector, municipality, state, and federal partners to generate funds sufficient to implement the program.

A stable and recurring source of revenue is needed to generate funding that can then be used to leverage dollars from state, federal, and private sources. The ability of the local agencies to generate a source of funding for trails depends on a variety of factors, such as taxing capacity, budgets, voter preferences, and political will.

Donations from individuals or companies are another potential source of local funding. Recommended funding sources are included in Appendix B: Potential Funding Sources.

Leverage Opportunities

In the course of seeking funding opportunities, consider partnerships with developers and non-traditional trail development partners. Implementing a community-wide bicycle, pedestrian, and trails system is an iterative process often well served by opportunistic chances. By involving the landowner or developer early in the trail development process, they have the opportunity to share in the discussions of the specific trail alignment and trail features, ultimately creating a transportation and recreation corridor that directly contributes to the economic potential of the developed property.

Proposed trail segments that connect to other regional trails also present opportunities to

leverage investments. As the Mountains-to-Sea Trail moves forward with trail development, there is an opportunity to connect into this statewide trail system -- leveraging funding investments and generating awareness for a potential regional trail network that links each of these corridors to one another.

Complete Priority Bicycle and Pedestrian Projects

By moving forward quickly on priority projects, the City and its stakeholders will demonstrate their commitment to carrying out the Plan and will better sustain enthusiasm generated during the outreach stages of the planning process. Chapters 3 and 4 identify priority bicycle, pedestrian, and trail projects.

Design, Construct, and Maintain Network Facilities

Once a network segment is selected and, if necessary, land or easements are acquired, facility design typically follows. For this Plan, some facilities, such as bicycle routes or shared-lane markings, will require signage and limited construction activities. Other segments will require varying degrees of clearing and natural surface grading, but still may be able to be implemented without design or construction documents. Preliminary design plans should be reviewed by multiple stakeholders, including emergency service personnel and the local police department, so they can offer suggestions and have their voices heard from the very beginning. There is sometimes a disconnect between the designer and operating staff. Designs that are pleasing to the eye are not always conducive to good and inexpensive maintenance. Therefore, it is imperative that cost saving should be a part of any design, with a thorough review of the plans while they in a preliminary stage.

Annual operations and maintenance costs vary, depending upon the facility to be maintained, level of use, location, and standard of maintenance. Operations and maintenance budgets should take into account routine and remedial maintenance over the life cycle of the improvements and on-going administrative costs for the operations and maintenance program. On-road bicycle facilities can be implemented in a variety of ways. These are described briefly below:

Striping - Some roadways can be simply striped with bicycle lanes because of adequate, wide widths of the roadway's outside lanes. This is an inexpensive implementation method.

Pavement Marking - Sharrows, as described in Chapter 4, are simple pavement markings added to the roadway. In these cases, additional pavement width is not needed. Therefore, this is an inexpensivce implementation method.

Roadway Retrofit (Lane Narrowing) - In some cases, existing roadway travel lanes can be narrowed to allow for a roadway restriped with bicycle lanes. The typical minimum travel lane is 10'. This is still inexpensive but requires removal of old striping. It is ideal to restripe during a scheduled resurfacing.

Roadway Retrofit (Road Diet) - In some cases, a reduction in travel lanes can be implemented to include bicycle lanes or cycle tracks. A full traffic analysis is required before implementing a road diet. A typical road diet occurs when converting a four-lane road to a three-lane with bicycle lanes.

Roadway Retrofit (Bicycle Boulevard) - The addition of pavement markings, signage, and traffic calming measures can be added at varying costs on an existing residential roadway.

New Construction - When a new roadway is constructed or existing roadway reconstructed, the addition of bicycle lanes, paved shoulders, cycle tracks, or sidepaths may occur.

The typical greenway development process is portrayed in a chart on the following page. A suggested on-road bicycle project delivery process is shown on page 7-10.

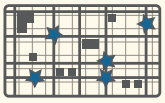
Typical Greenway Development Process

BICYCLE PROJECT DELIVERY PROCESS

Iterative Process

1. Project selected through prioritization process or other means for implementation

2. Project development and design process:
   - Data collection and technical analysis
   - Initial public engagement
   - Conceptual design alternatives
   - More public engagement
   - Preferred design selected
   - Assess maintenance needs



3. Further engage public and develop education materials to clearly explain new designs

4. Pre-implementation marketing

5. Project implementation

6. Post-implementation encouragement programming to publicize new facilities

7. Evaluate projects

8. Bicycle facility maintenance

9. Continue evaluation and consideration for upgrades

The above graphic includes all possible steps in the on-road bicycle facility development process. The process is flexible based upon facility type, implementation method, and desired public involvement.

Evaluation (Performance Measures)

The performance measures in the plan are important for assessing whether the plan is meeting its goals over time. While they are focused on assessing progress over the long-term, data on these measures should be collected on a regular basis to help track interim progress being made. This information will allow for course adjustments to be made to help ensure achievement of plan goals.

The plan performance measures are generated from the goals of the Plan (see Chapter 1). The performance measures for the Plan were selected in part based on the City's and State's ability to collect relevant data, both now and in the future. This data can help inform project selection and design, the development and success of education and encouragement programs, measures to improve safety, and other issues. Data and performance measures outlined in the following table represent the way the City will track achievement of the Plan's goals over time.

From the beginning, and continuously through the life of the BPAC, it should brainstorm additional specific benchmarks to track through a monitoring program and honor their completion with public events and media coverage. Monitoring should be supported by programmatic efforts, where possible, such as conducting annual or bi-annual bicyclist, pedestrian, and greenway trail counts or creating an annual Bicycle, Pedestrian, & Greenways Report Card. Benchmarks should be revisited and revised periodically as network development efforts evolve.

Table 7.2 Performance Measures

Goal	Performance Measure	Baseline Measurement	Performance Target/ Desired Trend
Programs/Events	Number of bicycle and pedestrian programs	2014 Number	Increase
Network/Connectivity	Percentage of bicycle and pedestrian network completed	2014 Percentage	Increase
Safety	Bicycle/Pedestrian Collision Rates Number of serious injuries and fatalities	NCDOT Dept. of Public Safety (2007-2012); City of Mebane Police Dept.	Reduce collision rates Zero fatalities
Funding/Awareness	Funding set aside for bike/ped improvements	2014 Number	Increase
Equity	Areas lacking bicycle facilities	2014 Number	Zero areas lacking bicycle and pedestrian facilities
Ridership/Walking	Commute mode share	2012 Census Data	Increase

Maintenance

The Mebane bicycle and pedestrian network should be viewed and maintained as a public resource. This network will become infrastructure similar to street systems or utility networks, serving the community for generations. The following guiding principles will help ensure the preservation of a first class system:

- Good maintenance begins with sound planning and design.
- Foremost, protect life, property, and the environment.
- Promote and maintain a quality outdoor recreation and transportation experience.
- Maintain quality control and conduct regular inspections.
- Include field crews, police and fire/rescue personnel in both the design review and ongoing management process.
- Maintain an effective, responsive public feedback system, and promote public participation.
- Be a good neighbor to adjacent properties.
- Operate a cost-effective program with sustainable funding sources.

Maintenance schedules and standards help keep trail systems attractive and as safe recreational destinations and transportation facilities, and are critical to the safety and enjoyment of trail users. Managing risk, safety, and security are important components woven into the management and maintenance scheme. Creating an effective administrative structure will foster the successful development and implementation of an efficient system with stable support, leading to a highly connected network of trails and pathways that will become part of everyday life and utility in Mebane. The following sections provide detail on how this will be achieved.

Maintenance Activities

The following are typical duties and activities often performed by management and maintenance staff.

- Vegetation Management: mowing, litter clean-up, manure removal, pruning, trimming, weeding, invasive species management, tree removal, planting
- Drainage Cleaning and Maintenance: flushing, raking, slough and berm removal, cleaning drain dips
- Trailhead, Amenity, and Signage Maintenance: parking, toilet facilities, informational kiosks, picnic tables, benches, maps, trail rules and regulations, traffic control for trail users, mile markers, directional signs, fencing
- Trail Inspection/Patrolling: greet users, encourage proper etiquette, make minor repairs, report vandalism

General annual management and maintenance costs vary depending on the facility to be maintained, level of use, location, and standard of maintenance. Budgets should take into account routine and remedial maintenance over the life cycle of the improvements and on-going administrative costs for the program. The section below provides an overview of approximate costs for basic greenway, bicycle, pedestrian, and equestrian trail management and maintenance services. The estimates include field labor, materials, equipment, and administrative costs.

Routine Management and Maintenance Costs

Routine management and maintenance refers to the day-to-day regimen of litter pick-up, trash and debris removal, weed and dust control, trail sweeping, sign replacement, tree and shrub trimming, and other regularly scheduled activities. It also includes minor repairs and replacements, such as fixing cracks and potholes or repairing a broken hand railing. The following are typical annual costs for different trail types.

Greenway Trails

Many factors influence greenway trail costs, such as amount of use, maintenance crew-size needed, proximity to urban centers, and number of interfaces with geographical and man-made features. Annual routine maintenance costs range from nominal to as high as $7,000 per mile. Research conducted by the Rails-to-Trails Conservancy (RTC) indicates costs are often on the lower end for managing and maintaining rail trails at approximately $1,500.

On-Road Bicycle Facilities

Maintenance of the on-roadway bicycle facility system is handled by the local Public Works Department and NCDOT. Some provision should be made however for up to fifteen regular inspections per year, to include minor repair or replacement of signs, vegetation grooming and other items that an inspector could remedy in the field. Additional attention should be paid to any potholes or other pavement damage. Additional sweeping may be required where bicycle lanes and wider shoulders are provided along roads. Staff costs can be reduced by training local volunteers or bicycle advocates to conduct inspections and providing a means for citizens to report bicycle facilities needing repairs.

Pedestrian Facilities (On Road Sidewalk/Sidepath)

Maintaining pedestrian facilities is an important part of maintaining the complete right-of-way for all users. When cracks, surface defects, tree root damage, and other problems are identified, they should be repaired to ensure sidewalks remain accessible to all pedestrians. Repairs are generally completed on an as-needed basis rather than through regularly scheduled evaluation of the sidewalk condition.

Remedial Management and Maintenance Costs

Remedial Management and Maintenance refers to correcting significant defects in the network, as well as repairing, replacing, or restoring major components that have been destroyed, damaged, or significantly deteriorated from normal usage and old age. Some items ("minor repairs") may occur on a five- to ten-year cycle, such as repainting, seal coating asphalt pavement, or replacing signage. Major reconstruction items will occur over a longer period or after an event such as a flood. Examples of major reconstruction include stabilization of a severely eroded hillside, repaving a trail surface or a roadway that is part of the bicycle network, or replacing a footbridge. Remedial maintenance should be part of a long-term capital improvement plan.

The following estimates provide a general idea of potential remedial management and maintenance obligations:

Greenway Trails

A 7- to 15-year life is assumed for asphalt and crushed fine trails after which an overlay may be required. A complete resurfacing after 20 to 25 years is anticipated. Concrete is assumed to last twice as long. Bridges, tunnels, retaining walls and other heavy infrastructure are assumed to have a 100-year life or longer.

On-road Bicycle Facilities

Remedial work for on-road bicycle facilities includes asphalt repaving (five feet on either side of the street), curb and gutter, sewer-grate, and manhole repair. Pothole and crack repair are considered routine. Pavement markings, such as bicycle lane lines, bicycle stencil markings, and fog lines should be re-installed when other roadway pavement markings are improved. Since this work is done as part of the current street maintenance regime the cost is assumed to be covered.

Pedestrian Facilities

Sidewalks should be constructed with concrete, which requires replacement in 50 to 75 years. A rough cost estimate for one linear mile of concrete sidewalk could be provided by NCDOT.

Setting Trail Priorities

A detailed and systematic management and maintenance system will help set priorities. Sound overall advice on setting trail maintenance priorities is provided in the U.S. Forest Service, Trail Construction and Maintenance Notebook, 2004 Edition (this edition is more specific on this topic than the updated 2007 edition. Though directed at backcountry trails, it is valid for all trail settings):

"High-quality and timely maintenance will greatly extend the useful life of a trail. The trail crew's task is to direct water and debris off the tread, and keep the users on it. The best trail maintainers are those with "trail eye," the ability to anticipate physical and social threats to trail integrity and to head off problems. Even though you know the proper maintenance specifications, sometimes there is too much work for the time you have to spend. How do you decide what to do? Since it is a given that there will always be more work to do than people to do it, it's important to:

- Monitor your trail conditions closely.
- Decide what can be accomplished as basic maintenance.
- Determine what can be deferred.
- Identify what area will need major work.
- The first priority for trail work is to correct truly unsafe situations. This could mean repairing impassable washouts along a cliff, or removing blow down from a steep section of a pack stock trail.
- The second priority is to correct things causing significant trail damage--erosion, sedimentation, and off-site trampling, for instance.
- The third priority is to restore the trail to the planned design standard. This means that the ease of finding and traveling the trail matches the design specifications for the recreational setting and target user. Actions range from simply adding "reassurance markers" to full-blown reconstruction of eroded tread or failed structures.

Whatever the priority, doing maintenance when the need is first noticed will help prevent more severe and costly damage later."

APPENDIX A

DESIGN GUIDELINES

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Overview

The sections that follow serve as an inventory of pedestrian and bicycle design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a walk- and bicycle-friendly, safe, and 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 NCDOT for specific design solutions. 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 bikeway design standards, and offers guidance on the current state of the practice designs. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US. The FHWA endorsed the NACTO Guide in 2013.
- Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle facility project. The United States Access Board's proposed *Public Rights-of-Way Accessibility Guidelines* (PROWAG) and the 2010 *ADA Standards for Accessible Design (2010 Standards)* contain standards and guidance for the construction of accessible facilities.
- The North Carolina Department of Transportation *Complete Streets Planning and Design Guidelines,* released in 2012, provide NCDOT and municipality staff with a guide to planning and designing streets that meet the needs of all users, including pedestrians, bicyclists, and motor vehicles. The guidelines include detailed information on the processes, street types, and recommendations for creating complete streets in North Carolina.

Should these standards be revised in the future and result in discrepancies with this appendix, the 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.

Design Needs of Pedestrians

Types of Pedestrians

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing. Table A-1 to the right summarizes common pedestrian characteristics for various age groups.

The MUTCD recommends a normal walking speed of three and a half feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to three feet per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.

Table A-1: Pedestrian Characteristics by Age

Age	Characteristics
0-4	Learning to walk Requires constant adult supervision Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision Poor depth perception
9-13	Susceptible to "dart out" intersection dash Poor judgment Sense of invulnerability
14-18	Improved awareness of traffic environment Poor judgment
19-40	Active, fully aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street Vision loss Difficulty hearing vehicles approaching from behind Could become disoriented or have limited cognitive abilities

Sidewalks

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel that is separated from vehicle traffic. Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped planting strip area. Sidewalks are a common application in both urban and suburban environments.

Attributes of well-designed sidewalks include the following:

Accessibility: A network of sidewalks should be accessible to all users.

Adequate width: Two people should be able to walk side-by-side and pass a third comfortably. Different walking speeds should be possible. In areas of intense pedestrian use, sidewalks should accommodate a high volume of walkers.

Safety: Design features of the sidewalk should allow pedestrians to have a sense of security and predictability. Sidewalk users should not feel they are at risk due to the presence of adjacent traffic.

Continuity: Walking routes should be obvious and should not require pedestrians to travel out of their way unnecessarily.

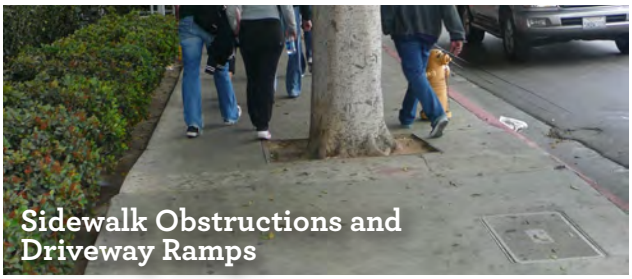
Landscaping: Plantings and street trees should contribute to the overall psychological and visual comfort of sidewalk users, and be designed in a manner that contributes to the safety of people.

Drainage: Sidewalks should be well graded to minimize standing water.

Social space: There should be places for standing, visiting, and sitting. The sidewalk area should be a place where adults and children can safely participate in public life.

Quality of place: Sidewalks should contribute to the character of neighborhoods and business districts.

Sidewalk Widths



Sidewalk Obstructions and Driveway Ramps

Pedestrian Amenities

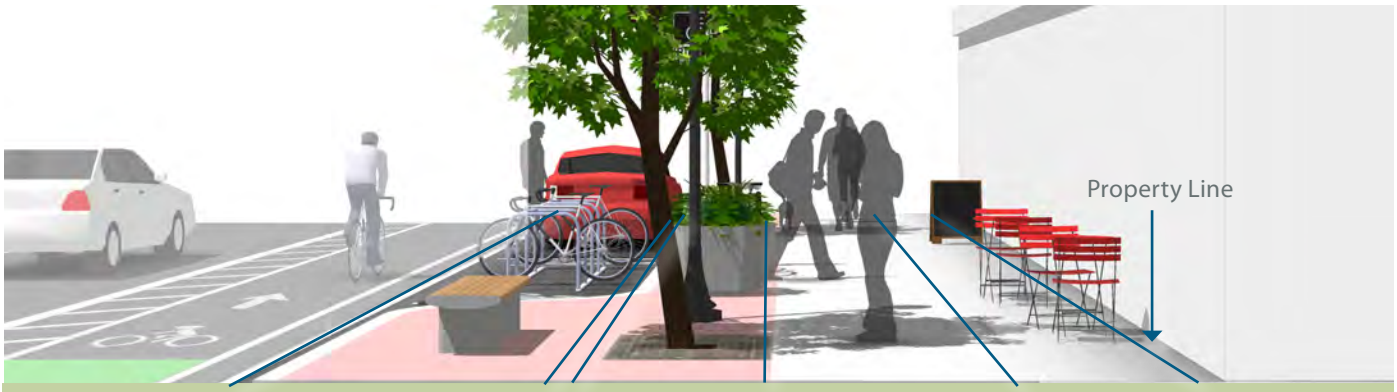
Sidewalk Widths

Description

The width and design of sidewalks will vary depending on street context, functional classification, and pedestrian demand. Below are preferred widths of each sidewalk zone according to general street type. Standardizing sidewalk guidelines for different areas of the city, dependent on the above listed factors, ensures a minimum level of quality for all sidewalks.

Guidance

It is important to provide adequate width along a sidewalk corridor. Two people should be able to walk side-by-side and pass a third comfortably. In areas of high demand, sidewalks should contain adequate width to accommodate the high volumes and different walking speeds of pedestrians. The Americans with Disabilities Act requires a 4 foot clear width in the pedestrian zone plus 5 foot passing areas every 200 feet.



Street Classification	Parking Lane/ Enhancement Zone	Furnishing/ Green Zone	Pedestrian Through Zone	Frontage Zone	Total Sidewalk Area
Local Streets	7 feet	4 - 8 feet	5 - 6 feet	N/A	9 - 12 feet
Commercial Areas	8 - 10 feet	6 - 8 feet	6 - 12 feet	2 - 8 feet	14- 28 feet
Arterials and Collectors	8 - 10 feet	6 - 8 feet	4 - 12 feet	2 - 4 feet	12 -24 feet

Areas that have significant accumulations of snow during the winter may prefer a wider furnishing zone for snow storage.

Six feet enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably

Total sidewalk area excludes parking dimensions

Recommended dimensions shown here are based on the NCDOT Complete Streets Planning and Design Guidelines. Exact dimensions should be selected in response to local context and expected/desired pedestrian volumes.

Additional References and Guidelines

USDOJ. (2010). ADA Standards for Accessible Design.
United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).
NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped boulevard. Surfaces must be firm, stable, and slip resistant.

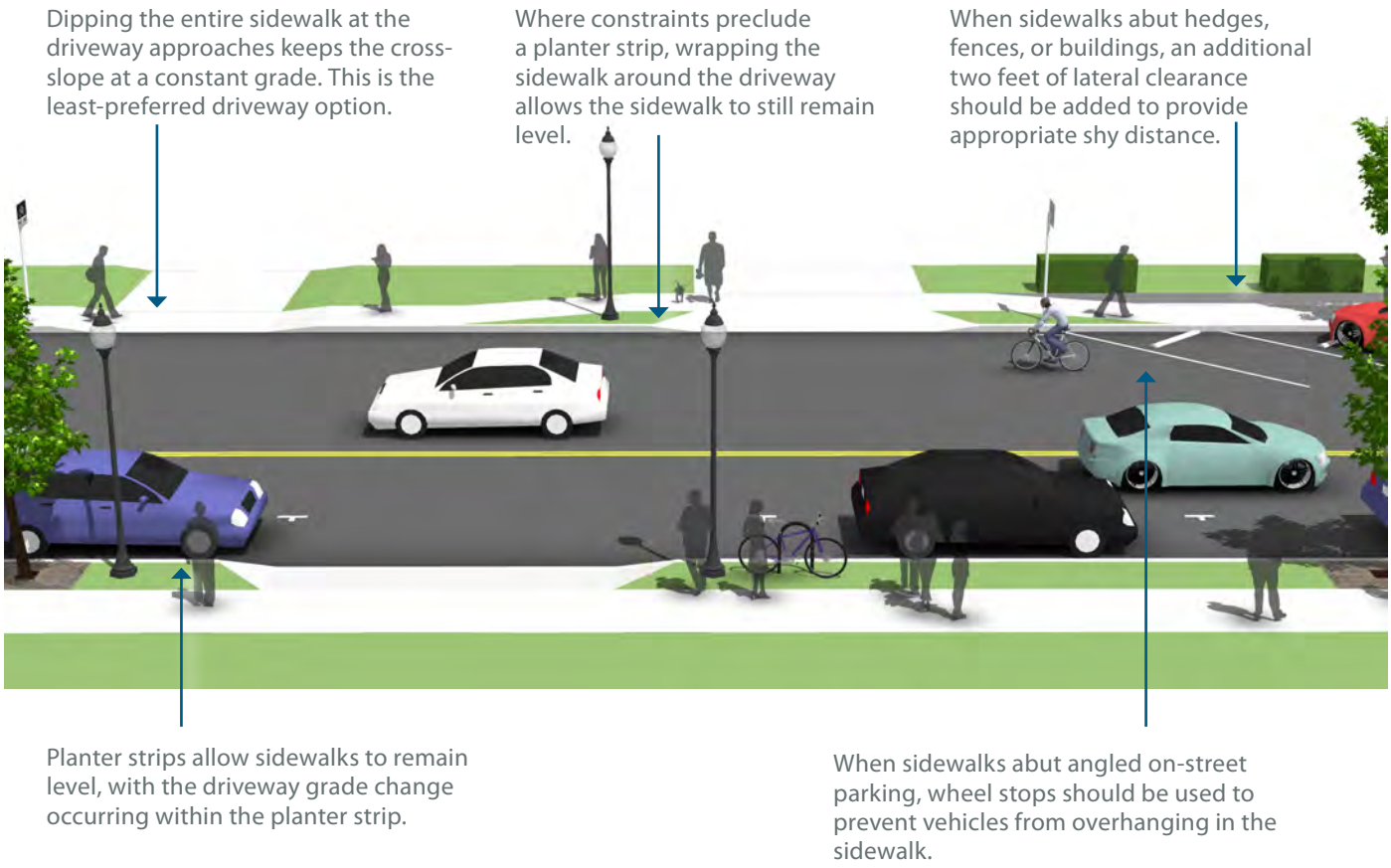
Sidewalk Obstructions and Driveway Ramps

Description

Obstructions to pedestrian travel in the sidewalk corridor typically include driveway ramps, curb ramps, sign posts, utility and signal poles, mailboxes, fire hydrants and street furniture.

Guidance

- Reducing the number of accesses reduces the need for special provisions. This strategy should be pursued first.
- Obstructions should be placed between the sidewalk and the roadway to create a buffer for increased pedestrian comfort.



Driveways are a common sidewalk obstruction, especially for wheelchair users. When constraints only allow curb-tight sidewalks, dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. However, this may be uncomfortable for pedestrians and could create drainage problems behind the sidewalk.

Additional References and Guidelines

USDOJ. (2010). ADA Standards for Accessible Design.
United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

Excessive cracks, gaps, pits, settling, and lifting of the sidewalk creates a pedestrian tripping hazard and reduces ADA accessibility; damaged sidewalks should be repaired.

Pedestrian Amenities

Description

A variety of streetscape elements can define the pedestrian realm, offer protection from moving vehicles, and enhance the walking experience. Pedestrian amenities should be placed in the furnishing zone on a sidewalk corridor. Signs, meters, and tree wells should go between parking spaces. Key features are presented below.

Street Trees

In addition to their aesthetic and environmental value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down. It is important that trees do not block light or the vision triangle.

Street Furniture

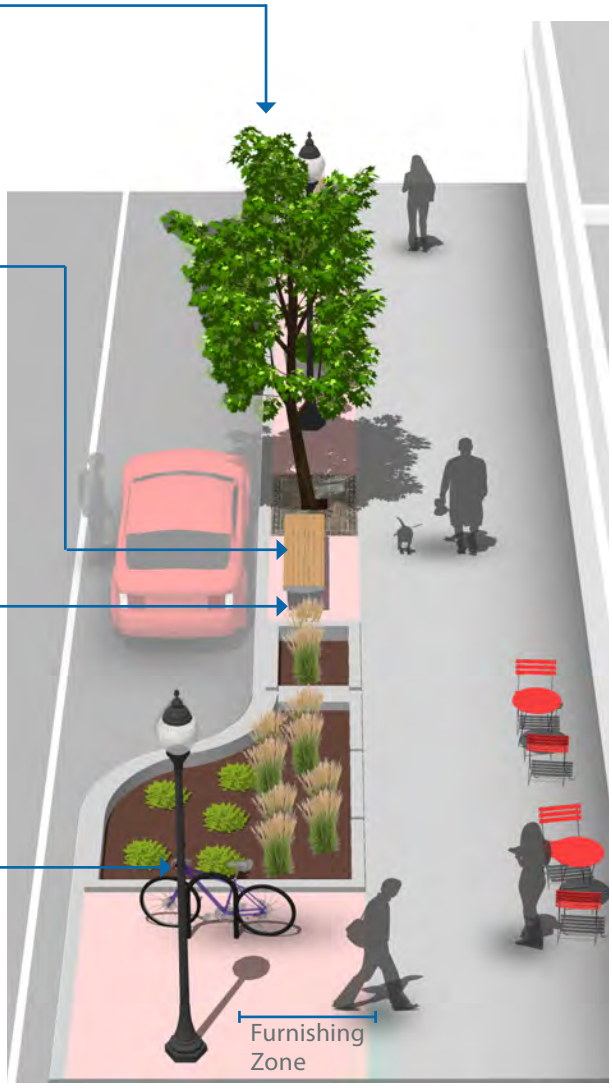
Providing benches at key rest areas and viewpoints encourages people of all ages to use the walkways by ensuring that they have a place to rest along the way. Benches should be 20" tall to accommodate elderly pedestrians comfortably. Benches can be simple (e.g., wood slats) or more ornate (e.g., stone, wrought iron, concrete). If alongside a parking zone, street furniture must be 3 feet from the curbface.

Green Features

Green stormwater strategies may include bioretention swales, rain gardens, tree box filters, and pervious pavements (pervious concrete, asphalt and pavers). Bioswales are natural landscape elements that manage water runoff from a paved surface. Plants in the swale trap pollutants and silt from entering a river system.

Lighting

Pedestrian scale lighting improves visibility for both pedestrians and motorists - particularly at intersections. Pedestrian scale lighting can provide a vertical buffer between the sidewalk and the street, defining pedestrian areas.



Additional References and Guidelines

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG). NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Establishing and caring for your young street trees is essential to their health. Green features may require routine maintenance, including sediment and trash removal, and clearing curb openings and overflow drains.

Pedestrians at Intersections

Attributes of pedestrian-friendly intersection design include:

Clear Space: Corners should be clear of obstructions. They should also have enough room for curb ramps, for transit stops where appropriate, and for street conversations where pedestrians might congregate.

Visibility: It is critical that pedestrians on the corner have a good view of vehicle travel lanes and that motorists in the travel lanes can easily see waiting pedestrians.

Legibility: Symbols, markings, and signs used at corners should clearly indicate what actions the pedestrian should take.

Accessibility: All corner features, such as curb ramps, landings, call buttons, signs, symbols, markings, and textures, should meet accessibility standards and follow universal design principles.

Separation from Traffic: Corner design and construction should be effective in discouraging turning vehicles from driving over the pedestrian area. Crossing distances should be minimized.

Lighting: Adequate lighting is an important aspect of visibility, legibility, and accessibility.

These attributes will vary with context but should be considered in all design processes. For example, suburban and rural intersections may have limited or no signing. However, legibility regarding appropriate pedestrian movements should still be taken into account during design.


Marked/Raised Crosswalks


Median Refuge Islands


Minimizing Curb Radii


Curb Extensions


ADA Compliant Curb Ramps

Marked Crosswalks

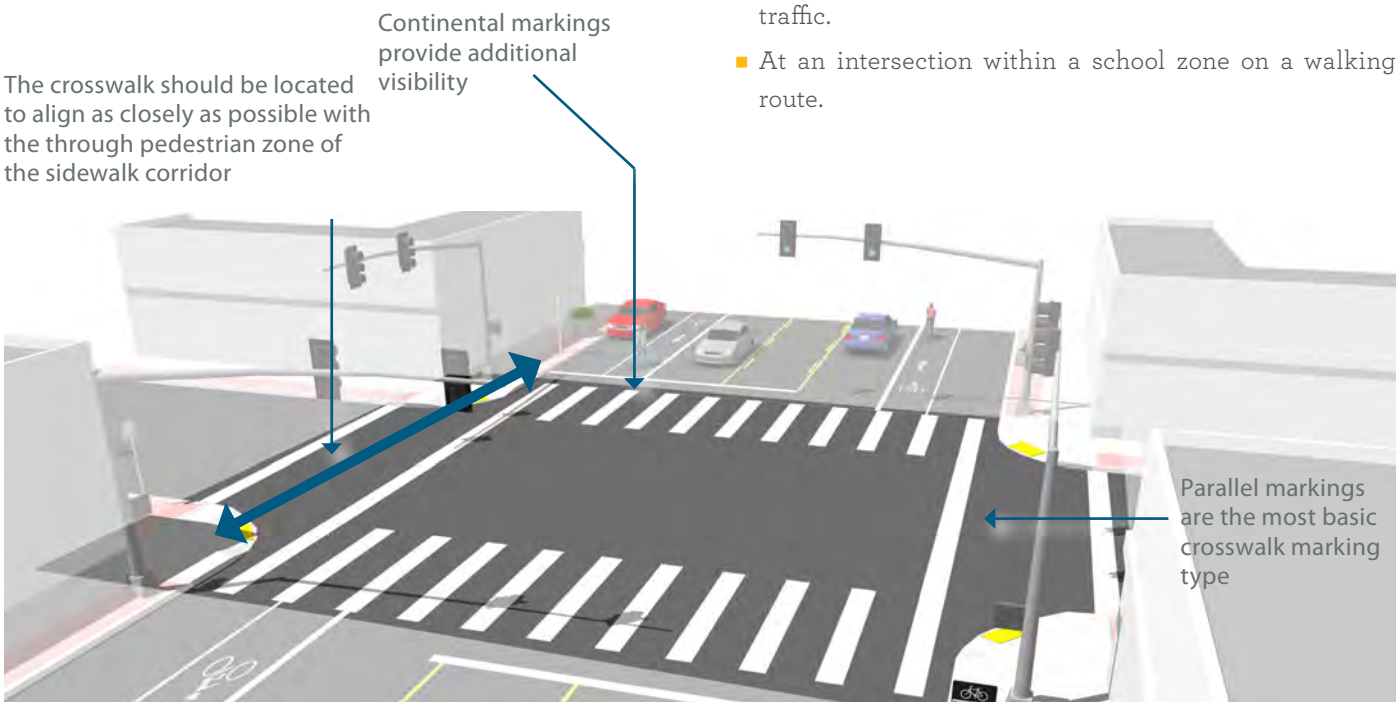
Description

A marked crosswalk signals to motorists that they must stop for pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily make crossings safer especially on multi-lane roadways.

At mid-block locations, crosswalks can be marked where there is a demand for crossing and there are no nearby marked crosswalks.

Guidance

- At signalized intersections, all crosswalks should be marked. At unsignalized intersections, crosswalks may be marked under the following conditions:
- At a complex intersection, to orient pedestrians in finding their way across.
- At an offset intersection, to show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts.
- At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
- At an intersection within a school zone on a walking route.



Continental crosswalk markings should be used at crossings with high pedestrian use or where vulnerable pedestrians are expected, including: school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and at intersections where there is expected high pedestrian use and the crossing is not controlled by signals or stop signs.

Additional References and Guidelines

FHWA. (2009). Manual on Uniform Traffic Control Devices. (3B.18) AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities. FHWA. (2005). Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations.
FHWA. (2010). Crosswalk Marking Field

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority. Thermoplastic markings offer increased durability compared to conventional paint.

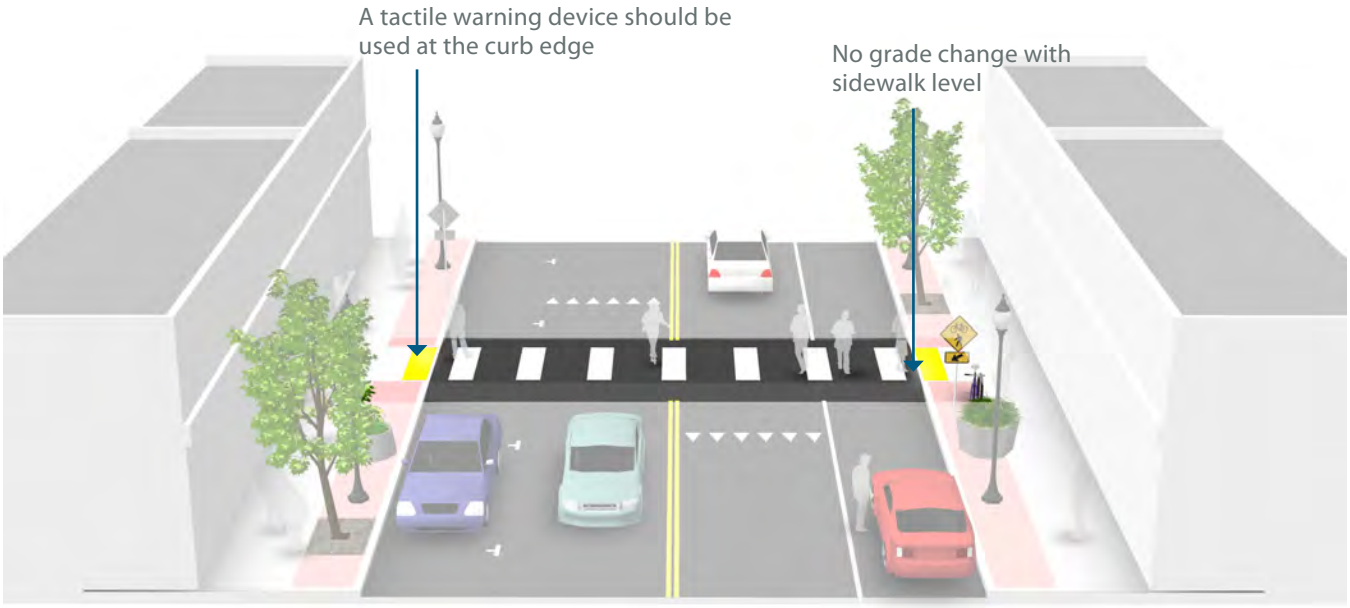
Raised Crosswalks

Description

A raised crosswalk or intersection can eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street. Raised crosswalks should be used only in very limited cases where a special emphasis on pedestrians is desired, and application should be reviewed on case-by-case basis.

Guidance

- Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.
- Approaches to the raised crosswalk may be designed to be similar to speed humps.
- Raised crosswalks can also be used as a traffic calming treatment.



Like a speed hump, raised crosswalks have a traffic slowing effect which may be unsuitable on emergency response routes.

Additional References and Guidelines

FHWA. (2009). Manual on Uniform Traffic Control Devices. (3B.18) AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.
USDOJ. (2010). ADA Standards for Accessible Design.
NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

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

Median Refuge Islands

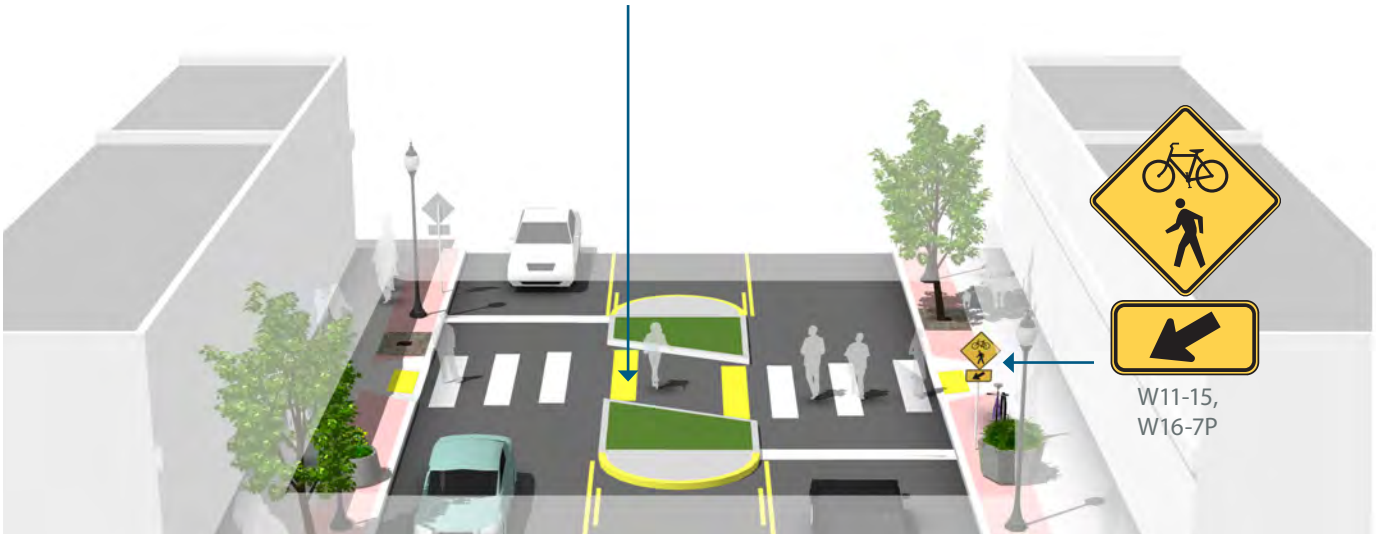
Description

Median refuge islands are located at the mid-point of a marked crossing and help improve pedestrian safety by allowing pedestrians to cross one direction of traffic at a time. Refuge islands minimize pedestrian exposure by shortening crossing distance and increasing the number of available gaps for crossing.

Guidance

- Can be applied on any roadway with a left turn center lane or median that is at least 6' wide.
- Appropriate at signalized or unsignalized crosswalks
- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- The island should be at least 6' wide between travel lanes (to accommodate bikes with trailers and wheelchair users) and at least 20' long.
- On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and "KEEP RIGHT" signage.

Cut through median islands are preferred over curb ramps, to better accommodate bicyclists.



If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Shrubs and ground plantings should be no higher than 1 ft 6 in. On multi-lane roadways, consider configuration with **active warning beacons** for improved yielding compliance.

Additional References and Guidelines

FHWA. (2009). Manual on Uniform Traffic Control Devices. AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities. NACTO. (2012). Urban Bikeway Design Guide. NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Refuge islands may collect road debris and may require somewhat frequent maintenance. Refuge islands should be visible to snow plow crews and should be kept free of snow berms that block access.

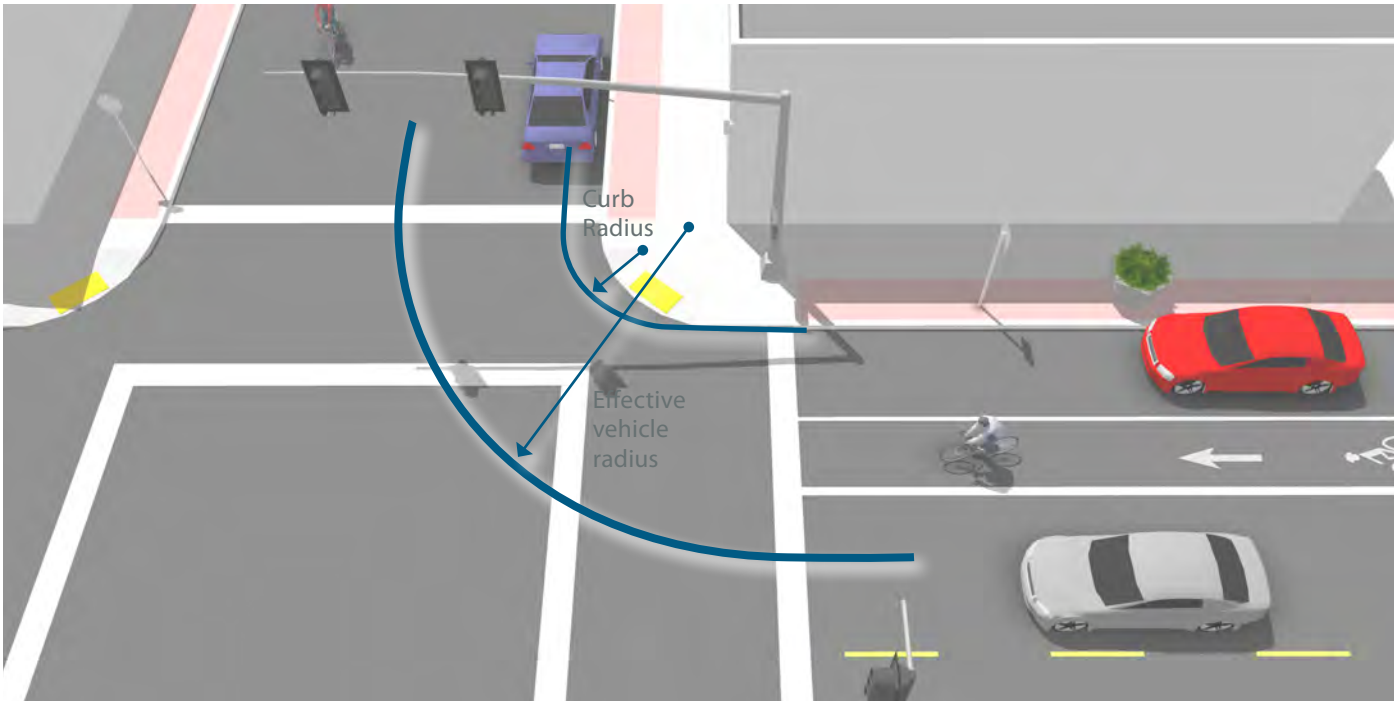
Minimizing Curb Radii

Description

The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crossing distance and requires vehicles to slow more on the intersection approach. During the design phase, the chosen radius should be the smallest possible for the circumstances.

Guidance

The radius may be as small as 3 ft where there are no turning movements, or 5 ft where there are turning movements, adequate street width, and a larger effective curb radius created by parking or bike lanes.



Several factors govern the choice of curb radius in any given location. These include the desired pedestrian area of the corner, traffic turning movements, street classifications, design vehicle turning radius, intersection geometry, and whether there is parking or a bike lane (or both) between the travel lane and the curb.

Additional References and Guidelines

AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities. AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.
NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Improperly designed curb radii at corners may be subject to damage by large trucks.

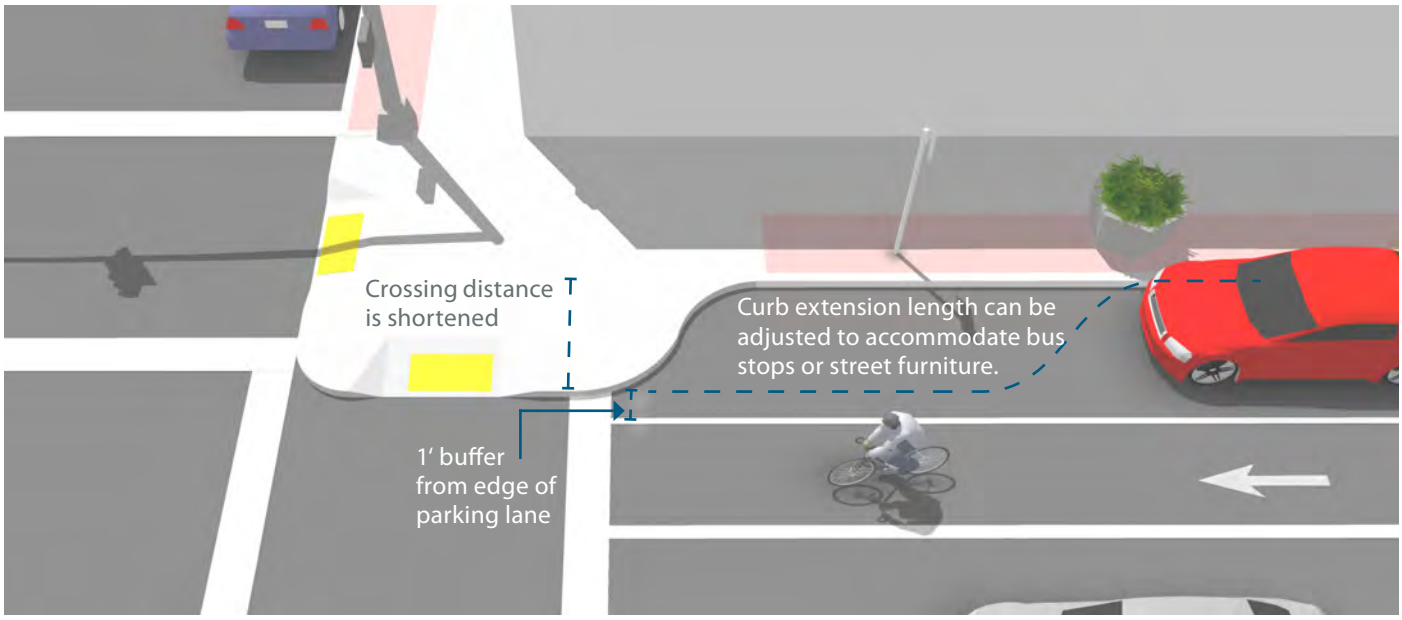
Curb Extensions

Description

Curb extensions minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing. They are appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb.

Guidance

- In most cases, the curb extensions should be designed to transition between the extended curb and the running curb in the shortest practicable distance.
- For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft and the two radii should be balanced to be nearly equal.
- Curb extensions should terminate one foot short of the parking lane to maximize bicyclist safety.



If there is no parking lane, adding curb extensions may be a problem for bicycle travel and truck or bus turning movements.

Additional References and Guidelines

AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities. AASHTO. (2004). A Policy on Geometric Design of Highways and Streets. NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Planted curb extensions may be designed as a bioswale, a vegetated system for stormwater management.

ADA Compliant Curb Ramps

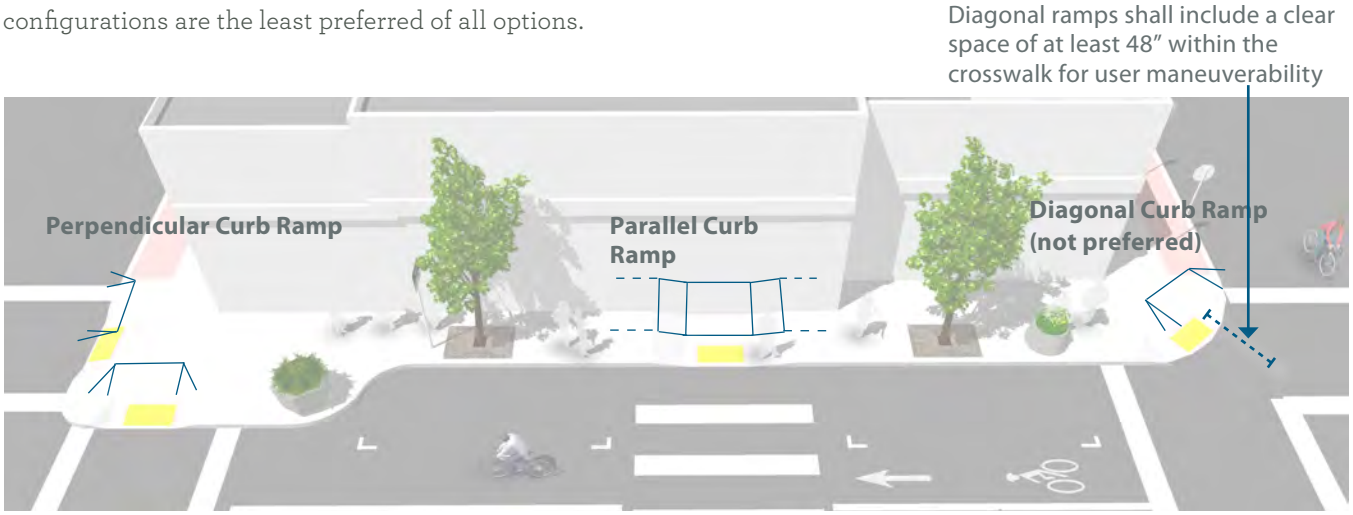
Description

Curb ramps are the design elements that allow all users to make the transition from the street to the sidewalk. There are a number of factors to be considered in the design and placement of curb ramps at corners. Properly designed curb ramps ensure that the sidewalk is accessible from the roadway. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access.

Although diagonal curb ramps might save money, they create potential safety and mobility problems for pedestrians,including reduced maneuverability and increased interaction with turning vehicles, particularly in areas with high traffic volumes. Diagonal curb ramp configurations are the least preferred of all options.

Guidance

- The landing at the top of a ramp shall be at least 4 feet long and at least the same width as the ramp itself.
- The ramp shall slope no more than 1:50 (2.0%) in any direction.
- If the ramp runs directly into a crosswalk, the landing at the bottom will be in the roadway.
- If the ramp lands on a dropped landing within the sidewalk or corner area where someone in a wheelchair may have to change direction, the landing must be a minimum of 5'-0" long and at least as wide as the ramp, although a width of 5'-0" is preferred.



Crosswalk spacing not to scale. For illustration purposes only.

The edge of an ADA compliant curb ramp will be marked with a tactile warning device (also known as truncated domes) to alert people with visual impairments to changes in the pedestrian environment. Contrast between the raised tactile device and the surrounding infrastructure is important so that the change is readily evident. These devices are most effective when adjacent to smooth pavement so the difference is easily detected. The devices must provide color contrast so partially sighted people can see them.

Additional References and Guidelines

United States Access Board. (2002). Accessibility Guidelines for Buildings and Facilities. United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG). USDOJ. (2010). ADA Standards for Accessible Design.

Materials and Maintenance

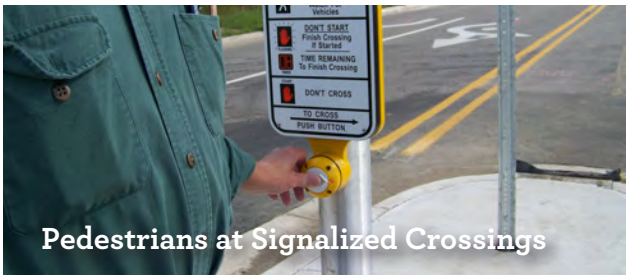
It is critical that the interface between a curb ramp and the street be maintained adequately. Asphalt street sections can develop potholes at the foot of the ramp, which can catch the front wheels of a wheelchair.

Signalization

Crossing beacons and signals facilitate crossings of roadways for pedestrians and bicyclists. Beacons make crossing intersections safer by clarifying when to enter an intersection and by alerting motorists to the presence of pedestrians and bicyclists.

Flashing amber warning beacons can be utilized at unsignalized intersection crossings. Push buttons, signage, and pavement markings may be used to highlight these facilities for pedestrians, bicyclists and motorists.

Determining which type of signal or beacon to use for a particular intersection depends on a variety of factors. These include speed limits, traffic volumes, and the anticipated levels of pedestrian and bicycle crossing traffic. An intersection with crossing beacons may reduce stress and delays for crossing users, and discourage illegal and unsafe crossing maneuvers.



Pedestrians at Signalized Crossings


Pedestrian Hybrid Beacon

Pedestrians at Signalized Crossings

Description

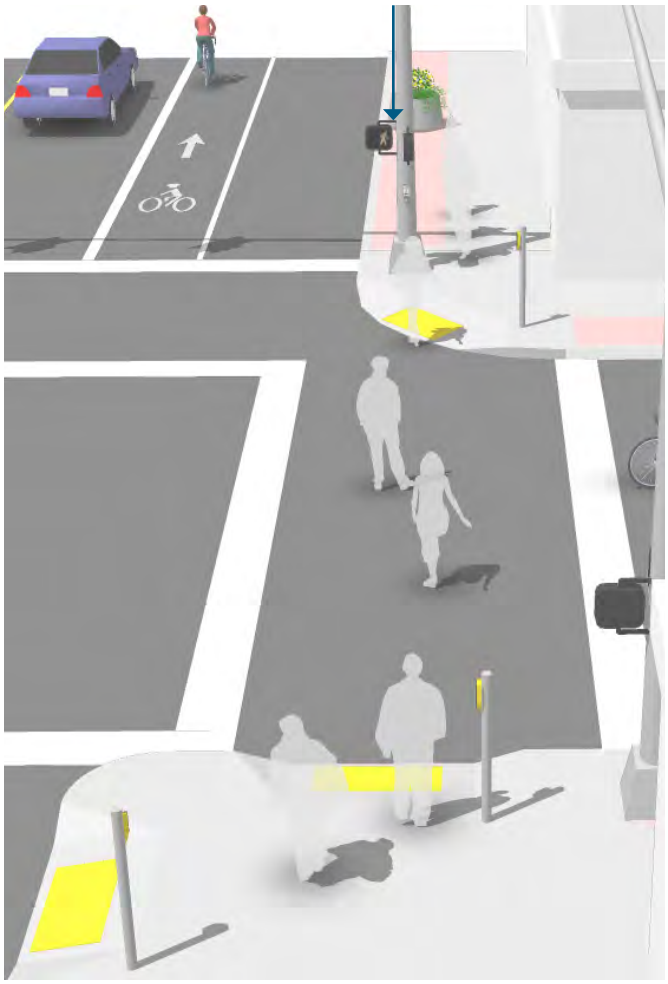
Pedestrian Signal Head

- All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage.
- Countdown signals should be used at all signalized intersections to indicate whether a pedestrian has time to cross the street before the signal phase ends.

Signal Timing

- Providing adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The MUTCD recommends traffic signal timing to assume a pedestrian walking speed of 3.5' per second, meaning that the length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street.
- At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3' per second may be assumed.
- In busy pedestrian areas such as downtowns, the pedestrian signal indication should be built into each signal phase, eliminating the requirement for a pedestrian to actuate the signal by pushing a button.

Audible pedestrian traffic signals provide crossing assistance to pedestrians with vision impairment at signalized intersections



Consider the use of a Leading Pedestrian Indication (LPI) to provide additional traffic protected crossing time to pedestrians

When push buttons are used, they should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk, and marked (for example, with arrows) so that it is clear which signal is affected. In areas with very heavy pedestrian traffic, consider an all-pedestrian signal phase to give pedestrians free passage in the intersection when all motor vehicle traffic movements are stopped.

Additional References and Guidelines

United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.
NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

It is important to repair or replace traffic control equipment before it fails. Consider semi-annual inspections of controller and signal equipment, intersection hardware, and loop detectors.

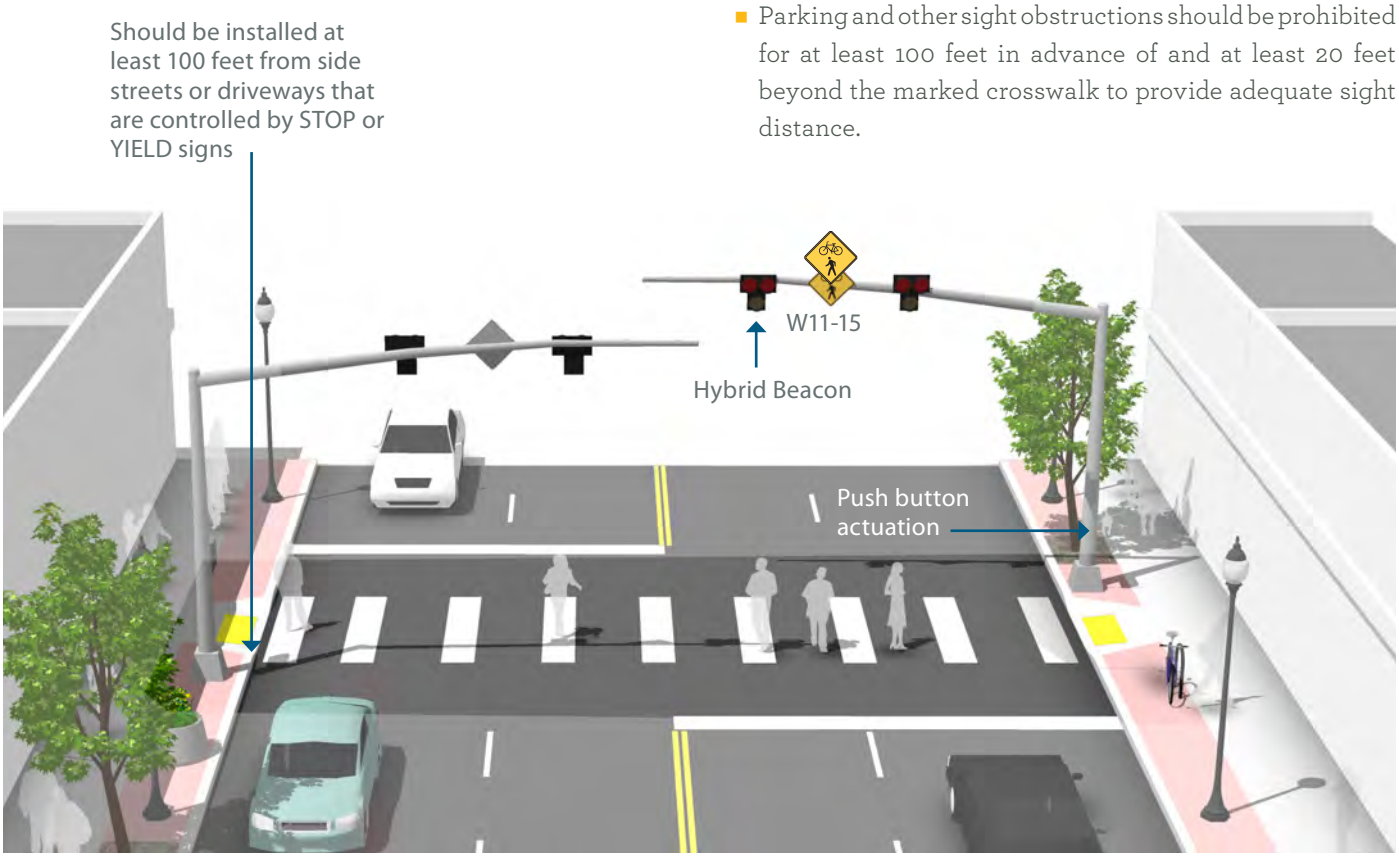
Pedestrian Hybrid Beacon

Description

Hybrid beacons are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal-head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk.

Guidance

- Hybrid beacons may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable pedestrian crossings.
- If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.



Hybrid beacon signals are normally activated by push buttons, but may also be triggered by infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.

Additional References and Guidelines

FHWA. (2009). Manual on Uniform Traffic Control Devices.
NACTO. (2012). Urban Bikeway Design Guide.
NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Hybrid beacons are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

Active Warning Beacons

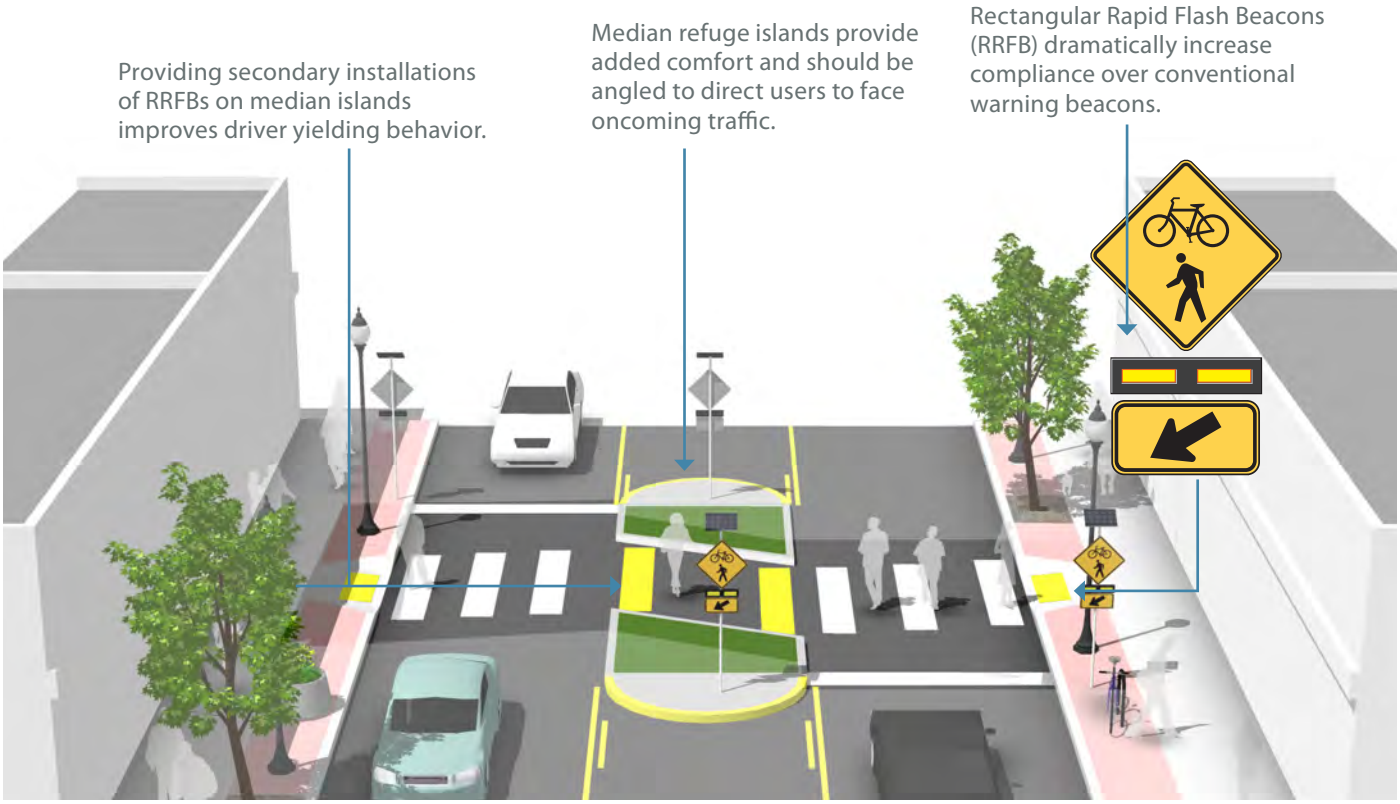
Description

Active warning beacons are user-actuated illuminated devices designed to increase motor vehicle yielding compliance at crossings of multi-lane or high-volume roadways.

Types of active warning beacons include conventional circular yellow flashing beacons, in-roadway warning lights, or rectangular rapid flash beacons (RRFB).

Guidance

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



Rectangular rapid flash beacons have the highest compliance of all the warning beacon enhancement options. A study 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 percent. Additional studies over long term installations show little to no decrease in yielding behavior over time.

Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide.
FHWA. (2009). Manual on Uniform Traffic Control Devices.
FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)

Materials and Maintenance

Depending on power supply, maintenance can be minimal. If solar power is used, RRFBs can run for years without issue.

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.

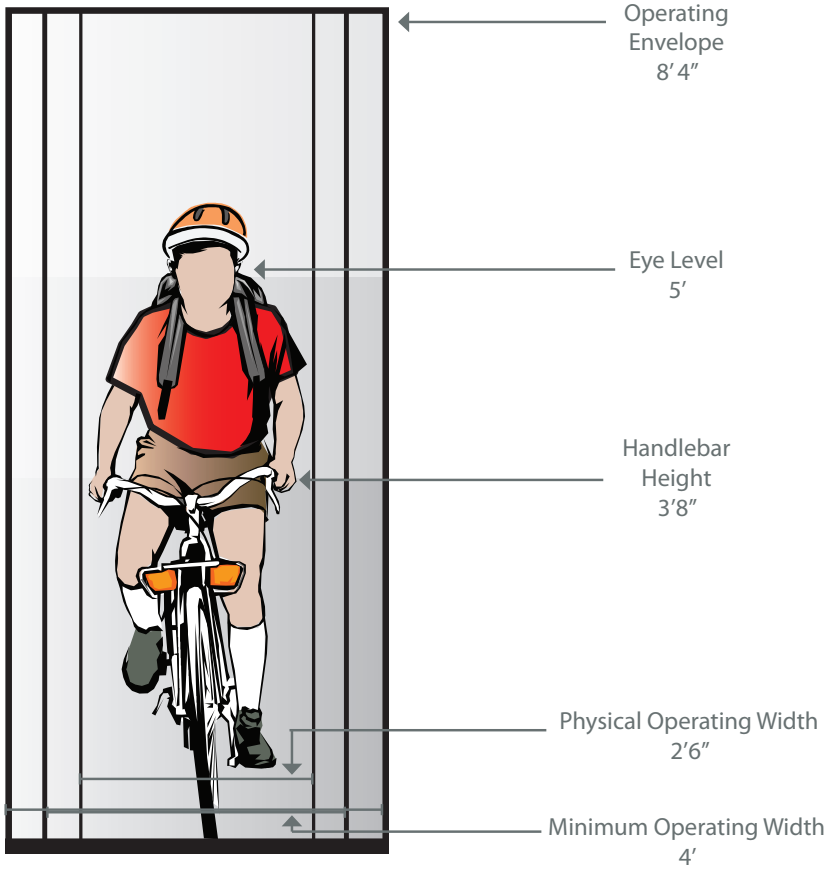
Bicycle as a Design Vehicle

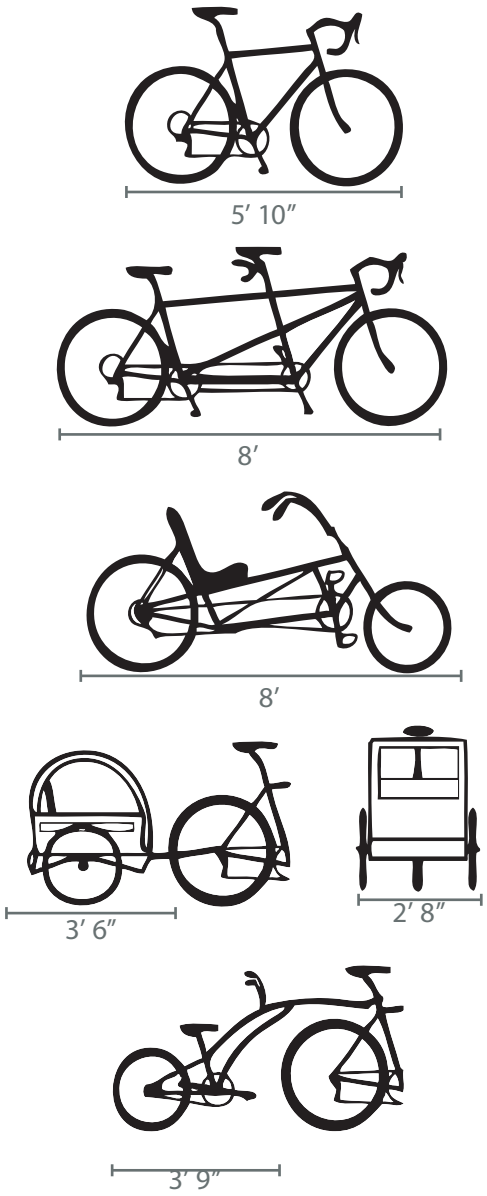
Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The 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 following figure and table summarize typical bicycle dimensions.

Standard Bicycle Rider Dimensions
Source: AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition





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.

Design Speed Expectations

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as multi-use paths. The table to the right provides typical bicyclist speeds for a variety of conditions.

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	8 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 8 in

Bicycle as Design Vehicle - Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Paved level surfacing	15 mph
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5 -12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

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

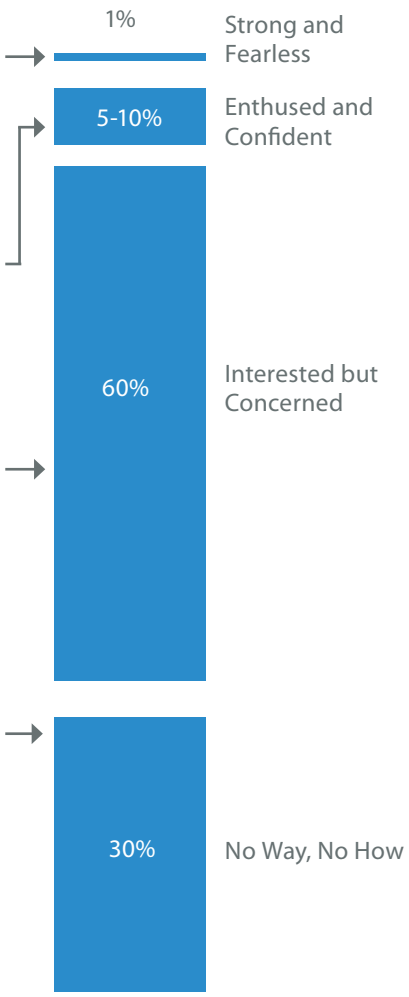
Types of Bicyclists

It is important to consider bicyclists of all skill levels when creating a non-motorized plan or project. Bicyclist skill level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. 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.

The bicycle planning and engineering professions currently use several systems to classify the population, which can assist in understanding the characteristics and infrastructure preferences of different bicyclists. The most conventional framework classifies the "design cyclist" as Advanced, Basic, or Child[1]. A more detailed understanding of the US population as a whole is illustrated in the figure below. Developed by planners in Portland, OR[2] and supported by data collected nationally since 2005, this classification provides the following alternative categories to address varying attitudes towards bicycling in the US:

- *Strong and Fearless* (approximately 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 multi-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 multi-use paths 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* (approximately 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 multi-use 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 "Enthused & Confident" with encouragement, education and experience.
- *No Way, No How* (approximately 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 never ride a bicycle other than on rare occasions or under special circumstances (e.g., in a park, with a child).

Typical Distribution of Bicyclist Types



1 Selecting Roadway Design Treatments to Accommodate Bicycles. (1994). Publication No. FHWA-RD-92-073

2 Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation. http://www.portlandonline.com/transportation/index.cfm?&a=237507

Bicycle Facility Selection Guidelines

This section summarizes the bicycle facility selection typology developed for the City of Mebane. The specific facility type that should be provided depends on the surrounding environment (e.g. auto speed and volume, topography, and adjacent land use) and expected bicyclist needs (e.g. bicyclists commuting on a highway versus students riding to school on residential streets).


Facility Classification


Facility Continua

Facility Selection Guidelines

There are no 'hard and fast' rules for determining the most appropriate type of bicycle facility for a particular location – roadway speeds, volumes, right-of-way width, presence of parking, adjacent land uses, and expected bicycle user types are all critical elements of this decision. Studies find that the most significant factors influencing bicycle use are motor vehicle traffic volumes and speeds. Additionally, most bicyclists prefer facilities separated from motor vehicle traffic or located on local roads with low motor vehicle traffic speeds and volumes. Because off-street pathways are physically separated from the roadway, they are perceived as safe and attractive routes for bicyclists who prefer to avoid motor vehicle traffic. Consistent use of treatments and application of bikeway facilities allow users to anticipate whether they would feel comfortable riding on a particular facility, and plan their trips accordingly. This section provides guidance on various factors that affect the type of facilities that should be provided.

Facility Classification

Description

Consistent with bicycle facility classifications throughout the nation, these Bicycle Facility Design Guidelines identify the following classes of facilities by degree of separation from motor vehicle traffic.

Shared Roadways are bikeways where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. The most basic type of bikeway is a signed shared roadway. This facility provides continuity with other bicycle facilities (usually bike lanes), or designates preferred routes through high-demand corridors.

Shared Roadways may also be designated by pavement markings, signage and other treatments including directional signage, traffic diverters, chicanes, chokers and /or other traffic calming devices to reduce vehicle speeds or volumes. Shared-lane markings are included in this class of treatments.

Separated Bikeways, such as bike lanes, use signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists. Paved shoulders are also included in this classification.

Cycle Tracks are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes.

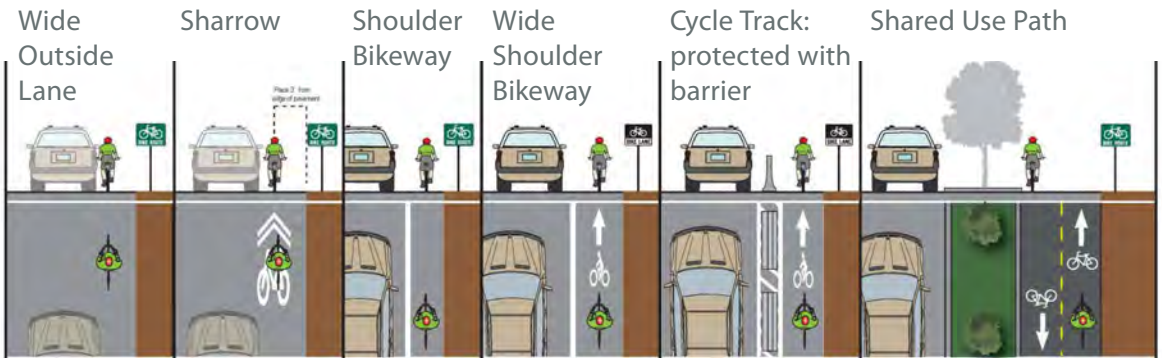
Multi-use Paths are facilities separated from roadways for use by bicyclists and pedestrians. Greenways and side paths are included in this classification.

Facility Continua

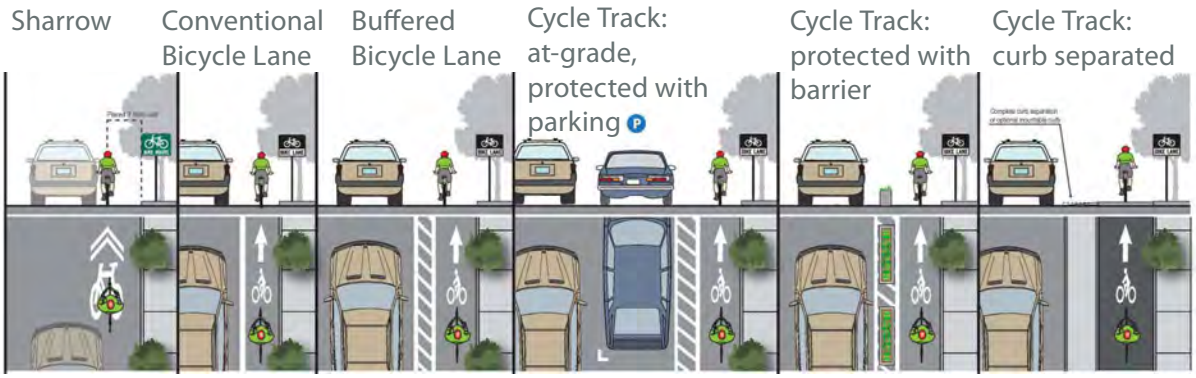
The following continua illustrate the range of bicycle facilities applicable to various roadway environments, based on the roadway type and desired degree of separation. Engineering judgment, traffic studies, previous municipal planning efforts, community input, and local context should be used to refine criteria when developing bicycle facility recommendations for a particular street. In some corridors, it may be desirable to construct facilities to a higher level of treatment than those recommended in relevant planning documents in order to enhance user safety and comfort. In other cases, existing and/or future motor vehicle speeds and volumes may not justify the recommended level of separation, and a less intensive treatment may be acceptable.

Least Protected → Most Protected

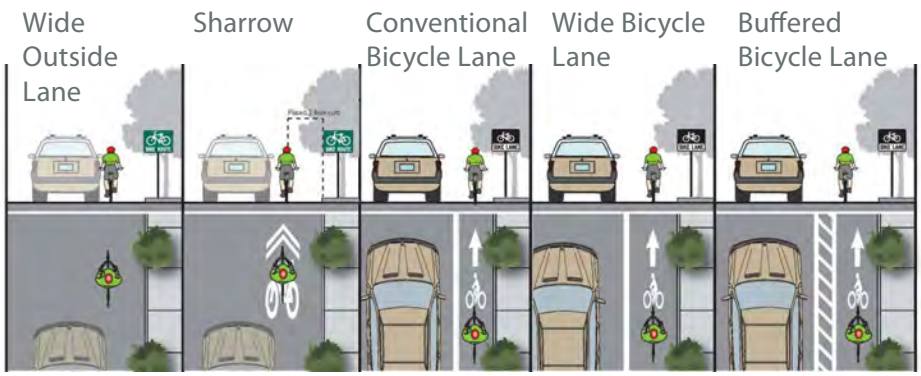
Arterial/Highway Bikeway Continuum (without curb and gutter)



Arterial/Highway Bikeway Continuum (with curb and gutter)



Collector Bikeway Continuum



Shared Roadways

On shared roadways, bicyclists and motor vehicles use the same roadway space. 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, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.

Signed Shared Roadway


Marked Shared Roadway


Bicycle Boulevard

Signed Shared Roadways

Description

Signed Shared Roadways are facilities shared with motor vehicles. They 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.

Guidance

Lane width varies depending on roadway configuration. Bicycle Route signage (D11-1) should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists. Commonly, this includes placement at:

- Beginning or end of Bicycle Route.
- At major changes in direction or at intersections with other bicycle routes.
- At intervals along bicycle routes not to exceed ½ mile.

MUTCD D11-1

Signed Shared Roadways serve either to provide continuity with other bicycle facilities (usually bike lanes) or to designate preferred routes through high-demand corridors.

This configuration differs from a Bicycle Boulevard due to a lack of traffic calming, wayfinding, pavement markings and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

Additional References and Guidelines

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

Materials and Maintenance

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

Marked Shared Roadway

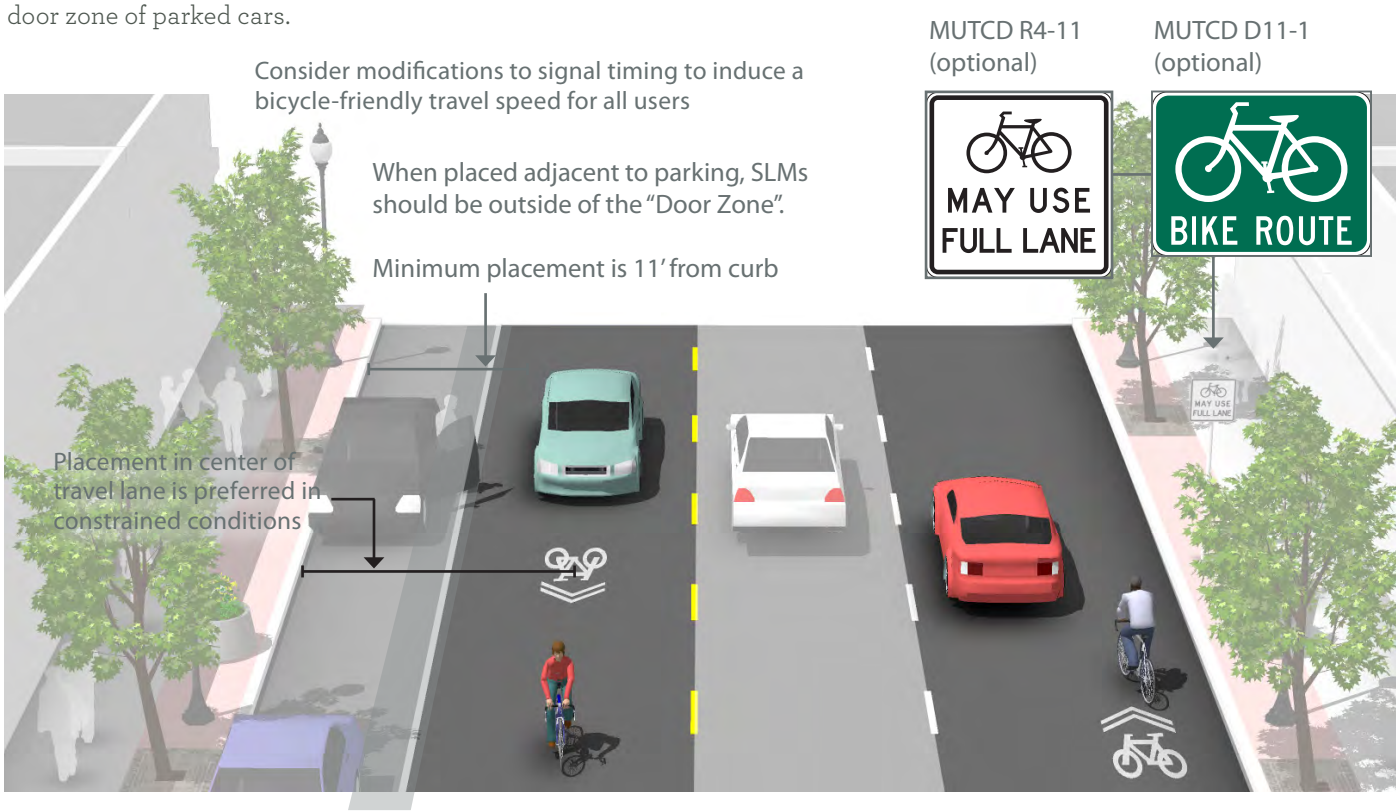
Description

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

- 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.



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)

This configuration differs from a Bicycle Boulevard due to a lack of traffic calming, wayfinding, and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

Additional References and Guidelines

FHWA. (2009). Manual on Uniform Traffic Control Devices.
NACTO. (2012). Urban Bikeway Design Guide. NCDOT.
(2000). Traditional Neighborhood Development (TND) Guidelines.

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.

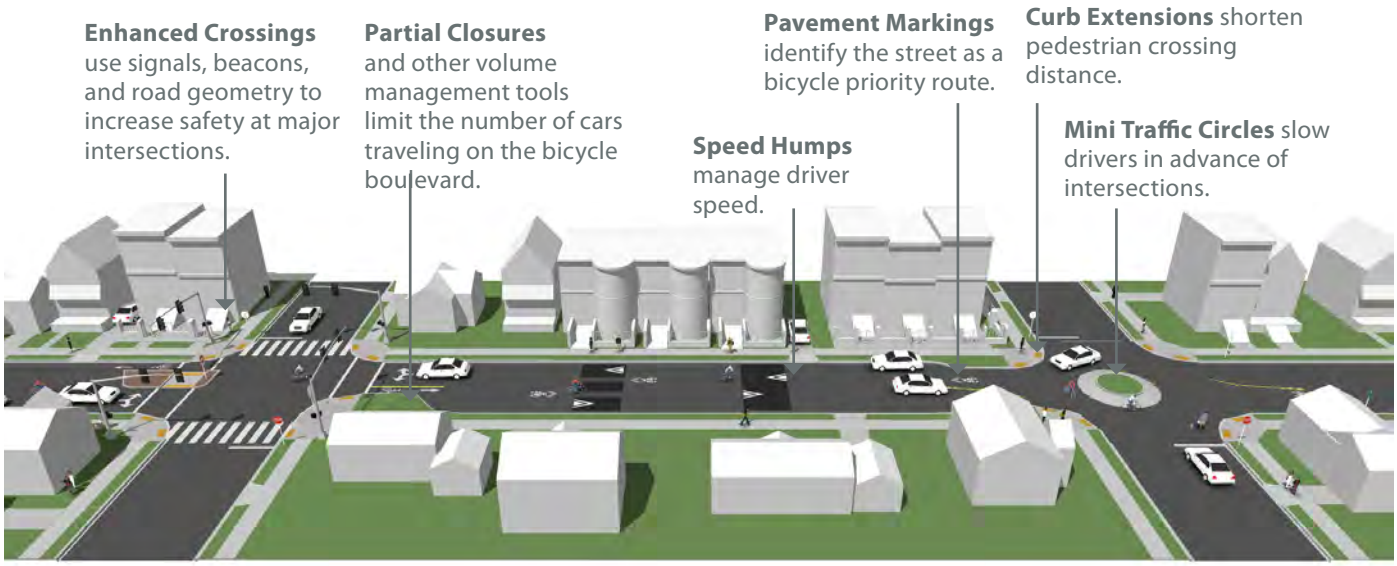
Bicycle Boulevard

Description

Bicycle boulevards are a special class of shared roadways designed for a broad spectrum of bicyclists. They are low-volume, low-speed local streets modified to enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic.

Guidance

- Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard.
- Bicycle boulevards should have a maximum posted speed of 25 mph. Use traffic calming to maintain an 85th percentile speed below 22 mph.
- Implement volume control treatments based on the context of the bicycle boulevard, using engineering judgment. Target motor vehicle volumes range from 1,000 to 3,000 vehicles per day.
- Intersection crossings should be designed to enhance safety and minimize delay for bicyclists.



Bicycle boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the bicycle boulevard and compromise safety.

Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Additional References and Guidelines

Alta Planning + Design and IBPI. (2009). Bicycle Boulevard Planning and Design Handbook. BikeSafe. (No Date). Bicycle countermeasure selection system. Ewing, Reid. (1999). Traffic Calming: State of the Practice. Ewing, Reid and Brown, Steven. (2009). U.S. Traffic Calming Manual.

Materials and Maintenance

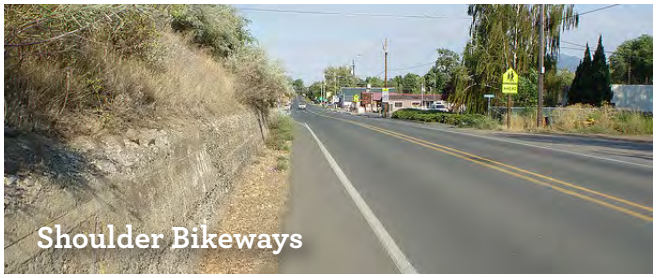
Vegetation should be regularly trimmed to maintain visibility and attractiveness.

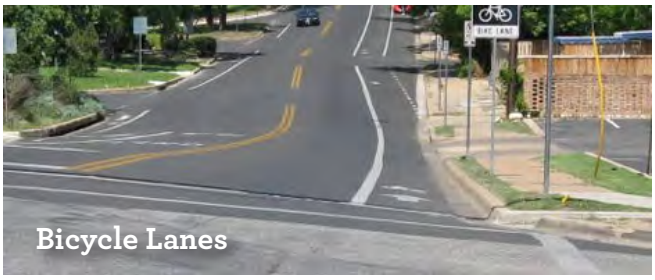
Separated Bikeways

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.

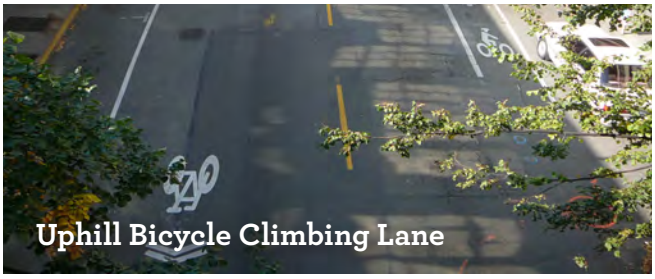
Separated bikeways can increase safety and promote proper riding by:

- 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.


Shoulder Bikeways


Bicycle Lanes


Buffered Bike Lanes


Uphill Bicycle Climbing Lane

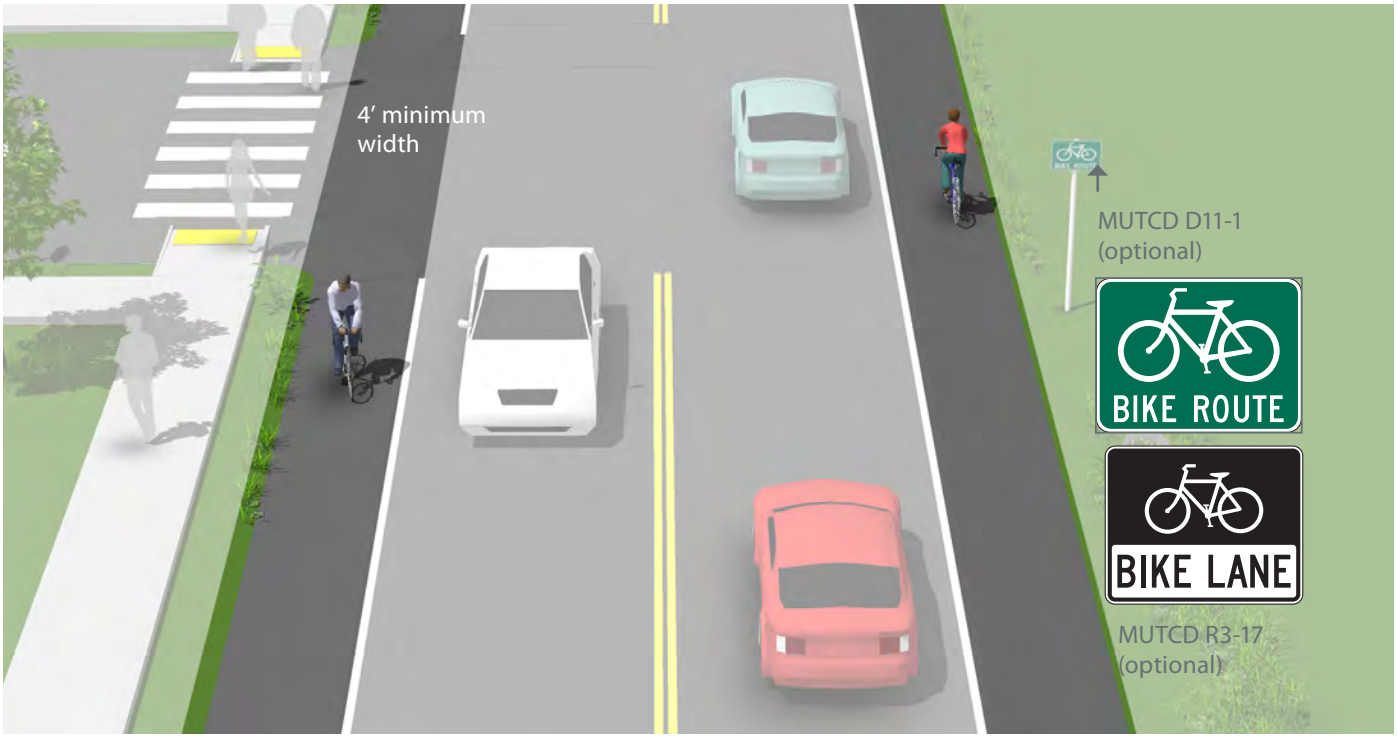
Shoulder Bikeways

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

- 4 foot minimum width. Greater widths preferred.
- 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.



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 and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NCDOT. (1994). Bicycle Facilities Planning and Design Guidelines.

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.

Bicycle Lanes

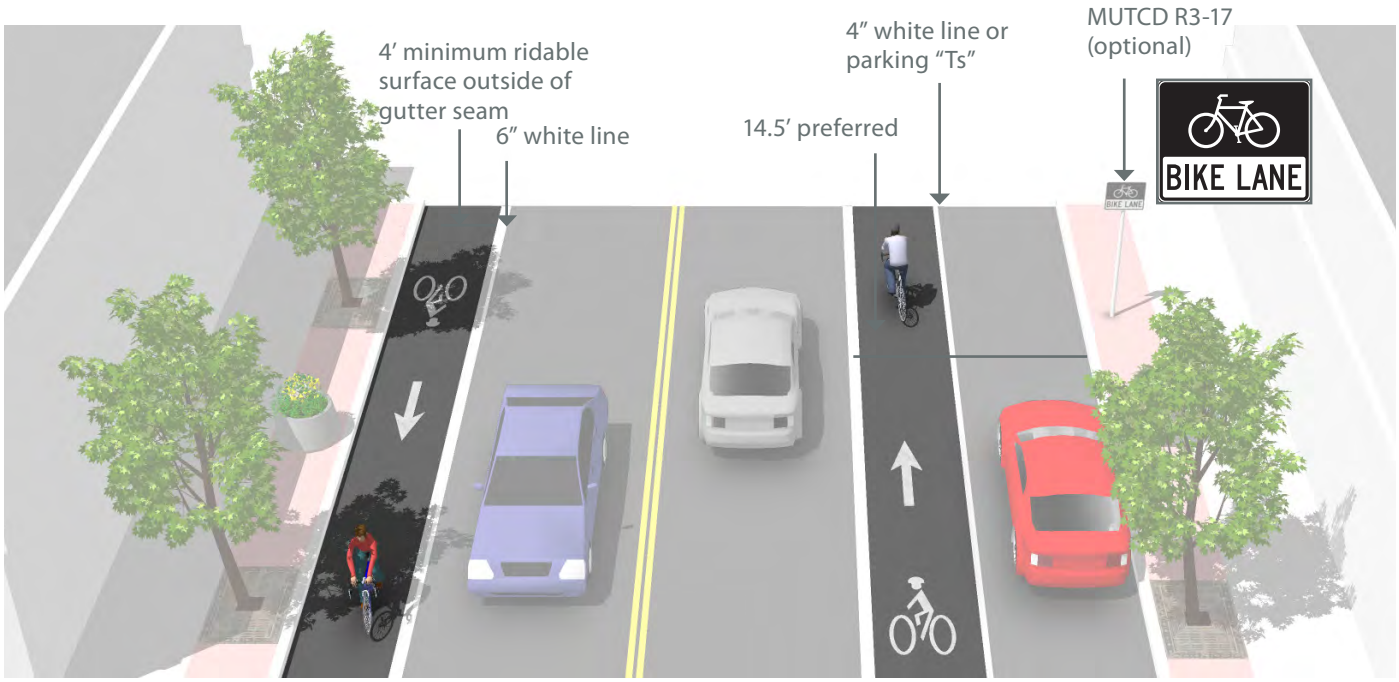
Description

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.



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 Bicycle Lanes when further separation is desired.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. NCDOT. (2000). Traditional Neighborhood Development (TND) Guidelines. NCDOT. (1994). Bicycle Facilities Planning and Design Guidelines.

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 Lanes

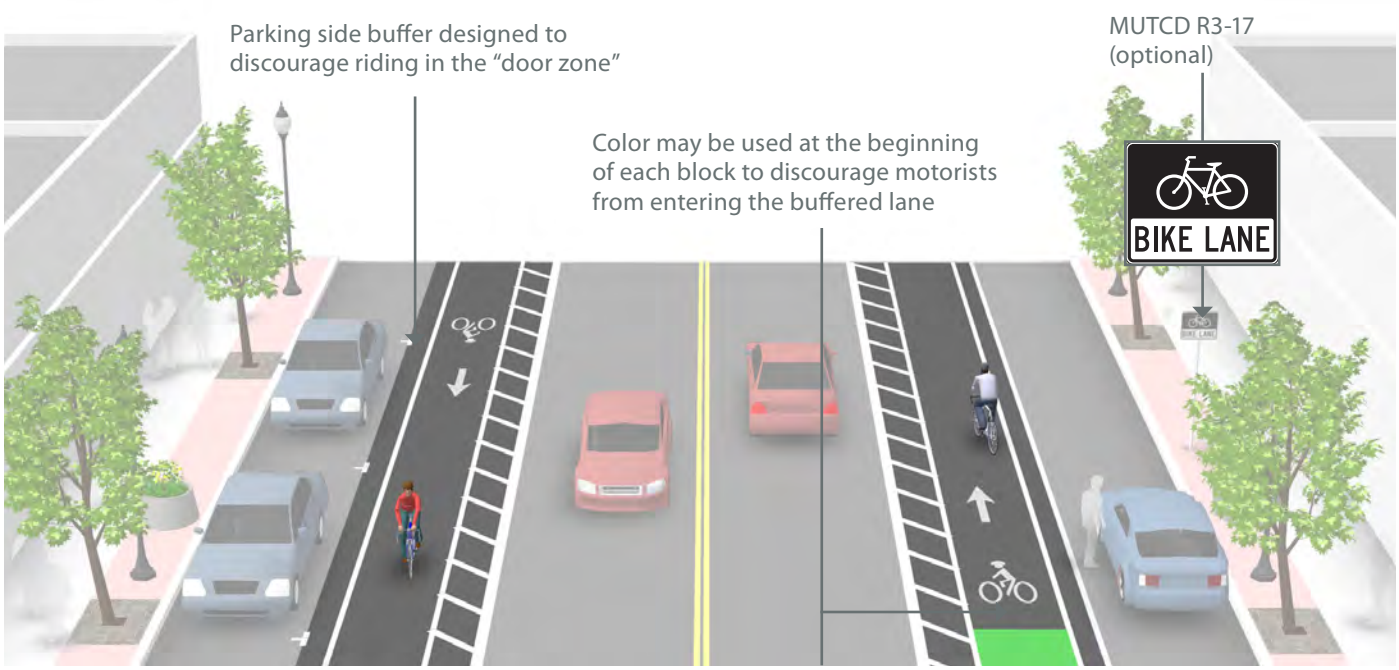
Description

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 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.

Guidance

- Where bicyclist volumes are high or where bicyclist speed differentials are significant, the desired bicycle travel area width is 7 feet.
- 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 or colored pavement for the inside buffer boundary where cars are expected to cross.



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 and Guidelines

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

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.

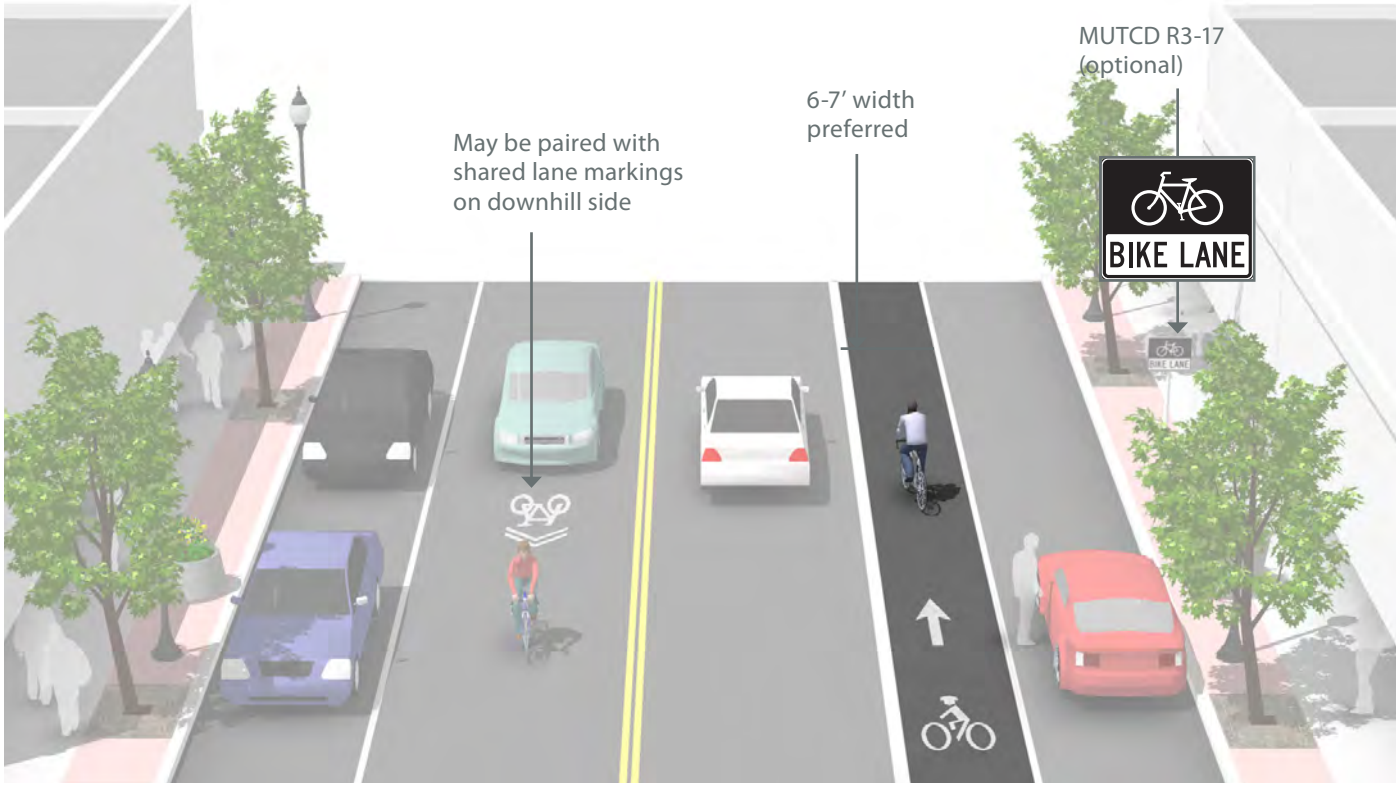
Uphill Bicycle Climbing Lane

Description

Uphill bike lanes (also known as "climbing lanes") enable motorists to safely pass slower-speed bicyclists, thereby improving conditions for both travel modes.

Guidance

- Uphill bike lanes should be 6-7 feet wide (wider lanes are preferred because extra maneuvering room on steep grades can benefit bicyclists).
- Can be combined with Shared Lane Markings for downhill bicyclists who can more closely match prevailing traffic speeds.



This treatment is typically found on retrofit projects as newly constructed roads should provide adequate space for bicycle lanes in both directions of travel. Accommodating an uphill bicycle lane often includes delineating on-street parking (if provided), narrowing travel lanes and/or shifting the centerline if necessary.

Additional References and Guidelines

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

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.

Separated Bikeways at 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.

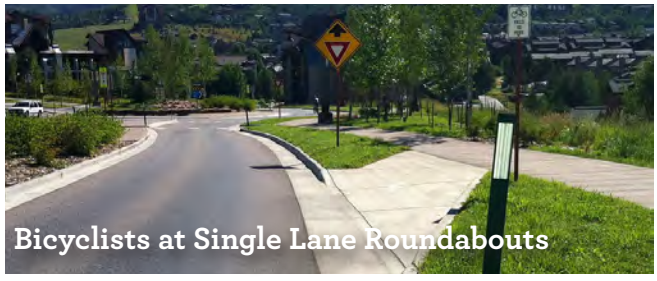
The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing 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


Colored Bike Lanes in Conflict Areas

Combined Bike Lane/Turn Lane


Intersection Crossing Markings


Bicyclists at Single Lane Roundabouts

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.

For other potential approaches to providing accommodations for bicyclists at intersections with turn lanes, please see shared bike lane/turn lane, bicycle signals, and colored bike facilities.

Additional References and Guidelines

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

Materials and Maintenance

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

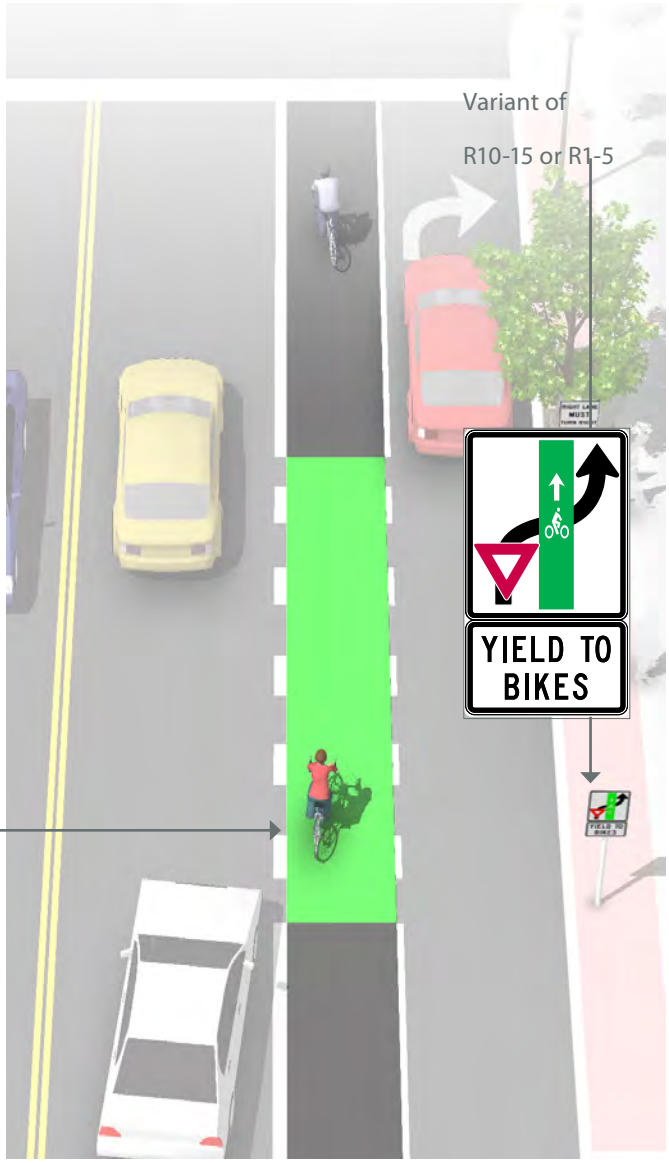
Colored Bike Lanes in Conflict Areas

Description

Colored pavement within a bicycle lane increases the visibility of the facility and reinforces priority of bicyclists in conflict areas.

Guidance

- Green colored pavement was given interim approval by the Federal Highways Administration in March 2011. See interim approval for specific color standards.
- The colored surface should be skid resistant and retro-reflective.
- A "Yield to Bikes" sign should be used at intersections or driveway crossings to reinforce that bicyclists have the right-of-way in colored bike lane areas.



Evaluations performed in Portland, OR, St. Petersburg, FL and Austin, TX found that significantly more motorists yielded to bicyclists and slowed or stopped before entering the conflict area after the application of the colored pavement when compared with an uncolored treatment.

Additional References and Guidelines

FHWA. (2011). Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10. NACTO. (2012). Urban Bikeway Design Guide.

Materials and Maintenance

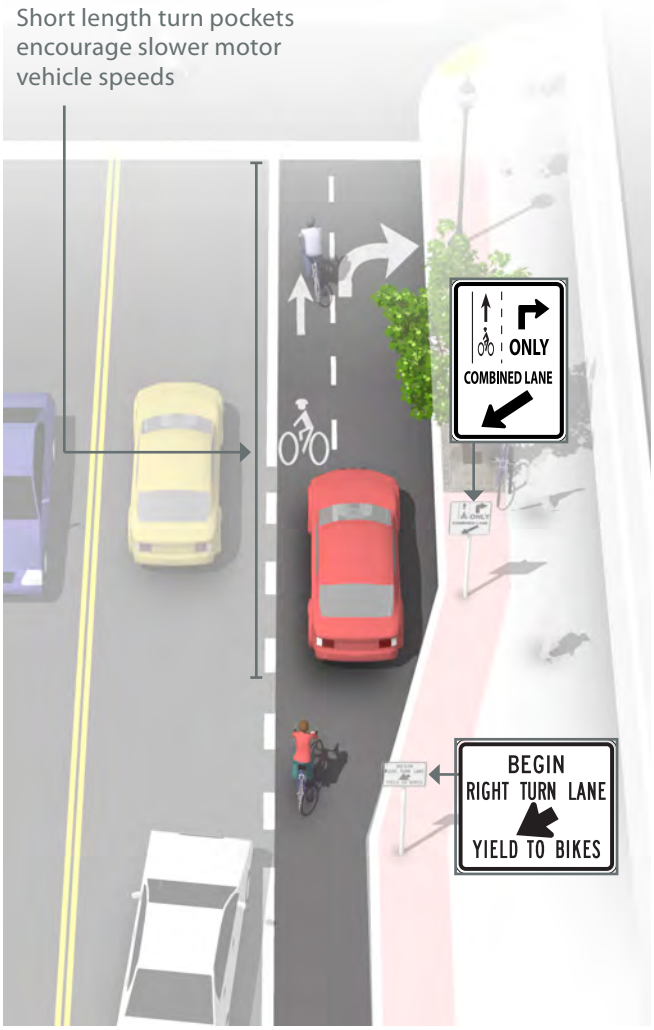
Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

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.

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 and Guidelines

NACTO. (2012). Urban Bikeway Design Guide.
This treatment is currently slated for inclusion in the next edition of the AASHTO Guide for the Development of Bicycle Facilities

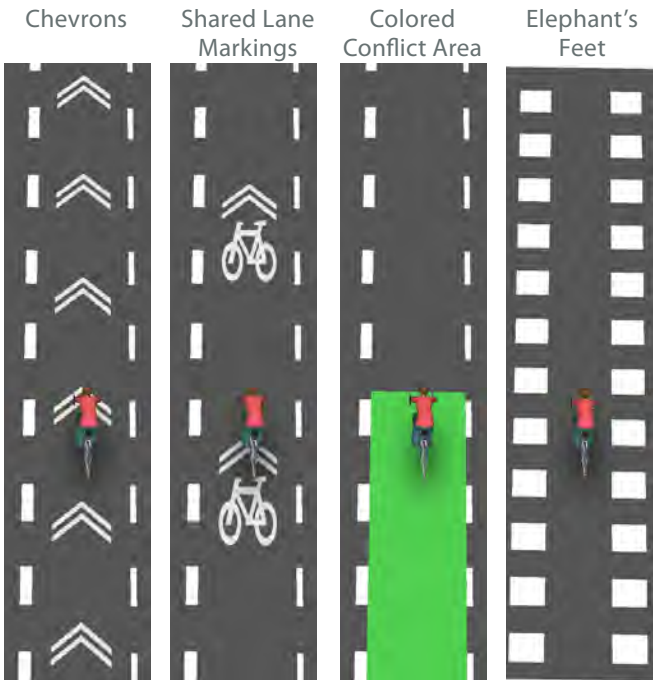
Materials and Maintenance

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

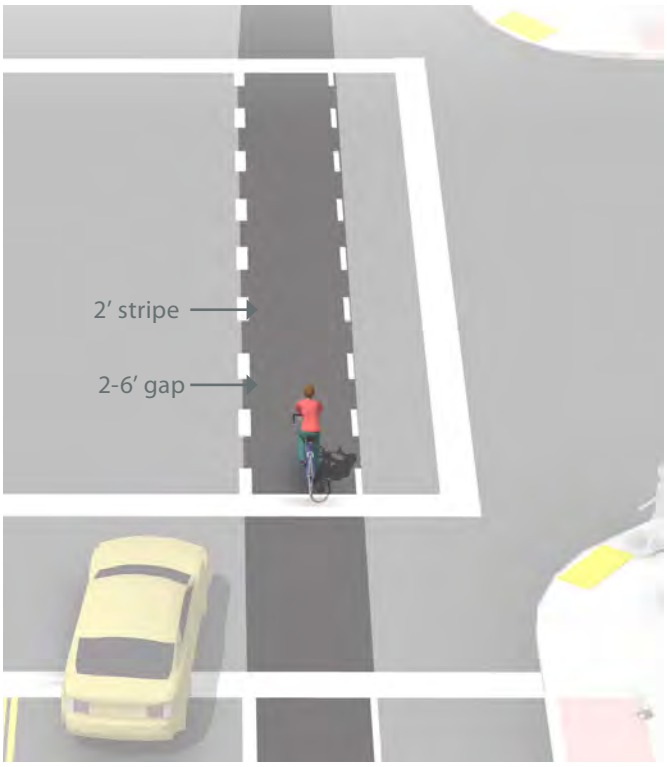
Description

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 in conflict areas 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.



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 and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. (3A.06). NACTO. (2012). Urban Bikeway Design Guide.

Materials and Maintenance

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

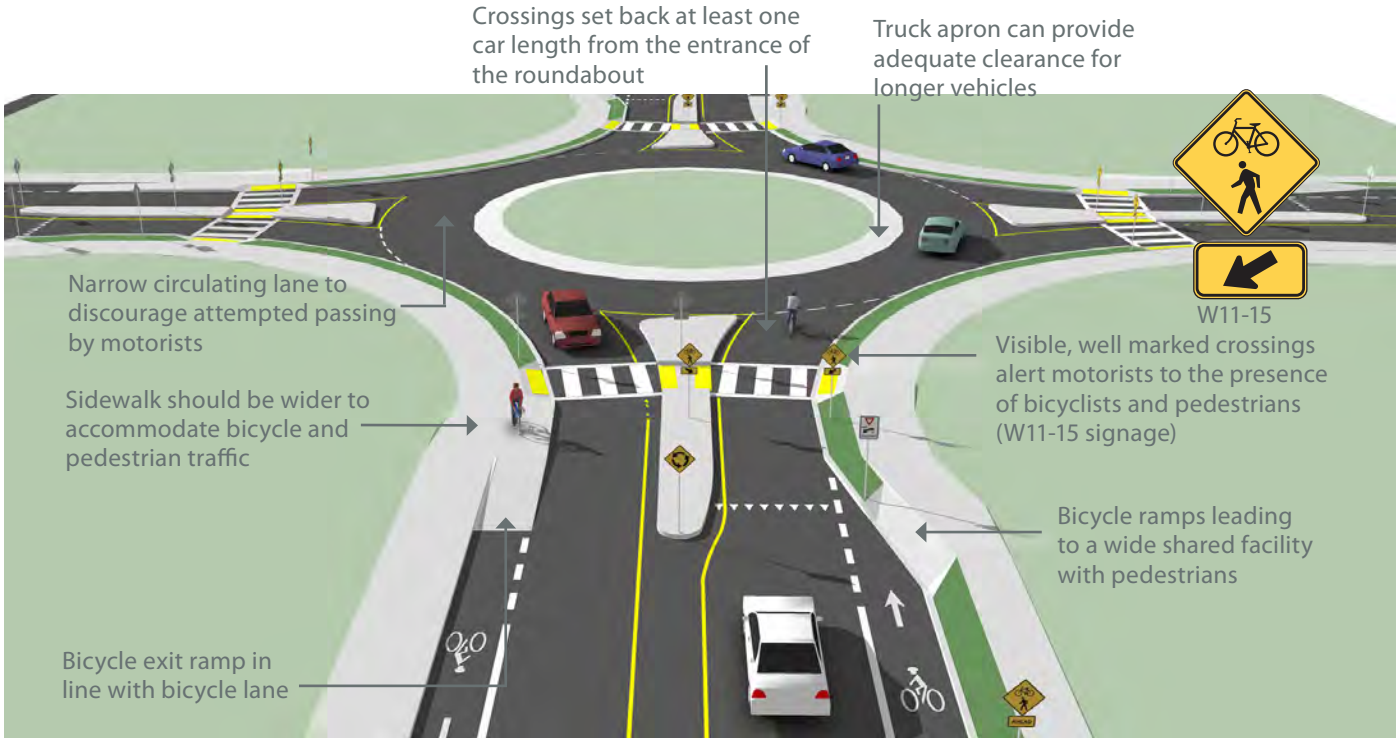
Bicyclists at Single Lane Roundabouts

Description

In single lane roundabouts it is important to indicate to motorists, bicyclists and pedestrians the right-of-way rules and correct way for them to circulate, using appropriately designed signage, pavement markings, and geometric design elements.

Guidelines

- 25 mph maximum circulating design speed.
- Design approaches/exits to the lowest speeds possible.
- Encourage bicyclists navigating the roundabout like motor vehicles to "take the lane."
- Maximize yielding rate of motorists to pedestrians and bicyclists at crosswalks.
- Provide separated facilities for bicyclists who prefer not to navigate the roundabout on the roadway.



Research indicates that while single-lane roundabouts may benefit bicyclists and pedestrians by slowing traffic, multi-lane roundabouts may present greater challenges and significantly increase safety problems for these users.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2000). Roundabouts: An Informational Guide. FHWA. (2010). Roundabouts: An Informational Guide, Second Edition. NCHRP 672

Materials and Maintenance

Signage and striping require routine maintenance.

Signage Programs

A comprehensive system of signage ensures that information is provided regarding the safe and appropriate use of all facilities, both on-road and on multi-use paths. The bicycle network should be signed seamlessly with other alternative transportation routes, such as bicycle routes from neighboring jurisdictions, trails, historic and/or cultural walking tours, and wherever possible, local transit systems.

Signage includes post- or pole-mounted signs and pavement striping. Signage is further divided into information signs, directional/wayfinding signs, regulatory signs and warning signs. Trail signage should conform to the Manual on Uniform Traffic Control Devices and the American Association of State Highway Transportation Official Guide for the Development of Bicycle Facilities. Bicycle signage should also be coordinated with local colleges and universities.

Share the Road signs remind motorists that bicyclists have the right to ride on the roadway.

W11-1

W16-1P

R4-11

The "Bikes Allowed Use of Full Lane" sign is currently used on an experimental basis in several cities.

Directional Signs

Implementing a well-planned and attractive system of signing can greatly enhance bikeway facilities by signaling their presence and location to both motorists and existing or potential bicycle users. Effective signage can encourage more bicycling by leading people to bikeways, and by creating a safe and efficient transportation option for local residents and visitors.

The signage examples on page A-40 show a number of different signs and markings, both on poles and on the roadway. Wayfinding signs such as these improve the clarity of travel direction while illustrating that destinations are only a short ride away. The signs shown are provided only as a point of reference for the purposes of these guidelines.

Regulatory/Warning Signs

Regulatory and warning bicycle signage like the examples shown on page A-40 should conform to the Manual on Uniform Traffic Control Devices (MUTCD). The signage on page A-40 are examples of regulatory signs for bicycle (their labels are sign reference numbers for the MUTCD).

Special Purpose Signage

The "Share the Road" sign (to the left), is designed to advise motorists that bicyclists are allowed to share and have the right to cycle on narrow roadways with motor vehicles. For more on the "Share the Road Initiative" go to: http://ncdot.org/transit/bicycle/safety/programs_initiatives/share.html

Innovative signage is often developed to increase bicycle awareness and improve visibility (such as 'Bikes Allowed Use of Full Lane', bottom left). Special purpose signs to be installed on public roadways in North Carolina must be approved by NCDOT's Traffic Control Devices Committee and/or the City of Mebane. New designs can be utilized on an experimental basis with NCDOT approval.

R1-1

R1-2

R3-17

R3-17a

R3-17b

R4-1

R4-2

R4-3

R4-4


R4-7

R5-1b

R9-3c

R5-3


R5-6

R7-9

R7-9a


R9-3a

R9-5

R9-6

R9-7

R10-3

R10-22

R15-1

Bikeway Signing

The ability to navigate through a town is informed by landmarks, natural features and other visual cues. Signs throughout the 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:

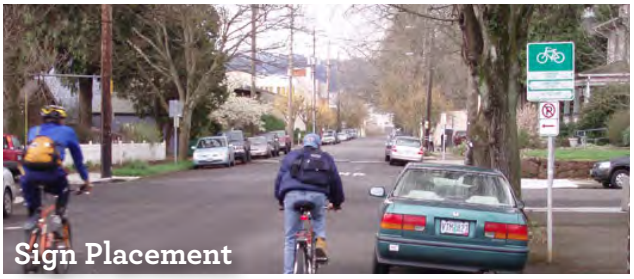
- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misconceptions about time and distance
- Helping overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., "interested but concerned" bicyclists)

A community-wide bicycle 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
- Approximate distance and travel time to each destination

Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle 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 rather than per vehicle signage standards.

Sign Types


Sign Placement

Sign Types

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:

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.

Decisions Signs

Mark the junction of two 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 pedestrian-oriented travel times, local town logos, and sponsorship branding.

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.

Sign Placement

Guidance

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.

Decisions Signs

Near-side of intersections in advance of a junction with another bicycle route.

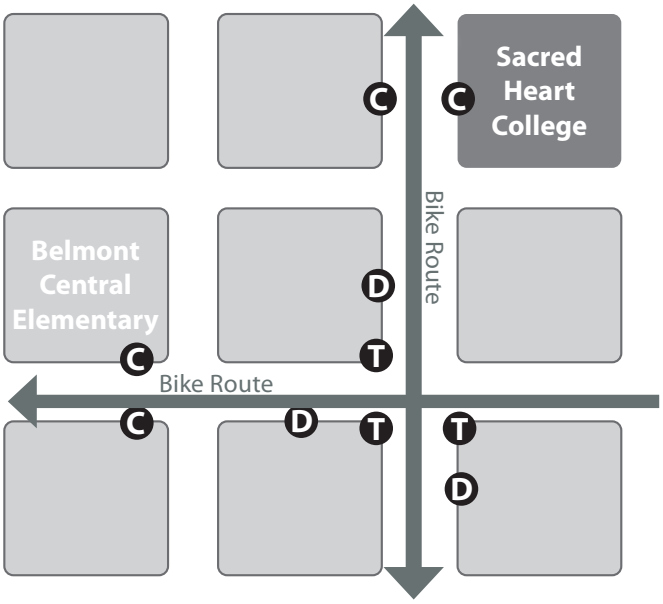
Along a route to indicate a nearby destination.

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 act as confirmation that a bicyclist is on a preferred route.

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.



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 and Guidelines

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

Materials and Maintenance

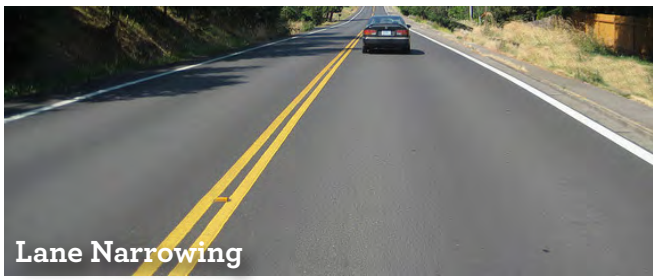
Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

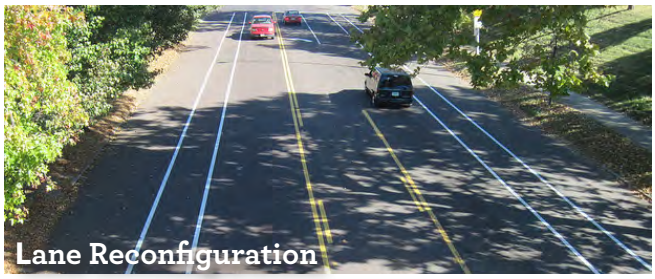
Retrofitting Existing Streets to Add Bikeways

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


Lane Narrowing


Lane Reconfiguration


Parking Reduction

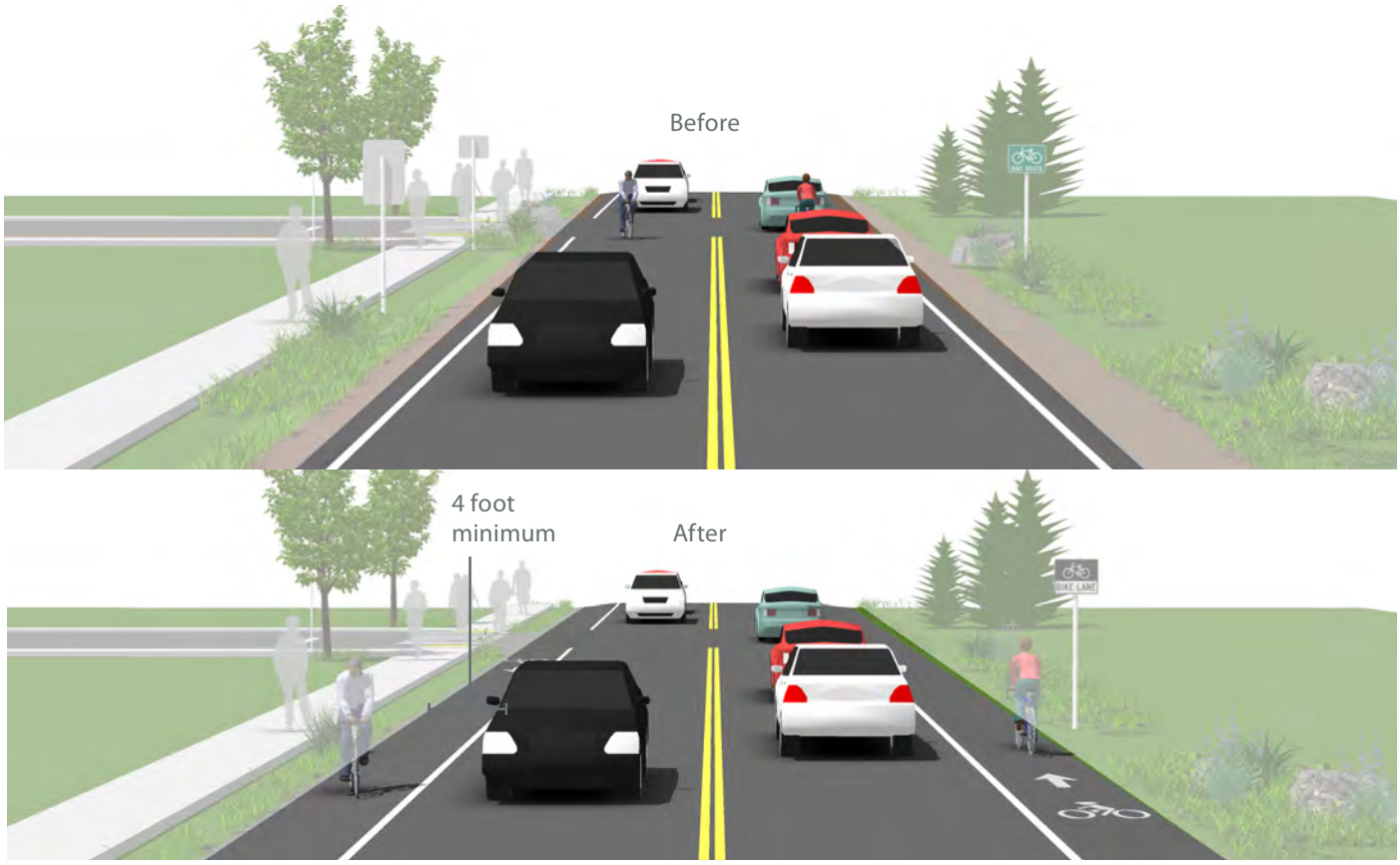
Roadway Widening

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-striping 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.



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 and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities.

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.

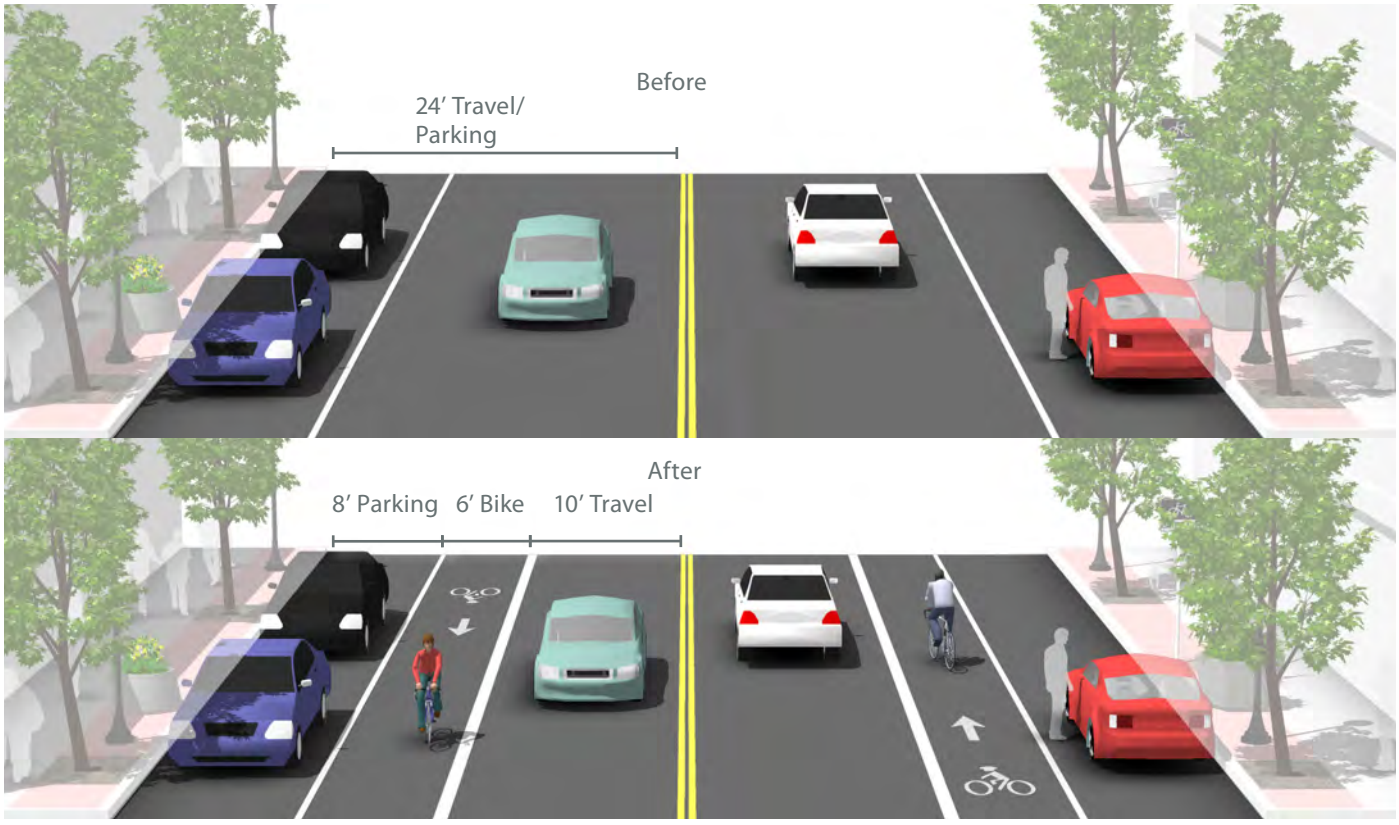
Guidance

Vehicle lane width:

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

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



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 and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

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.

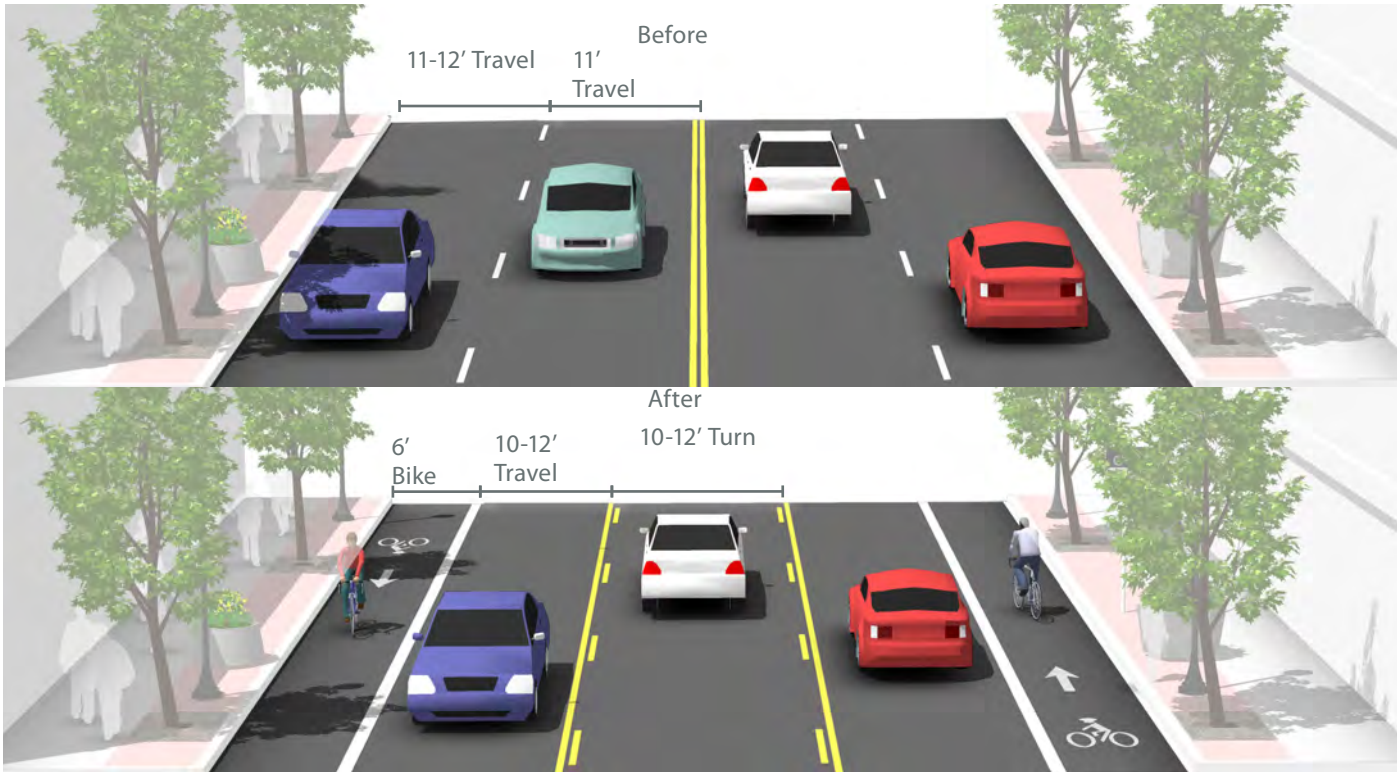
Guidance

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.



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 and Guidelines

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

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.

Parking Reduction

Description

Bike lanes can replace one or more on-street parking lanes on streets where excess parking exists and/or the importance of bike lanes outweighs parking needs. For example, parking may be needed on only one side of a street. Eliminating or reducing on-street parking also improves sight distance for bicyclists in bike lanes and for motorists on approaching side streets and driveways.

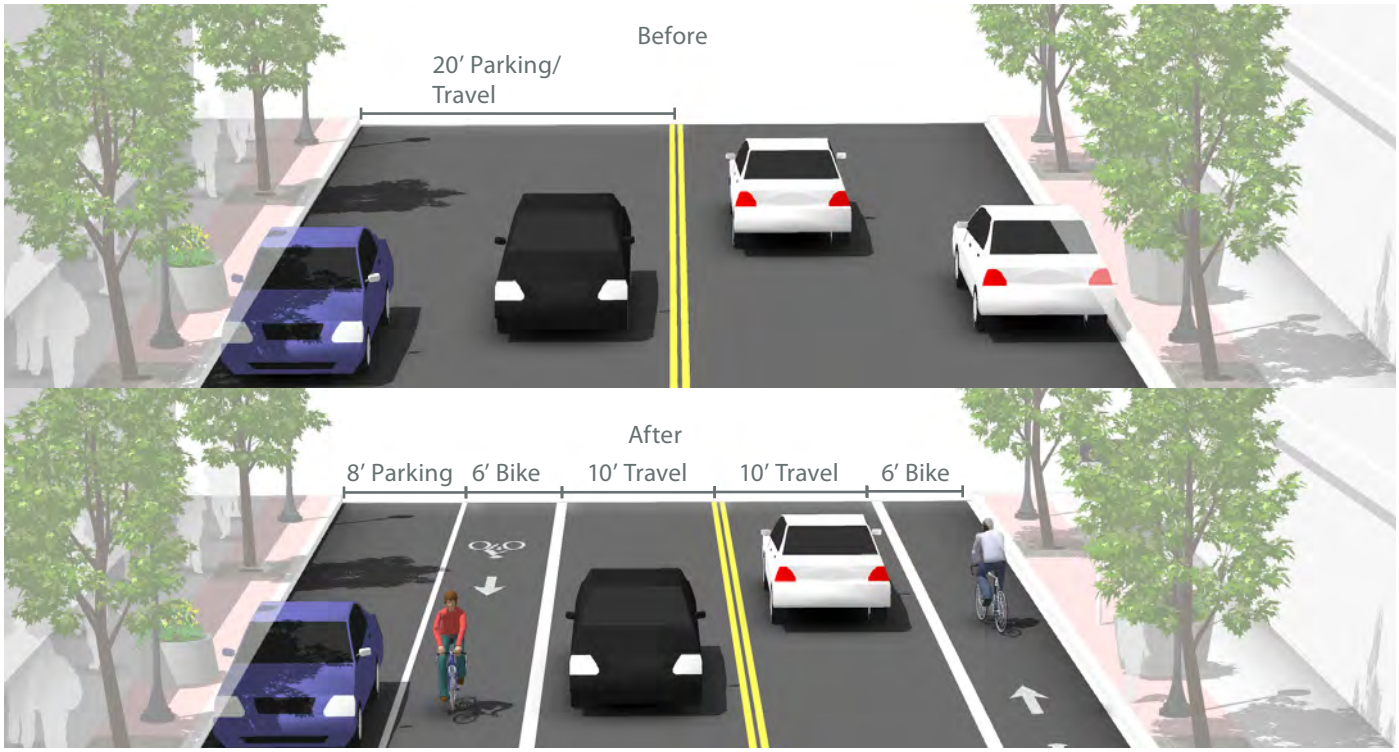
Guidance

Vehicle lane width:

- Parking lane width depends on project. No travel lane narrowing may be required depending on the width of the parking lanes.

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



Removing or reducing on-street parking to install bike lanes requires comprehensive outreach to the affected businesses and residents. Prior to reallocating on-street parking for other uses, a parking study should be performed to gauge demand and to evaluate impacts to people with disabilities.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities.
AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

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.

Multi-use Paths and Off-Street Facilities

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

Key features of multi-use paths include:

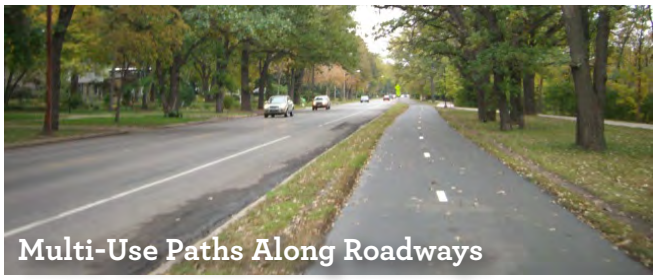
- Frequent access points from the local road network.
- Directional signs to direct users to and from the path.
- A limited number of at-grade crossings with streets or driveways.
- Terminating the path where it is easily accessible to and from the street system.
- Separate treads for pedestrians and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


General Design Practices


Multi-use Paths in River and Utility Corridors


Multi-use Paths in Abandoned Rail Corridors


Local Neighborhood Accessways


Multi-Use Paths Along Roadways

General Design Practices

Description

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

Guidance

Width

- 8 feet is the minimum allowed for a two-way bicycle path 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 path 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.

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.

Terminate the path 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.

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of shared use paths along roadways. Also known as "sidepaths", 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 when either entering or exiting the path.

Additional References and Guidelines

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

Materials and Maintenance

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

Multi-use Paths in River and Utility Corridors

Description

Utility and waterway corridors often offer excellent greenway development and bikeway gap closure opportunities. Utility corridors typically include powerline and sewer corridors, while waterway corridors include canals, drainage ditches, rivers, and beaches. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills.

Guidance

Multi-use paths in utility corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.

Access Points

Any access point to the path should be well-defined with appropriate signage designating the pathway as a bicycle facility and prohibiting motor vehicles.

Path Closure

Public access to the path may be prohibited during the following events:

- Canal/flood control channel or other utility maintenance activities
- Inclement weather or the prediction of storm conditions

Similar to railroads, public access to flood control channels or canals is undesirable by all parties. Hazardous materials, deep water or swift current, steep, slippery slopes, and debris all constitute risks for public access. Appropriate fencing may be required to keep path users within the designated travel way. Creative design of fencing is encouraged to make the path facility feel welcoming to the user.

Additional References and Guidelines

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

Materials and Maintenance

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

Multi-use Paths in Abandoned Rail Corridors

Description

Commonly referred to as Rails-to-Trails or Rail-Trails, these projects convert vacated rail corridors into off-street paths. Rail corridors offer several advantages, including relatively direct routes between major destinations and generally flat terrain.

In some cases, rail owners may rail-bank their corridors as an alternative to a complete abandonment of the line, thus preserving the rail corridor for possible future use.

The railroad may form an agreement with any person, public or private, who would like to use the banked rail line as a trail or linear park until it is again needed for rail use. Municipalities should acquire abandoned rail rights-of-way whenever possible to preserve the opportunity for trail development.

Guidance

Multi-use paths in abandoned rail corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.

In full conversions of abandoned rail corridors, the sub-base, superstructure, drainage, bridges, and crossings are already established. Design becomes a matter of working with the existing infrastructure to meet the needs of a rail-trail.

It is often impractical and costly to add material to existing railroad bed fill slopes. This results in trails that meet minimum path widths, but often lack preferred shoulder and lateral clearance widths.

Rail-to-trails can involve many challenges including the acquisition of the right of way, cleanup and removal of toxic substances, and rehabilitation of tunnels, trestles and culverts. A structural engineer should evaluate existing railroad bridges for structural integrity to ensure they are capable of carrying the appropriate design loads.

Additional References and Guidelines

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

Materials and Maintenance

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

Local Neighborhood Accessways

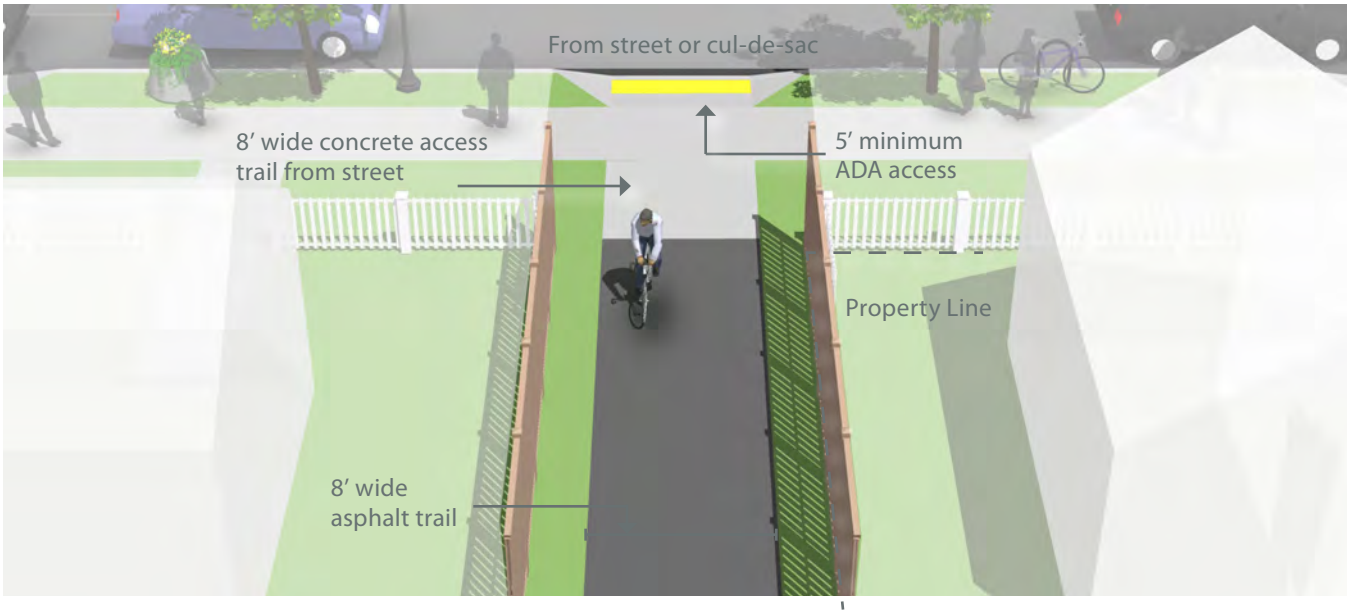
Description

Neighborhood accessways provide residential areas with direct bicycle and pedestrian access to parks, trails, greenspaces, and other recreational areas. They most often serve as small trail connections to and from the larger trail network, typically having their own rights-of-way and easements.

Additionally, these smaller trails can be used to provide bicycle and pedestrian connections between dead-end streets, cul-de-sacs, and access to nearby destinations not provided by the street network.

Guidance

- Neighborhood accessways should remain open to the public.
- Trail pavement shall be at least 8' wide to accommodate emergency and maintenance vehicles, meet ADA requirements and be considered suitable for multi-use.
- Trail widths should be designed to be less than 8' wide only when necessary to protect large mature native trees over 18" in caliper, wetlands or other ecologically sensitive areas.
- Access trails should slightly meander whenever possible.



Neighborhood accessways should be designed into new subdivisions at every opportunity and should be required by town/county subdivision regulations.

For existing subdivisions, Neighborhood and homeowner association groups are encouraged to identify locations where such connects would be desirable. Nearby residents and adjacent property owners should be invited to provide landscape design input.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. FHWA. (2006). Federal Highway Administration University Course on Bicycle and Pedestrian Transportation. Lesson 19: Greenways and Shared Use Paths.

Materials and Maintenance

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

Natural Surface Greenways

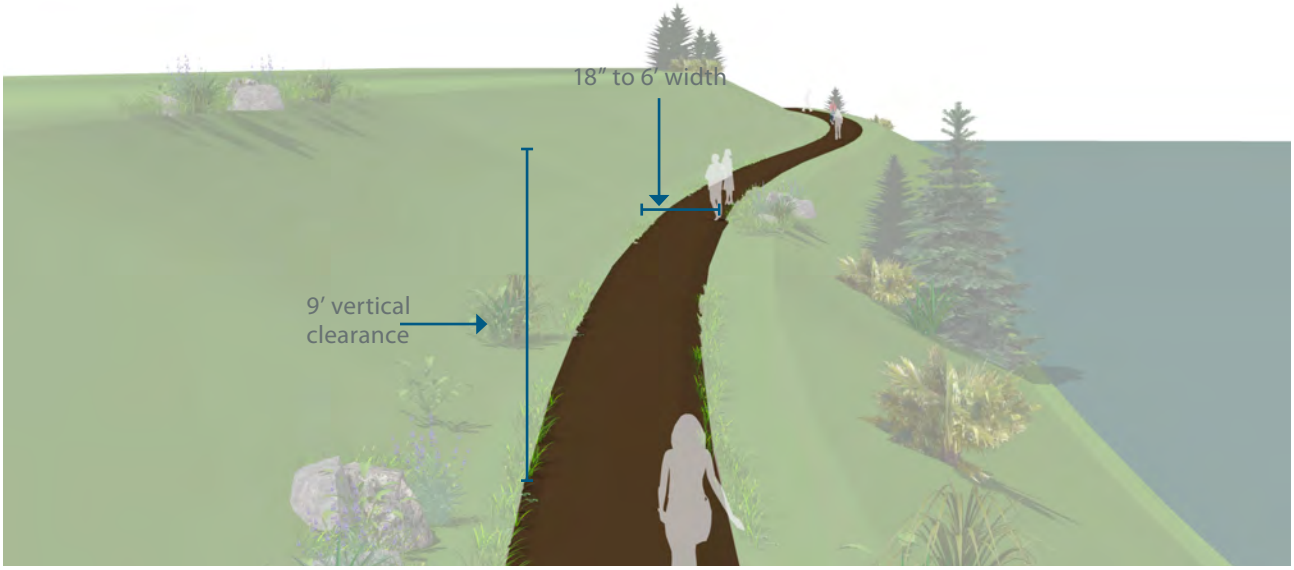
Description

Sometimes referred to as footpaths or hiking trails, the natural surface 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 presented in this section does not include considerations for bicycle users. Natural surface trails designed for bicycle users are typically known as single track trails.

Guidance

- Trails can vary in width from 18 inches to 6 feet or greater; vertical clearance should be maintained at nine-feet above grade.
- 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).



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.

Additional References and Guidelines

Flink, C. (1993). Greenways: A Guide To Planning Design And Development.

Materials and Maintenance

Consider implications for accessibility when weighing options for surface treatments.

Multi-Use Paths Along Roadways

Description

A multi-use path 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.

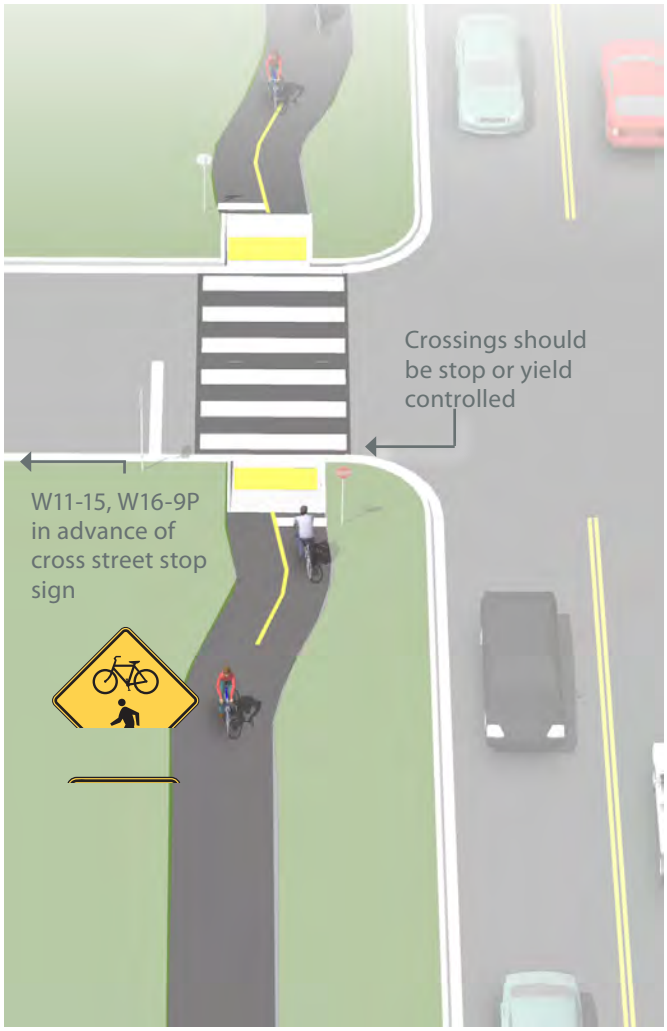
Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of multi-use paths directly adjacent to roadways.

Guidance

- 8 feet is the minimum allowed for a two-way bicycle path 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 such as joggers, bicyclists, rollerbladers and pedestrians. A separate track (5' minimum) can be provided for pedestrian use.
- Bicycle lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

Pay special attention to the entrance/exit of the path as bicyclists may continue to travel on the wrong side of the street.



When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility will generally be superior to the "sidepath" for experienced bicyclists and those who are cycling for transportation purposes.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. NACTO. (2012). Urban Bikeway Design Guide. See entry on Raised Cycle Tracks.
NCDOT. (1994). Bicycle Facilities Planning and Design Guidelines.

Materials and Maintenance

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

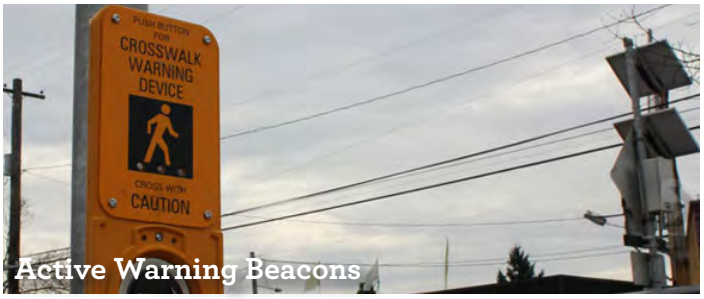
Multi-use Path Crossings

At-grade roadway crossings can create potential conflicts between path users and motorists, however, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for path users. This is evidenced by the thousands of successful facilities around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Path facilities that cater to bicyclists can require additional considerations due to the higher travel speed of bicyclists versus pedestrians.

Consideration must be given to adequate warning distance based on vehicle speeds and line of sight, with the visibility of any signs absolutely critical. Directing the active attention of motorists to roadway signs may require additional alerting devices such as a flashing beacon, roadway striping or changes in pavement texture. Signing for path users may include a standard "STOP" or "YIELD" sign and pavement markings, possibly combined with other features such as bollards or a bend in the pathway to slow bicyclists. Care must be taken not to place too many signs at crossings lest they begin to lose their visual impact.

A number of striping patterns have emerged over the years to delineate path crossings. A median stripe on the path approach will help to organize and warn path users. Crosswalk striping is typically a matter of local and State preference, and may be accompanied by pavement treatments to help warn and slow motorists. In areas where motorists do not typically yield to crosswalk users, additional measures may be required to increase compliance.


Marked/Unsignalized Crossings



Active Warning Beacons


Route Users to Existing Signals

Unsignalized Marked Crossings

Description

An unsignalized marked crossing typically consists of a marked crossing area, signage and other markings to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.

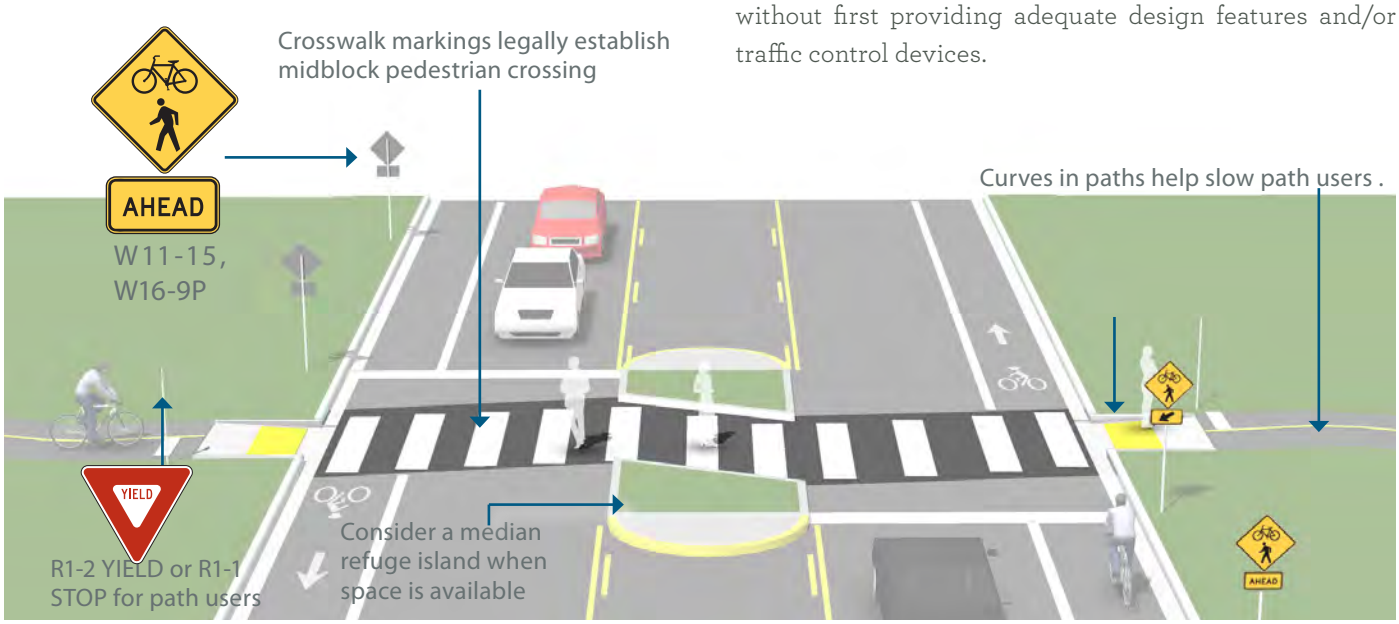
When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time.

Guidance

Refer to the FHWA report, "Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations" for specific volume and speed ranges where a marked crosswalk alone may be sufficient.

Where the speed limit exceeds 40 miles per hour, marked crosswalks alone should not be used at unsignalized locations.

Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices.



Marked crosswalks alone will not make crossings safer, nor will marked crosswalks necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g. raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions, etc.) as needed to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Locate markings out of wheel tread when possible to minimize wear and maintenance costs.

Active Warning Beacons

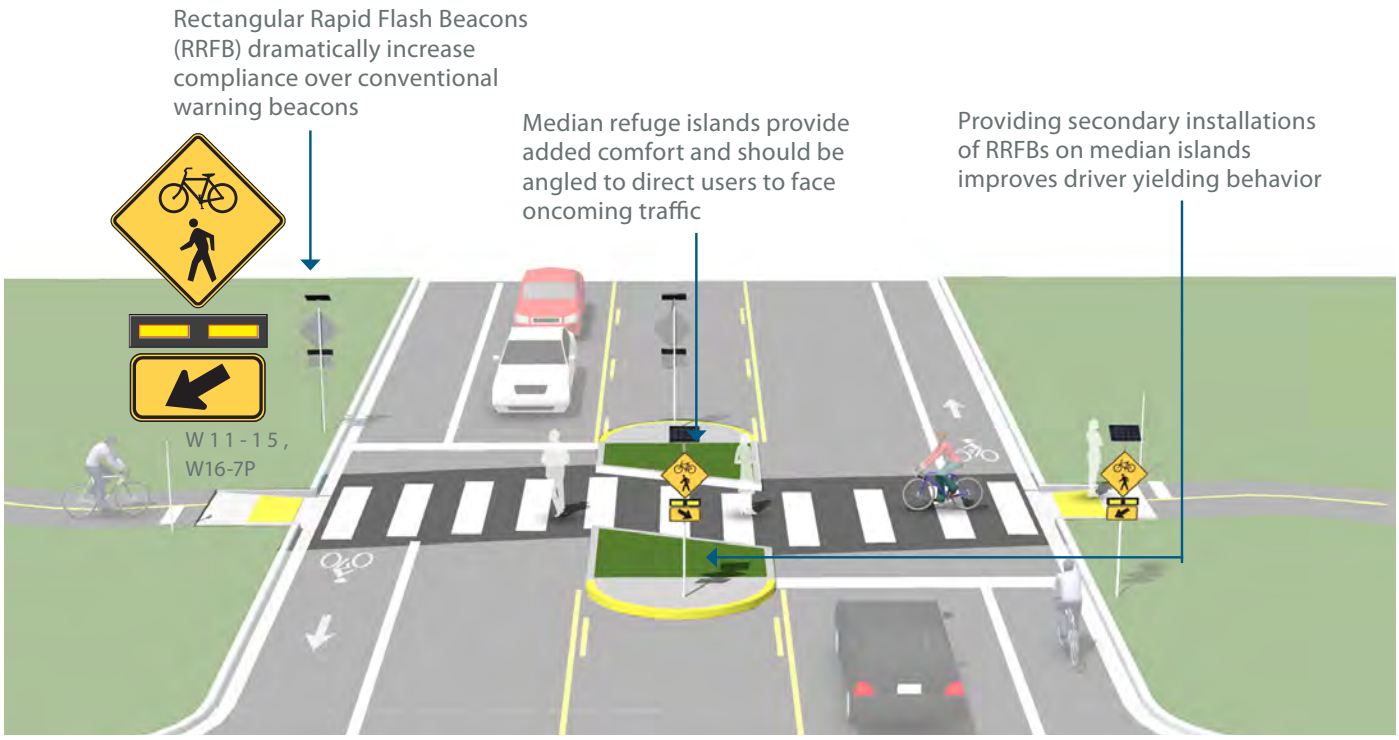
Description

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 pathway user or sensor actuated warning beacons, Rectangular Rapid Flash Beacons (RRFB) shown below, or in-roadway warning lights.

Guidance

- Guidance for Unsignalized Marked 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 show the most increased compliance of all the warning beacon enhancement options.

A study 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 References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide. FHWA. (2009). Manual on Uniform Traffic Control Devices. FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11) NCDOT. (2012). Complete Streets Planning and Design Guidelines.

Materials and Maintenance

Depending on power supply, maintenance of active warning beacons can be minimal. If solar power is used, signals should run for years without issue.

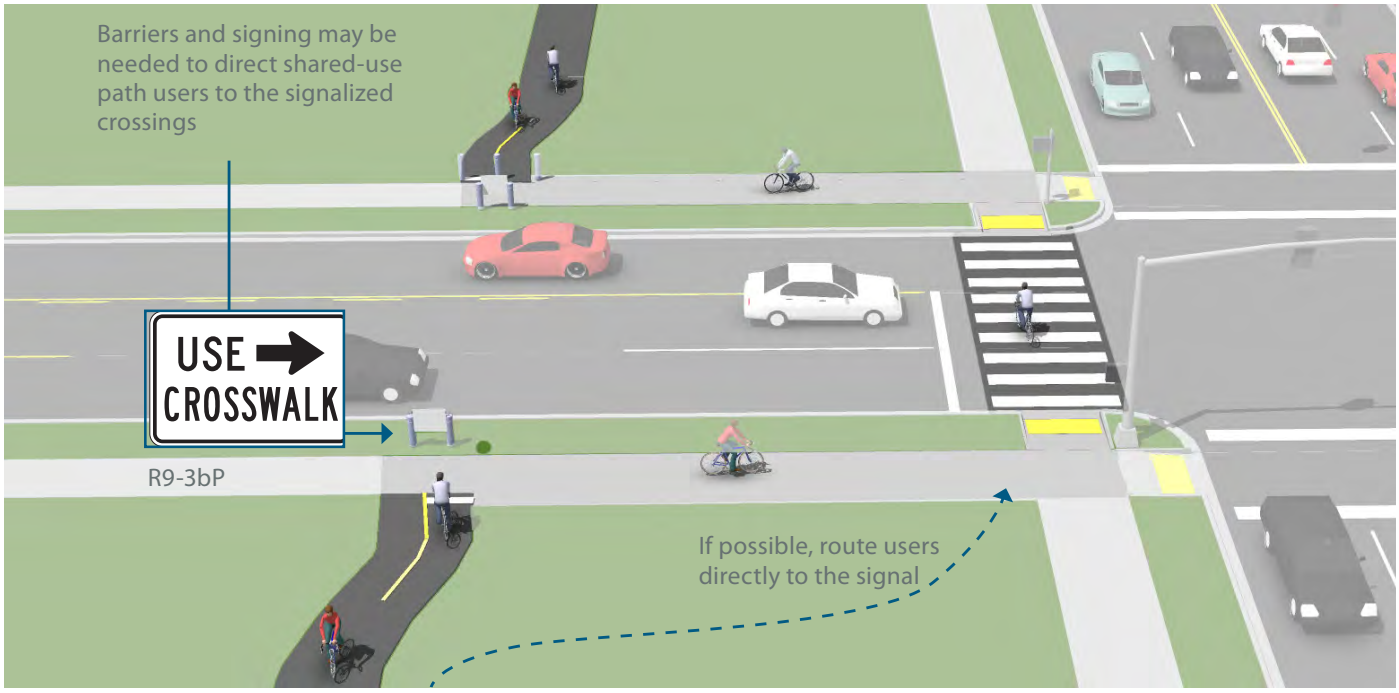
Route Users to Signalized Crossings

Description

Path 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 path users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.

Guidance

Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.



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 and Guidelines

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

Materials and Maintenance

Municipalities should maintain comprehensive inventories of the location and age of bicycle wayfinding signs to allow incorporation of bicycle wayfinding signs into any asset management activities.

Bikeway Support and Maintenance

Bicycle Parking

Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

Bicycle Racks

Maintenance

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Pavement overlays are a good opportunity to improve bicycle facilities.


Sweeping

Recommended Bikeway Maintenance Activities

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/ blowing	As needed, with higher frequency in the early Spring and Fall
Pavement sealing	5 - 15 years
Pothole repair	1 week – 1 month after report
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement	As needed
Signage replacement	As needed
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

Bicycle Racks

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.

Standards Compliance

Some of these treatments covered by these guidelines are not directly referenced in the current versions of the AASHTO Guide or the MUTCD, although many of the elements of these treatments are found within these documents. An "X" marking in the following table identifies the inclusion of a particular treatment within the national and state design guides. A "-" marking indicates a treatment may not be specifically mentioned, but is compliant assuming MUTCD compliant signs and markings are used.

In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.

	Manual of Uniform Traffic Control Devices (2009)	Guide for the Development of Bicycle Facilities (2012)	Urban Bikeway Design Guide (2012)	NCDOT Bicycle Facilities & Planning Design Guidelines
Signed Shared Roadway	X	X		X
Marked Shared Roadway	X	X	X	
Bicycle Boulevard		X	X	
Shoulder Bikeway	X	X		X
Bicycle Lane	X	X	X	X
Buffered Bike Lane	-	X	X	
Uphill Bicycle Climbing Lane	-	X	X	
Cycle Tracks	-	Called "one-way sidepath"	X	
Bike Lanes at Right Turn Only Lanes	X	X	X	X
Colored Bike Lanes in Conflict Areas	Interim Approval Granted	X	X	
Combined Bike Lane/Turn Lane	-		X	
Intersection Crossing Markings	X	X	X	
Bicyclists at Single Lane Roundabouts	-	X		
Wayfinding Sign Types	X	X	X	X
Wayfinding Sign Placement	X	X	X	X
Multi-use Paths/Greenways	X	X		X
Shared Use Paths along Roadways	X	Discouraged		Discouraged

APPENDIX B

FUNDING RESOURCES

Chapter Contents

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Overview

When considering possible funding sources for bicycle and pedestrian projects in the City of Mebane, 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. A summary table of funding sources is included on page B-2. Note that this appendix 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 21st 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 as Public Law 112-141. The Act replaces the Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU), which was valid from August 2005 – June 2012.

MAP-21 authorizes funding for federal surface transportation programs including highways and transit for the 27-month period between July 2012 and September 2014. 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.

FUNDING SOURCE	PLANNING	PROGRAMMING	DESIGN/ CONSTRUCTION
FEDERAL FUNDING			
Transportation Alternatives	x	x	x
Surface Transportation Program			x
Highway Safety Improvement Program		x	x
Congestion Mitigation/Air Quality		x	x
FTA Metropolitan Planning Program	x		
FTA Enhanced Mobility of Seniors and Individuals with Disabilities		x	x
Partnership for Sustainable Communities	x	x	x
Land and Water Conservation Fund	x		x
Rivers, Trails, and Conservation Assistance Program	x		
National Scenic Byways Discretionary Grant Program			x
Federal Lands Transportation Program	x		x
Energy Efficiency and Conservation Block Grants	x		x
STATE FUNDING			
NCDOT State Transportation Improvement Program			x
Incidental Projects			x
Spot Safety Program			x
High Hazard Elimination Program			x
Governor's Highway Safety Program			x
Bicycle and Pedestrian Planning Grant Initiative	x	x	
Eat Smart, Move More North Carolina Community Grants		x	x
The North Carolina Division of Parks and Recreation			x
The North Carolina Parks and Recreation Trust Fund (PARTF)			x
Adopt-a-Trail Program			x
Powell Bill Funds			x
Community Development Block Grant	x	x	x
Clean Water Management Trust Fund	x	x	x
Safe Routes to School Program	x	x	x
Urban and Community Forestry Grant	x		x
LOCAL FUNDING			
Capital Reserve Fund			x
Capital Project Ordinance			x
Local Improvement District			x
Municipal Service District			x
Tax Increment Financing			x
Bonds and Loans			x

FUNDING SOURCE	PLANNING	PROGRAMMING	DESIGN/ CONSTRUCTION
LOCAL FUNDING (continued)			
Revenue Bonds			x
General Obligation Bonds (cities, counties, and service districts)			x
Special Assessment Bonds			x
State Revolving Fund Loans			x
Sales Tax	x		x
Property Tax	x		x
Excise Tax			x
Occupancy Tax			x
Stormwater Utility Fees			x
Streetscape Utility Fees			x
Impact Fees			x
Exactions			x
Installment Purchase Financing			x
In-Lieu-of Fees			x
PRIVATE/NON-PROFIT FUNDING			
The Robert Wood Johnson Foundation	x	x	
North Carolina Community Foundation	x	x	
Walmart State Giving Program	x	x	x
The Rite Aid Foundation Grant		x	x
Z. Smith Reynolds Foundation			x
Bank of America Charitable Foundation	x	x	
Duke Energy Foundation		x	
American Greenways Eastman Kodak Awards	x	x	x
National Trails Fund		x	x
The Conservation Alliance	x	x	
National Fish and Wildlife Foundation	x	x	x
The Trust for Public Land	x	x	
Blue Cross Blue Shield of North Carolina Foundation		x	x
Alliance for Biking and Walking Advocacy Advance Grants			x
Local Trail Sponsors			x
Corporate Donations	x	x	x
Private Individual Donations	x	x	x
Fundraising/Campaign Drives	x	x	x
Volunteer Work	x	x	x

U.S. Department of Transportation

Federal Highway Administration

There are a number of programs identified within MAP-21 that are applicable to pedestrian and bicycle projects. These programs are discussed on the following pages.

For more information, visit: http://www.fhwa.dot.gov/map21/summaryinfo.cfm

Transportation Alternatives

Transportation Alternatives (TA) is a new 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, bikeways, 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 NCDOT. 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.

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

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.

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.

For more information: http://www.fhwa.dot.gov/map21/hsip.cfm

Congestion Mitigation/Air Quality Program

The Congestion Mitigation/Air Quality Improvement Program (CMAQ) provides funding for projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter which reduce transportation related emissions. States with no non-attainment areas may use their CMAQ funds for any CMAQ or STP eligible project. These federal dollars can be used to build bicycle and pedestrian facilities that reduce travel by automobile. Purely recreational facilities generally are not eligible. Communities located in attainment areas who do not receive CMAQ funding apportionments may apply for CMAQ funding to implement projects that will reduce travel by automobile.

For more information: http://www.fhwa.dot.gov/map21/cmaq.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.

For more information: http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Enhanced_Mobility_of_Seniors_and_Individuals_with_Disabilities.pdf

Partnership for Sustainable Communities

Founded in 2009, the Partnership for Sustainable Communities 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 transportation 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.

For more information:
http://www.sustainablecommunities.gov/
http://www.epa.gov/smartgrowth/partnership/

Resource for Rural Communities:
http://www.sustainablecommunities.gov/pdf/Supporting_Sustainable_Rural_Communities_FINAL.PDF

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.

For more information: http://www.fhwa.dot.gov/map21/fltp.cfm

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/

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.

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

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

State Funding Sources

The funding sources covered in this section were updated in the Fall of 2013 and reviewed for accuracy by NCDOT staff. However, at the time of development of this plan, the Strategic Transportation Investment initiative was being reviewed by the Joint Legislative Transportation Oversight Committee. Therefore, the status of future funding sources is subject to change. The availability of these funding resources should be confirmed during the implementation of a project.

North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program

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 funded for construction before then will proceed as scheduled under the current Equity Formula; projects slated for 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: Statewide Mobility, Regional Impact, and Division Needs. All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are ranked using the following five criteria:

- Safety
- Access
- Demand or density
- Constructability
- Benefit/cost ratio

These rankings largely determine which projects will be included in the department's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation improvements prioritized by stakeholders for inclusion in the Work Program over the next ten years. The STIP is updated every two years. The STIP contains funding information for various transportation divisions of NCDOT including highways, aviation, public transportation, rail, bicycle and pedestrian, and the Governor's Highway Safety Program.

Access to federal funds require that projects be incorporated into the STIP. The STIP is the primary method for allocating state and federal transportation funds. Starting in 2015, state funds will not be available to match federally-funded projects. As a result, local governments should plan to use local or Powell Bill funds to secure federal dollars to fund bicycle and pedestrian projects.

For more information on STI:
www.ncdot.gov/strategictransportationinvestments/
https://connect.ncdot.gov/projects/planning

Incidental Projects

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 system. Bicycle and pedestrian accommodations such as bike lanes, sidewalks, intersection improvements, widened paved shoulders, and bicycle- and pedestrian-safe bridge design are frequently included as incidental features of highway projects. Most bicycle and pedestrian safety accommodations built by NCDOT are funded with a combination of federal and state roadway construction funds or with a local fund match. The local government may be responsible for a portion of the costs to construct the bike or pedestrian project, even for Complete Streets projects.

For more information: http://www.ncdot.gov/bikeped/funding/process/

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

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/

Powell Bill Funds

Powell Bill Funds are state funding resources that can be used for most bicycle and pedestrian improvements. Each year, 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 bikeways 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.

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

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/CommunityGrants.html

The North Carolina Division of Parks and Recreation

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.

For more information: http://www.ncparks.gov/About/grants/main.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.

For more information: http://www.ncparks.gov/About/grants/partf_main.php

NC Department of Environment and Natural Resources – Recreational Trails and Adopt-a-Trail Grants

The State Trails Program is a section of the N.C. Division of Parks and Recreation. The program originated in 1973 with the North Carolina Trails System Act and is dedicated to helping 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 Recreation Trails Program awards grants up to $75,000 per project. The Adopt-A-Trail Program awards grants up to $5,000 per project.

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.

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.

For more information: http://www.cwmtf.net/#appmain.htm

cleanwater
MANAGEMENT TRUST FUND

Safe Routes to School Program (Managed by NCDOT, DBPT)

Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bike to school. 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, 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.

For more information: http://www.fhwa.dot.gov/environment/safe_routes_to_school/overview/

Or contact DBPT/NCDOT at (919) 807-0774.

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.

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 Programs (CIP). 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

For more specific information about what types of projects are funded and how to apply, visit www.rwjf.org/applications/

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 grants start at $25,000, and there is no maximum award amount. The program accepts grant applications on an annual, state by state basis January 2nd through March 2nd.

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. A wide array of activities are eligible for funding, including infrastructural and programmatic projects.

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. They have two grant cycles per year and generally do not fund land acquisition. However, they may be able to offer support in other areas of open space and greenways development.

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. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development.

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 three focus areas: Environment and Energy Efficiency, Economic Development, and Community Vitality. 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: www.conservationfund.org

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 $240,000 to 56 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 (one to two years).
- Funding emphasis may not be on general operating expenses or staff payroll.

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

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 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

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 awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants, and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from $50,000-$300,000 and typically require a minimum 2:1 non-federal match.

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/pages/grants/home.aspx

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. The Health of Vulnerable Populations grants program focuses on improving health outcomes for at-risk populations. The Healthy Active Communities grant concentrates on increased physical activity and healthy eating habits. 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. Advocacy Advance Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. With sponsor support, the Alliance for Biking & Walking has awarded more than $500,000 in direct grants, technical assistance, and scholarships to advocacy organizations across North America since the Advocacy Advance Grant program's inception. In 2009 and 2010, these one-year grants were awarded twice annually to startup organizations and innovative campaigns to dramatically increase 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.peoplepoweredmovement.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 form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

APPENDIX C

PUBLIC ENGAGEMENT

Chapter Contents

Overview C-1
Steering Committee Meetings C-1
Public Outreach Events C-2
Project Resources C-3
Public Comment Form Responses C-8

Overview

The public engagement effort for this plan involved numerous meetings, events, and materials to spread awareness of the City of Mebane Comprehensive Bicycle and Pedestrian Transportation Plan. The purpose of the public engagement process was to ensure that a variety of local perspectives containing essential insight were incorporated into the plan and informed the planning process. A variety of media and resources were developed to provide opportunities for all Mebane residents to give their input in some form, whether in person, in writing, or electronically. The public engagement component included the following efforts:

- Steering Committee Meetings (4)
- Public Input Events (2)
- Project Resources
  - Project website
  - Public comment form (online and in hard copy)
  - Project display boards
  - Large format maps
  - Project information cards

Public input banner displayed at outreach events

Steering Committee Meetings

The Project Steering Committee for the plan consisted of a mixture of representatives from state/local/county government, health/wellness groups, local businesses, local advocates, and interested residents. The Project Steering Committee was involved throughout the process and met four times with project consultants from Alta Planning + Design, focusing on project vision and goals (April 2014), existing conditions (July 2014), the draft plan (September 2014), and the final plan (TBA). During the April 2014 meeting, the consultant gave a presentation on the planning process while the group established a mission statement and goals for the plan. In both April and July 2014 meetings, members of the Steering Committee worked with the consultant team to mark up maps of Mebane to identify gaps in the current network and high priority areas for improvement. The final two meetings involved making revisions and addenda to the plan document. Input from the Steering Committee is reflected throughout the recommendations of this plan.

Steering committee members identify opportunities for walking and bicycling facilities in Mebane.

Public Outreach Events

The Project Consultant attended multiple events in order to reach more Mebane area residents. These are described below.

4th of July Event

Project consultants set up an informational booth at the Fourth of July Celebration on Friday, July 4, 2014. People were invited to learn about the plan and provide input via a public comment form about where they would like to see improvements for bicycling and walking. The consultant team set up a public input map, information cards, and plan display boards to gather public feedback and two project consultants answered questions, collected completed comment forms, and recorded input. The general feedback was highly positive, with many people interested in seeing Mebane become a more bike and pedestrian-friendly community.

Public Event #2

The project team held a second public workshop at Mebane City Hall on Tuesday, September 23 from 5 to 7 PM. Over 20 people stopped by to provide input on the maps, display boards, and comment forms; took information cards with plan information and a link to the website; and asked questions. Group discussions generated feedback on the plan's recommendations and helped to brainstorm modifications and additions to the recommendations. There was broad interest in and support for more places to safely walk and bike in Mebane.

Public outreach at 4th of July Celebration

Project Resources

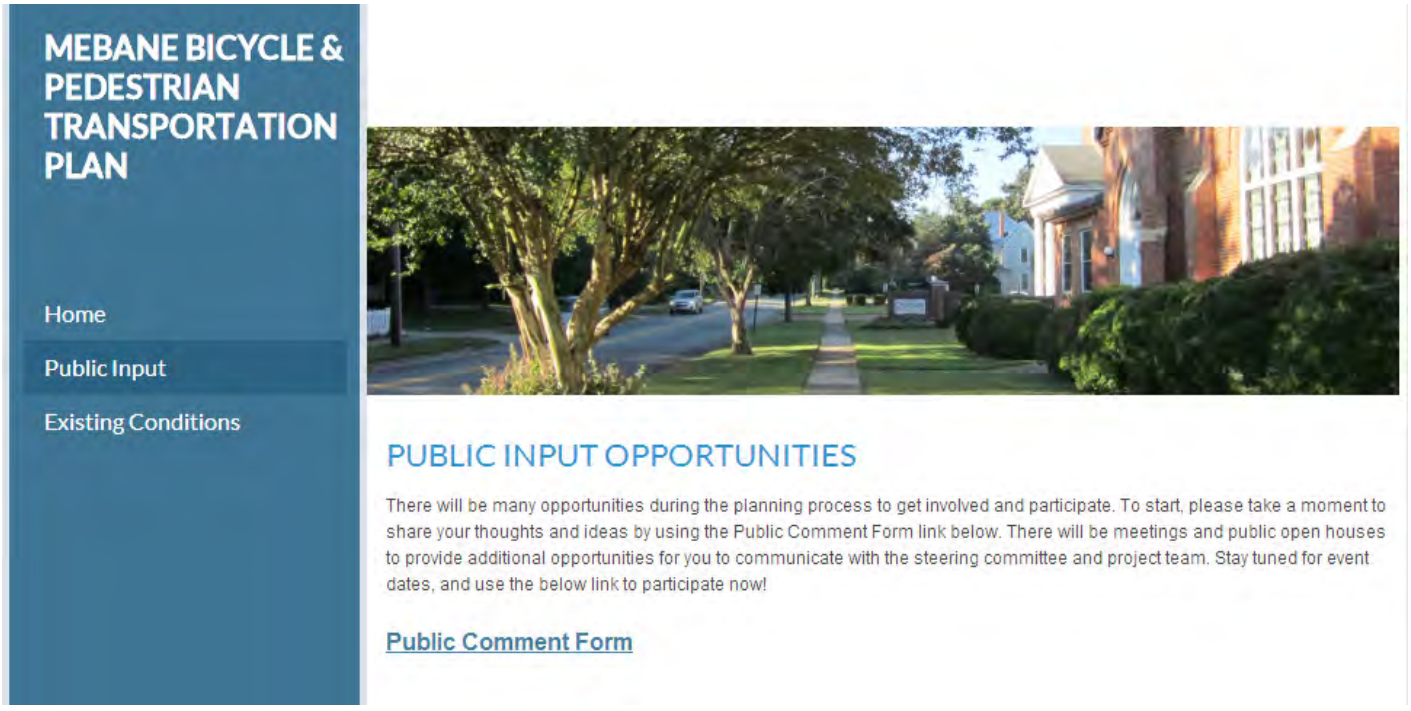
A number of resources were developed to enhance project awareness and participation. These tools also played a significant role in ensuring all members of the general public would have the opportunity to participate.

Project Website

A project website (http://www.mebanebikepedplan.com/) was developed to provide information on the plan and planning process, public input opportunities, maps and fieldwork photos, and project contact information. The website also featured a link to the online public comment form page, offering a convenient way for the Mebane community to participate in the planning process and provide valuable input for the plan.

Project Display Boards

A series of project information boards were created to showcase and invite feedback throughout the plan's development. These boards presented existing bicycle and pedestrian conditions in Mebane, the vision and goals of the plan, types of bicycle and pedestrian facilities, and proposed recommendations for improving Mebane's walking and bicycling environment. The boards were displayed at committee meetings and public outreach events. The public was invited to write their input on the boards and vote on their favorite program and facility recommendations. The feedback received on the boards was used to craft the recommendations found in this plan.



Mebane Bicycle & Pedestrian Transportation Plan project website

Map of bicycling and walking opportunities and constraints in Mebane

Large Format Maps

The project team produced and displayed large maps of Mebane at steering committee meetings and public outreach events. Participants were invited to comment on the existing walking and bicycling conditions in Mebane; draw on the map to point out facility gaps, safety issues, and opportunities for improvement; and leave feedback on the proposed facility recommendations of the draft plan. The input received on the maps was recorded and incorporated into the facility recommendations of the final plan.

Project Information Cards

The information card shown below was designed to spread awareness of the project, direct interested citizens to the website and to project contacts for further information, and invite citizens to complete the online comment form. Project information cards were distributed at steering committee meetings and public outreach events, and were handed out to local interest groups and advocates to further distribute throughout the community.

Project information card

Public Comment Form

The public comment form served as an essential tool in the public engagement effort for this plan. The form was made available online throughout the duration of the project, with the link provided on the website, on project information cards handed out at public outreach events, sent out to local interest groups, and circulated via email. Hard copies of the public comment form were available at the public outreach events and steering committee meetings. Over 100 residents completed the comment form.

The project team collected and tabulated all of the comment form responses to provide insight into local residents' values and opinions about the project. The complete results are found on the following pages.

CITY OF MEBANE Bicycle and Pedestrian Master Plan **Comment Form**

1. How **OFTEN** do you walk or ride your bike? (Select one)
   - _ It is part of my daily routine
   - _ A few times a week
   - _ A few times a month
   - _ A few times a year
   - _ I rarely walk or bike
   - _ I don't own a bicycle
2. What would make walking and biking a more **VIABLE** option? (Select two)
   - _ Many of my destinations are close to each other
   - _ My route choices are direct; I don't have to go out of my way
   - _ I have multiple route options
   - _ Walking or biking is a convenient choice
   - _ Bike parking is available
   - _ Better sidewalk, bikeway, and greenway connectivity
3. What would make walking or biking **SAFE**? (Select two)
   - _ Better lighting
   - _ Safer roadway conditions
   - _ Better intersection features, such as crosswalks
   - _ More protection or separation between cars and myself
   - _ Slower vehicle speeds
   - _ More police enforcement
   - _ More education for drivers, cyclists and pedestrians
4. What would make **walking** more **COMFORTABLE**? (Select two)
   - _ Better lighting
   - _ More street trees
   - _ More space between cars and myself
   - _ Slower vehicle speeds
   - _ Places to sit
   - _ More sidewalks
5. What would make **biking** more **COMFORTABLE**? (Select two)
   - _ Slower vehicle speeds
   - _ Well maintained roadways
   - _ Bicycle facilities separated from vehicular traffic
6. What would make walking or biking more **INTERESTING**? (Select three)
   - _ Seeing people I know while I am out
   - _ Being more social/group-oriented
   - _ Hearing and seeing nature
   - _ Having several places to shop or visit on one walk or bike ride
   - _ Public art
7. Why do you walk or bike? (Select all that apply)
   - _ I don't walk or bike
   - _ Recreation/Fitness
   - _ To get to school/work
   - _ To get to nearby destinations
8. If you had 10 dollars to spend on improving walking and biking conditions in Mebane, what would you spend it on and how much would you spend on each item?
   - _ New bike lanes
   - _ New trails
   - _ New sidewalks
   - _ Intersection improvements
   - _ Infrastructure enhancements in downtown
   - _ Infrastructure enhancements around schools
   - _ Infrastructure enhancements in my neighborhood
   - _ Maintain and repair what we already have
9. Which roadway in Mebane do you think would benefit the most from pedestrian and bicycling improvements?

   _____
10. How should bike facilities be funded?
    - _ Local funds
    - _ State funds
    - _ Federal funds
    - _ Public grants
    - _ Private funds
11. What is your sex?
    - _ Male
    - _ Female
12. What is your age?
    - _ < 20
    - _ 20s
    - _ 30s
    - _ 40s
    - _ 50s
    - _ 60s
    - _ 70+
13. What are the top reasons to get more people walking and biking? (Select three)
    - _ Quality of life
    - _ Transportation
    - _ Economic development
    - _ Health
    - _ Environmental Stewardship
    - _ Recreation
14. Would you walk or bike more if safe and comfortable facilities were created for you?
    - _ Yes
    - _ No

Project Contact: Mr. Chris Rollins, Asst. City Manager, City of Mebane, 106 E Washington St Mebane, NC 27302 e: crollins@cityofmebane.com p: 919-563-5901

Public comment form

News Articles

14 Mebane Enterprise Wednesday, October 1, 2014

Citizens come out for bike/ped plan meeting

By KAREN CARTER
Enterprise Editor

Mebanites came out to City Hall Monday evening, Sept. 29 to help community leaders decide which sidewalk, crosswalk, and greenway improvements are needed to make Mebane safer for walking and bicycling.

"We're hearing from everybody tonight," said Matt Hayes, project manager for the consultant side of the plan for the City of Mebane's first bicycle and pedestrian plan. Hayes works for Alta and is the southeast regional manager for the company, out of Durham. He said he has been doing this work of bike and ped plans and designs for years. "A good geographic distribution represented here tonight," Hayes said of the crowd.

Hayes has worked closely with the city staff, especially assistant city manager Chris Rollins throughout the process. Since last April, volunteers have joined the project consultants to create a vision, help analyze the existing environment and to make recommendations, said Rollins.

The draft bicycle and pedestrian plan was released last month and is available on the website for downloading and distribution. Rollins asks if any one wants more information to contact him at 919-563-5901 or email crollins@cityofmebane.com and go to the City of Mebane's website for a draft of the plan: www.mebanebikepedplan.com

Hayes said one of the things citizens voiced at Monday's drop-in style of meeting to review the maps and see the plans was a request to get to downtown. "They said, 'I live one, two or three miles away. Can we just get to downtown biking or walking?'"

Another request that came from the meeting was feedback to use sewer easements for greenway corridors.

A concrete suggestion came from citizens that want greenways to connect to the Mebane Arts and Community Center, located at Corregidor Drive off South Third Street, to South Mebane Elementary School. "Folks in the neighborhoods surrounding the Arts Center and the school want short greenways to connect them to ride bikes and walk," said Hayes.

Hayes mentioned three things that folks attending the informational meeting voiced to the city staff: first, connectivity—walk or bike to get to places; second, a quality of life with health and recreational benefits from a walking/biking community; and third, safety for bikers and walkers.

The city staff, consultants, and volunteers will take the information and continue to work on a draft of the bike/ped plan. Rollins said the City would have the plan ready for it to be approved and adopted by the end of the year.

A hard copy of the bicycling and pedestrian plan is available at City Hall, and the city staff hope that Mebanites will continue to give public comment on the website.

Purpose. The City of Mebane, with the support of the Burlington-Graham Metropolitan Planning Committee, the North Carolina Department of Transportation, and other local and regional entities, have all worked together to figure out ways to encourage more healthy lifestyles and provide the services Mebane residents want and expect with sidewalk, crosswalk and greenway improvements.

When the City of Mebane approved its first historic Mebane Recreation Plan last year, greenways and walking trails and amenities for parks were among the priorities of Mebanites, according to the survey results.

The City of Mebane has had a scheduled program of adding sidewalks, but Rollins said the Burlington-Graham MPO approved a bike plan with funding. Mebane agreed to put more money to the pedestrian side of the project.

"If you want money from the Department of Transportation, you have to have bike lane projects, crosswalks, sidewalk projects, and a pedestrian plan," he said.

"The City has done good work with the sidewalks," said Hayes, "but we need help with the crosswalks. The brick paver crosswalks are nice on Clay Street, but we need them elsewhere."

Hayes commented on the attraction of a bike and ped plan for homeowners and businesses that want to move to Mebane. "People used to want to move to a golf course community. Now they want places where they can walk and ride bikes."

Hayes mentioned that safe routes to schools, walking to schools, is another priority in the program planning.

"It's a comprehensive plan with the three Es: education, encouragement and enforcement," he said.

CITY OF MEBANE

City to roll out first bike and ped plan

Public information meeting set for Monday, Sept. 29 for opportunity to give input on sidewalks, crosswalks, safe routes

By KAREN CARTER
Enterprise Editor

The City of Mebane has completed its first draft of a bicycle and pedestrian plan for Mebane.

Hundreds provided input from the survey, said assistant city manager Chris Rollins. Now the City asks for more citizen input to help community leaders decide which sidewalk, crosswalk, and greenway improvements are needed to make Mebane safer for walking and bicycling.

The project team will be at Mebane City Hall, located at 106 E. Washington St., on Monday, Sept. 29 from 5 to 7 p.m. Please drop by and meet with the team and give the City your feedback.

For more information, questions, and comments, contact assistant city manager Chris Rollins at 919-563-5901 or email crollins@cityofmebane.com and go to the City of Mebane's website for a draft of the plan: www.mebanebikepedplan.com

Next Monday's evening's drop-in style of meeting will show the work that has been going into the project since the planning began in April. Volunteers joined the project consultants to create a vision, help analyze the existing environment and to make recommendations, said Rollins.

The draft bicycle and pedestrian plan was released last month and is available on the website for downloading and distribution. In fact, Rollins said he'd like for everyone to pass the word along to friends, families, neighbors, and co-workers.

Purpose. The City of Mebane, with the support of the Burlington-Graham Metropolitan Planning Committee, the North Carolina Department of Transportation, and other local and regional entities, have all worked together to figure out ways to encourage more healthy lifestyles and provide the

See PLAN, page 2A

2010 Census
Walking - Biking needs identified

7.6 percent of the population do not have access to a vehicle

20 to 30 percent of the population do not have vehicles in the central parts of town

newer parts of town range from 5 to 20 percent without vehicles

PLAN

Continued from page 1A

services Mebane residents want and expect with sidewalk, crosswalk and greenway improvements.

When the City of Mebane approved its first historic Mebane Recreation Plan last year, greenways and walking trails and amenities for parks were among the priorities of Mebanites, according to the survey results.

The City of Mebane has had a scheduled program of adding sidewalks, but Rollins said the Burlington-Graham MPO approved a bike plan with funding. Mebane agreed to put more money to the pedestrian side of the project.

"If you want money from the Department of Transportation, you have to have bike lane projects, crosswalks, sidewalk projects, and a pedestrian plan," he said.

Third and Fifth streets and Highway 70 are state-maintained roads, said Rollins.

And the City of Mebane has done a "masterful job" of providing sidewalks, Rollins said: 42 miles of sidewalks, 52 miles of street. "Most towns don't have those numbers."

But there are "gaps" in the sidewalks connecting, said Rollins, for example, as at Third Street with Governors Green.

With steering committee meetings and public outreach events, such as next Monday evening's public workshop at City Hall, Mebane will reach its goal of making bicycle and pedestrian improvements. That's why it is important for Mebane residents to come out and look at the maps and give input to the steering committee.

Since April, the planners have been gathering data, getting survey results, getting feedback such as at the July 4 Music Festival, and drafting a plan.

Rollins said the City hopes to have everything approved and finalized by the end of the year.

One of the things that has been looked at is the possibility of linking greenways to sidewalks. Another issue raised has been safety, how for people to cross safely at major intersections.

For example, how is it possible for Mebane residents to walk and run along S. Fifth St. and Mebane Oaks Road? Rollins said, Fifth Street is a little tough getting across the railroad tracks. In other words, there are places all along where a bicycle and pedestrian plan will increase safety as well as promote a healthy lifestyle of walking and running.

Rollins said cycling is like walking; more people are doing it. Mebane needs bike lanes. "It takes vision, planning, and assessing where the needs are. Now we're ready with a draft plan for folks to look at."

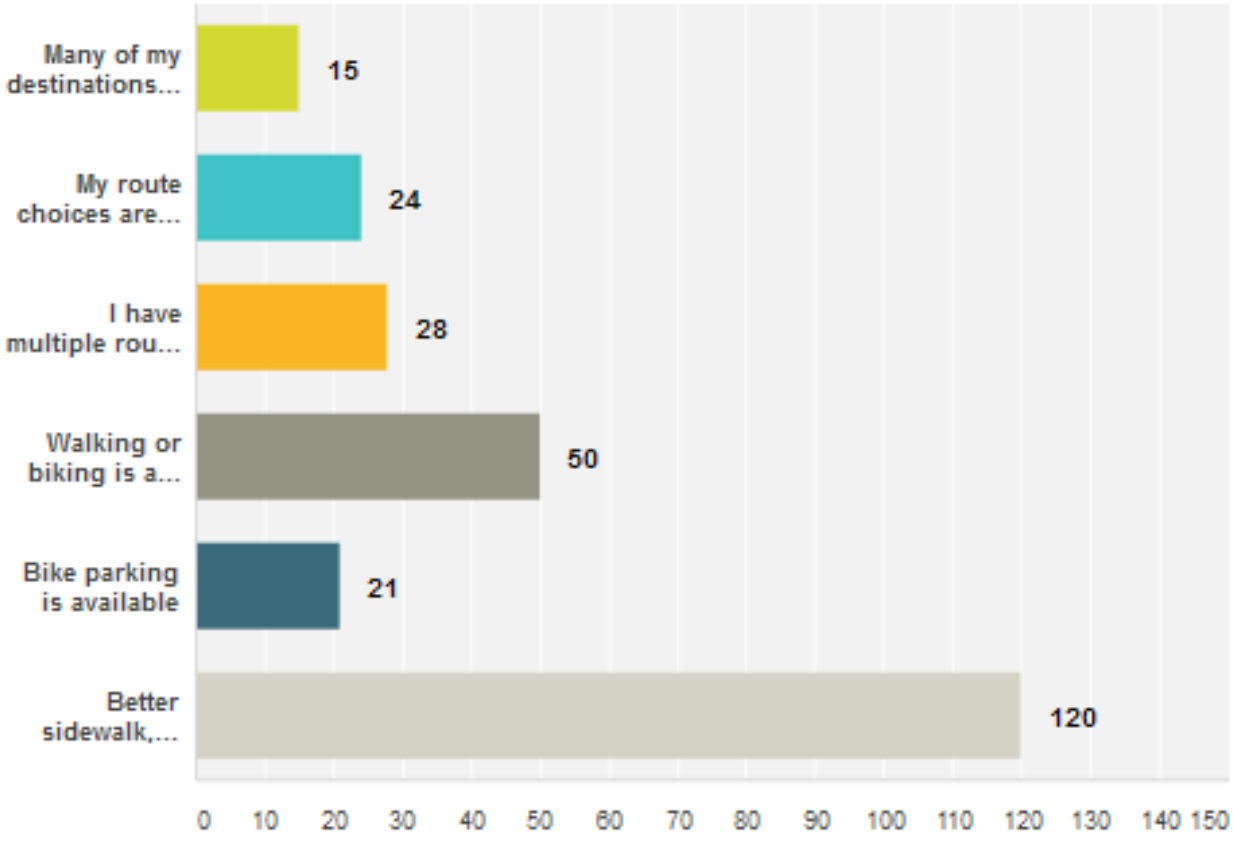
Rollins showed the Enterprise some graphs from the census data—the U.S. 2010 Census—that estimated that about 7.6 percent of the population in Mebane do not have access to a vehicle, and can be referred to as zero car households. The maps showed that in the central parts of town 20 to 30 percent do not have vehicles. The newer parts of town range from five to 20 percent without access to a vehicle.

Public Comment Form Responses

The public comment form was made available from May to September 2014. Once the comment period was closed, the project team tallied the online and hard copy responses and analyzed the results to obtain a big picture understanding of walking and bicycling in Mebane. The following charts show the summarized responses for each question of the public comment form.

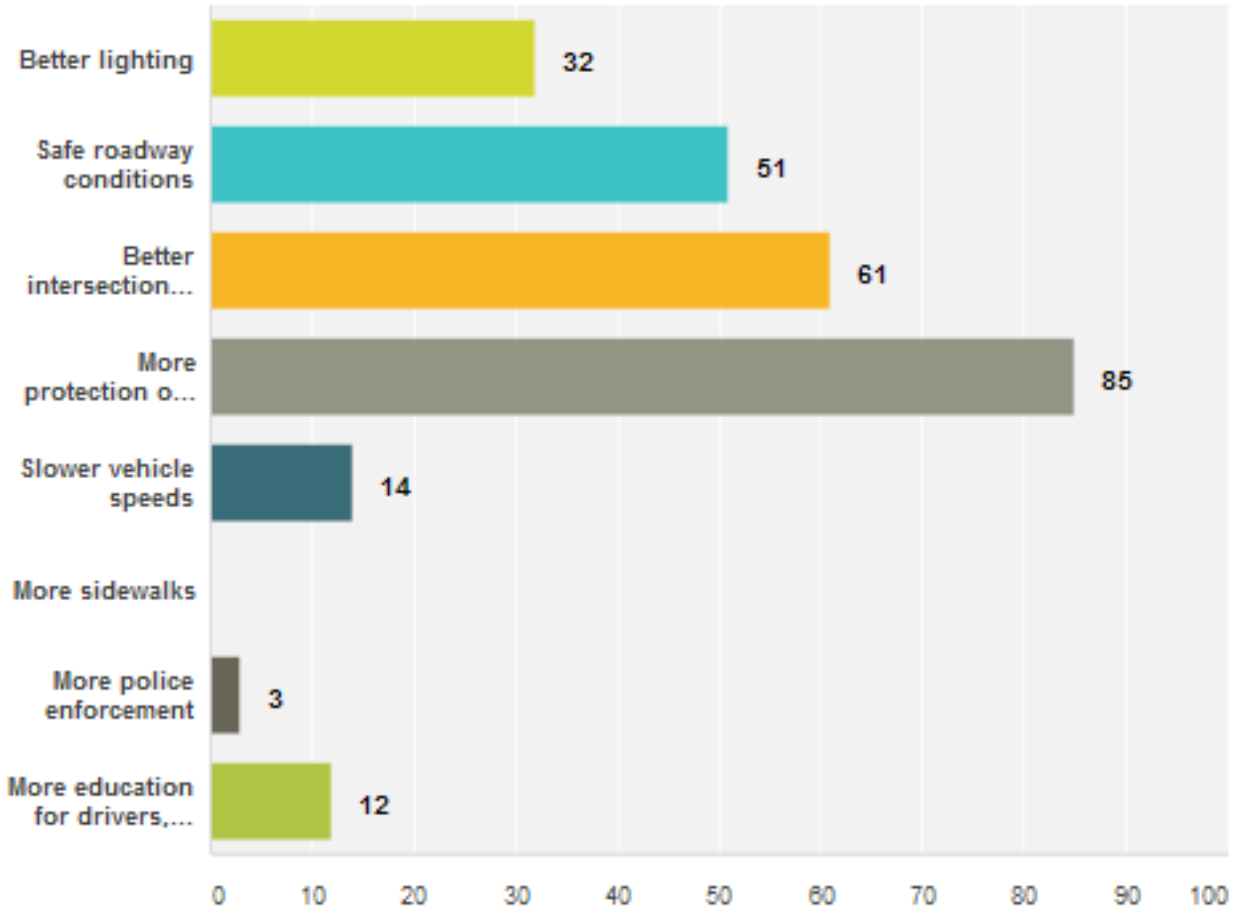
1. How OFTEN do you walk or ride your bike?

2. What would make walking and biking a more VIABLE OPTION? (Select two)



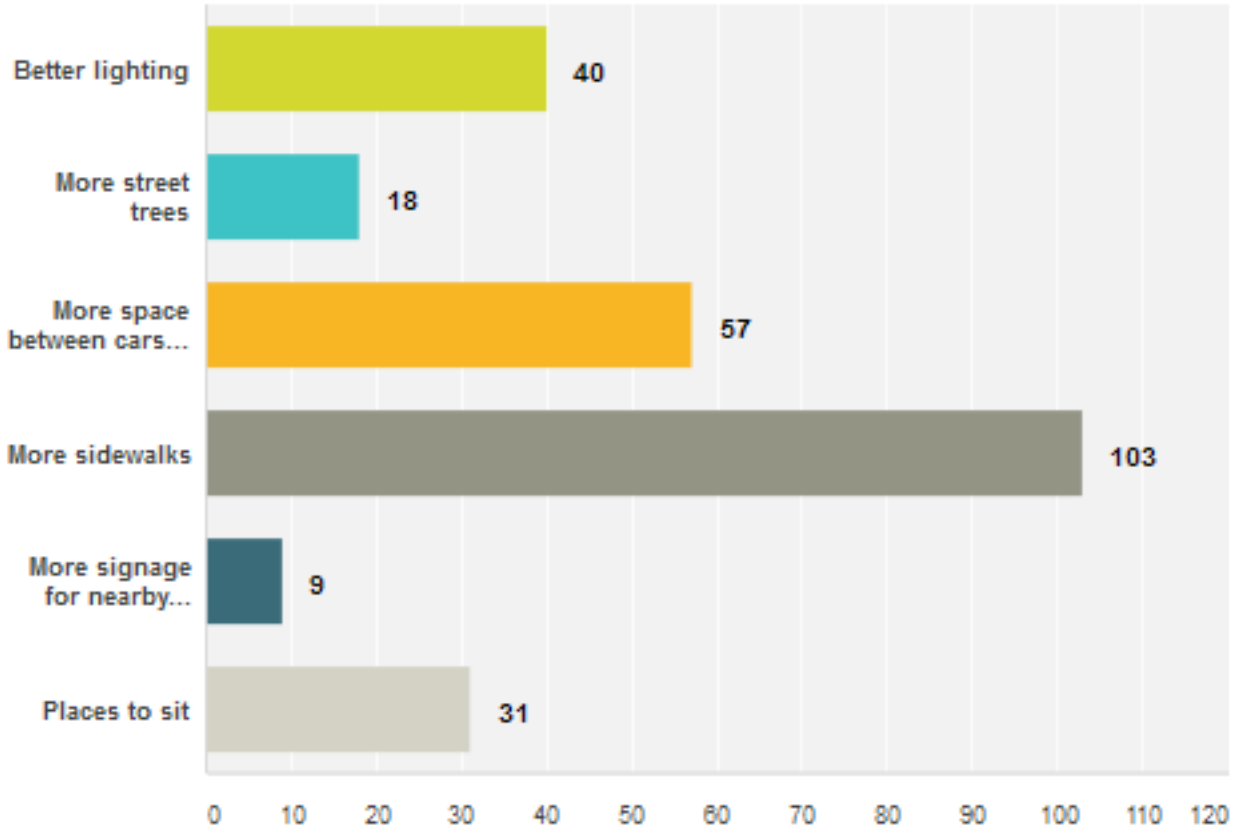
Answer Choices	Responses	
Many of my destinations are close to each other	12%	15
My route choices are direct; I don't have to go out of my way	19%	24
I have multiple route options	22%	28
Walking or biking is a convenient choice	39%	50
Bike parking is available	16%	21
Better sidewalk, bikeway, and greenway connectivity	93%	120
Total Respondents: 129		

3. What would make walking or biking SAFE? (Select two)



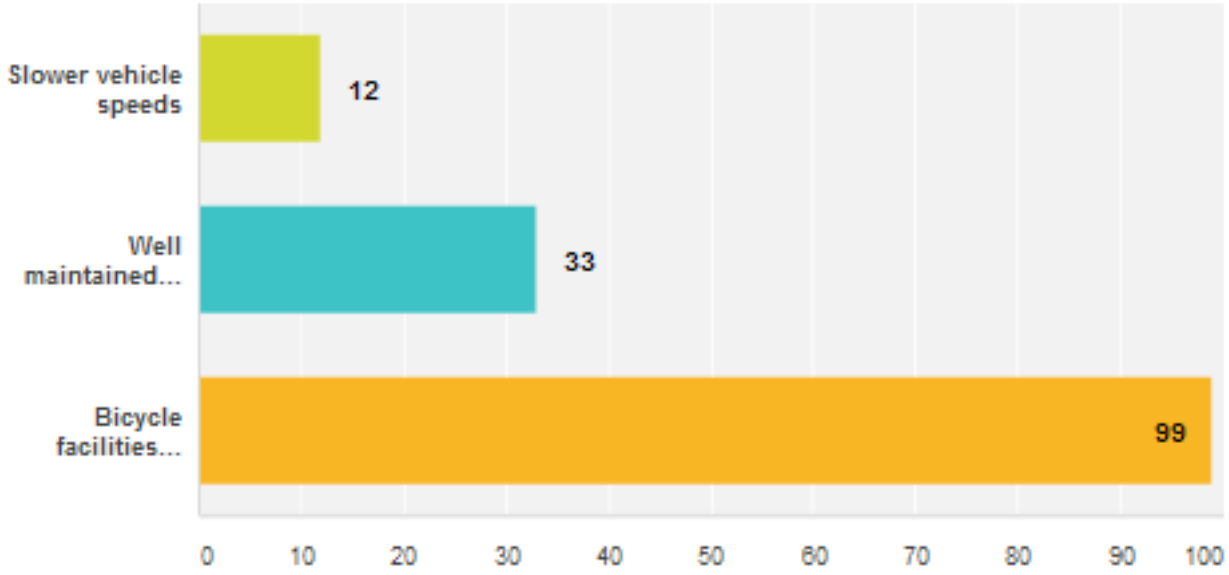
Answer Choices	Responses	
Better lighting	25%	32
Safe roadway conditions	40%	51
Better intersection features, such as crosswalks	47%	61
More protection or separation between cars and myself	66%	85
Slower vehicle speeds	11%	14
More sidewalks	0%	0
More police enforcement	2%	3
More education for drivers, cyclists, and pedestrians	9%	12
Total Respondents: 129		

4. What would make walking more COMFORTABLE? (Select two)



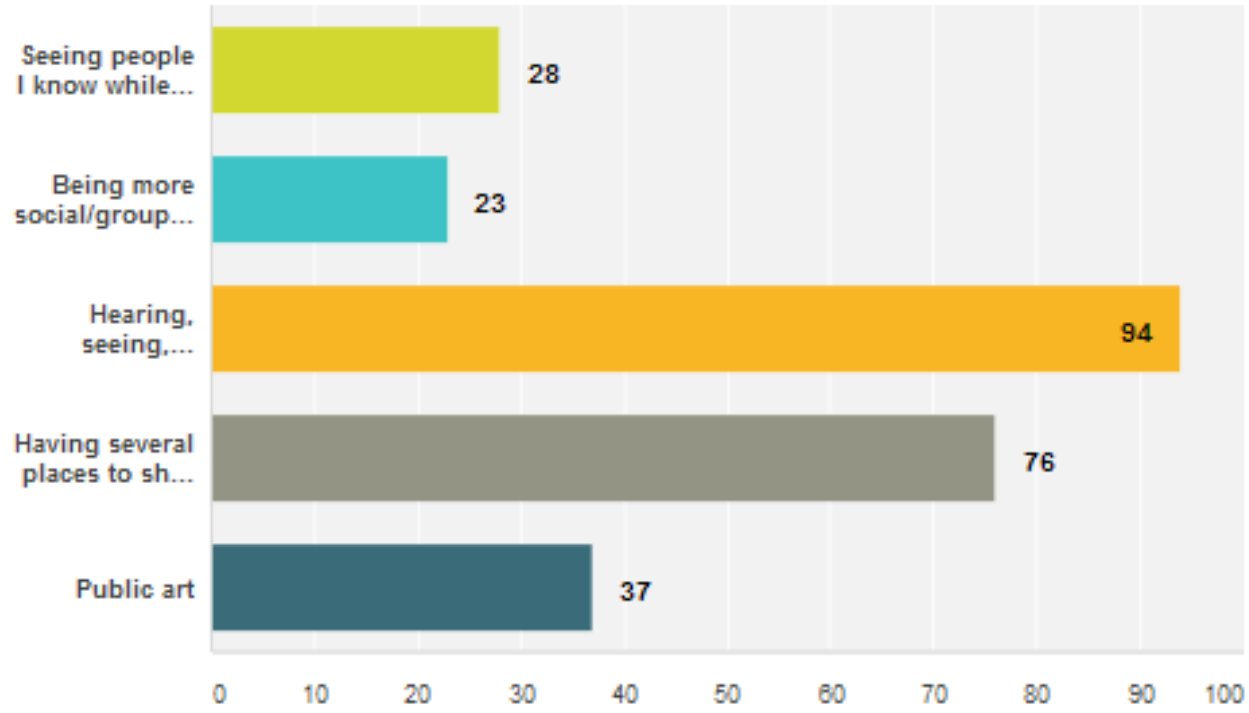
Answer Choices	Responses	
Better lighting	31.01%	40
More street trees	13.95%	18
More space between cars and myself	44.19%	57
More sidewalks	79.84%	103
More signage for nearby destinations	6.98%	9
Places to sit	24.03%	31
Total Respondents: 129		

5. What would make biking more COMFORTABLE? (Select one)



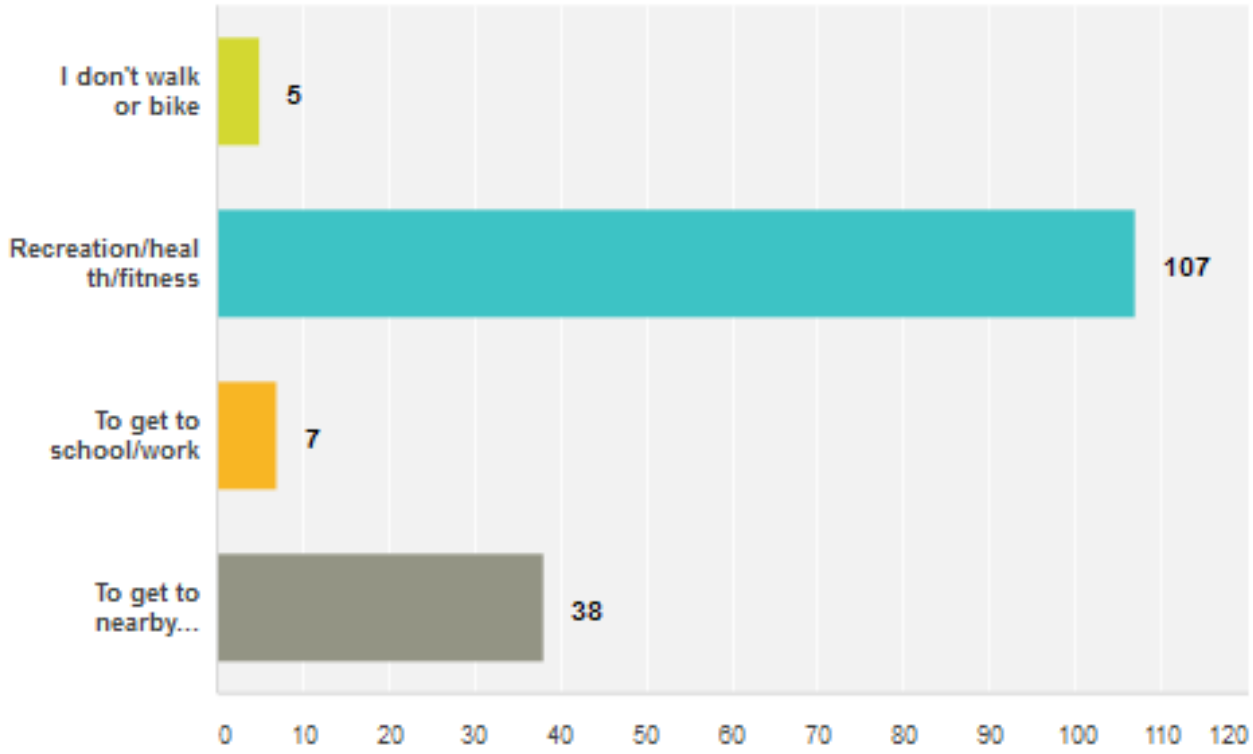
Answer Choices	Responses	
Slower vehicle speeds	9%	12
Well maintained roadways	26%	33
Bicycle facilities separated from vehicular traffic	77%	99
Total Respondents: 128		

6. What would make walking or biking more INTERESTING? (Select two)



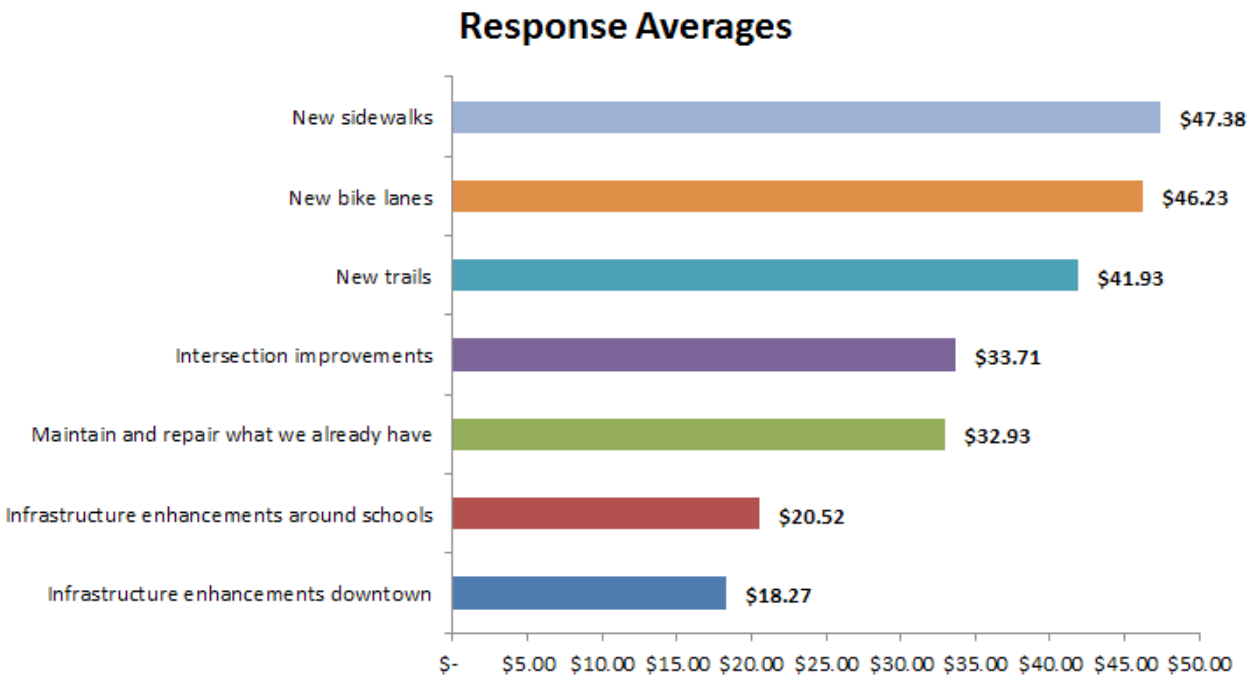
Answer Choices	Responses	
Seeing people I know while I am out	21.71%	28
Being more social/group-oriented	17.83%	23
Hearing, seeing, experiencing the natural environment	72.87%	94
Having several places to shop or visit on one walk or bike ride	58.91%	76
Public art	28.68%	37
Total Respondents: 129		

7. Why do you walk or bike?

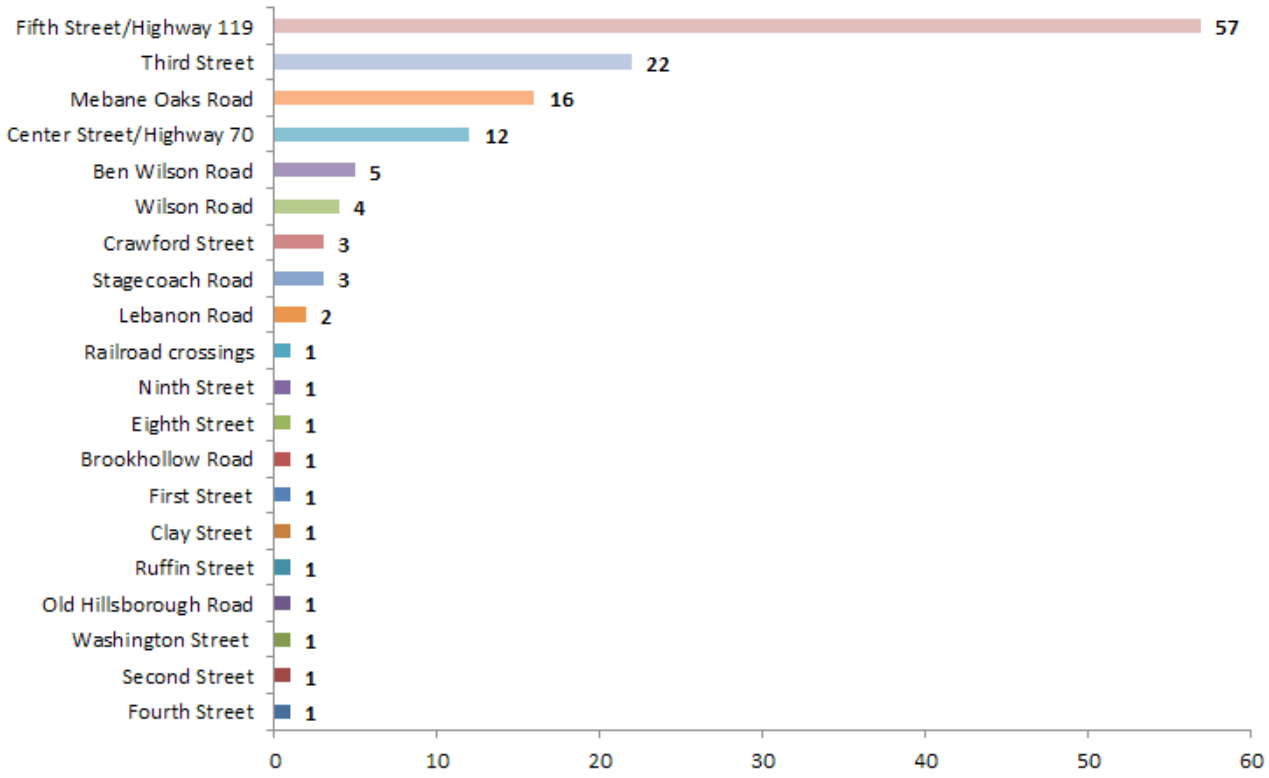


Answer Choices	Responses	
I don't walk or bike	4.10%	5
Recreation/health/fitness	87.70%	107
To get to school/work	5.74%	7
To get to nearby destinations	31.15%	38
Total Respondents: 122		

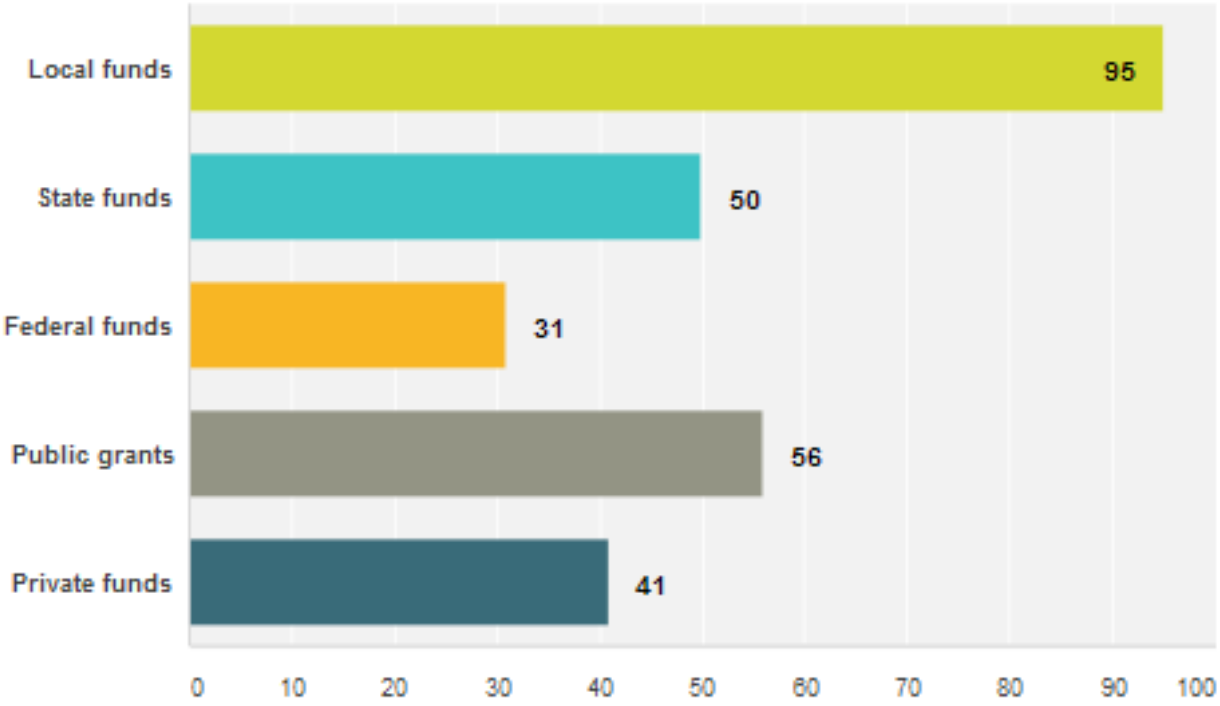
8. If you had 100 dollars to spend on improving walking and biking conditions in Mebane, what would you spend it on and how much would you spend on each item?



9. Which roadway in Mebane do you think would benefit the most from pedestrian and/or bicycling improvements?

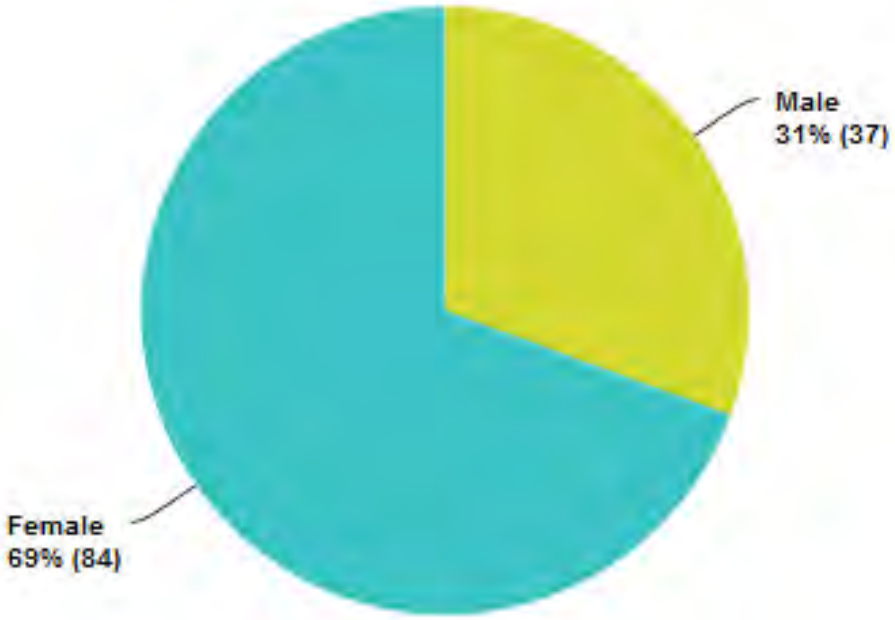


10. How should pedestrian and bicycling facilities be funded?



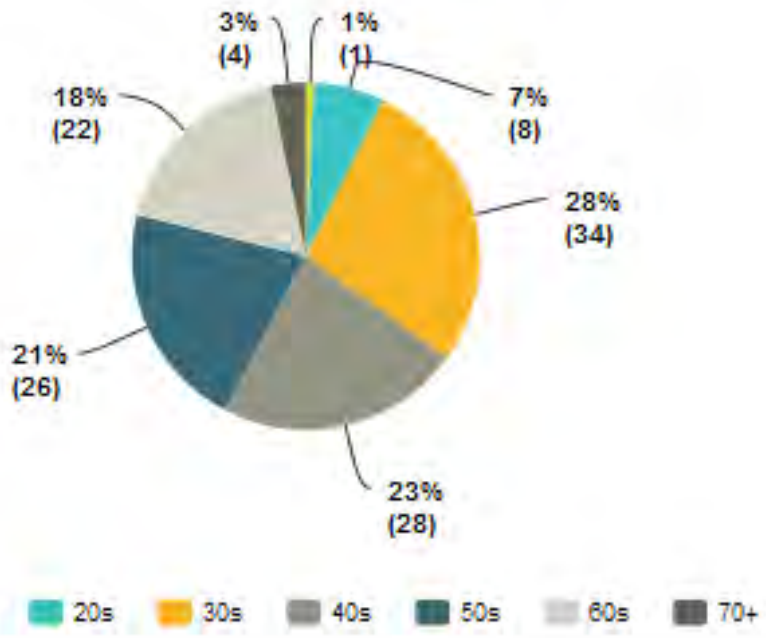
Answer Choices	Responses	
Local funds	77.24%	95
State funds	40.65%	50
Federal funds	25.20%	31
Public grants	45.53%	56
Private funds	33.33%	41
Total Respondents: 123		

11. What is your sex?



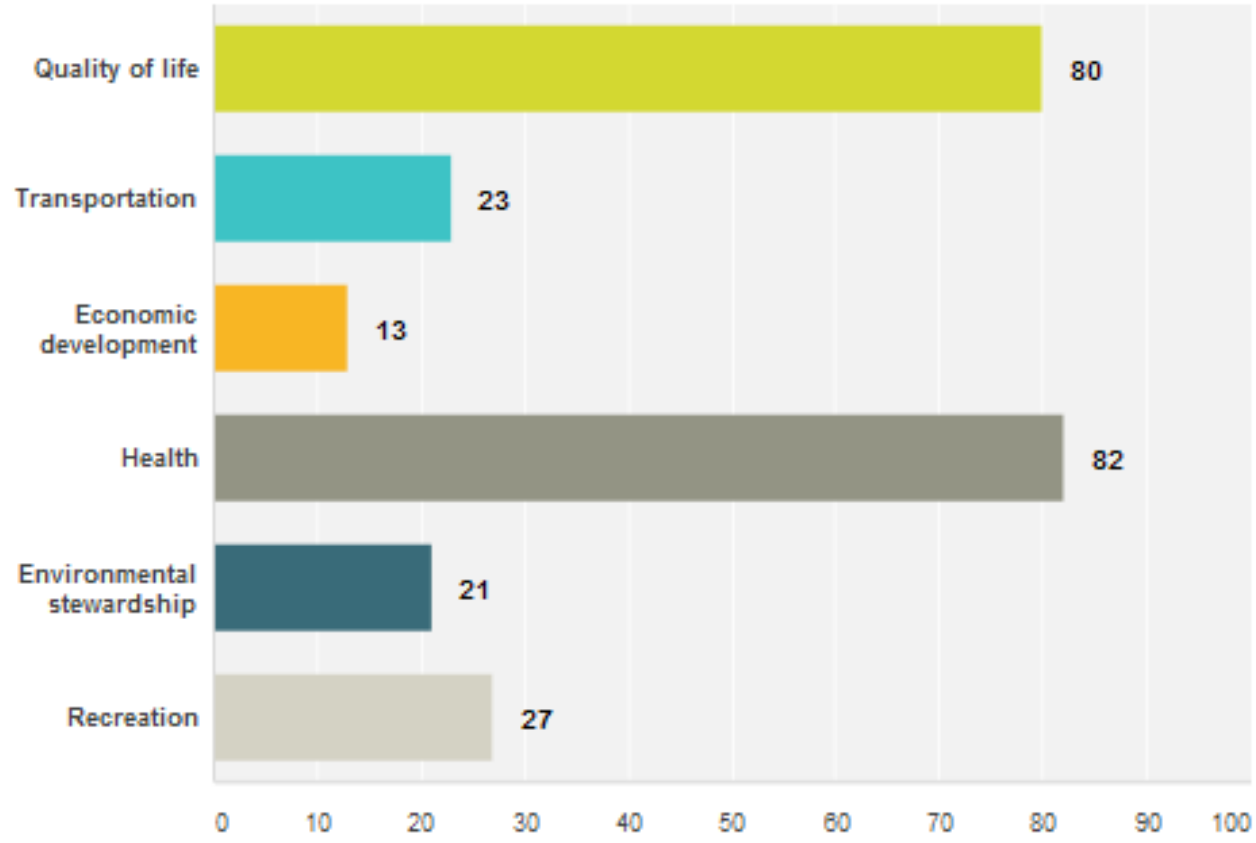
Answer Choices	Responses	
Male	31%	37
Female	69%	84
Total		121

12. What is your age?



Answer Choices	Responses	
< 20	1%	1
20s	7%	8
30s	28%	34
40s	23%	28
50s	21%	26
60s	18%	22
70+	3%	4
Total		123

13. What are the top reasons to get more people walking and biking? (Select two)

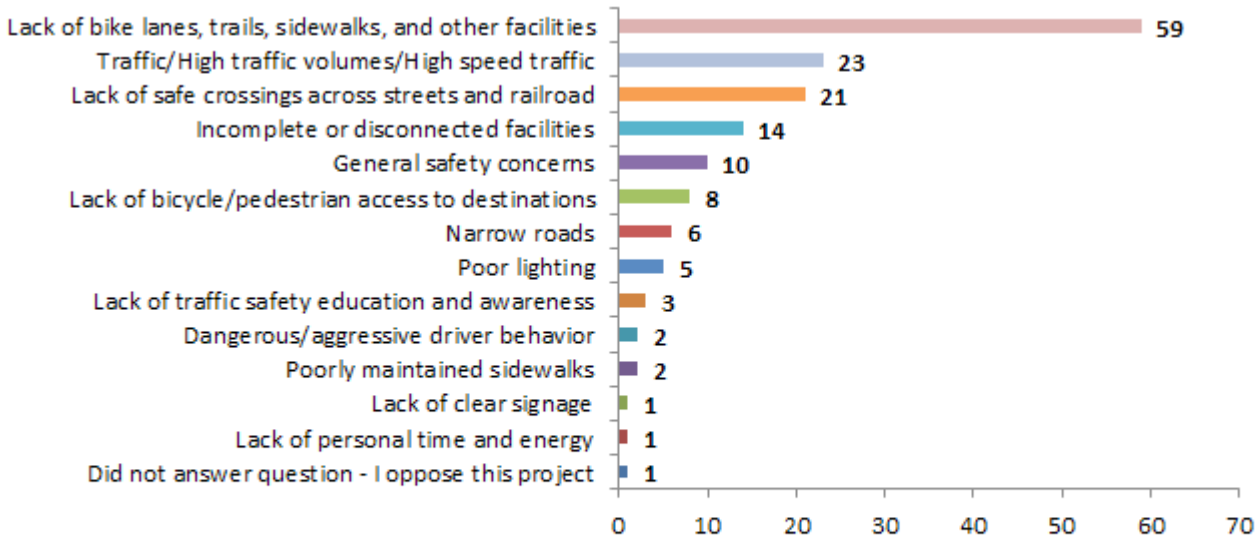


Answer Choices	Responses	
Quality of life	65%	80
Transportation	19%	23
Economic development	11%	13
Health	67%	82
Environmental stewardship	17%	21
Recreation	22%	27
Total Respondents: 123		

14. Would you walk or bike more if safe and comfortable facilities were created for you?

Answer Choices	Responses	
Yes	97%	118
No	3%	4
Total		122

15. What barriers or challenges to walking and bicycling exist in Mebane?



APPENDIX D

PRIORITIZATION TABLES

Chapter Contents

Overview D-1
Sidewalk Prioritization D-2
On-Road Bicycle Facility Prioritization D-10
Shared Use Trail Prioritization D-16

Overview

In order to determine the highest priority improvements recommended in this plan, a series of criteria were developed by which to rank each project. Sidewalk, on-road bicycle, and shared-use trail recommendations were evaluated individually based on whether the project met the following criteria:

- Reported pedestrian or bicycle crash location
- Direct access to or from an existing trail, bike route (for on-road bicycle facility prioritization), or Mebane on the Move walking route or sidewalk (for sidewalk and trail prioritization)
- Direct access to or from proposed facilities
- Top 3 recommendations from the public comment form
- Park, library, or recreation center is within 1/2 mile radius
- Elementary, middle, or high school is within 1/2 mile radius
- Direct access to a major shopping center or business area
- Direct access to downtown
- Low-income area (Median household income <$40,000)*
- Low vehicle access area (>20% of households with no access to a motor vehicle)*
- High minority population area (>20% of population identifies as some race other than white)*
- High density population area (>20 persons/acre)**
- Fills an existing sidewalk gap (for sidewalk prioritization) or provides separation from high motor vehicle traffic volumes (for on-road bicycle facility prioritization)

Steering committee members ranked each criterion on a scale of 1-5 (1 = "Not Important, 5 = "Very Important"), and the scores from each committee member were aggregated and averaged to develop prioritization weights for each of the above criteria. These scores were then applied to each segment of recommended sidewalk, on-road bicycle facility, and shared-use trail to rank projects, with the highest scores signifying the highest priorities for Mebane.

The following tables present the results for sidewalk, on-road bicycle, and shared-use trail prioritization, with projects ranked from highest prioritization score to lowest.

**US Census, American Community Survey 5-Year (2008-2012) Block Group Data*
***US Census, 2010 Decennial Census Block Data*

Sidewalk Prioritization

Roadway	From	To	Side	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
S SECOND	W HOLT	South to existing sidewalk	West	846	3.89	4.44	0	3.67	
N THIRD	W GRAHAM	BELLE	West	1,798	0	4.44	0	0	
N FIFTH	E CENTER	E RUFFIN	East	516	0	4.44	0	0	
W JACKSON	S FIRST	S THIRD	North	539	3.89	4.44	0	3.67	
E JACKSON	S FOURTH	S FIFTH	North	399	3.89	4.44	0	3.67	
S FOURTH	W ROOSEVELT	W MCKINLEY	West	634	3.89	4.44	0	3.67	
STONEWALL	STUART	FAIR OAKS	East	786	3.89	4.44	0	3.67	
W CENTER	N CHARLES	MOORE	North	1,924	3.89	4.44	0	3.67	
CLAY	WILBA	East to existing sidewalk	North	207	3.89	0	0	0	
E RUFFIN	N THIRD	N FIFTH	North	932	0	4.44	0	0	
CLAY	N SECOND	East to existing sidewalk	North	145	0	4.44	0	0	
N SECOND	W GRAHAM	W CRAWFORD	West	494	0	4.44	0	0	
FIRST	W WASHINGTON	South to existing sidewalk	West	161	3.89	4.44	0	0	
E LEE	S THIRD	S FIFTH	North	914	3.89	4.44	0	3.67	
W JACKSON	S THIRD	East to existing sidewalk	North	96	3.89	4.44	0	3.67	
BEAUREGARD	STONEWALL	S THIRD (sidewalk gaps)	South	68	3.89	4.44	0	3.67	
W JACKSON	S FIRST	West to proposed trail	North	549	3.89	4.44	0	3.67	
MCKINLEY	S FIFTH	West to dead end	North	2,437	3.89	4.44	0	3.67	
S FOURTH	W ROOSEVELT	South to proposed trail	West	226	3.89	4.44	0	3.67	
S FOURTH	E ROOSEVELT	South to proposed trail	East	354	3.89	4.44	0	3.67	
W CRAWFORD	N FIRST	Existing sidewalk	South	144	0	4.44	0	0	
W CRAWFORD	Existing sidewalk	N THIRD	South	553	0	4.44	0	0	

	Pedestrian/Bicycle Crash Location	Connects to Existing Facility or Walking Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Fills an Existing Sidewalk Gap	TOTAL
	0	4.67	4.56	0	4.33	4.78	0	4.33	5.00	39.66
	0	4.67	4.56	4.33	4.33	4.78	0	4.33	5.00	36.43
	0	4.67	4.56	4.33	4.33	4.78	0	4.33	5.00	36.43
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	35.33
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	35.33
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	35.33
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	35.33
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	35.33
	0	4.67	4.56	0	4.33	4.78	3.56	4.33	5.00	35.12
	0	4.67	4.56	0	4.33	4.78	0	4.33	5.00	32.10
	0	4.67	4.56	0	4.33	4.78	0	4.33	5.00	32.10
	0	4.67	4.56	0	4.33	4.78	0	4.33	5.00	32.10
	0	4.67	0	0	4.33	4.78	0	4.33	5.00	31.44
	0	4.67	0	0	4.33	4.78	0	0	5.00	30.78
	0	4.67	0	0	4.33	4.78	0	0	5.00	30.78
	0	4.67	0	0	4.33	4.78	0	0	5.00	30.78
	0	4.67	4.56	0	4.33	4.78	0	0	0	30.33
	0	4.67	4.56	0	4.33	4.78	0	0	0	30.33
	0	4.67	4.56	0	4.33	4.78	0	0	0	30.33
	0	4.67	4.56	0	4.33	4.78	0	0	0	30.33
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	27.77
	0	4.67	4.56	0	4.33	4.78	0	0	5.00	27.77

Sidewalk Prioritization

Roadway	From	To	Side	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
N FOURTH	E CRAWFORD	North to existing sidewalk	East	94	0	4.44	0	0	
N FOURTH	E GRAHAM	E CRAWFORD	East	348	0	4.44	0	0	
CLAY	N SECOND	West to existing sidewalk	South	82	0	4.44	0	0	
WILBA	W CENTER	North to existing sidewalk	East	119	0	4.44	0	0	
WILBA	W CENTER	North to existing sidewalk	West	168	0	4.44	0	0	
WILBA	W CLAY	North to existing sidewalk	East	127	0	4.44	0	0	
N FIFTH	E GRAHAM	North to existing sidewalk	West	90	0	4.44	0	0	
FIFTH	E WASHINGTON	E CENTER	East	183	0	4.44	0	0	
S NC 119	LOWES	HOLMES	West	2,189	0	0	0	0	
N CARR	W CARR	STAGECOACH	West	2,563	0	4.44	4.00	0	
MEBANE OAKS	ARROWHEAD/ CAMERON	FOREST	West	2,120	0	0	0	0	
N CHARLES	W CENTER	W CLAY	East	382	3.89	4.44	0	0	
CLAY	N CHARLES	N CHARLES	North	207	3.89	4.44	0	0	
FOURTH	W WASHINGTON	W CENTER	West	122	3.89	4.44	0	0	
FOURTH	E WASHINGTON	E CENTER	East	116	3.89	4.44	0	0	
E OAKWOOD	S EIGHTH	S LANE	South	735	3.89	0	0	3.67	
S THIRD	HOLMES	FOUST	South	1,513	0	0	0	3.67	
S THIRD	MAPLE	HOLMES	South	1,174	0	0	0	3.67	
S THIRD	CORPORATE PARK	NC 119	North	1,417	0	0	0	3.67	
BEAUREGARD	STONEWALL	East to existing sidewalk	South	394	3.89	4.44	0	3.67	
W GRAHAM	N FIRST	East to existing sidewalk	South	119	0	4.44	0	0	
E GRAHAM	N FIFTH	N SIXTH	North	327	0	4.44	0	0	
E GRAHAM	N SEVENTH	N NINTH	South	824	0	4.44	0	0	
N SEVENTH	E CLAY	E GRAHAM	East	321	0	4.44	0	0	

Pedestrian/Bicycle Crash Location	Connects to Existing Facility or Walking Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Fills an Existing Sidewalk Gap	TOTAL
0	4.67	4.56	0	4.33	4.78	0	0	5.00	27.77
0	4.67	0	0	4.33	4.78	0	4.33	5.00	27.55
0	4.67	0	0	4.33	4.78	0	4.33	5.00	27.55
0	4.67	0	0	4.33	4.78	0	4.33	5.00	27.55
0	4.67	0	0	4.33	4.78	0	4.33	5.00	27.55
0	4.67	0	0	4.33	4.78	0	4.33	5.00	27.55
0	4.67	0	4.33	4.33	4.78	0	0	5.00	27.55
0	4.67	0	4.33	4.33	0	0	4.33	5.00	27.10
0	4.67	4.56	0	4.33	4.78	3.56	0	5.00	26.89
0	4.67	4.56	0	4.33	4.78	0	0	0	26.77
4.56	4.67	4.56	4.33	0	0	3.56	0	5.00	26.66
0	4.67	4.56	0	4.33	4.78	0	0	0	26.66
0	4.67	4.56	0	4.33	4.78	0	0	0	26.66
0	4.67	0	0	4.33	0	0	4.33	5.00	26.66
0	4.67	0	0	4.33	0	0	4.33	5.00	26.66
0	4.67	4.56	0	4.33	0	0	0	5.00	26.12
0	4.67	4.56	4.33	0	0	3.56	0	5.00	25.78
0	4.67	4.56	4.33	0	0	3.56	0	5.00	25.78
0	4.67	4.56	4.33	0	0	3.56	0	5.00	25.78
0	0	4.56	0	4.33	4.78	0	0	0	25.67
0	4.67	0	0	4.33	4.78	0	0	5.00	23.22
0	4.67	0	0	4.33	4.78	0	0	5.00	23.22
0	4.67	4.56	0	4.33	0	0	0	5.00	23.00
0	4.67	4.56	0	4.33	0	0	0	5.00	23.00

Sidewalk Prioritization

Roadway	From	To	Side	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
W CRAWFORD	N CHARLES	N FIRST	South	990	0	4.44	0	0	
E BROWN	N FIFTH	N NINTH	North	1,403	0	4.44	0	0	
E CRAWFORD	N THIRD	N FIFTH	South	872	0	4.44	0	0	
E ASHLAND	N NINTH	LEBANON	South	1,360	0	0	0	3.67	
S NC 119	I-40 RAMP - SOUTH SIDE	HOLMES	East	1,574	0	0	0	0	
E CENTER	N NINTH	West to existing sidewalk	North	450	3.89	4.44	0	0	
E FOREST	S EIGHTH	East to existing sidewalk	North	437	3.89	0	0	3.67	
WASHINGTON	S ELEVENTH	West to existing sidewalk	South	783	3.89	0	0	3.67	
N CARR	North end	STAGECOACH	West	2,511	3.89	0	4	0	
S FIFTH	HOLMES	FOUST	South	2,719	0	0	0	0	
CENTER	N CHARLES	West to proposed trail	North	227	3.89	0	0	3.67	
PEPPERTREE	S THIRD	PEPPERTREE	East	207	0	0	0	0	
N NINTH	E STAGECOACH	E ASHLAND	West	1,365	0	4.44	0	0	
MEBANE OAKS	ARROWHEAD/ CAMERON	FOREST OAKS	East	1,076	0	0	0	0	
N SEVENTH	E CENTER	North to existing sidewalk	East	113	0	4.44	0	0	
N NINTH	E CENTER	E GRAHAM	West	649	0	4.44	0	0	
S EIGHTH	MEBANE OAKS	East to existing sidewalk	South	369	0	0	0	3.67	
MOORE	W CENTER	HOLT	East	625	3.89	4.44	0	0	
LEBANON	N NINTH	E ASHLAND	West	3,265	0	0	0	3.67	
ARROWHEAD	PRIVATE (TANGER OUTLETS)	E OAKWOOD	North	919	3.89	4.44	0	3.67	
E CENTER	N NINTH	SUPPER CLUB	North	1,344	3.89	0	0	3.67	
MRS WHITE	NC 119	RUTLEDGE	South	935	0	0	0	0	
ST ANDREWS	NC 119	OAKMONT	South	2,043	0	0	0	0	

Pedestrian/Bicycle Crash Location	Connects to Existing Facility or Walking Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Fills an Existing Sidewalk Gap	TOTAL
0	4.67	4.56	0	4.33	4.78	0	0	0	22.77
0	4.67	4.56	0	4.33	4.78	0	0	0	22.77
0	4.67	4.56	0	4.33	4.78	0	0	0	22.77
0	4.67	4.56	0	4.33	0	0	0	5.00	22.23
0	4.67	4.56	0	4.33	4.78	3.56	0	0	21.89
0	4.67	4.56	0	4.33	0	0	0	0	21.89
0	4.67	0	0	4.33	0	0	0	5.00	21.56
0	4.67	0	0	4.33	0	0	0	5.00	21.56
0	4.67	4.56	0	4.33	0	0	0	0	21.45
0	4.67	4.56	4.33	4.33	0	3.56	0	0	21.44
0	0	4.56	0	4.33	4.78	0	0	0	21.23
0	4.67	0	0	4.33	4.78	0	0	5.00	18.78
0	4.67	4.56	0	0	0	0	0	5.00	18.66
0	4.67	4.56	4.33	0	0	0	0	5.00	18.55
0	4.67	0	0	4.33	0	0	0	5.00	18.44
0	4.67	4.56	0	4.33	0	0	0	0	18.00
0	4.67	4.56	0	0	0	0	0	5.00	17.89
0	0	4.56	0	0	4.78	0	0	0	17.67
0	4.67	4.56	0	4.33	0	0	0	0	17.23
0	0	4.56	0	0	0	0	0	0	16.56
0	0	4.56	0	4.33	0	0	0	0	16.45
0	4.67	4.56	0	0	0	0	0	5	14.23
0	4.67	4.56	0	0	0	0	0	5	14.23

Sidewalk Prioritization

Roadway	From	To	Side	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
S FIFTH	E DOGWOOD	West to existing sidewalk	South	341	0	0	0	0	
AVALON	S EIGHTH	APPLECROSS	South	316	0	0	0	3.67	
FOREST OAKS	MEBANE OAKS	COLLINGTON	South	2,185	0	0	0	0	
SUPPER CLUB	LEBANON	E CENTER	West	1,727	0	0	0	3.67	
TANGER (PRIVATE)	Proposed trail at Tanger Outlets	Proposed trail at Tanger Outlets	North	1,367	0	0	0	3.67	
WILSON/BEN WILSON	FOREST OAKS	BRAY	South	5,543	0	0	0	0	
TROLLINGWOOD	S THIRD EXT	West of Trollingwood Hawfields	North	3,131	3.89	0	0	0	
BRUNDAGE	GARRETT CROSSING	MEBANE OAKS	South	1,076	0	0	0	0	
BRUNDAGE	BROADWOOD ACRES	GARRETT CROSSING	South	384	0	0	0	0	
S THIRD EXT (FUTURE)	S THIRD EXT	S FIFTH	Both	2,504	0	0	0	0	
NEW NC 119	S FIFTH	S THIRD	East	1,317	0	0	0	0	

Pedestrian/Bicycle Crash Location	Connects to Existing Facility or Walking Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Fills an Existing Sidewalk Gap	TOTAL
0	4.67	0	4.33	0	0	0	0	5.00	14.00
0	4.67	4.56	0	0	0	0	0	0	12.89
0	4.67	4.56	0	0	0	3.56	0	0	12.78
0	0	4.56	0	4.33	0	0	0	0	12.56
0	0	4.56	0	0	0	3.56	0	0	11.78
0	4.67	4.56	0	0	0	0	0	0	9.23
0	0	4.56	0	0	0	0	0	0	8.45
0	0	4.56	0	0	0	3.56	0	0	8.11
0	0	4.56	0	0	0	0	0	0	4.56
0	0	4.56	0	0	0	0	0	0	4.56
0	0	4.56	0	0	0	0	0	0	4.56

On-Road Bicycle Facility Prioritization

Roadway	From	To	Facility Type	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
FIFTH ST	STAGECOACH	CENTER	Bike Lane & Traffic Calming	4,385	3.89	4.44	0	3.67	
FOURTH ST	North dead end	South dead end	Bicycle Boulevard	5,268	3.89	4.44	0	3.67	
SECOND ST	W WASHINGTON	South Mebane Elementary School	Bicycle Boulevard	2,717	3.89	4.44	0	3.67	
EIGHTH ST	MEBANE OAKS	E WASHINGTON	Bike Lane	7,772	3.89	4.44	0	3.67	
JACKSON ST	MADISON ST	S EIGHTH	Bicycle Boulevard	3,910	3.89	4.44	0	3.67	
S THIRD ST	TROLLINGWOOD	South Mebane Elementary School	Paved Shoulder	15,415	3.89	0	0	3.67	
SECOND ST	W CENTER	North dead end	Bicycle Boulevard	1,680	0	4.44	0	0	
CLAY ST	N CHARLES	N FIFTH	Bicycle Boulevard	2,653	0	4.44	0	0	
RUFFIN ST	N CHARLES	N FOURTH	Bike Lane	1,993	0	4.44	0	0	
N CHARLES ST	W STAGECOACH	W CARR	Bicycle Boulevard	2,680	0	4.44	4.00	0	
WASHINGTON ST	S FIRST	S FIFTH	Shared Lane	1,793	3.89	4.44	0	0	
CENTER ST	N SECOND	N FIFTH	Shared Lane	1,390	0	4.44	0	3.67	
ROOSEVELT ST	S FIRST	S FIFTH	Bicycle Boulevard	1,788	3.89	4.44	0	3.67	
MOORE ST	W HOLT	South to proposed trail	Signage	641	3.89	4.44	0	3.67	
GILES ST	W HOLT	ROOSEVELT	Signage	2,003	3.89	4.44	0	3.67	
MADISON ST	W HOLT	W JACKSON	Signage	369	3.89	4.44	0	3.67	
W HOLT ST	S FOURTH	MADISON	Shared Lane	1,824	3.89	4.44	0	3.67	
CARR ST	W STAGECOACH	W CARR	Paved Shoulder	2,648	0	4.44	4.00	0	
E BROWN/LEBANON RD	N FIFTH	E STAGECOACH	Paved Shoulder	6,094	0	4.44	0	3.67	
CENTER ST	WOODLAWN	N SECOND	Paved Shoulder	3,514	0	4.44	0	3.67	
CENTER ST	N FIFTH	N NINTH	Paved Shoulder	1,910	0	4.44	0	3.67	
MEBANE OAKS/ FALCON	North end of Falcon Ln	OLD HILLSBOROUGH	Paved Shoulder	7,121	0	0	0	3.67	

Pedestrian/Bicycle Crash Location	Connects to Existing Trail or Bike Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Separation from Motor Vehicle Traffic	TOTAL
0	4.67	4.56	4.33	4.33	4.78	0	4.33	5	44.00
0	4.67	4.56	0	4.33	4.78	0	4.33	5	39.67
0	4.67	4.56	0	4.33	4.78	0	4.33	5	39.67
0	4.67	4.56	0	4.33	4.78	3.56	0	5	38.90
0	4.67	4.56	0	4.33	4.78	0	0	5	35.34
0	0	4.56	4.33	4.33	4.78	3.56	0	3	32.12
0	4.67	4.56	0	4.33	4.78	0	4.33	5	32.11
0	4.67	4.56	0	4.33	4.78	0	4.33	5	32.11
0	4.67	4.56	0	4.33	4.78	0	4.33	5	32.11
0	4.67	4.56	0	4.33	4.78	0	0	5	31.78
4.56	4.67	4.56	0	4.33	4.78	0	0	0	31.23
0	4.67	4.56	0	4.33	4.78	0	4.33	0	30.78
0	0	4.56	0	4.33	4.78	0	0	5	30.67
0	4.67	4.56	0	4.33	4.78	0	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	3	29.78
4.56	4.67	4.56	0	4.33	0	0	0	3	29.23
0	0	4.56	0	4.33	4.78	0	4.33	3	29.11
0	4.67	4.56	0	4.33	0	0	4.33	3	29.00
4.56	4.67	4.56	4.33	0	0	3.56	0	3	28.35

On-Road Bicycle Facility Prioritization

Roadway	From	To	Facility Type	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
ARROWHEAD BLVD	MEBANE OAKS	OAKWOOD	Paved Shoulder	5,107	3.89	4.44	0	3.67	
GRAHAM ST	N FIRST	N NINTH	Shared Lane	3,515	0	4.44	0	0	
FIRST ST	W CRAWFORD	W RUFFIN	Shared Lane	781	0	4.44	0	0	
NINTH ST	E CENTER	E STAGECOACH	BICYCLE BOULEVARD	4,933	0	4.44	0	3.67	
MCKINLEY	S SECOND	West to dead end	Signage	589	3.89	4.44	0	3.67	
VANCE ST	West dead end	East dead end	Signage	1,424	3.89	4.44	0	3.67	
FIRST ST	STAGECOACH	W CRAWFORD	Paved Shoulder	2,534	0	4.44	0	0	
WASHINGTON ST	S FIFTH	S EIGHTH	Paved Shoulder	1,517	0	0	0	3.67	
OAKWOOD ST	S EIGHTH	MATTRESS FACTORY	Paved Shoulder	9,276	3.89	4.44	0	3.67	
ELEVENTH ST	E WASHINGTON	OAKWOOD	Paved Shoulder	1,859	3.89	4.44	0	3.67	
CRAWFORD ST	N CHARLES	N FIFTH	BICYCLE BOULEVARD	2,743	0	4.44	0	0	
NC 119	LANDI	E STAGECOACH	Paved Shoulder	8,266	3.89	0	0	3.67	
N WILBA RD	W STAGECOACH	W CRAWFORD	Paved Shoulder	2,450	0	4.44	0	0	
CORRIGIDOR ST	S THIRD	North dead end	Paved Shoulder	2,201	0	0	0	3.67	
US 70/CENTER	N NINTH	SUPPER CLUB	Paved Shoulder	1,310	0	0	0	3.67	
S FIFTH ST	HOLMES	FALCON	Paved Shoulder	6,688	0	0	0	0	
MATTRESS FACTORY	E WASHINGTON	OAKWOOD	Paved Shoulder	4,123	3.89	4.44	0	3.67	
MCPHERSON	S FIFTH	AO SMITH	Signage	2,618	0	0	0	3.67	
CEDAR LN/AO SMITH	S EIGHTH	MCPHERSON	Signage	2,138	0	0	0	3.67	
SEBASTIAN CT	West dead end	East dead end	Signage	749	0	4.44	0	0	
NINTH ST	E STAGECOACH	North dead end	Signage	957	3.89	0	0	3.67	
CENTER ST	WOODLAWN	West to proposed trail	Paved Shoulder	4,620	0	0	0	3.67	
S NC 119	LOWES	HOLMES	Paved Shoulder	2,309	0	0	0	0	

Pedestrian/Bicycle Crash Location	Connects to Existing Trail or Bike Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Separation from Motor Vehicle Traffic	TOTAL
0	4.67	4.56	0	0	0	3.56	0	3	27.79
0	4.67	4.56	0	4.33	4.78	0	4.33	0	27.11
0	4.67	4.56	0	4.33	4.78	0	4.33	0	27.11
0	4.67	4.56	0	4.33	0	0	0	5	26.67
0	0	4.56	0	4.33	4.78	0	0	0	25.67
0	0	4.56	0	4.33	4.78	0	0	0	25.67
0	0	4.56	0	4.33	4.78	3.56	0	3	24.67
4.56	0	4.56	0	4.33	0	0	4.33	3	24.45
0	0	4.56	0	4.33	0	0	0	3	23.89
0	0	4.56	0	4.33	0	0	0	3	23.89
0	0	4.56	0	4.33	4.78	0	0	5	23.11
0	0	4.56	0	4.33	0	3.56	0	3	23.01
0	0	4.56	0	4.33	4.78	0	0	3	21.11
0	0	4.56	0	4.33	4.78	0	0	3	20.34
0	4.67	4.56	0	4.33	0	0	0	3	20.23
0	4.67	4.56	4.33	0	0	3.56	0	3	20.12
0	0	4.56	0	0	0	0	0	3	19.56
0	4.67	4.56	0	0	4.78	0	0	0	17.68
0	4.67	4.56	0	0	4.78	0	0	0	17.68
0	0	4.56	0	4.33	0	3.56	0	0	16.89
0	4.67	4.56	0	0	0	0	0	0	16.79
0	0	4.56	0	0	4.78	0	0	3	16.01
0	0	4.56	0	0	4.78	3.56	0	3	15.90

On-Road Bicycle Facility Prioritization

Roadway	From	To	Facility Type	Length (Feet)	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
WASHINGTON ST	S EIGHTH	MATTRESS FACTORY	Paved Shoulder	4,271	0	0	0	3.67	
SUPPER CLUB	LEBANON	US 70/CENTER	Paved Shoulder	1,966	0	0	0	3.67	
FIELDSTONE DR	NC 119	S THIRD	Paved Shoulder	2,235	0	0	0	3.67	
ALBERTA ST	W HOLT	South to proposed trail	Signage	226	0	0	0	0	
CURRY ST	W HOLT	Dead end	Signage	890	0	0	0	0	
FITCH DR	W HOLT	FITCH DR	Signage	1,884	0	0	0	0	
FITCH DR	W HOLT	FITCH DR	Signage	1,480	0	0	0	0	
AVALON	S EIGHTH	East end	Signage	1,879	0	0	0	3.67	
LONDON LN	EMERSON	MCGREGOR	Paved Shoulder	3,511	0	0	0	0	
CORPORATE PARK DR	S THIRD	PARK CENTER	Paved Shoulder	2,803	0	0	0	3.67	
E WASHINGTON	MATTRESS FACTORY	SARGENTS PATH	Paved Shoulder	1,605	0	0	0	0	

	Pedestrian/Bicycle Crash Location	Connects to Existing Trail or Bike Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	Separation from Motor Vehicle Traffic	TOTAL
	0	0	4.56	0	4.33	0	0	0	3	15.56
	0	0	4.56	0	4.33	0	0	0	3	15.56
	0	0	4.56	0	4.33	0	0	0	3	15.56
	0	4.67	4.56	0	4.33	0	0	0	0	13.56
	0	4.67	4.56	0	4.33	0	0	0	0	13.56
	0	4.67	4.56	0	4.33	0	0	0	0	13.56
	0	4.67	4.56	0	4.33	0	0	0	0	13.56
	0	4.67	4.56	0	0	0	0	0	0	12.90
	0	0	4.56	0	4.33	0	0	0	3	11.89
	0	0	4.56	0	0	0	0	0	3	11.23
	0	0	4.56	0	0	0	0	0	3	7.56

Shared Use Trail Prioritization

From	To	Length (Miles)	Description	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
Mebane Arts & Community Center property	W Jackson	1.00	Sewer easement north to W Jackson. Connects Vance, W Lee, W McKinley, and Stonewall	3.89	4.44	0	3.67	
Roosevelt	Hawfields	0.66	East-west sewer easement from Roosevelt, along South Mebane ES property, to Hawfields	3.89	4.44	0	3.67	
Dodson	S First	1.61	Sidepath along W Holt	3.89	4.44	0	3.67	
W Carr	W Holt	0.32	Trail from W Carr along EM Yoder ES property, south to Center St	3.89	4.44	0	3.67	
S Fifth	W Center	2.02	Sidepath along NC 119	0	0	0	3.67	
I-40	NC 119	1.30	Sewer easement south through Hawfields MS, west to NC 119. Spur trail to Spring Forest & Deerfield	0	0	4.00	0	
Moore	Mebane Arts & Community Center property	0.37	Sewer easement from south end of Moore to northern edge of Mebane Arts & Community Center property	3.89	4.44	0	3.67	
Vance	Mebane Arts & Community Center property	0.24	Sewer easement from south end of Vance to northern edge of Mebane Arts & Community Center property	3.89	4.44	0	3.67	
N Carr	N Ninth	0.73	Sidepath along Stagecoach Rd	3.89	4.44	0	0	
S Fifth at NC 119	I-40	0.29	Short sewer easement connection (Potential future bridge location)	0	0	0	0	
S Fifth	I-40	0.31	Short sewer easement connection near Terrell St	0	0	0	0	
Deerfield	South of White Ct	1.10	Sidepath along NC 119	3.89	0	0	0	
E McPherson	Oakwood	0.22	Sewer easement from McPherson south to Avalon and east to Oakwood	3.89	4.44	0	3.67	
Mrs Fuller	Stagecoach	1.44	Sidepath along NC 119	3.89	0	0	0	
S Lane	Mattress Factory	1.62	Sidepath along Oakwood	3.89	4.44	0	3.67	
S Fifth	Mebane Oaks	0.19	Sewer easement from S Fifth, across Arrowhead Ln and S Eighth, then south and west to Mebane Oaks	0	0	0	3.67	
E Stagecoach	N Fourth	0.42	Follows sewer easement north-south between N Third and N Fifth	0	4.44	0	0	
E Sebastian	E Orange	0.30	Sewer easement southeast from east end of E Sebastian to west end of E Orange	0	4.44	0	0	
Woodlawn	N Carr	0.93	Sidepath along Stagecoach Rd	0	4.44	0	0	

Pedestrian/Bicycle Crash Location	Connects to Existing Trail or Bike Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	TOTAL
0	4.67	4.56	0	4.33	4.78	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	30.34
0	4.67	4.56	0	4.33	4.78	0	0	30.34
0	4.67	4.56	4.33	4.33	4.78	3.56	0	29.90
0	4.67	4.56	0	4.33	4.78	3.56	0	25.90
0	0	4.56	0	4.33	4.78	0	0	25.67
0	0	4.56	0	4.33	4.78	0	0	25.67
0	4.67	4.56	0	4.33	0	3.56	0	25.45
0	0	4.56	4.33	4.33	4.78	3.56	0	21.56
0	0	4.56	4.33	4.33	4.78	3.56	0	21.56
0	4.67	4.56	0	0	4.78	3.56	0	21.46
0	4.67	4.56	0	0	0	0	0	21.23
0	4.67	4.56	0	4.33	0	3.56	0	21.01
0	0	4.56	0	4.33	0	0	0	20.89
0	4.67	4.56	4.33	0	0	3.56	0	20.79
0	4.67	4.56	0	4.33	0	0	0	18.00
0	4.67	4.56	0	4.33	0	0	0	18.00
0	4.67	4.56	0	4.33	0	0	0	18.00

Shared Use Trail Prioritization

From	To	Length (Miles)	Description	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
Fitch	Mebane Arts & Community Center property	0.53	Sewer easement south from Fitch to north end of Corregidor	0	0	0	3.67	
NC 119	Mebane Arts & Community Center property	0.58	Sewer easement from NC 119 east along Huckleberry Loop to north end of Corregidor	0	0	0	3.67	
E Webb	Cedar	0.23	North-south sewer easement found to the west of S Lane	0	0	0	3.67	
Gibson	Corporate Park	0.96	Sidepath along S Third St	0	0	0	3.67	
Corporate Park sewer easement	NC 119	0.30	Sidepath along Corporate Park from sewer easement, north to Park Center, east to NC 119	0	0	0	3.67	
Ashland	Stagecoach	0.23	Sidepath along Lebanon	0	0	0	3.67	
Sewer easement between N Third and N Fifth	Food Lion	0.09	Follows sewer easement to the backside of the Food Lion	0	4.44	0	0	
N First	E Stagecoach	0.42	Follows sewer easement from N First southeast to E Stagecoach. Spur to north end of Ninth	3.89	0	0	3.67	
Sargents Path	Mattress Factory	0.82	Short sewer easement from south end of Sargents Path to Mattress Factory	3.89	4.44	0	3.67	
NC 119	B	1.02	Sidepath along Old Hillsborough Rd	0	0	0	0	
N Ninth	Mill Creek	1.23	Sidepath along Stagecoach & Lebanon	0	0	0	0	
Briarwood	S Fifth	0.07	Sewer easement from Briarwood south across S Third and London Ln to S Fifth. Spur to Falcon Ln.	0	0	0	0	
N First	Sam Snead	0.09	Follows sewer easement for short trail connection northeast from N First to Sam Snead	0	0	0	3.67	
Birkdale	Corporate Park	0.67	East-west sewer easement	0	0	0	3.67	
Lake Michael	Village Lake	0.15	Follows sewer easement to connect to end of Village Lake Dr	0	0	0	3.67	
Fitch	Alberta	0.14	Sewer easement from Fitch to south end of Alberta	0	0	0	3.67	
Curry	Fitch	0.07	Short sewer easement connection from south end of Curry to Fitch	0	0	0	3.67	
N First	N First	0.83	Follows sewer easement along Swift Creek south, to east end of Briarcliff, then SE back to N First	3.89	0	0	3.67	

Pedestrian/Bicycle Crash Location	Connects to Existing Trail or Bike Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	TOTAL
0	0	4.56	0	4.33	4.78	0	0	17.34
0	0	4.56	0	4.33	4.78	0	0	17.34
0	4.67	4.56	0	4.33	0	0	0	17.23
0	4.67	4.56	4.33	0	0	0	0	17.23
0	4.67	4.56	0	4.33	0	0	0	17.23
4.56	0	4.56	0	4.33	0	0	0	17.12
0	0	4.56	0	4.33	0	3.56	0	16.89
0	4.67	4.56	0	0	0	0	0	16.79
0	0	4.56	0	0	0	0	0	16.56
0	4.67	4.56	0	0	4.78	0	0	14.01
4.56	4.67	4.56	0	0	0	0	0	13.79
0	4.67	4.56	0	4.33	0	0	0	13.56
0	4.67	4.56	0	0	0	0	0	12.90
0	4.67	4.56	0	0	0	0	0	12.90
0	0	4.56	0	4.33	0	0	0	12.56
0	0	4.56	0	4.33	0	0	0	12.56
0	0	4.56	0	4.33	0	0	0	12.56
0	0	4.56	0	0	0	0	0	12.12

Shared Use Trail Prioritization

From	To	Length (Miles)	Description	Low-Income Area	Low Vehicle Access Area	High Density Population Area	High Minority Population Area	
Arrowhead	I-40	0.22	Sewer easement south from Arrowhead into Tanger Outlets, southwest to I-40 crossing (future bridge)	0	0	0	3.67	
Arrowhead at Pear Tree	Private (Tanger Outlets)	0.05	Short trail connection to Tanger Outlets	0	0	0	3.67	
Dodson	Woodlawn	1.40	Sidepath along Stagecoach Rd	0	0	0	0	
Longleaf Pine	Old Hillsborough	0.18	Sewer easement traveling southwest from Longleaf Pine to Old Hillsborough	0	0	0	0	
Mebane Rogers	US 70	1.16	Sidepath along Dodson	0	0	0	0	
Lebanon Rd	St Andrews Dr	1.34	Sewer easement between Lebanon Rd and St Andrews Dr	0	0	0	0	
Wilson	B	0.78	North-south sewer easement from Wilson, across Forest Oaks, to north end of B St. Spur to Connolly	0	0	0	0	
Forest Oaks	Sutton	0.11	Forest Oaks-Sutton Place Connector	0	0	0	0	
Supper Club	Ashbury	0.38	Sidepath along US 70	0	0	0	0	
Copper	Trollingwood Hawfields	0.11	Short sewer easement connection	0	0	0	3.67	
Lebanon	Mockingbird	0.19	Follows sewer easement to connect to end of Mockingbird Ln	0	0	0	3.67	
Lebanon	Creeks Edge	0.16	Follows sewer easement to connect to end of Creeks Edge Ct	0	0	0	3.67	
Bob White	US 70	0.08	Short trail connection from south end of Bob White to US 70	0	0	0	0	

	Pedestrian/Bicycle Crash Location	Connects to Existing Trail or Bike Route	Connects to Proposed Facility	Top 3 Need from Public Comments	Park, library, or recreation center within 1/2 mile	Grade school within 1/2 mile	Connects to Shopping/ Business Areas	Connects to Downtown	TOTAL
	0	0	4.56	0	0	0	3.56	0	11.79
	0	0	4.56	0	0	0	3.56	0	11.79
	0	0	4.56	0	0	4.78	0	0	9.34
	0	0	4.56	0	0	4.78	0	0	9.34
	0	0	4.56	0	0	4.78	0	0	9.34
	0	4.67	4.56	0	0	0	0	0	9.23
	0	4.67	4.56	0	0	0	0	0	9.23
	0	4.67	4.56	0	0	0	0	0	9.23
	0	0	4.56	0	4.33	0	0	0	8.89
	0	4.67	0	0	0	0	0	0	8.34
	0	0	4.56	0	0	0	0	0	8.23
	0	0	4.56	0	0	0	0	0	8.23
	0	0	4.56	0	0	0	0	0	4.56

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